



# CENTRAL BANK OF THE FUTURE



## Central Bank of the Future

Working Paper 2

Released November 1, 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. Thanks are also due to the research assistants at the Center on Finance, Law & Policy, especially Jennifer Chasseur, Charmaine Chua, and Abigail DeHart, and to our roundtable participants.

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

<https://financelawpolicy.umich.edu/central-bank-research>

© Center on Finance, Law, and Policy 2019.  
All rights reserved.

## **Abstract**

This paper is intended to distill the discussion of the June 2019 Central Bank of the Future Roundtable held at the University of Michigan's Gerald R. Ford School of Public Policy. The goal of the Roundtable was to consider new ideas that could better facilitate Central Bank innovation to support financial inclusion. With the increasing prevalence of digital currencies (fiat and non-fiat), financial data, digital payments, and technologies such as machine learning and artificial intelligence, it is important for Central Banks to consider their role in mitigating threats to consumer protection, financial inclusion, and the global economy while also leveraging and promoting technology to foster financial and economic inclusion. This paper presents an overview of the discussion relating to these goals. Attendees participated in the conversation under the Chatham House Rule. Therefore, the ideas outlined below are not attributed or attributable to any one participant. The sections below represent short summaries of ideas presented during the conversation. The views expressed in this paper are not those of the authors. Rather, the authors of this paper have synthesized and reordered the conversation in order to summarize the discussion among the Roundtable participants.

## **Institutional Capacity**

One key topic of discussion included whether and to what extent Central Banks have the institutional capacity to manage the technological innovation in financial services, either as regulators of such innovation or users of it, and how such capacity may be used to foster financial inclusion.

- The role of Central Banks as regulatory authorities has evolved over time. Most Central Banks currently prioritize a fundamental goal of keeping the value of a currency stable through monetary policy, but Central Banks could have broader responsibilities than acting as banking and payments authorities. Notably, Central Banks have the potential to play a prominent role in capital markets for financial services.
- To accomplish their current goals, Central Banks are balancing their role as regulators of a financial services industry being disrupted by technology and themselves trying to innovate to keep pace with the changing world. Overall, many Central Banks are questioning whether it would be best to watch the market, allow innovation, and react accordingly to regulatory concerns, or whether they should be leading innovation by using it in support of their mission. This reflects a tension between managing risk and innovation versus bearing risk themselves.
- Following the financial crisis, Central Bank mandates have expanded while some would argue their independence has eroded. Because price stability has remained the core

objective of many Central Banks, it is possible that adding more functions related to financial inclusion –such as maintaining bank accounts– could complicate and interfere with the Banks’ core mandates. Allowing an increasing number of technology companies to play a role in financial services, however, also impacts Central Banks, as it may increase the number and broaden the type of entities under their authority. Although technology companies may have the potential to make an enormous impact on financial inclusion through creating accounts and payment systems, the private sector may have different priorities and incentives compared to Central Banks.

- It is clear that Central Banks have a role to play in leveraging and managing technology to foster financial inclusion and that they likely will have to create new institutional capacity to do so effectively.

## **Consumer Protection**

The group also discussed Central Banks’ role in consumer protection in the context of an increasingly decentralized and digital financial services industry.

- As Central Banks explore their changing responsibilities, consumer protection will remain a key priority. To enforce consumer protections, Central Banks typically regulate banking products through oversight of banks rather than by explicitly incorporating consumer protection into their mandates. Because financial services regulation often focuses on overseeing processes rather than outcomes, innovation that could deliver better outcomes for consumers may flounder as a result of skepticism by banks that have a low risk tolerance and regulators who question the innovations’ value.
- In the United Kingdom and Singapore, regulatory sandboxes have allowed Central Banks to better understand the implications of using FinTech for consumer protection. Consumer protection and a focus on outcomes have not been as explicit in American (mostly state-based) sandboxes compared to international sandboxes, but introducing outcomes-based regulation could help advance financial inclusion compared to the current process-based approach. For example, regulation allowing 5% of bad outcomes to occur in the aggregate would spread costs and risk over the entire system, minimizing adverse outcomes while encouraging innovation. Outcomes-based regulation could also ensure that producers are held liable for bad outcomes above this threshold based on a strict liability standard, providing accountability to consumers.
- Leveraging technology to better control data for various financial services may place a large burden and responsibilities on consumers by requiring them to interact with data systems and make decisions about the use and sharing of their data. Given the risks

associated with integrating personal and financial information into large data systems, there will be a tradeoff between increasing operational efficiency for banks and reducing access to financial services for consumers if they opt out of new technologies. To facilitate consumer participation, Central Banks will need to design systems focused both on privacy and equitable distribution of affordable financial services and products.

### **Payment Systems and Non-Fiat Currencies**

- Facilitating effective transmission of money systems is implicit in many Central Bank mandates, and in the digital age, an increasing number of Central Banks are developing electronic payment systems. As monetary policy is a core objective of many Central Banks, promoting an effective, centralized payment system to support the economy falls within Banks' authority. For Central Banks focusing on financial inclusion as a primary or secondary objective, it will be crucial to consider well-designed frameworks for expanding payment services and providing accounts to the unbanked and underbanked.
- When considering the architecture of the payments system, Central Banks must also consider the broader responsibility of providing digital infrastructure in order to enable access to financial services. For example, creating a nationalized payments system implies that every individual would have access to a bank account. However, simply owning a bank account does not mean that an individual is financially healthy. Rather, access to a bank account should also imply robust digital infrastructure for fast payment systems, data security, and an interface for portable data systems that can help an individual access other financial products and services.
- Establishing digital infrastructure for payment systems also could allow Central Banks to function as central exchanges for all currencies, including non-fiat currencies such as Bitcoin. Today, there is an increasing amount of e-money, cryptocurrency, and other digital assets backed by fiat currencies in circulation. When regulating digital currency, Central Banks and regulators have historically tried to implement targets and instruments in the aggregate in order to stay non-political and avoid harming specific groups of people. Without policy intervention, however, movement toward private currencies has the potential to exclude many people and work against financial inclusion objectives. Specifically, thus far cryptocurrencies have not been particularly helpful with facilitating financial inclusion despite their potential to improve payment systems.
- Looking to the future of cryptocurrency and digital assets, it would be worth returning to lessons learned from banking from the sixteenth century to the 1930s when hybrid systems of public and private currencies were commonly used. The use of a wide variety of payment techniques with only some money backed by fiat currencies jeopardized

financial stability and financial inclusion in many economies. Additionally, using a multiplicity of currencies put risk back onto individuals who were not fully equipped to manage such risk. This led fiat and regulated entities to adjust their terms due to the many financial crises caused by regulatory parameters constraining Central Bank intervention.

- Today, having a mixture of currency providers and licensing regimes for non-bank providers is becoming increasingly problematic for keeping prices and currency stable. To ameliorate risk posed by having many digital assets in circulation, Central Banks could create specific offices dedicated to overseeing and administering digital assets such as stable coins that rely on an algorithm-based system pegged to fiat currencies. Although Central Banks have historically safeguarded a one-to-one relationship between entity and fiat currency, the rise of virtual currencies presents an opportunity for Central Banks to divide their functions under different institutions.

### **Artificial Intelligence and Other Technology**

The emergence of artificial intelligence in financial services will be an important consideration for Central Banks moving forward. The rise of this technology has resulted in numerous possibilities for Central Banks to expand their mandates regarding financial services and institutional capacity.

- For example, implementing human-supervised machine learning and artificial intelligence in monetary policy and regulation could increase financial inclusion and outcome-based solutions. Specifically, Central Banks could use technology internally to increase efficiencies in capital markets, facilitate decision-making with algorithms, and improve consumer identification. Employing new technology also could help ease a high supervisory burden on Central Banks which may currently be limiting the number of players in a market and curtailing competition. Furthermore, there is potential for Central Bank decision-making processes to be improved by building technical regulatory requirements into machine learning algorithms to support supervisory efforts.
- Lowering the operational costs of managing financial services through digitization could better enable Central Banks to administer financial services to the unbanked and underbanked. One of the most illustrative examples of using technology to achieve financial inclusion is Alibaba, which provided an accessible payments system for individuals in China who previously did not have access to a traditional bank account. Using technology that facilitates data sharing, such as digital ID and APIs, could reduce the cost of supervising or even administering financial services for Central Banks. Similarly, integrating technology into areas such as microfinance could significantly

reduce operational and administrative costs, thus expanding coverage to clients. Technologies such as blockchain also could be used to better control and retract data for enhanced consumer protection and data permissioning.

- Although technology has an enormous potential to make finance more inclusive through digitized payments, Central Banks specifically focusing on financial inclusion objectives risk further excluding the unbanked and underbanked population if technology is not easily accessible for these groups. Therefore, to facilitate financial inclusion, Central Banks must consider what consumers can access before structuring their payment systems. For example, a consumer who may not have access to a smartphone or the internet could obtain certain financial services at a post office. Additionally, if Central Banks rely too heavily on external technology to enable access to accounts and financial services, Central Banks will have to continuously restructure their payment systems as technology advances.

## **Data**

There is currently little legal authority or regulatory framework in place to monitor how financial data is taken and used, but engaging in an open dialogue regarding data frameworks could present an opportunity for Central Banks to shape the world of finance.

- Regulators and Central Banks should consider that commodifying consumer data may increasingly be core to the future state of financial services, which may motivate non-bank technology companies to conduct activities beyond the scope of activities that they undertake today. Technology could allow Central Banks to collect high-quality data to improve regulation and market supervision, especially given that protecting consumers and monitoring market conduct are labor-intensive.
- Having greater access to high-quality data also could help overcome negative stereotypes around categories such as race and gender and could be combined with consumer control of the data and relevant incentives to combat discrimination. For example, organizations such as FinRegLab are empirically evaluating the additive use of transaction-level data to traditional credit scoring data as well as machine learning algorithms to control for data that may proxy for protected classes. Taking the perspective that current datasets could be considered exclusionary, such as FICO credit scores in the United States, having a greater volume of financial data available could allow Central Banks to manage risk as well as understand and decide what kind of exclusion could be considered permissible.

- Increased usage of financial data by Central Banks could also work against financial inclusion measures if initiatives are poorly implemented. For example, factoring utility payments into credit scoring could result in a lower consumer credit score if an individual routinely defaults on utility payments. The increased access to data will change the individual's incentives for prioritizing payments and may result in decreased flexibility. Additionally, as previously mentioned, a digital divide could leave behind those who are already excluded and may not have access to the technology necessary to receive and send digital payments, such as a computer or a smartphone, further exacerbating inequality. Furthermore, if Central Banks ignore financial inclusion objectives when designing data frameworks, the regulatory architecture may miss real opportunities to harmonize key issues in data privacy such as defining consumer data sovereignty, regulating data access by banks and non-banks, improving data accuracy and data transparency, and controlling data flows. Incorporating financial inclusion objectives into considerations for these data usages would extend data privacy and security considerations beyond traditional regulatory framework.

## **Conclusion**

In order to better address the expanding role of Central Banks as financial services are increasingly digitized, Central Banks must reexamine their responsibilities and opportunities for regulatory leadership. Accordingly, Central Banks must evaluate new critical functions in order to fulfill their mandates and priorities relating to price stability, financial inclusion, and employment. They must also evaluate how technology could be better utilized in these areas. Resolving these two points will allow Central Banks to provide better direction for initiatives like providing digital fiat currencies and payment systems directly operated by Central Banks.

Building newer versions of these institutions that will last for the next fifty to one hundred years will require Central Banks to reassess their internal culture and the temperament of their leadership. Given that the financial services sector is traditionally conservative, and its regulators perhaps even more so, Central Banks will need to be more dynamic. Arguably, looking forward may be more important than adapting regulation itself. Creating nimble institutions and building blocks for the future will allow Central Banks to better contain risk and protect consumers as innovation in the financial sector continues.

In order to achieve this flexibility, cross agency cooperation is crucial. Breaking silos internally and across government agencies will significantly help Central Banks manage their capacity and skills, allowing them to better understand and adapt regulations as the need arises. As digital products and services are increasingly adopted, building the internal competency required to monitor and support these initiatives has proven to be expensive. In less secure economies, developing this capacity might be hindered by a lack of resources, as building internal

knowledge may take away from more pressing functions such as market supervision. Although some degree of familiarity with technology is required to regulate digital initiatives, having an open dialogue with the private sector and cooperation with other regulators and policy-makers are good initial steps that Central Banks can take to better harness digital finance to foster financial inclusion.