CENTER ON FINANCE, LAW & POLICY
UNIVERSITY OF MICHIGAN

CENTRAL BANK
OF THE FUTURE

Central Bank of the Future

Working Paper 1

Released July 8, 2019

Authors

Adrienne A. Harris
adrienah@umich.edu

Michael S. Barr
msbarr@umich.edu

The authors thank the Bill & Melinda Gates Foundation for their support of this research. They also thank the research assistants at the University of Michigan's Center on Finance, Law & Policy, especially Jennifer Chasseur, Charmaine Chua, Jessica Kaplan, Safia Sayed, Emma Waitzman, and Michael Xu.

Center on Finance, Law & Policy
University of Michigan
Weill Hall Suite 5211
735 S. State St.
Ann Arbor, MI 48109

http://financelawpolicy.umich.edu/central-bank-research

Abstract

The goal of this paper is to provide an early research note, beginning to build a foundation for a series of forthcoming Central Bank of the Future (CBOTF) papers, so that readers embark on this journey with a basic understanding of the evolution of Central Bank involvement in financial inclusion. This paper acknowledges several contributions to the research on Central Bank involvement in financial inclusion but is not intended to be an exhaustive review of current work.[1] Rather, this paper seeks to provide research summaries and a few case studies to provide a high-level overview of the nexus between Central Banks and financial inclusion. Future CBOTF papers will take a deeper dive into both traditional and potential new pillars of Central Bank mandates, including the potential impact of fintech and regtech, for financial inclusion. The final paper in the series will synthesize the previous papers and recommend potential stakeholder investments towards improving financial inclusion through Central Bank policy and financial regulation.

History and Early Developments of Central Banks' Involvement in Financial Inclusion

Countries created Central Banks at different times and in different contexts to assist in reaching government goals, including serving Treasury functions, facilitating commerce, and advancing stable economies. (Barr, Jackson, & Tahyar, 2018, pp. 935-938; Mishkin & Eakins, 2012, pp. 225-226, 244-255). Today, many Central Banks around the world conduct monetary policy, supervise financial institutions, and foster payment system safety and efficiency (Board of Governors of the Federal Reserve System, n.d.). When preventative measures for safety and soundness fail, Central Banks often implement emergency measures to manage financial crises, serving as a lender of last resorts (Thornton, 1802; Bagehot, 1873; Campbell & Lastra, 2009).

Central Banks' mandates have changed over time, and in some cases have broadened beyond peace stability, financial stability, and payments, to include broader measures of financial inclusion. This expansion started slowly as individual countries and their financial regulators explored the nexus between banking and broad-based economic growth. For example, in 1977, the United States Congress enacted the Community Reinvestment Act, placing responsibility on the Federal Reserve (and other financial regulators) to ensure banks met an affirmative duty

[1] The World Bank's Global Financial Inclusion and Consumer Protection (FICP) Survey (available at http://www.worldbank.org/en/topic/financialinclusion/brief/ficpsurvey) provides a comprehensive overview of financial inclusion efforts of all financial sector authorities, including central banks.

to serve the needs of their surrounding communities.[2] The same year, the Indian government tasked the Reserve Bank of India with overseeing the Integrated Rural Development Programme to alleviate rural poverty through bank credit (Reserve Bank of India, 2019).

By the 1990s, more Central Banks began to follow suit in incorporating social measures into their core responsibilities. Beginning in 1992, the Central Bank of Brazil sought partnerships with stakeholders and hosted events on issues of inclusion (Alliance for Financial Inclusion, 2018). In 2001, the State Bank of Pakistan issued an Ordinance for Microfinance Institutions, with the first item in the preamble stating that it "is expedient to promote . . . organizational, financial and infrastructural support to poor persons, particularly poor women, for mitigating poverty and promoting social welfare and economic justice through community building and social mobilization. . . ." (State Bank of Pakistan, 2007).

By 2010, the effort to incorporate financial inclusion into the mandates of Central Banks gained international and collective momentum. At their Toronto and Korea Summits in 2010, the G20 countries endorsed a set of recommendations known as "The Principles for Innovative Financial Inclusion" and a Financial Inclusion Action Plan. To carry forward these new commitments, the G20 established the Global Partnership for Financial Inclusion (GPFI) as the main implementing platform. GPFI engages partners from G20 and non-G20 countries, the private sector, civil society, and various regional, national and international bodies for systematic coordination and implementation of the Action Plan, and to raise awareness of financial inclusion (Global Partnership for Financial Inclusion, 2011). Additionally, in 2016,, the G20 crafted High-Level Principles for Digital Financial Inclusion, intended to build on the success of GPFI's 2010 work (G20 Financial Inclusion Experts Group, 2010), which includes eight principles to assist member countries in "balanc[ing] the promise of digital [financial] innovation" for financial inclusion with its risks (Global Partnership for Financial Inclusion, 2016). Much of the work outlined by these G20 initiatives relies heavily on Central Banks and other financial regulators for implementation.

In 2011, the Alliance for Financial Inclusion (AFI), a global network of concerned policymakers and supervisors, issued the Maya Declaration, a "global and measurable set of commitments" to financial inclusion (Alliance for Financial Inclusion, n.d.). Starting as a Bill & Melinda Gates Foundation-funded project, AFI has encouraged Central Banks and other financial regulatory institutions from more than 90 low- and middle-income countries to pledge commitment to financial inclusion by endorsing the Maya Declaration (Alliance for

---

[2] The Community Reinvestment Act (1997) "requires the Federal Reserve and other federal banking regulators to encourage financial institutions to help meet the credit needs of the communities in which they do business, including low- and moderate-income (LMI) neighborhoods."

Financial Inclusion, 2019). The first adopters included Brazil, Burundi, Ethiopia, Fiji, Guinea, Kenya, Malawi, Nigeria, Pakistan, and Paraguay.[3]

Most recently, in April 2013, the World Bank Group (WBG) launched its Financial Inclusion Support Framework (FISF). The FISF is an "initiative that aims to accelerate and increase the effectiveness of reforms and other country-led actions to achieve national financial inclusion goals." The initiative "supports analysis, synthesis, and knowledge-sharing in key underserved areas" and provides technical assistance to "build on and contribute to public and private sector commitment to financial inclusion." Participating countries have included Côte d'Ivoire, Indonesia, Ethiopia, Mozambique, Pakistan, Rwanda, Vietnam and Zambia (World Bank, 2018).

Central Banks and Financial Inclusion Landscape from Selected Research

Researchers have been exploring the evolution of Central Banks' involvement in financial inclusion and have conducted multiple surveys and studies to better understand the impact of Central Bank work on connecting individuals to financial services.

In 2015, The Bank for International Settlements (BIS) Irving Fisher Committee on Central Bank Statistics (IFC) conducted a survey of 47 of 91[4] of its Central Bank members on financial inclusion. The survey aimed to "compare [Central Bank] financial inclusion policies . . . [across the following] dimensions: definitions; central bank mandates, policies and governance; data types and sources; contribution to international initiatives and global forums" (Tissot and Gadanecz, 2017). The survey concluded that half of the Central Banks self-reported no financial inclusion mandate, but most Central Banks did report objectives related to financial inclusion. The survey revealed the need for more clarification, communication and collaboration in the work on Central Banks and financial inclusion: for example, that "[o]fficial definitions of financial inclusion are not widespread... [or] harmonised across countries" and that "[c]entral banks that do not currently use an official definition of financial inclusion should

[3] Central Banks that adopted the Maya Declaration include: Banco Central do Brazil, Bank of the Republic of Burundi, National Bank of Ethiopia, Reserve Bank of Fiji, Central Bank of Guinea, Central Bank of Kenya, Reserve Bank of Malawi, Central Bank of Nigeria, State Bank of Pakistan, and Central Bank of Paraguay.

[4] See Bank for International Settlements (2007) for a complete list of 91 BIS IFC Central Bank members. See also CGAP (2018, pg. 2), which notes "[a]s of 2018, the number of countries publicly committed to promoting financial inclusion tops 90 and continues to grow… Many of these countries' financial regulators and supervisors are explicitly tasked with implementing policies and strategies on financial inclusion (I) alongside their core responsibilities for promoting micro- and macroprudential stability (S), financial integrity (I), and protecting financial consumers (P), collectively referred to as I-SIP."

consider the merits and drawbacks of having one"; that "operations in… [the financial inclusion] domain are often decentralised" and "adequate governance structures may have to be put in place"; and that "[m]ost survey participants saw a clear need for international data-sharing and cross-country harmonisation of financial inclusion definitions and measures" (Tissot and Gadanecz, 2016). In addition, the BIS report cites a "data gap" pertaining to "the assessment of financial inclusion policy implementation…" and concludes that "existing data collection frameworks are rarely designed to directly assess whether policy targets in the area of financial inclusion are being met." The BIS report mentions the Bill & Melinda Gates Foundation as a potential data provider for these initiatives (Tissot and Gadanecz, 2017, pp. 6). Other key data sources, including the Global Findex and The World Bank's Global Financial Inclusion and Consumer Protection (FICP) Survey, are discussed in more detail below.

In addition to BIS's work, the World Bank's Universal Financial Access 2020 (UFA2020) framework is a key initiative that aims to achieve "Universal Financial Access by 2020... and help promote financial inclusion" (World Bank, 2018). The World Bank UFA2020 website shows both global and country progress on financial access, drawing on both the Findex and the Global Financial Inclusion and Consumer Protection (FICP) Survey 2017.

> "The UFA2020 initiative . . . focus[es] on 25 countries[5] where 73% of all financially excluded people live [, but] the WBG's financial inclusion work is not limited to these countries. Based on estimates and key interventions identified in the UFA framework, countries *worldwide* have the opportunity to enable access to a transaction account and other financial services to:
>
> - **1.3 billion adults** by opening up the regulatory environment and market to reach financially active, unbanked adults who currently save, remit or pay bills in cash.
> - **167 million adults** by digitizing government (G2P) payments provided to unbanked adults and depositing them directly into transaction accounts.
> - **802 million adults** by developing and implementing national financial inclusion strategies (NFIS) to coordinate financial inclusion efforts and increase the number of banked adults over time.

[5] Bangladesh, Brazil, China, Colombia, Cote d'Ivoire, DRC, Egypt, Ethiopia, India, Indonesia, Kenya, Mexico, Morocco, Mozambique, Myanmar, Nigeria, Pakistan, Peru, Philippines, Rwanda, South Africa, Vietnam, Tanzania, Turkey, and Zambia (World Bank, 2019).

> These opportunities are not exhaustive, and they overlap. Key enablers like financial capability, adequate consumer protection and/or financial infrastructure also are needed to foster the full reach to the unbanked." (World Bank, 2019).

Another robust example of research on Central Bank involvement in financial inclusion is an Asian Development Bank Institute (ADBI) Working Paper published in 2016, which assesses financial inclusion in a number of developed and developing economies in Europe and Asia (Yoshino and Morgan, 2016). Its findings highlight factors that inhibit financial inclusion, in addition to key approaches countries may adopt in order to expand inclusion. Aside from national-level strategies, the paper identifies strategies led by Central Banks as most effective in promoting financial inclusion. The paper proceeds to highlight key Central Bank initiatives and strategies, including regulatory measures such as simplified identification requirements for opening a financial institution account and licensing of microfinance institutions to allow them to accept deposits, as well as financial education initiatives. The paper cites examples of countries, including India and Bangladesh, that have made strides in financial inclusion, in large part thanks to active efforts by their Central Banks. The Reserve Bank of India, for example, has enacted rules for the opening of rural bank branches and promoted a diverse range of bank types and accounts, including "no-frills" accounts with minimal or even nonexistent minimum balance requirements. Similarly, the Bangladesh Bank has increased the reach of financial services in rural areas through expansion of rural bank branches and implementation of "Taka 10" accounts allowing farmers to obtain collateral-free loans ("Tk 2b fund," 2014).

Research, such as in the reports cited above, relies heavily on data compiled from a variety of sources. Indeed, much of the challenge surrounding financial inclusion is in collecting robust and consistent data by which to measure progress and the efficacy of specific policy and/or programmatic initiatives. Just as the BIS suggests that the Bill and Melinda Gates Foundation (BMGF) be a resource for financial inclusion data, much of the research points to other data sources, including, most notably, The Global Findex (which itself originated as a BMGF project) and The World Bank's Global Financial Inclusion and Consumer Protection (FICP) Survey 2017.[6] These are two examples of data sources that cover a significant portion of the globe and serve as an important basis for the CBOTF research project. The Global Findex,

[6] Still other data sources include the IMF Financial Access Survey which has collected more than 10 years of data since 2009 assessing "supply-side... [information] on access to and use of financial services" in 189 countries ("What Is the Financial Access Survey (FAS)?", n.d.); Finscope Survey which explores financial inclusion on the demand side and which touts itself as "the most comprehensive demand side instrument of its kind" (FinMark Trust, n.d.); and the World Bank Global Payment Systems Survey, "the only global survey that… covers all aspects of a national payment system" (World Bank, 2018).

supported by both the World Bank and the BMGF, is the most comprehensive source of data on global financial inclusion and an authoritative measure of a variety of key indicators (World Bank, n.d.). The Findex assesses, for example, the percentage of a country's residents who possess a financial institution account, who used the internet to pay bills, who saved, borrowed, or invested funds for a range of purposes, and who received wages (Demirgüç-Kunt et al., 2018). These measures are further disaggregated by gender, age, income, education, and urban/rural status. In addition to providing a baseline for measuring financial inclusion, the Findex database investigates explanatory factors for lack of inclusion. For those who do not have a financial institution account, for example, the Findex surveys potential reasons for exclusion, including geographic distance, distrust, and lack of documentation. Findex is thus a useful tool in examining the extent of financial inclusion and in identifying means for redress on a country-by-country basis. The scope of Findex is global, and survey data are available from years 2011, 2014, and 2017.

While the Findex tracks financial inclusion from a consumer standpoint, the Global FICP Survey 2017 surveys financial sector authorities in an effort to understand each country's "policy, legal, regulatory, and supervisory [approach to] financial inclusion and financial consumer protection" (World Bank, 2017). It thus takes a broad look at national policy towards financial inclusion, noting, among other things, whether a country has a national financial inclusion strategy, which activities various institutions are permitted to undertake, and the extent to which legal requirements safeguard consumer protection (World Bank, 2017)[7]. Representing "more than 90% of the world's unbanked... population", the Global FICP Survey 2017 contains self-reported survey responses from financial sector authorities from 124 jurisdictions and 141 economies (World Bank, 2017). The survey focuses on regulated financial service providers offering retail credit, and deposit and/or payment products and services, and surveys whether there are efforts to improve the enabling environment for financial inclusion and financial consumer protection. According to the 2017 survey, financial sector authorities are increasingly implementing policy strategies oriented towards financial inclusion, but progress is uneven. A vast majority of surveyed jurisdictions have enacted regulations to safeguard e-money funds (86 percent) and allow third-party agents to deliver financial services (85 percent). Only half of jurisdictions, however, have simplified documentation requirements for opening a financial institution account. And even fewer (27 percent) jurisdictions report the institution of national financial inclusion strategies.

Case Studies: Mexico, China, India & Ghana

[7] See Global Financial Inclusion and Consumer Protection Survey, 2017 Report.

Several jurisdictions and their Central Banks are pursuing policies and programs to increase financial inclusion. The following section outlines a few examples of Central Banks active in the work of financial inclusion, whether as a result of legislative mandate or internal program decisions. The case studies below are not intended to be an exhaustive outline of Central Bank activities, but rather are intended to show a sample of work taking place by Central Banks in different regions.

Banco de México

In October 2011, the Mexican government created the National Council for Financial Inclusion (Comisión Nacional de Inclusión Financiera; CONAIF) through an executive order by President Felipe Calderón Hinojosa (Office for the Treasury and Public Credit, 2011). The National Council for Financial Inclusion includes members from the Ministry of Finance, the Bank of Mexico, and the National Banking and Securities Commission, among others. CONAIF was originally tasked with the development of Mexico's National Policy for Financial Inclusion, which launched in June 2016 and embodies six public policy pillars meant to address specific challenges of financial inclusion, including the use of financial technological innovations for financial inclusion (National Council for Financial Inclusion, 2016).

In addition to CONAIF, the National Banking and Securities Commission (Comisión Nacional Bancaria y de Valores; CNBV) and the National Institute of Statistics and Geography (Instituto Nacional de Estadística y Geografía; INEGI) conducted the first National Survey of Financial Inclusion (Encuesta Nacional de Inclusión Financiera; ENIF) in 2012 (Comisión Nacional Bancaria y de Valores, 2012). Since then, two additional surveys were administered in 2015 and 2018. The main goal of the surveys is to better understand whether those who live in the country have access to any type of banking or other financial instrument. According to their findings, 14.6 million people in Mexico were brought into the financial system between 2012 and 2018. In other words, México increased from 39.4 million people in the banking system in 2012 to 54 million by 2018 (National Council for Financial Inclusion, 2018). Overall, the percentage of adults who had a bank account increased from 27.4 percent in 2011 to 36.9 percent in 2017.[8]

One key finding of the survey is that most people in the country do not trust the financial system and prefer alternative saving and credit mechanisms (i.e. rotating savings and credit associations (ROSCAs)) and alternative lenders (payday loans or pawnshops). These

[8] Supplementary data are available from the World Bank Global Findex Database 2017 (World Bank, 2018). See https://globalfindex.worldbank.org/#data_sec_focus.

alternatives are usually riskier and more expensive options compared to traditional banking (National Council for Financial Inclusion, 2018), and therefore reliance on these services is a key driver for the government's desire to increase access to traditional providers. In addition to promoting access to safer, less expensive financial products and services, the Mexican government and Central Bank are focused on financial inclusion because the extensive use of cash as a means of payment imposes high costs on consumers and the government. Relying on cash increases the risk of loss for consumers and prevents individuals from establishing credit histories. Reliance on cash also imposes high administrative and transportation costs on the government (National Council for Financial Inclusion, 2018). For example, the Mexican government saved an estimated 1.27 billion dollars USD in 2012 by digitizing payments for wages, pensions, and social transfers, or 3.3 percent of its annual expenditures (Babatz, 2013). Furthermore, unregistered transactions decrease government revenue that would have been collected from value added taxes (National Council for Financial Inclusion, 2018).

Mexico is also exploring technology uses for financial inclusion. In March 2018, the Ministry of Finance and Public Credit and the Bank of Mexico in collaboration with the National Baking and Securities Commission developed a proposal enacted into law by the Mexican Congress to regulate financial technologies (FinTech Law). The FinTech Law is based on five principles and is intended to enable the National Policy for Financial Inclusion's second pillar - Use of Technological Innovation for Financial Inclusion (Guzman, 2018). It is too early to know the impact of the FinTech Law on financial inclusion, but its enactment and implementing regulation is an important example of how countries and their financial regulators are seeking to leverage fintech innovation to promote financial inclusion.

In addition to the FinTech Law, the Bank of Mexico and the Ministry of Finance and Public Credit are finding uses for fintech in financial inclusion. Recently, the Bank of Mexico announced the introduction of a digital payment system called Cobro Digital (CoDi) (Office for the Treasury and Public Credit, 2019). The CoDi system uses QR codes and smartphones to make payments without using cash and without fees (Banco de Mexico, n.d.). The CoDi system works similarly to WeChat pay in China, without the WeChat interface and social network components.[9] CoDi is aimed specifically at increasing financial inclusion among young people and rural inhabitants. The addition of innovative systems like CoDi to the Mexican financial system demonstrates the efforts of the Mexican government and the Bank of Mexico to democratize financial services and achieve broad-based financial inclusion using technology.

[9] For more information regarding WeChat Pay, see https://pay.weixin.qq.com/wechatpay_guide/quick_pay.shtml.

People's Bank of China

With 78% of Chinese adults able to access a financial institution account as of 2017, China is a regional leader of financial inclusion (Demirgüç-Kunt et al., 2018). Improvement is nonetheless possible, and the People's Bank of China (PBOC) has played a leading role in expanding financial access in rural regions, where financial inclusion is relatively low. The mandate of the People's Bank of China, contained in the Law of the People's Republic of China on the People's Bank of China, states financial stability as the Bank's main objective (People's Republic of China, 1995) and lists traditional central banking responsibilities—monetary policy implementation, payments system oversight—in pursuance of this objective.[10] Nevertheless, in issuing guidelines and regulations, PBOC has promoted financial inclusion, particularly in rural areas.

In 2011, PBOC issued a *Notice on Promoting Bank-card Withdrawal Services for Rural Residents*, which expressly stated a policy strategy to expand previous pilot projects for agent-based service points—nonbank financial access points that facilitate rural engagement with financial services (World Bank Group; People's Bank of China, 2018). PBOC subsequently issued guidelines that increased the services such agents could offer. PBOC also encouraged the proliferation of agent-based service points by working with local governments to financially incentivize their installation. To further promote the success of agent-driven services in rural areas, PBOC developed a financial infrastructure for interbank clearing and issued requirements as necessary to manage financial risk (World Bank Group; People's Bank of China, 2018).

Between 2004 and 2014, PBOC issued four guidelines designed to further enhance payments systems in rural China, including through the stabilization and expansion of rural credit cooperatives. The Bank also provided credit to farmers through its establishment of a supply chain finance platform. PBOC additionally incentivized other financial service providers to similarly expand credit access to farmers through its lending and discounting activities (World Bank Group; People's Bank of China, 2018). Furthermore, PBOC recently shifted its open market operations toward longer-term instruments to stabilize banking system liquidity, increasing the availability of finance (China Banking News, 2018). These measures illustrate PBOC's innovative use of traditional central bank duties to further financial inclusion.

In the 2015 *Guidelines on Promoting Sound Development of Internet Finance,* PBOC identified fintech as an important and growing component of the financial sector. PBOC has adopted a "wait and see" approach in regulating fintech, a strategy it believes contributed to

---

[10] See Article 2 (People's Republic of China, 1995).

the licensing of nearly 300 digital payment providers by 2016 (World Bank Group; People's Bank of China, 2018). PBOC continues to develop its regulatory strategy for fintech, aiming to expand inclusion while mitigating risk (Pymnts, 2019). In 2017, PBOC issued a *Notice Concerning the Migration of Internet-based Payment Transactions of Non-Banking Payment Institutions from the Direct Connection Model Toward the Online Clearing Platform.* The notice stipulates all online payment transactions conducted using third-party payment platforms such as AliPay and WeChat Pay must be administered through a centralized online payment platform. By centralizing digital payments using one platform, PBOC seeks to increase the efficiency of payment transactions, close regulatory loopholes, and provide increased transaction security for users (Xu, 2017). The often conflicting aims of inclusion and risk mitigation were also addressed by PBOC in its issuance of a tiered account system for accounts with both banks and nonbank digital payment providers, allowing for a range of flexibility in account requirements based on account type (World Bank Group; People's Bank of China, 2018).

PBOC also contributes to efforts surrounding data collection and financial literacy, which are both crucial to financial inclusion. Data on financial access allows countries to assess their levels of inclusion and identify means for improvement. To that end, PBOC oversaw the development of new indicators for digital financial inclusion in 2016. Furthermore, the Financial Consumer Protection Bureau of PBOC conducts its own survey each year assessing financial knowledge, attitudes, and behaviors of Chinese financial consumers. To support financial education in China, PBOC celebrates an annual "Month for Popularizing Financial Knowledge" each September, during which it launches educational activities in schools, military camps, and rural areas. PBOC also publishes and distributes a *Book of Financial Knowledge Dissemination* (World Bank Group; People's Bank of China, 2018).

The impact of PBOC's efforts towards financial inclusion in rural areas may be reflected in the percentage of rural adults with financial institution account access, which grew from 58% in 2011 to 78% in 2017, thus achieving near parity with the level of financial inclusivity in the country as a whole (Demirgüç-Kunt et al., 2018). As recently as its annual research conference in April 2019, PBOC signaled continued commitment to furthering rural financial inclusion (China Banking News, 2019).

Reserve Bank of India

While the Reserve Bank of India (RBI) is not legally bound to support financial inclusion according to its mandate in the Reserve Bank of India Act (Reserve Bank of India, 2009), RBI has pursued a broad range of unique financial inclusion initiatives. The Brookings Institution recently reported on a number of notable policies RBI is pursuing. First, RBI mandated that

Scheduled Commercial and Public-Sector Banks, as defined by the Reserve Bank of India Act, lend a specified portion of credit to "priority sectors." These include individuals in the agricultural industry, students pursuing an education, and low- to moderate-income households. Second, RBI has allowed banks to open more branches in rural towns with a population less than 50,000 people. RBI also stated that 1/3 of commercial banks' expansion should take place in "underbanked" regions. Third and most recently, RBI in 2015 created a payments bank license, allowing non-banking entities – such as telecommunications companies, digital payment providers, and post offices – to establish subsidiaries that provide payment services and hold funds on behalf of customers. The stated objective of such "payment banks" is to further financial inclusion, by both providing a vehicle for small savings and by increasing the accessibility of payment services to such populations as migrant laborers, low-income households, and small businesses (Ravi, 2019). Payment banks enable cellular, postal, and digital payment service users to conduct basic financial transactions, even if they lack access to a traditional bank.

Prime Minister Narendra Modi has been implementing federal policies, with the assistance of RBI, to address financial inclusion. Two initiatives often highlighted by intergovernmental organizations are Pradhan Mantri Jan-Dhan Yojana (PMJDY) and Aadhaar. PMJDY is a policy which instructed all public-sector banks to open accounts for people between the ages of 20 to 65 (Ravi, 2019). This initiative aimed to provide financial services to those in rural areas at a low cost, as there is no minimum balance requirement. PMJDY helped 310 million Indians open formal bank accounts and access financial services (Pradhan and Beniwal, 2018). Additionally, the Indian government implemented the now well-known Aadhaar. The Unique Identification Authority of India (UIDIA) uses individuals' biometric information to provide valid identification cards (Bellens, 2018). Government officials are researching how to use "Aadhaar enabled Payment Systems (AePS)" as a mechanism to allow people to transfer money, make payments, and monitor their bank accounts. Aadhaar thus simplifies financial access, especially for those lacking documentation typically required in traditional banking; through AePS, only an Aadhaar number and biometric identity verification is required to conduct financial transactions (National Payments Corporation of India, 2018). The Aadhaar system is further helping retired individuals receive timely pension payments, which promotes financial health. Aadhaar numbers also provide historically marginalized groups such as women, transgender individuals, indigenous populations, and gig economy workers with government recognized identification (Banerjee, 2015).

Even though Aadhaar demonstrates considerable potential for improving financial inclusion, the project raises numerous concerns surrounding the Right to Privacy and Right to

Association and Assembly[11] (The Centre for Internet & Society, n.d.). Notably, having an Aadhaar number is mandatory for accessing specific services, subsidies, and benefits that have limited and unclear alternatives. Aadhaar does not enforce a strong consent mechanism and individuals cannot opt-out of the program, meaning that any data collected on the individual cannot be erased. Furthermore, individuals enrolled in the program do not have a clear right to access the data collected by the UADIA on the individual. The Aadhaar Bill also retains the authority to publicize an individual's Aadhaar number and core biometric data, which is vaguely defined in the Rules. (The Centre for Internet & Society, 2016).

Despite the progress India has made, however, there are other notable limitations to these policies as well. Though PMJDY encouraged banks to open accounts for individuals, many of those accounts remain inactive. Meanwhile, reports of long lines at ATMs, cash shortages at bank branches, and slowed banking processes (Pradhan and Beniwal, 2018) seem to indicate that India's banking infrastructure is still working to accommodate widening inclusion in tandem with new, alternative providers. Nonetheless, India still serves as a valuable example of a Central Bank's work in financial inclusion.

Bank of Ghana

According to the World Bank's 2017 Global Findex, the percentage of Ghanaian adults with access to a formal financial service account increased from 29% in 2011 to 58% in 2017. In addition, Ghana ranks among the top seven countries with the highest proportion of residents who possess a mobile money account - 39% of Ghanaians owned such an account in 2017 (Demirgüç-Kunt et al, 2018).[12] Despite a significant increase in financial service account holders, nearly seven million Ghanaians still remain without a bank account (World Bank, 2018).

While the Bank of Ghana's original mandate in the 2002 Bank of Ghana Act does not mention financial inclusion, a number of subsequent regulations concerning payment services, e-money issuers, and bank agents have furthered the Bank's role in promoting financial inclusion. As

[11] The Centre for Internet & Society notes "the authentication process involves use of an Iris scanner, fingerprint scanner and face camera" and posits that the Aadhaar program functions as a public surveillance system. For more information, see https://cis-india.org/internet-governance/blog/aadhaar-project-and-bill-faq and https://www.business-standard.com/article/opinion/aadhaar-is-actually-surveillance-tech-sunil-abraham-116031200790_1.html.

[12] The rest of the top seven countries with the highest proportion of residents possessing a mobile money account include (in order); Kenya, 73%; Uganda, 51%; Zimbabwe, 49%; Gabon, 44%; Namibia: 43%; and Tanzania, 39%.

early as 2008, the Bank of Ghana issued branchless banking regulations that enabled banks to leverage digital technologies in the financial inclusion space (Bank of Ghana, 2008).[13] The Bank of Ghana has also promoted financial inclusion in the guidelines it has set out for e-money issuers and banking agents (Bank of Ghana, 2015; Bank of Ghana, 2015).[14] Additionally, the Payments Services Regulation of 2016 endows the Bank of Ghana with supervisory and regulatory authority over payments systems, specifically requiring the Bank to "promote financial inclusion through the supervision of payment and settlement systems without risking the safety and soundness of the financial system" (Bank of Ghana, 2016).[15]

Although there are more Central Banks that have undertaken different strategies for promoting financial inclusion, the above case studies provide some key examples of such work. Future CBOTF papers will provide additional case studies germane to more discrete issues of Central Banks and financial inclusion.

Conclusion

While Central Banks did not necessarily endeavor to address financial inclusion as part of their core mandate, recent developments in financial technology have prompted Central Banks and other financial regulators to redouble their financial inclusion efforts. The CBOTF project is intended to examine this history and work toward designing a Central Bank that can do even more to advance financial inclusion. This first paper is an early research note, helping to begin to lay the foundation for the remainder of this two-year exploration. Future papers will explore in more detail discrete issues related to Central Banks and how they can promote financial inclusion, including but not limited to the use of monetary policy, changes to supervisory and regulatory practices, and the exploration of new tools not yet leveraged by financial regulators. This inquiry will have a special focus on the use of financial technology in such pursuits. The CBOTF project will conclude with discrete recommendations for the design of Central Banks as well as for investments that the private and philanthropic sectors might make to assist Central Banks in promoting more inclusive financial systems and a more inclusive economy that serves that needs of all.

[13] The regulations list the promotion of financial inclusion without risking the safety and soundness of the banking system as one of the guidelines' main objectives.

[14] See Section 2, Bank of Ghana Guidelines for E-Money Issuers in Ghana, (Bank of Ghana, 2015); and Section 2, Bank of Ghana Agent Guidelines (Bank of Ghana, 2015).

[15] See Section 3, Payment Services Regulation 2016 (Bank of Ghana, 2016).

References

1. Alliance for Financial Inclusion. (2018, August). *Brazil: Financial Citizenship Journey in Brazil* (Rep.). Retrieved from https://www.afi-global.org/sites/default/files/publications/2018-08/AFI_MS_Brazil_AW_digital.pdf.

2. Alliance for Financial Inclusion. (2019, March 27). AFI Official Members. Retrieved from https://www.afi-global.org/sites/default/files/inline-files/AFI%20Official%20Members_28%20Mar%202019.pdf.

3. Alliance for Financial Inclusion. (n.d.). *A Quick Guide to the Maya Declaration to Financial Inclusion* (Rep.). Retrieved from https://www.afi-global.org/sites/default/files/publications/afi_maya_quick_guide_withoutannex_i_and_ii.pdf.

4. Babatz, G. (2013, November). *Sustained Effort, Saving Billions: Lessons from the Mexican Government's Shift to Electronic Payments* (Rep.). Retrieved https://btca-prod.s3.amazonaws.com/documents/19/english_attachments/WEB-UNCDF-BTCA-Mexico-LongVersion-English-20150624.pdf?1438251994.

5. Bagehot, W. (1873). *Lombard Street: A description of the money market*. New York, NY: Scribner, Armstrong & Co.

6. Banco de México. (n.d.). Información sobre CoDi® Cobro Digital. Retrieved from http://www.banxico.org.mx/sistemas-de-pago/codi-cobro-digital-banco-me.html.

7. Banerjee, S. (2015, December). *Aadhaar: Digital Inclusion and Public Services in India* (Rep.). Retrieved April 17, 2019, from The World Bank website: http://pubdocs.worldbank.org/en/655801461250682317/WDR16-BP-Aadhaar-Paper-Banerjee.pdf.

8. Bank for International Settlements. (2007, September 07). Members of the Irving Fisher Committee on Central Bank Statistics. Retrieved from https://www.bis.org/ifc/members.htm#1.

9. Bank of Ghana. (2008). *Guidelines for Branchless Banking (NOTICE NO. BG/GOV/SEC/2008/21)*. Retrieved from https://www.bog.gov.gh/privatecontent/Monetary_Policy/2008/August/regulatory%20framework%20for%20branchless%20banking.pdf.

10. Bank of Ghana. (2015, July 6). *Agent Guidelines*. Retrieved from https://www.bog.gov.gh/privatecontent/Banking/AGENT%20GUIDELINES%20UPDATED3.pdf.

11. Bank of Ghana. (2015, June 29). *Guidelines for E-Money Issuers in Ghana*. Retrieved from https://www.bog.gov.gh/privatecontent/Banking/E-MONEY%20GUIDELINES-29-06-2015-UPDATED5.pdf.

12. Bank of Ghana. (2016). *Payment Services Regulation*. Retrieved from https://www.bog.gov.gh/privatecontent/Payment%20Systems/Payment%20Services%20Regulation_2016.pdf.

13. Barr, M. S., Jackson, H. E., & Tahyar, M. E. (2018). *Financial regulation: Law and policy* (2nd ed.). St. Paul, MN: Foundation Press.

14. Bellens, J. (2018, April 25). How banks can play a stronger role in accelerating financial inclusion. Retrieved April 17, 2019, from https://www.ey.com/en_gl/trust/can-inclusive-banking-drive-economic-growth-in-emerging-markets.

15. Board of Governors of the Federal Reserve System. (n.d.). "About the Fed." Retrieved from https://www.federalreserve.gov/aboutthefed.htm.

16. Campbell, A., & Lastra, R. (2009). Revisiting the lender of last resort. *Banking & Finance Law Review, 24*(3), 453-497. Retrieved from http://proxy.lib.umich.edu/login?url=https://search-proquest-com.proxy.lib.umich.edu/docview/218867839?accountid=14667.

17. China Banking News. (2018, June 8). PBOC Shifts from Short to Long-term Instruments to Improve Financial Inclusion. Retrieved from http://www.chinabankingnews.com/2018/06/08/pboc-shifts-short-long-term-instruments-financial-inclusion/.

18. China Banking News. (2019, April 11). Chinese Central Bank's 2019 Research Conference Flags Further Rural Finance and Financial Inclusion Measures. Retrieved from http://www.chinabankingnews.com/2019/04/11/chinese-central-banks-2019-research-conference-flags-further-rural-finance-and-financial-inclusion-measures/.

19. Comisión Nacional Bancaria y de Valores. (2012, September). *Encuesta Nacional de Inclusión Financiera: Análisis descriptivo de los resultados* (Rep.). Retrieved July 2, 2019, from Secretaría de Hacienda Y Crédito Público website: https://www.cnbv.gob.mx/Inclusión/Documents/Encuesta Nacional de IF/Análisis Descriptivo ENIF 2012.pdf.

20. Consultative Group to Assist the Poor (CGAP). (2018, November). *Financial Inclusion Stability, Integrity, and Protection (I-SIP): Policy Making for an Inclusive Financial System* (Rep.). Retrieved https://www.cgap.org/sites/default/files/publications/Toolkit-ISIP-Nov-2018_1.pdf.

21. Consultative Group to Assist the Poor. (2018, November). *Financial Inclusion Stability, Integrity, and Protection (I-SIP): Policy Making for an Inclusive Financial System* (Rep.). Retrieved https://www.cgap.org/sites/default/files/publications/Toolkit-ISIP-Nov-2018_1.pdf.

22. Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *The Global Findex database 2017: Measuring financial inclusion and the fintech revolution*. Washington, D.C.: World Bank.

23. Finmark Trust. (n.d.). Finscope. Retrieved April 21, 2019, from http://finmark.org.za/programmes/finscope/.

24. G20 Financial Inclusion Experts Group. (2010, May 25). *Innovative Financial Inclusion: Principles and Report on Innovative Financial Inclusion from the Access through Innovation Sub-Group of the G20 Financial Inclusion Experts Group* (Rep.). Retrieved http://www.gpfi.org/sites/gpfi/files/documents/Principles and Report on Innovative Financial Inclusion_0.pdf.

25. Global Partnership for Financial Inclusion. (2011, April). *G20 Principles for Innovative Financial Inclusion* (Rep.). Retrieved from Alliance for Financial Inclusion website: http://www.gpfi.org/sites/gpfi/files/documents/G20%20Principles%20for%20Innovative%20Financial%20Inclusion%20-%20AFI%20brochure.pdf.

26. Global Partnership for Financial Inclusion. (2016). *G20 High-Level Principles for Digital Financial Inclusion* (Rep.). Retrieved from https://www.gpfi.org/sites/gpfi/files/documents/G20%20High%20Level%20Principles%20for%20Digital%20Financial%20Inclusion%20-%20Full%20version-.pdf.

27. Guzman, R. M. (2018, November 16). How Financial Tech Can Aid Financial Inclusion in Mexico. *Cornell Policy Review*. Retrieved from http://www.cornellpolicyreview.com/fin-tech-mexico/

28. International Monetary Fund. (n.d.). What is the Financial Access Survey (FAS)? – IMF Data Help. Retrieved April 21, 2019, from http://datahelp.imf.org/knowledgebase/articles/882546-what-is-the-financial-access-survey-fas.

29. Mishkin, F. S., & Eakins, S. G. (2015). *Financial markets and institutions, global edition* (8th ed.). Boston, MA: Pearson/Prentice Hall.

30. N. Yoshino. and Morgan, P. (2016). Overview of Financial Inclusion, Regulation, and Education. ADBI Working Paper 591. Tokyo: Asian Development Bank Institute. Retrieved from http://www.adb.org/publications/overview-financial-inclusion-regulation-and-education/.

31. National Council for Financial Inclusion (Consejo Nacional de Inclusión Financiera). (2018). *Reporte Nacional de Inclusión Financiera* (Rep.). Retrieved from https://www.cnbv.gob.mx/Inclusión/Documents/Reportes de IF/Reporte de Inclusion Financiera 9.pdf.

32. National Council for Financial Inclusion. (2016, June). *National Policy for Financial Inclusion* (Rep.). Retrieved https://www.gob.mx/cms/uploads/attachment/file/199615/Mexico_s_National_Policy_Financial_Inclusion.pdf.

33. National Payments Corporation of India. (2018, April 24). AePS Product Overview. Retrieved April 17, 2019, from https://www.npci.org.in/product-overview/aeps-product-overview.

34. Office for the Treasury and Public Credit (Secretaria de Hacienda y Credito Publico). (2011, October 3). *Acuerdo Por El Que Se Crea El Consejo Nacional De Inclusión Financiera*. Retrieved from https://www.cnbv.gob.mx/Inclusión/Documents/Acuerdo creación del CONAIF.pdf.

35. Office for the Treasury and Public Credit (Secretaria de Hacienda y Credito Publico). (2019, January 8). *Comunicado No. 003-2019: La SHCP y Banxico presentaron ocho acciones que se llevarán a cabo para impulsar el sector financiero.*[Press release]. Retrieved from https://www.gob.mx/shcp/prensa/comunicado-no-003-2019-la-shcp-y-banxico-presentaron-ocho-acciones-que-se-llevaran-a-cabo-para-impulsar-el-sector-financiero?idiom=es.

36. People's Republic of China, National People's Congress. (1995, March 10). *Laws of the People's Republic of China on the People's Bank of China*. Retrieved from https://track.unodc.org/LegalLibrary/LegalResources/China/laws/China Law of the People's Bank of China 1995.pdf.

37. Pradhan, B., & Beniwal, V. (2018, July 16). India's Banking Revolution Has Left Its Villagers Behind. *Bloomberg*. Retrieved April 17, 2019, from https://www.bloomberg.com/news/articles/2018-07-16/india-s-banking-revolution-has-left-its-villagers-behind.

38. Pymnts. (2019, March 18). People's Bank Of China To Regulate FinTech. Retrieved from https://www.pymnts.com/news/regulation/2019/peoples-bank-of-china-regulate-fintech/.

39. Ravi, S. (2019, March 5). *Accelerating Financial Inclusion in India* (Rep.). Retrieved https://www.brookings.edu/wp-content/uploads/2019/03/Accelerating-Financial-Inclusion-.pdf.

40. Reserve Bank of India. (2009, February 28). *Reserve Bank of India Act, 1934*. Retrieved from https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/RBIAM_230609.pdf.

41. Reserve Bank of India. (2019). Chronology of Events. Retrieved from https://www.rbi.org.in/Scripts/chro_1968.aspx.

42. State Bank of Pakistan. (2007, July 1). *Microfinance Institutions Ordinance 2001 (LV of 2001)*. Retrieved from http://www.sbp.org.pk/l_frame/MF_Inst_Ord_2001.pdf.

43. The Centre for Internet & Society. (2016, March 21). Salient Points in the Aadhaar Bill and Concerns. Retrieved June 26, 2019, from https://cis-india.org/internet-governance/salient-points-in-the-aadhaar-bill-and-concerns.

44. The Centre for Internet & Society. (n.d.). Critique of the Aadhaar Bill 2016. Retrieved June 26, 2019, from https://cis-india.org/aadhaar-bill-2016.

45. Thornton, H. (1802). *An enquiry into the nature and effects of the paper credit of Great Britain.* London.

46. Tissot, B., & Gadanecz, B. (2016, June). *Measures of financial inclusion - a central bank perspective: 2015 Survey conducted by the Irving Fisher Committee on Central Bank Statistics (IFC)* (Rep.). Retrieved https://www.bis.org/ifc/publ/ifc_finan_inclu.pdf.

47. Tissot, B., & Gadanecz, B. (2017, July 14). *Measures of financial inclusion - a central bank perspective* (Rep.). Retrieved https://www.bis.org/ifc/publ/ifcb47q_rh.pdf.

48. Tk 2b fund for Tk 10 account holders. (2014, May 15). *The Financial Express*. Retrieved from https://www.bb.org.bd/recentupcoming/news/may152014newse984.pdf.

49. World Bank Group; People's Bank of China. (2018). Toward Universal Financial Inclusion in China : Models, Challenges, and Global Lessons. World Bank and People's Bank of China.(Rep.) Retrieved from https://openknowledge.worldbank.org/handle/10986/29336.

50. World Bank Group. (2017). Global Financial Inclusion and Consumer Protection Survey, 2017 Report. World Bank, Washington, DC. Retrieved from https://openknowledge.worldbank.org/handle/10986/28998.

51. World Bank. (2017, December 18). Global Financial Inclusion and Consumer Protection (FICP) Survey. Retrieved from http://www.worldbank.org/en/topic/financialinclusion/brief/ficpsurvey.

52. World Bank. (2018, December 4). Global Payment Systems Survey (GPSS). Retrieved from http://www.worldbank.org/en/topic/financialinclusion/brief/gpss.

53. World Bank. (2018, June 6). Financial Inclusion Support Framework (FISF). Retrieved from http://www.worldbank.org/en/topic/financialinclusion/brief/financial-inclusion-support-framework.

54. World Bank. (2018, October 1). UFA2020 Overview: Universal Financial Access by 2020. Retrieved from http://www.worldbank.org/en/topic/financialinclusion/brief/achieving-universal-financial-access-by-2020.

55. World Bank. (2018, October 31). Ghana - Global Financial Inclusion (Global Findex) Database 2017. Retrieved from https://datacatalog.worldbank.org/dataset/ghana-global-financial-inclusion-global-findex-database-2017.

56. World Bank. (2018). The Global Findex Database 2017. Retrieved from https://globalfindex.worldbank.org/.

57. World Bank. (2019). Universal Financial Access 2020: Country Progress. Retrieved from http://ufa.worldbank.org/country-progress.

58. Xu, Y. (2017, August 7). China to Process All Online Payments via Centralized Clearing Platform From June 2018. *Yicai Global*. Retrieved June 13, 2019, from https://yicaiglobal.com/news/china-process-all-online-payments-centralized-clearing-platform-june-2018.