# Chartering the Fintech Future

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What we use as our medium of exchange is subject to dramatic change over time, and sometimes bank regulation has accelerated such changes. The national banking system, founded in 1863, envisioned the creation of a uniform medium of exchange in the form of national bank notes, which replaced the preexisting system of state bank note issuance. But the creation of the national banking system soon resulted in the diminished importance of bank notes as a medium of exchange. Under the new system, state banks faced a prohibitive tax of 10 percent per year on any notes they issued, and national banks had to maintain collateral at the Treasury for their outstanding national bank notes equal to 111 percent of their outstanding notes, and also had to maintain an additional 5 percent in required government-currency ("greenback") cash reserves on hand. That meant that if a bank wanted to make loans, it had to find an alternative to bank notes as a funding source for those loans.

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Deposits had been growing in importance leading up to the National Banking Act of 1863, but the act accelerated the growth of deposits markedly, and they became the primary funding vehicle for loans. As Comptroller Eckels remarked in 1896: "And thus it has come about that deposit taking is now the feature, and the issuing of circulating notes but the incident, in national banking, instead of, as in the early history of the system, the note-issuing function being the feature and *deposit banking but the incident*" (Eckels 1896: 565; emphasis added).

Furthermore, bank notes were not issued by all banks prior to the 19th century. Bank notes were a 17th-century innovation, and they were not the primary medium of exchange or the main liability for many important banks in the 18th and early 19th centuries. For many transactions, bankers' acceptances, and bills of exchange were both the primary vehicle of credit and the medium of exchange, and banks like Amsterdam's famous Wisselbank functioned primarily as a clearinghouse for such bills.

Clearly, the history of successful bank chartering informs us that banking has always been defined by the *core functions* that banks engage in—lending funds or clearing payments, or both. In fact, the word "bank" has been linked to both of those functions, and scholars debate whether payments transfers (initially accomplished on a "bench") or the creation of a portfolio of loans (a "mound," or bank, of loans) has the greater claim to the origins of the word. The particular means banks use to lend or transfer payments changes over time as a function of technological and regulatory changes. In particular, transfers can be made via bills of exchange, bank notes, deposits, credit cards, electronic balance transfers, or exchanges of cryptocurrency tokens via blockchain. History also teaches us that banks don't always provide both lending and payments services. Some banks specialize in one or the other. Indeed, I will show that it requires some rather complicated and specialized economic modeling assumptions to explain why banks sometimes choose to bundle lending and payments services within one intermediary. Those assumptions do not always hold, which explains why bundling is not always a good idea.

Sometimes changes in banks' structures and functions are predictable. The rise of deposit banking in the mid-19th century United States was predictable as a matter of arithmetic if one recognized that banks would continue to act as lenders (given that notes could no longer serve as a funding source for loans after the passage of the

National Banking Act). The rise of nationwide universal banking in the United States after 1980 was also predictable, given the evident inefficiencies of the preexisting U.S. banking system (Calomiris 2000; Calomiris and Haber 2014).

Similarly, the demise of traditional models of banking today (including nationwide universal banking provided by today's too-big-to-fail banks) has similar elements of predictability based on clear trends that are driving change. In this article, I consider why current changes are occurring and consider what the new structure of chartered banks likely will be in the future. I don't offer a single forecast of that future, but rather a conditional set of forecasts. If special interests, many of which already are currently struggling hard to preserve the status quo, fail to halt the path of progress, then I believe that technology will lead us down a path of substantially increased efficiency and stability and the expansion of chartering to encompass novel banks. But the evolution of banking has never been entirely determined by technology or economic logic. Politics is at least equally important in shaping the chartering of banks. If special interests are successful in blocking progress (as our history shows they often have been), then a very different path—one of persistent inefficiency and instability designed to preserve the status quo—is also possible, at least for the foreseeable future.

The article is organized as follows. First, I consider the post-1980 emergence of a nationwide universal banking system and explain how and why technological changes now favor "unbundling" and the ascendance of new fintech banks capable of providing services that threaten that status quo.[1] A detailed analysis of how fintech banks are improving financial inclusion, not just improving efficiency, for existing bank customers is provided. Second, I describe how the chartered banking system could and would evolve over the next decades if special interests fail in their attempt to preserve the status quo. In the near term, this evolution could see substantial numbers of fintech shadow banks becoming chartered national banks, including many that do not rely on deposits as a source of funding. As part of that analysis, I show that there may be substantial advantages from the

[1]Throughout this article, I use the term "fintech bank" to mean a fintech firm engaged in lending or payment services, or both. I use the term to apply to both chartered and shadow banks, where I define "shadow banks" as those operating without a state or national bank charter.

standpoint of efficiency, convenience, and stability to encouraging the creation of a chartered national bank network of stable-value coin banks issuing nondepository liabilities. Finally, I identify the powerful special interests that are attacking, or may oppose, the chartering of fintech banks.

## From Bundling to Unbundling

In the 1980s and 1990s, the United States moved from a system in which banks were fragmented by location, and in which financial services were provided by specialist firms (bank lenders, insurance companies, broker/dealers, and asset managers) to a system dominated by nationwide universal banks. By 2000, a handful of large banks operating throughout the country provided an unprecedentedly wide range of services. Based on the evident historical shortcomings of the U.S.'s fragmented financial system (see Calomiris 2000; Calomiris and Haber 2014), the new banking structure made sense as a means of achieving greater portfolio diversification through geographic integration across bank locations, reusing customer relationship information, and taking advantage of advertising and marketing economies of scale. After two centuries of regulation-induced geographic and service fragmentation, by 2000, it seemed that we finally had arrived at what some of us imagined would be a new nirvana of stable and efficient nationwide universal banking.

But only 20 years (and one major financial crisis) later, the bloom of efficiency and stability is off the rose of nationwide universal banking. We experienced one of the worst financial crises in history in 2007–2009. Since then, the traditional chartered banking system wallows in a state of unprofitability and inefficiency. For the first time in history, new entry into chartered banking has been virtually nonexistent for over a decade. Banks' services remain expensive (and some have become more expensive since 2009), and more than 60 million Americans are still described an "unbanked" or "underbanked."

As has always been the case in banking history, the drivers of these facts are regulation and technological change, which are themselves interdependent. With respect to regulation, the merger wave of 1980 to 2005, which produced the integrated nationwide banking system, occurred as part of a political bargain that drove merging banks to increase their real estate risk exposures, thereby also increasing systemic risk (Calomiris and Haber 2014: chaps. 6–8). The Card Act of

2009 and the Dodd-Frank Act of 2010 did little to remedy those incentives (banks' exposures to real estate risk remain very high), but instead added to the already heavy compliance burdens and other costs banks bear (Calomiris 2017; Calomiris and Campello 2018).

With respect to technological changes, new methods for providing loans and payment services by "shadow banks," especially by fintech banks over the past several years, are accelerating the long-term trend of financial disintermediation from chartered banking by providing more attractive alternatives to customers (Jagtiani and John 2018; Thakor 2020). According to Statista, the chartered banks' share of personal loans granted fell from 40 percent in 2013 to 28 percent in 2018 while fintech banks' personal loans rose from a 5 percent market share in 2013 to 38 percent in 2018. Interestingly, these new competitors are structured very differently from traditional banks. They tend to focus on one or two lines of business, and typically provide either loan services or payments services, but not both. In sharp contrast to the pre-2000 trend toward universal banking, fintech providers are demonstrating a new model of financial intermediation "unbundling." The new wave of innovative, low-cost, unbundled fintech providers are making behemoth universal banks look as necessary as buggy whips. Such providers are gaining market share in both the payments and lending side dramatically over the past several years, are out-competing traditional banks for talent, and are attracting huge amounts of new investor capital owing to their extremely high profit rates. What is driving the new unbundling trend?

First, it is worth noting that there have always been profitable examples of unbundled banking. The famous Wisselbank of Amsterdam, chartered in 1609, revolutionized the clearing of payments associated with international trade by clearing bills of exchange but made almost no loans during its first century of operation. In the United States in the late 20th century, narrowly focused credit card banks specialized in this type of loan and payments service, which replaced deposits for executing many transactions, and some chartered banks still specialize in providing credit card–based loans and payments. Initially, banks funded their credit card receivables with deposits, but, subsequently, many banks replaced deposits with securitization as the funding source for credit card lending, finding it cheaper to fund their credit card receivables with securitized debt offerings. Academic research explaining that change pointed to the cost savings from securitization, which among

other advantages, provided a better and more disciplined means for the timely processing of information about the evolving risks of credit card receivables, which also permitted risk to be managed better. This was accomplished through a novel securitization intermediation process involving rating agency tracking of receivables performance, early amortization triggers (that punish excessive surprises in defaulting receivables), and the spread of new information technologies in the 1990s that made such tracking possible. Securitization also segmented risk into various pieces to better align debt risks with debt-holders' differing risk preferences, further reducing funding costs (Calomiris and Mason 2004).

Second, there is no overarching economic theory that generally favors bundled banking. Indeed, it requires some rather complicated and specialized assumptions to motivate bundled banking. That is not to say that those assumptions rarely hold. On the contrary, until recently, I would argue that the assumptions necessary to explain bundled banking have been more the rule than the exception historically. Until now.

In any business, absent a strong advantage to bundling, there are good managerial reasons to avoid it. Businesses that combine multiple lines of business suffer from a lack of strategic managerial focus. And large, multiline organizations can be too tolerant of poor performance; underperforming business segments sometimes avoid making hard but necessary changes because they ride on the coattails of successful business segments. Absent a strong advantage from bundling, unbundled service providers generally will be more efficient and profitable.

In theory, bundling of payments and lending generally is understood to reflect *informational* advantages from combining both within the same intermediary. Tracking a borrower's payments history may provide timely information to a lender about how their business is doing (Mester, Nakamura, and Renault 2007). Or a bank engaged in opaque lending may find it advantageous to fund itself with demand deposits because of the discipline that comes from exposing itself to sudden withdrawal risk. Such discipline may ensure that the bank behaves honestly and manages credit risk more efficiently (Calomiris and Kahn 1991; Calomiris, Heider, and Hoerova 2018). In both of these theories, the informational challenges of screening and monitoring bank borrowers underlie the advantages of bundling deposit taking and lending.

Such bundling advantages become less relevant as new screening and monitoring technologies provide alternative approaches to reducing information costs associated with lending. Banks have new data resources they can use to screen and monitor borrowers, making the need to bundle a borrower's deposits and loans less necessary. And those same informational improvements may allow banks to convey information about their own lending practices, thus reducing the need to use the discipline of deposit withdrawal risk to reduce their funding costs.

Consider, for example, the information services provided by OakNorth, which collects information about small and medium-sized businesses, which it packages for lenders. OakNorth developed its system in the United Kingdom, where it also used the system as a lender. In the United States, OakNorth provides informational services to other lenders. It draws real time information about borrowers from thousands of databases and makes that information conveniently accessible to lenders. Not only do these data assist lenders in screening borrowers, they flag potential problems in loans early, often before there are any delays in payments or other traditional indicators of potential loan losses. These sophisticated monitoring procedures have made many of the traditional screening and monitoring procedures used in the past less important, including the need to gather information from observing a borrower's checking account.

Furthermore, the efficiency improvements from unbundling credit from payments often includes the ability—demonstrated decades ago in credit card securitization—to match specific sources of funding to their preferred portfolio risks. For example, at least one innovative fintech mortgage provider allows competing mortgage purchasers to express their preferences by bidding for mortgages whose characteristics fit their portfolios.

Some of the gains from universal banking had resulted from other cost savings from the reusability of information across banking services. For example, a lender that has served a firm for many years may more easily be able to underwrite securities for the same firm (Calomiris and Pornrojnangkool 2009). Or a consumer lender may be in a better position to offer insurance to its borrower. But now big data systems permit all would-be lenders or insurance providers to access information that allows them to compete to provide a service without a prior history of providing other services; the advantages of bundling thus are reduced.

Another advantage that drove nationwide banking was the portfolio diversification that came from a larger geographic footprint (i.e., bundling across different geographies). Being able to branch across state lines meant that banks could pool risks related to different industries or crops to the extent that those industries or crops had locational specificity (as they often do). And nationwide banks also could expand their branch networks to gather lower-cost deposits from new locations. But fintech providers are able to make loans and raise funds on the internet without having to maintain costly physical branches or loan offices. Furthermore, a local geographical presence is not nearly as important as it used to be for lenders who need to gather soft information about borrowers, as the example of OakNorth illustrates.

Unbundled fintech enterprises that can customize loan portfolios to meet the specific preferences of loan funders, that can take advantage of state-of-the-art information processing when screening and monitoring borrowers, and that can avoid the physical costs of maintaining branch networks, will increasingly win the competitive struggle to serve customers.

Given the regulatory and technological changes in recent years, it is no wonder that unbundled fintech providers are increasing their market shares in payments and lending dramatically. Of course, some customers still find bundled relationships more convenient, or they are less comfortable with internet-based banking. But others may dislike or distrust traditional banks and feel more comfortable transacting with fintech banks on the internet. Indeed, some fintech banks have modeled their business precisely to attract such customers.

## Fintechs and Financial Inclusion

Not only are new unbundled fintech providers more profitable and efficient than traditional banks, their technologies are proving to be very promising for improving access to financial services for many people who have not been served well by traditional banks, especially lower-income people. The U.S. banking system serves about 80 percent of American families' needs to make payments, save, and borrow. But what about the other 20 percent, the so-called unbanked and underbanked? What barriers explain why the normally reliable pressure of market competition has not led

banks to compete for the business of such a large fraction of the population? How are fintech banks breaking down some of those barriers?

Historically, the barriers that have kept the unbanked or underbanked from becoming fully integrated into the formal financial sector consist of several supply-side and demand-side factors. On the supply side, these include challenges lenders face in differentiating borrowers' risks, the high transaction costs of serving small-dollar customers, and the costs of regulatory uncertainty (which are often defined on a per-customer basis, and therefore, disproportionately disadvantage small-dollar customers). On the demand side, factors such as the limited financial resources of low-income customers, their limited experience with financial service providers, and their preferences for particular kinds of products can limit access.

With respect to demand-side factors, how have fintech banks improved financial access for the unbanked or underbanked? According to an FDIC survey, 13 percent of unbanked households state that banks do not offer products or services that they need. For example, a majority of unbanked or underbanked households live paycheck to paycheck, cannot afford the high standard minimum balances or account fees banks require, and do not live near branches.[2] To meet some of these demands, fintech banks have developed different products that may be particularly attractive to unbanked or underbanked households. In particular, fintech banks provide novel products with low-cost fees and smaller minimum-dollar loans. For example, some offer free overdraft protection (typically limited to up to $100)[3] or 0 percent APR cash advance that requires no credit check and no monthly fee (limited to $250).[4] Many now offer bank accounts with no monthly fees, no overdraft fees for limited overdraft protection, and no minimum balance fees, as well as no ATM fee access for in-network ATMs.[5] The common denominator of these products is that physical cost savings from operating as a fintech provider make it more economical to serve

[2] Indeed, about 9 percent of unbanked household cite inconvenient locations or inconvenient hours as the reason for not having a bank account.

[3] Chime.com; Varomoney.com; Dave.com.

[4] Moneylion.com.

[5] Chime.com; Varomoney.com; Dave.com; Moneylion.com.

small-dollar amount customers, which is particularly advantageous to low-income customers.

Other fintech banks have designed products to smooth spending in the face of high-frequency fluctuations in customers' incomes. Because there is a lag between the days wages are earned and the day that employees are paid, some fintech banks have attracted unbanked and underbanked customers by offering "paycheck deposits."[6] Instead of depositing paycheck funds into a customer's account with the traditional delay (waiting for the funds to clear from the employer's bank), these fintech banks deposit the funds as soon as the transfer instructions are received, taking on the minimal risk that the employer's bank is unable to fund the transaction. This decreases the customer's waiting time by two days. Other fintech banks offer customers access to their wages in advance of the payday on terms that are generally far superior to payday lenders or to the costs of paying traditional bank overdraft fees.[7]

Fintech banks also cater to unbanked and underbanked customers' demands by designing innovative and convenient means for customers to access services through mobile phones, therefore obviating the need to be near a branch. Because the majority of unbanked and underbanked households have mobile phones, fintech banks have been able to attract many low-income customers by offering mobile phone access.

Consumers with limited financial experience sometimes make financial decisions that damage their credit record and leave high-cost lenders as their only option. Financial education and counseling services can reduce these costly mistakes. While academic evidence regarding the impact of financial education and counseling has been mixed, there is evidence that certain approaches provide benefits. In particular, education appears to be most effective when it is targeted to a particular borrower's needs and is delivered at the time the knowledge can be used.[8] For example, research has shown that mortgage counseling conducted at the time a mortgage is originated can reduce default rates.[9]

[6] Chime.com; Varomoney.com; Dave.com; Moneylion.com.

[7] Even.com and Payactiv.com.

[8] See Fernandes, Lynch, and Netemeyer (2014).

[9] See Agarwal, et al. (2020).

Many fintech banks provide precisely this form of financial counseling as part of the loan products they offer. They use a wide range of educational services to build relationships with customers that have limited experience with financial transactions. One online lender offers lower rates for completing their online courses on managing debt,[10] while another online lender prominently advertises "community support," whereby borrowers are connected with free and trusted financial counselors.[11] Other fintech banks produce free content for customers or potential customers to help explain when and how their products fit into a well-managed financial plan or to instruct customers on managing finances and debt more generally.[12] Finally, many comparison shopping fintech banks provide free tools for consumers to evaluate alternative debt scenarios, such as debt consolidation, or to create a plan to reach a savings goal.[13] To reduce confusion or misunderstandings that can undermine trust, some fintech providers have developed products that alert customers when they are at risk of being charged a fee, thus helping to reduce fees and improve their decisionmaking.[14]

With respect to supply-side factors, many innovative fintech business models are reducing the costs of serving customers. These costs consist of physical costs and information costs. Physical costs are lower for fintechs because they avoid the high overhead costs of traditional banks, which is especially beneficial to small-dollar account customers.

With respect to information costs, many unbanked and underbanked customers are "credit invisibles"—people without formal credit scores. That lack of information makes it challenging to lend to them. For an estimated 26 million Americans, traditional credit products remain out of reach because they lack a credit score.[15] These "credit invisibles" often turn to payday lenders, pawn shops,

[10] Lendup.com.

[11] Oportun.com.

[12] Personifyfinancial.com; Saverlife.org.

[13] Nerdwallet.com; Lendingtree.com.

[14] See Burhouse, Navarro, and Osaki (2016).

[15] https://files.consumerfinance.gov/f/201505_cfpb_data-point-credit-invisibles.pdf.

or auto-title lenders, or end up paying high overdraft fees at traditional banks. Such borrowing is expensive, with APRs as high as 300 percent.[16] What's more, repayment of these loans often doesn't establish a credit score, so experience in these markets brings borrowers no closer to cheaper credit. Instead, they end up in cycles of accumulating debt. Such borrowing amounts to over 280 million transactions per year and roughly $78 billion in revenue.[17]

An important aspect of fintech banks' ability to provide improved access to credit for consumers comes from their use of new sources of information (Jagtiani and Lemieux 2017). By using information not traditionally found in a credit report, lenders are able to safely and affordably lend to customers with little or no credit history. Fintech banks such as Oportun and Upstart have advertised that using alternative data has allowed them to successfully provide credit to households who lack the formal credit scores required by most financial institutions. Some fintech lenders have started to use consumers' cash flow history—how much income flows into the person's bank accounts and how much spending draws out of them—to underwrite credit, while other fintech lenders use utility and telecom payment data to inform their risk scoring. One study finds that roughly half of credit invisibles interested in obtaining credit have stayed current on all of their bills in the past 12 months.[18] By using such alternative credit data to approve loans, fintech lenders can offer lower prices than their traditional counterparts. A LexisNexis study finds that of the 24 percent of consumers in their sample without a credit bureau score,[19] 86 percent became scorable using RiskView, a credit score that uses alternative data. However, the proportion of unbanked and underbanked consumers who would benefit from such a score or other applications of alternative data is hard to estimate precisely.

[16] https://www.urban.org/sites/default/files/publication/57871/410935-analysis-of-alternative-financial-service-providers.pdf.

[17] https://www.urban.org/sites/default/files/publication/57871/410935-analysis-of-alternative-financial-service-providers.pdf.

[18] https://www.fdic.gov/householdsurvey/2017/2017report.pdf.

[19] Consumers who did not have enough credit history to be scorable because they either did not have recent activity on their credit, only nontradeline data, or no credit obligations open for a long enough duration.

*From Chartered Fintechs to Stable Value Crypto Banks*

We are seeing only the beginning of what fintech banks can do to improve the efficiency of the financial system and promote financial inclusion. The industry continues to evolve as new and better approaches enter the market. As with traditional lending, fintech lending entails safety, soundness, and fairness risks. But the financial services industry and its regulators are well equipped to handle these risks. And agencies like the OCC are encouraging fintech banks to reach their full potential by coming out of the shadows and joining the chartered banking system.

In particular, some fintech banks may be able to deepen their resource base and broaden their customer reach by becoming national banks. Additionally, an OCC charter carries with it a thorough and strict examination process that can create value for member banks. Examination creates value by providing critical analysis of business strategies and operations, which can enhance a member bank's credibility in the market (Calomiris 2020). The OCC has made it clear that it welcomes innovative financial service providers to apply for national bank charters. Given the evolving banking landscape, it makes no sense to restrict bank charters to bundled providers, or to banks offering one kind of payment product, such as deposits. Unbundled banks that execute payments through means other than deposits, or those that confine themselves to lending rather than payment services, should be free to become chartered banks, if they so choose.[20]

I emphasize that I am not arguing in favor of requiring all fintech shadow banks to become chartered banks. For some firms, the benefits of the charter outweigh the costs of the charter, while for others, the benefits may not outweigh the costs. For that reason, forcing all fintechs to become chartered banks could reduce the supply of banking services.

The OCC has come to recognize that new technologies and consumer preferences, not regulators, will decide the future of banking

[20] For some, but not all, fintech business strategies, access to Fedwire is also a potential source of value creation related to becoming a chartered national bank. That is especially true for fintech shadow banks that currently rely on partnering with chartered banks to gain access to that system.

and will determine what combination of novel and traditional banking businesses will evolve over time. Government or court decisions on chartering, however, can decide how much of that future occurs within the chartered banking system. Allowing fintech shadow banks to bring their novel approaches to applying technological changes to the needs of customers' preferences into the chartered banking system will help those banks by giving them access to the value-creating aspects of bank charters.

Some have questioned how the OCC can apply prudential standards to novel banks whose cash flows may not arise from traditional intermediation practices, and whose balance sheets may contain only small amounts of tangible assets. In fact, the OCC has been setting prudential regulatory standards for many years for lines of business within traditional banks for which substantial cash flows arise without a connection to tangible assets on the balance sheet. Such prudential standards take into account the volatility of the bank's cash flows and the ability of the bank to meet its expenses, including operating costs and debt service. There is no legitimate cause for concern about the ability to establish effective prudential standards for banks with small amounts of tangible assets. Capital ratios on novel banks with only intangible assets (present values of future cash flows) can be determined to achieve the same safety and soundness criteria as for banks with mainly tangible assets (such as loans).

### *Chartered Banks and Stable Value Cryptocurrencies*

Recently, the OCC has clarified the regulation of national banks with respect to transactions involving some crypto assets. The OCC clarified that national banks may act as custodians of crypto assets and also may hold the reserve balances of certain stable value cryptocurrency providers. These actions reduce regulatory uncertainty and simply recognize the fact that crypto assets are a significant and growing part of the global financial system.

What about chartering cryptocurrency providers? The state of Wyoming has been among the most progressive authorities in establishing state chartering of banks involved in producing cryptocurrencies. The United Kingdom and European Union also seem willing to pursue similar initiatives. Whether and how other U.S. states or the OCC might follow suit remains unclear. The question of how to properly charter stable value coin providers as banks is an open one.

Which business models should be considered within the scope of chartering for the OCC? How should algorithms set by crypto coins be regulated and examined? What prudential capital and cash asset standards should be applied? In my discussion here, I do not mean to suggest that the OCC has decided the answers to these questions. I do, however, believe that there are several identifiable advantages from chartering stable value cryptocurrency providers with safe and sound business models as national banks. In what remains of this section, I consider the prospective advantages of chartering stable value cryptocurrency providers as national banks. I first identify several advantages from permitting stable value crypto coin providers (whether as shadow banks or chartered banks) to eventually develop a new nondepository payments network separate from the existing central bank–based network. At the end of that analysis, I also consider some reasons why it may be desirable to permit such banks to become chartered banks.

For the purpose of my example, to be concrete, I will consider a particular form of a stable value crypto coin–issuing bank. But my conclusions about the potential advantages of this arrangement apply more broadly than to just this model, although it would not apply to all potential business models for stable value coins. The point of this example is to show that a nondepository stable value crypto coin can be issued in a safe and sound manner, and that it could have substantial efficiency, convenience and stability advantages, if it were designed properly.

Imagine a bank that sells a total number of S coins, selling each coin it issues for $1. The coins can be used to transact in goods and services through blockchain clearing (i.e., through gross real-time settlement at nearly the speed of light). The bank maintains a secondary market in its coins. Specifically, it commits contractually to buying coins whenever their value falls to $0.99 at that price and selling coins whenever their value rises to $1.01 at that price. It does so automatically as long as it possesses sufficient cash on hand to buy or sell coins at those prices. If it is unable to purchase coins at $0.99 (due to a lack of cash), then its financial claims are revised, as described below. The secondary market purchase and sale policy is contractually credible and executed automatically by an algorithm. There is no redemption option for the coins and they never mature. The coins are effectively a kind of perpetual preferred stock in the bank.

The only claims on the bank are coins and common shares. If the bank is unable to purchase coins in the secondary market due to a lack of cash, its financial claims are revised as follows: coins enjoy a strict prior claim on the assets, and this is implemented by setting the value of preexisting common shares owned by the bank stockholders to zero in this state of the world. In that eventuality, the quantity of preexisting coins is reduced (written down) in amount by 5 percent. This avoids any need for a liquidation of assets or other bankruptcy proceedings. Coin holders then receive pro rata amounts of new common shares that give them the remaining residual interest in the bank. If, after this initial write-down, the bank is still unable to meet its secondary market purchase obligation, then a second 5 percent write-down occurs, and so on, until the bank has deleveraged sufficiently so that the value of its assets exceeds the value of its coins.[21]

I reiterate that this is only one model for how a nondepository stable value coin provider might operate in a safe and sound manner. I do not mean to suggest that it is the best model, but I find this example simple to analyze, and it allows one to see some advantages that arise from a liability structure different from typical depository banking. I now proceed to consider the services and risks entailed by this banking model.

Because the bank operates in a competitive environment (and has near zero physical costs) I assume that the bank contractually commits to paying interest on the coins equal to the U.S. Treasury bill rate. I initially assume that the bank's tangible assets consist of cash assets ($C) in the form of U.S. Treasury bills. I later consider deviations from that assumption. I also assume that the bank possesses an intangible asset equal to the present value of fees it expects to earn from executing payments ($F). To simplify our discussion, but without loss of generality, the amount of transaction fees expected to be

[21] Notice that, although in the model presented here, stable value coins always maintain their $1 value in equilibrium, the stable coin algorithm provides for a case where the stable value coins decline in value below $1. Why might this happen? Fraud, processing errors, or other operational errors are practical considerations that apply in reality even though they are not modeled here explicitly. The bank's design permits those risks to be borne by equity holders to a certain extent, but if equity proves inadequate for that purpose, the coins will be written down automatically, which avoids the inconvenience and delay associated with a receivership, as would occur under traditional depository banking.

earned in each period is not expected to grow over time. $F is the discounted value of that constant expected stream of earnings. But $F is stochastic; the arrival of news about changing transactions demand can affect $F. The lower support (lowest dollar value) of $F is $F′. The value of the bank's equity ($E) at any moment in time, owned by its common shareholders, is given by $E = $F + $C − $S.

If the bank sets S < $C, what will be the value of each of its coins, and in that case (where S < $C), will it ever fail to be able to honor its promised secondary market purchase policy?

So long as the bank is known to operate credibly under the above set of rules (i.e., its holdings of cash assets are deposited in a safe place and are observable to its coin holders, and its commitment to purchase and sell at the specified prices in the secondary market are contractually binding on it), then in equilibrium, each coin will trade at a value of $1 and the bank will never have to write down its coins. The bank can arrange a line of credit from another chartered bank collateralized by its Treasury bills that will allow the stable value coin bank to draw an amount of cash equal to its Treasury bill holdings, if needed.

No coin holder has an incentive to sell coins in the secondary market because it is not possible to profit from selling them at $0.99. The coins are riskless and useful for transacting in the market for goods and services, and the bank is always able to pay the contractual interest rate (the market interest rate on riskless cash assets). Therefore, the bank will never need to actually draw upon its line of credit. In equilibrium, the coins will be valued $1 each.

Can the bank reduce the amount of tangible assets it holds (by paying a dividend to its stockholders) without creating the possibility of a failure to maintain this riskless stable coin equilibrium?[22] Yes, if there is a known lower bound to $F equal to $F′, then the bank can pay out some of its cash assets as a dividend. To maintain a riskless commitment that keeps stable coins at the value of $1, the bank just has to maintain cash assets $C such that $C + $F′ = S. The bank will maintain a line of credit equal to $C + $F′, and as before, it will never have to draw on that line of credit because coin holders never

[22] In this model, the bank can also pay all of the transaction fees it earns per period out as dividends without running the risk of failing to maintain the $1 value of its stable coins.

have an incentive to sell coins below the price of $1 in the secondary market. Note that this implies a form of riskless fractional reserve banking. The bank can also pay all of the transaction fees it earns per period out as dividends without running the risk of failing to maintain the $1 value of its stable coins.

Note that because the bank does not rely on deposit funding and does not offer a first-come, first-served rule for redeeming its coins, it cannot experience a run. Coin holders see no advantage to being first in line to sell their coins in the secondary market.

Is it realistic to imagine that coin holders would demand these stable value coins rather than deposits in a conventional bank? Yes, for several reasons. First, this bank has zero overhead costs (more realistically, its overhead costs are much lower than for a conventional bank) so it is able to offer a higher interest rate on coins than depository banks can offer on deposits, which are similarly riskless. Second, the coins are more useful than deposits. A payment can be made with instant finality and can be accompanied by a message that assists in executing the transaction, which is the service that account for the fees charged for payments. Stable value coin producers already are creating novel services that facilitate transactions, which will further increase demand for their coins as media of exchange. For example, if the purchaser wishes to convey selective information about himself during a transaction, that can be done credibly by using verification procedures through the blockchain. A purchaser may wish to convey that he is older than 18 years so that he can engage in gambling online, or may want to convey his state of residence so that he can pay sales taxes on the transaction.

Furthermore, the coin holders gain from the fact that a blockchain payments network is much less vulnerable to cyberattack or hacking than the existing centralized payments network operated by the Fed. That advantage also has positive systemic risk consequences. Eisenbach, Kovner, and Lee (2020) argue that a cyberattack on a member of the existing centralized network will disrupt payments throughout the network, with large spillover effects on other banks and their customers. But because blockchain clearing occurs through a decentralized network, it offers an environment that is much more secure from hacking, and coin holders throughout the blockchain-based network bear less risk from hacking or cyberattacks.

How should governments react to this type of stable value coin issuing bank? Its existence adds to systemic stability for several reasons. First, coin holders bear no risk of default and there is no possibility of a run. Second, the systemic risk from cyberattack would be lower. Third, an additional systemic risk advantage comes from the absence of insured deposits and the unbundling of lending and clearing. The current bundling of lending with insured deposits has been shown to be a substantial source of systemic risk. Insuring the deposits of banks that engage in risky lending encourages banks to increase their lending risk,[23] as evidence across many countries' and more than a century of experience has demonstrated.[24] For example, Brewer (1995) shows that insurance of the deposits of savings and loans in the United States substantially increased the risk taking of those institutions during the 1980s. Gorton and Pennacchi (1992) propose a solution to the problem of deposit insurance funding of loans: banks that provide transactions accounts backed by riskless assets can give consumers the ability to hold riskless balances for payments without creating the systemic risks associated with insuring the deposits of lenders. The stable value coin bank modeled here is an example of such an intermediary.

Fourth, because transactions are executed via blockchain, which permanently records every transaction, regulation can credibly require the bank's transacting algorithm to contain protocols that minimize the possibilities of money laundering and tax avoidance (which could be required by law and enforced by examination ex post). That could substantially reduce such criminal activities.

So far I have only considered bank policies that result in a riskless stable value coin–issuing bank. Could a risky version of this bank arise in equilibrium (where the stable value coin bank would convert a significant fraction of its cash assets into risky assets)? This seems unlikely. It is hard to see why that would appeal to coin holders.

[23] An alternative policy of providing conditional lender-of-last-resort assistance in lieu of unconditional deposit insurance would permit the government to deal with the risks attendant to financial crises without contributing so much to systemic risk (Acharya and Thakor 2016).

[24] See, for example, Demirguc-Kunt and Detragiache (2002); Demirguc-Kunt and Huizinga (2004); Kane (2010); Calomiris and Jaremski (2016); and Calomiris and Chen (2020).

The stable value coin–issuing bank has no obvious comparative advantage in lending or stock picking, so it is not clear why it would seek to substitute loans or stock holdings for Treasury bills. If the bank were to buy a diversified portfolio of stocks with some of its cash assets, that would make coin balances riskier with no obvious gain to consumers given that the coin holders can purchase shares on the same terms if they so desire. Most importantly, people generally like to keep low-risk transaction balances separate from their long-term risky asset holdings (this is a defining characteristic of payments-related balances held by firms and consumers throughout the ages).[25] Furthermore, setting up a risky stable value coin bank likely would not appeal to the bank's organizers either; note that my model assumes that if the bank is unable to meet its contractual commitment in the secondary market, the preexisting shareholders of the bank would forfeit all of their common stock.

Even if I am missing some reason why a risky version of a stable value coin bank might appeal to coin holders and bank organizers, such a bank would not create any new risks for the rest of the economy from losses it incurs. In contrast, traditional depository banks *do magnify risk* in the economy when they suffer losses on their portfolios, especially through withdrawal pressures as a consequence of those losses (Calomiris and Wilson 2004), which can lead them to curtail the supply of lending, liquidate risky assets, and reduce the prices of the risky assets being liquidated. Recall that the stable value coin bank modeled here operates under a coin write-down protocol that automatically converts preexisting coins into new coins (of lower value). Thus, even if a risky stable value coin bank were created for some reason I cannot fathom, given that it does not rely on redeemable deposits, it would not contribute to systemic risk in the way that standard depository banks do.

If transactions balances are withdrawn from traditional banks and converted into stable value coins, will that undermine the ability of banks to lend? For example, Calomiris and Kahn (1991) show that lenders might need to establish traditional banking structures funded with the discipline of redeemable or short-term debt. First, as discussed earlier, improvements in information technology may have

[25] Gorton and Pennacchi (1990) explain why this is true, in theory. Calomiris and Wilson (2004), among others, show empirically that even when banks are uninsured, market discipline forces them to offer very low-risk deposits.

mitigated the theoretical motivations that drive this contracting structure of bundled intermediation. Second, if lenders still need the discipline from borrowing short-term funds in the market, then that is best provided by *risky* debt, not insured deposits. Lenders can rely on commercial paper or repo, as many finance companies and hedge funds have done since the 1960s. Here again, efficiency is served by unbundling lending from payments, and stable value coins offer a means of improving transacting. I see no gain to be had from preventing that.

In summary, a payments system founded on sound business models for stable value coins, operating via a decentralized blockchain network, would reduce transaction costs, increase payment speed, reduce hacking risks, raise interest paid on accounts, and allow new services (such as the communication of information about the payer) to be provided efficiently. That decentralized network would also lower systemic risk and reduce criminal activity.

Should the OCC and state banking authorities charter stable value coin banks like those that are modeled here? Although the details of the OCC's chartering policy remain a subject for study and ongoing debate as they gather all the facts about appropriate business models and ways of regulating and supervising these banks, my analysis contributes to the argument in favor of the view that it would be desirable to allow such banks to obtain national bank charters. Chartering them would allow banks' customers to gain from credible examination of their algorithms and accounting and managerial skills. By encouraging shadow banks of all kinds (including stable coin banks) into the chartered system, examination can ensure that consumers are not taken advantage of by unscrupulous, dishonest, or misleading practices. The government would also gain because examination would ensure that the bank's algorithms comply with laws against money laundering and tax evasion and that its accounting is honest.

Will some stable value banks be willing to join the ranks of chartered banks? I think so. First, they would reap the advantages from having examinations help them build market credibility for their algorithms and managerial practices. And a national bank charter, in particular, helps banks to expand their market reach across state lines. Finally, stable value coin banks, like other novel banks whose business models do not require that they borrow deposits, will be able to reap those advantages while avoiding some of the regulatory

apparatus that makes traditional banking more costly. For example, a national bank that avoids issuing deposits does not have to be regulated by the FDIC or obtain deposit insurance (which is superfluous to it). A nondeposit bank also can be owned by a holding company without having to face the regulatory burdens of Fed oversight (which in many cases also would be superfluous, given the simple business models of stable value coin banks). It would be regulated by the OCC, but some of the costs of OCC regulation would be reduced for nondepository banks. For example, nondepository banks are not subject to the Community Reinvestment Act. The gains from avoiding those various regulatory burdens largely would accrue to consumers (recall that regulatory costs are one of the barriers that prevent traditional banks from serving small-dollar bank customers affordably). I conclude that stable value coin bankers, their customers, and the government all stand to gain from chartering stable value banks. The same logic that favors the chartering of unbundled fintech banks today likely also applies to stable value coin banks in the future.

## But Misery Loves Company and Power Is Addictive

Not everyone welcomes a future in which unbundled fintech banks become an important part of the chartered national and state banking systems. The idea that today's unbundled fintech banks, and possibly tomorrow's stable value coin banks, should become chartered banks is anathema to the special interests that profit from keeping progressive financial intermediaries in the shadows. And some powerful entities may be especially threatened by the idea that a banking system could arise to accomplish payments transfers without needing to maintain liabilities in the form of deposits. After all, powerful special interests possess huge economic rents that are conferred on them as a consequence of preserving the status quo. Who are those special interests and how likely are they to be successful in preventing a chartered fintech future?

State authorities that license shadow banks are one special interest group that has already identified itself as hostile to the chartering of fintech banks. The state of New York is suing to prevent the OCC from chartering nondepository fintech banks (Lacewell v. OCC). In 2019 alone, New York State earned over $100 million in licensing fees. Not only would chartering fintechs move fees out of

the state coffers for the banks that migrate to the national system, the state licensing authorities would likely lose from the consequent decline in the fortunes of other financial service firms that they license because those firms may find themselves in a less competitive position. For example, payday lenders are entirely state licensed and regulated. Chartering fintech banks as national banks (including those with financial inclusion strategies discussed earlier) could substantially reduce the market share of payday lenders. That would benefit consumers throughout the country by reducing the cost of small-dollar loans, but state licensing fees from payday lenders likely would fall.

Traditional banks, especially the least efficient among them, should and do see chartered fintechs as a threat that would likely accelerate their declining market shares and profits. Traditional banks are struggling. With few exceptions, their business models are antiquated. Net interest margins for traditional banks today are at historic lows, and branch networks have become highly unprofitable owing to the low-interest rate environment that has prevailed since 2009. With the wholesale interest rate near zero, the interest savings from attracting core deposits (the primary purpose of bank branches) are also near zero, which means that noninterest expenses associated with operating branches are a source of value destruction for the banking enterprise. This effect is visible in the declining values of core deposits to banks' enterprise values (Calomiris and Nissim 2014).

The bundled, universal, too-big-to-fail banks already are waging a battle to discredit progressive fintech banks. They wage this battle mainly through their policy advocacy arm, known as the Bank Policy Institute (BPI). Articles published by BPI economists either stoke fear that new technologies will be destabilizing, or argue that it is unfair to allow unbundled banks to provide services to consumers with lower regulatory costs than the too-big-to-fail banks are forced to bear.[26] It is somewhat astounding to see these large banks asking regulators to preserve their businesses from more efficient competitors. It never seems to occur to them that they might change

[26] See Rosenthal and Court (2020) and the references therein to other BPI policy papers.

their business models instead, by taking to heart the trend toward unbundling, by becoming more focused in their strategies, and by making more efficient use of resources. Sometimes traditional bank advocates even join the state licensing authorities in making the self-serving and contra-historical argument (as the introduction to this article showed), that the very definition of a chartered bank requires a reliance on deposit funding.

This is no surprise given that the too-big-to-fail banks have reason to be concerned about their future. Their business models are not doing well, and their size and complexity make it especially challenging for them to conceive of ways to adapt to the new competitive environment. Not only are they displaying low profitability, two of the largest four bank-holding companies in the United States have total common shares worth less in market value than the value of their tangible common equity, which implies that the present value of their nontangible assets is *negative*.[27] In other words, their business models destroy value rather than create value.

It is likely that traditional banks—especially the large banks and their advocates—will continue to lose market share to fintechs, whether or not fintechs become chartered national banks. Inefficient banks would do more for their shareholders by improving their business models than complaining as the future of financial services unfolds before them.

There are other potential losers from the chartering of fintech banks who may also join the buggy whip coalition. The Federal Reserve is a very powerful organization that stands to lose its monopoly over the payment system as blockchain-based networks develop. The Fed's political power is closely linked to the centralized payment system that it controls, and it has always been mindful of expanding and preserving its power (Calomiris 2019). Furthermore, some fintech firms are choosing to structure their chartered banks in ways that will not require Federal Reserve Board oversight of their holding companies, implying another potential decline in Fed power. Finally, Fed digital currency is a possibility being discussed by many economists. Advocates of a Fed cyber

[27] Note that bank accounting treatment sets tangible asset books values at market value, which is why market-to-book measures are so informative of value creation or value destruction (Calomiris and Nissim 2014).

dollar see its creation (alongside the abolition or restriction of the use of paper dollars) as a means of empowering the Fed. A cyber dollar could pay negative interest, thereby removing the zero lower bound on interest rates as an obstacle to the Fed's ability to pursue expansionary policy. Fintech banks, especially stable value crypto coin producers of the future operating via blockchain, are an important prospective source of competition that could limit the Fed's ability to impose negative interest rates on consumers and firms.[28]

Given that the Fed could lose substantial power as the result of the chartering of nondepository fintech banks, it may oppose them. One can hope that the Fed will be guided more by public interest than a desire to preserve its own power. As far as I know, the Fed has not taken an official position on the question of fintech chartering. Time will tell.

What about community organizations, such as the members of the National Community Reinvestment Coalition (NCRC)? One would hope that these organizations, too, which have given themselves the mission of helping to advance the lives of America's poor and underprivileged, would see the advantages for financial inclusion of chartering fintech banks, as described in detail above. On the other hand, the heads of these organizations make large salaries and have gained substantial power by serving as poverty

[28] It would be possible for the Fed to set the yield on Treasury bills at a negative nominal value through open market purchases. It could at the same time also pay a negative interest rate on cyber dollar reserves to its member banks. Banks would be forced by competitive pressure to pass on the negative interest rate to their depositors. If a stable coin bank pegged its currency to the cyber dollar, and held Treasury bills as reserves, it too, would be forced to pass on a negative interest rate to its coin holders. In that case, however, consumers and firms could decide to shift holdings to stable value coin providers that peg to something other than the cyber dollar. For example, some stable value coins already are backed by foreign currency assets. Another possibility would be to adopt a commodity standard (which could be done relative to gold, or to a broader basket of commodities). If gold were used as the unit of account, then gold holdings would serve as reserves. If a broader commodity standard were chosen as the unit of account, then a basket of futures contracts could serve as reserves. Stable value coin–chartered national banks conceivably could participate in noncyber dollar denominated coin issuance too. There is precedent for national banks to avoid using the legal tender dollar as their unit of account. National gold banks issued notes redeemable in gold rather than legal tender dollars in the late 19th century. These banks were created under the Currency Act of July 12, 1870. Ten national gold banks were chartered, nine in California and one in Boston.

intermediaries. As agents of the poor, they (like all agents) can be conflicted. In particular, NCRC members have gained a great deal personally (in salaries and power) from the regulation of traditional depository banks under the Community Reinvestment Act, which entailed transfers of *trillions* of dollars (either in the form of grants or targeted lending) to their organizations (see Calomiris and Haber 2014: chap. 7). As with the Fed, it is too early to know how these organizations will greet the chartered fintech future. Will they prioritize improving the lives of the poor, even if doing so weakens their own control over resources? Again, time will tell.

I conclude that, although the chartering of fintech banks as national banks would promote efficiency and inclusion, there are powerful vested interests that either have already expressed hostility to the idea (the too-big-to-fail banks and state licensing authorities) or that may do so in the near future (the Fed and NCRC members). These are all powerful players in what Stephen Haber and I call the political "Game of Bank Bargains," and it would be naïve to think that the chartering of fintech banks is a foregone conclusion as the result of its compelling economic logic. Politics has its own logic, and it isn't always pretty.

## Conclusion

I have shown that the chartering of fintech shadow banks as national banks is a desirable development. In the near term, this will occur in the form of unbundled, novel providers of payments or lending services. Some of their business models entail borrowing deposits, but some do not. All of them are banks. They and their consumers stand to benefit greatly from coming out of the shadows and becoming chartered banks. For many shadow banks, the advantages of greater geographic reach and enhanced market credibility from OCC examination will outweigh the new costs of regulations they will bear. That is especially so if they are able to avoid unnecessary regulatory burdens on their organizations.

I emphasize that I am not arguing in favor of *requiring* fintech banks to obtain national charters. This would impose new regulatory burdens on banks, some of which would be less able to meet customer needs as a consequence. I also emphasize that the externality argument often used to justify forcing traditional intermediaries that issue deposits to be chartered does not apply to

unbundled nondepository fintechs. Traditional banks that use deposits to fund loans can magnify recessions as the result of the combination of deposit taking and lending. Losses on loans create credit crunches when banks facing loan losses cut lending to maintain a low risk of default on deposits, and such banks can face a risk of runs if they are unable to keep deposit risk low (Calomiris and Wilson 2004). Unbundled banking does not create these sorts of externalities, and therefore, there are no obvious arguments for forcing fintech shadow banks to obtain charters unless doing so creates value for their enterprises.

The point of chartering fintech banks should be to allow them to reap the net gains of a charter, if those gains are positive for them. This approach ensures chartering only occurs when the charter creates value. Furthermore, by permitting, but not requiring, fintech banks to obtain charters, society reaps a further benefit: technology serves as a check on excessive regulation. If chartering authorities know that excessive regulatory burdens will discourage fintech banks from coming out of the shadows, then regulators will be more mindful of the costs of regulation.[29]

Consumers stand to gain dramatically from allowing fintechs to obtain national bank charters. Chartered fintechs, in many cases, could offer lower costs, better service, and greater access to financial services, especially for the unbanked and underbanked. Consumers will also gain from improved supervision of these banks, which will help to ensure that their customers are treated fairly and that the banks are run on a safe and sound basis. For all these reasons, the OCC is welcoming novel fintech banks to apply for national bank charters.

Does it make sense to extend the national bank charter to encompass stable value crypto coin providers? I show that doing so could have some important advantages. The OCC is currently considering this possibility, although the policy framework that would guide

[29] Some might argue that fintech banks should be forced to obtain charters because of the reduced systemic risk externalities that come from the regulation of chartered banks. I don't find this argument convincing when applied to fintech shadow banks. As I pointed out in my discussion of stable value crypto banks, because they avoid issuing deposits, and because they do not combine deposits with lending, they do not generate the sorts of negative externalities related to systemic risk (credit crunches or stock market value declines) that traditional banks can create.

national bank chartering of stable value coin providers remains a topic of study and ongoing debate.

When considering whether fintech shadow banks, including stable coin providers, will eventually become an important part of the chartered banking system, it is crucial to take into account the political power of the special interests who stand to lose from doing so. Whether consumers are able to realize the gains of a chartered fintech future ultimately will depend as much on politics as it will on economics.

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