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Future-Proofing Inclusion: Technology Proposals for CDFIs and MDIs

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Preface

The Honorable Gregory Meeks

United States Representative, New York's 5th District

In Washington, we often theorize about a world where small institutions - especially minority-owned and community-focused depositories – are able to thrive in our economy and best serve those most in need. In practice, regulatory hurdles, economies of scale, and technological disruption pose existential challenges for smaller financial institutions, especially those that focus on serving the underserved.

This gap in what policymakers aspire towards and everyday realities is one that can be closed through robust communication between scholars, regulators, lawmakers, practitioners, and leaders of tomorrow. That is why I am so proud of the work being done by Professor Christopher Brummer to facilitate such dialogue, especially at the 5th annual Fintech Week.

This year's focus on MDIs and community banks is on mark as technological innovation, harnessed appropriately, can help us make significant headway in ensuring the long-term sustainability of these institutions and the communities they serve. I look forward to what comes out of these discussions and learning more about how Congress can better play its part to ensure a financial ecosystem where small depositories - especially MDIs - continue to play a key role in providing banking services.

Introduction

Chris Brummer

Agnes N. Williams Professor of Law, Georgetown University Law Center and Director, Institute of International Economic Law

Minority depository institutions (MDIs) and community banks are critical to the success of America's diverse and entrepreneurial communities. These keystone institutions provide the essential funding for people seeking to purchase (often first) homes; they provide startup funding for small businesses where customers' personal networks and family wealth may be limited and offer a source of emergency support for individuals facing unexpected liquidity challenges throughout life.

Part of the competitive advantage of MDIs is their connection to their customers and their unique appreciation of their customers' challenges.[1] Even with smaller asset bases, and locations often in rural or higher poverty areas, they have proved highly capable of operating at similar levels of relative efficiency as their non-MDI counterparts.[2] In doing so, they provide critical alternatives to higher-cost products like credit cards, designed to fund short-term liquidity, not medium to longer term business ventures in a high-touch environment.[3] And in a world where minority borrowers are faced with more loan requirements, and in which 70 percent of minority neighborhoods do not have a bank branch, their existence can serve as a lynchpin to local economic development, affordable housing, and financial security.[4] MDIs do more with the resources they have, and scholars have hypothesized that with more investment, MDIs have the capacity to overcome decades of discrimination, efficiently serving the financial needs of their communities.[5]

Nevertheless, MDIs have experienced a period of significant decline over the last three decades. Since 2009, nationally, the number of MDIs dropped from 215 to 155 at the end of the second quarter of 2018, driven in part by

[1] The term "MDI" is one derived from regulatory practice. *See* Milken Institute, *Minority-Owned Depository Institutions: A Market Overview* (2019), at 3, https://milkeninstitute.org/sites/default/files/reports-pdf/Minority-Owned Depository Institutions - A Market Overview UPDATE-3-2p_0.pdf ("The Federal Deposit Insurance Corporation (FDIC) designates MDIs according to criteria that determine minority ownership of the depository institution. The minority ownership designation primarily refers to Asian, Black, Hispanic, and Native American populations.") [hereinafter *Milken Institute Report*].

[2] *See generally* Gregory B. Fairchild et al., *Good Money After Bad? The Comparative Efficiency of Minority Depository Institutions, Journal of Developmental Entrepreneurship, Vol. 25, No. 1* (2020), https://www.worldscientific.com/doi/10.1142/S1084946720500028.

[3] *See generally* Milken Institute Report, *supra* note 1.

[4] Milken Institute Report, *supra* note 1, at 3 ("According to Home Mortgage Disclosure Act (HMDA) data, MDIs are far more likely to have both branches in minority neighborhoods and a significant portion of their lending activity targeting minorities.").

[5] *See e.g.,* Salem Zelalem, *Minority-Owned Banks: Doing More with Less*, UVA Darden: Ideas to Action (Apr. 2, 2020), https://ideas.darden.virginia.edu/minority-owned-banks-more-with-less.

consolidation[6] and due to a significant decline in the number of MDIs owned by African Americans.[7] In addition, MDIs are far smaller than the average commercial banking institution. Black and Latino MDIs have average assets of $245 million and $2.7 billion, respectively, compared to an average of $3.1 billion for all US banks, and the largest MDI has only $38 billion in total assets.[8]

The COVID-19 pandemic threatened to hasten the decline as MDIs found themselves on the front lines of financial relief for some of the country's most vulnerable citizens. During the pandemic, MDIs, like non-MDIs, expanded their lending in response to the higher loan demand supported in part by the federal Paycheck Protection Program (PPP).[9] But as the crisis deepened, the fortunes of MDI customers tended to fall even more than elsewhere, creating a bigger shock to MDI balance sheets. Not only were MDI customers disproportionately falling ill, but racial and ethnic minority groups were unequally affected by unintended economic consequences of strategies to mitigate the disease, such as social distancing.[10] MDIs consequently suffered a significantly bigger drop in profitability than other banks during the pandemic. Their balance sheets weakened substantially.

In response, Congress passed significant measures to recapitalize MDIs,[11] but the drivers impairing MDI growth and sustainability were left unaddressed and remain. Perhaps the most significant challenge is robust technology adoption. As noted, MDIs are small in the broader commercial banking context, and thus more susceptible to challenges associated with riskier underwriting, exogenous shocks, as well as heightened surveillance, operational cost burdens, and regulatory compliance costs. Yet the MDI technology stack is not infrequently less developed and more disparately served than that of its peers. Paper based systems are common; and loan management, accounting, and customer relationship management tools utilize software systems that do not fully accommodate their customer's needs, nor consider their identities.[12]

These challenges, long understood on the ground, took special significance during the pandemic as the government enacted emergency legislation, creating what were in effect grants through forgivable loans under the Paycheck Protection Program for commercial borrowers and independent contractors seeking to subsidize their retained payroll. During the program, many MDIs lacked the proper technology to source, process, onboard, service, and retain large volumes of new customers and prospective relationships — even as the median MDI provided significantly more credit to their minority borrowers than the median non-MDI.[13] Furthermore, MDIs had to overcome pre-application processes that did not fully speak to the needs of diverse, and less wealthy customers and microentrepreneurial stakeholders.

The digital transformation of the banking system over the last 18 months has introduced if not new, then at least enhanced, competitive pressures as well. During the pandemic, brick and mortar morphed from a must- or maybe-

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[6] Milken Institute Report, supra note 1, at 12.

[7] Federal Reserve Bank of St. Louis Welcoming Remarks from James Bullard, Banking and the Economy: A Forum for Minorities in Banking Federal Reserve Bank of St. Louis (Sept. 26, 2019), at 4, https://www.stlouisfed.org/-/media/project/frbstl/stlouisfed/files/pdfs/bullard/remarks/2019/bullard_welcoming_remarks_minority_bankers_forum_26_sept_2019.pdf. ("From 2001 to 2018, the number of depository institutions owned by Asian Americans, Hispanics and Native Americans increased, while the number of MDIs owned by African Americans declined by more than half. African American MDIs represented just 15% of all MDIs at the end of last year.").

[8] Milken Institute Report, supra note 1, at 3.

[9] See generally Sophia Friesenhahn and Simon Kwan, Minority Banks during the COVID-19 Pandemic, FRSBF Economic Letter (Aug. 2, 2021), https://www.frbsf.org/economic-research/publications/economic-letter/2021/august/minority-banks-during-covid-19-pandemic/

[10] Id.

[11] See, Inclusiv, Congress Confirms Inclusion of $12 Billion in CDFI Funding in New Stimulus Bill, NEWS AT INCLUSIV (2021), https://www.inclusiv.org/congress-confirms-inclusion-of-12-billion-in-cdfi-funding-in-new-stimulus-bill/.

[12] See e.g., Anna Gomez, OFN Releases CDFI Loan Fund Technology Landscape: User Survey Results, OFN BLOG (June 28, 2017), https://ofn.org/articles/ofn-releases-cdfi-loan-fund-technology-landscape-user-survey-results.

[13] See Sophia Friesenhahn and Simon Kwan, supra note 9, at 4.

have asset to a competitive disadvantage as better resourced institutions switched online quickly to shed costs and to maintain and build customer relationships. Online and mobile usage meanwhile flourished as the pandemic accelerated trends that were already apparent – less traditional in-person and more online and digital. Supercharging digital transformation has been the proliferation of eCommerce and online shopping, as trust in online services has grown with the dependence of home-stricken consumers.[14] Yet many MDIs are poorly situated to take full advantage of the changes given their limited experience, expertise, and exposure in the digital space. Indeed, even now MDIs face the daunting challenge of competing with financial institutions that are often entirely online, or that operate in ways capable of delivering curated financial services at scale.

With that in mind, the following report prepared for Washington DC's 5th Annual Fintech Week features case studies and insights from some of the most advanced financial technology firms in the world, and as well as from firms just beginning to launch, many with some revolutionary ideas for the industry. We asked each to offer insights as to how MDIs might leverage novel applications of technology to achieve optimal growth and help service their customers.

Critically, the essays cover sectors far beyond the conventional MDI discourse, and touch on areas like open banking, machine learning, AI, and more. Directing the focus of the project towards some of the novel technologies of the future is a very intentional decision by the conference organizers. Philosophically, it is our belief that Black and Brown communities deserve the same high quality, innovative financial services as anyone else. Where the latest technologies present opportunities to help level the playing field, or bring individuals and firms long overlooked into the mainstream financial economy, they should be rigorously evaluated, and then leveraged alongside a larger toolset of government and social policy. Ignoring the digital transformation of the economy risks the further erosion of MDIs as levers of critical support for many of America's most fragile communities.

We thus thank our authors for their contributions and time to this project, and welcome responses from stakeholders and policymakers in the ecosystem as we kickstart a new, and much needed conversation.

A special thanks also goes to the Georgetown University Law Center, IFM, and Visa's Economic Empowerment Institute for their support of DC Fintech Week's MDI/CDFI Technology Dialogue.

[14] See Maria Schuld, How Technology Can Empower Community Banks to Deliver a Great Digital Experience, FINEXTRA BLOG (July 20, 2021), https://www.finextra.com/blogposting/20634/how-technology-can-empower-community-banks-to-deliver-a-great-digital-experience.

K2Integrity

Promoting Financial Inclusion with Federated Learning: The Consilient Solution

Alex Levitov, Senior Director, K2 Integrity
Gail Fuller, Managing Director, K2 Integrity

PART I:
The Challenge: Understanding and Managing the Risks of Underserved Populations

Whether it comes to pricing and extending credit, predicting fluctuations in the market, or protecting against operational breakdowns or abuse by illicit actors, financial institutions are in the business of managing risk. But in each of these domains, a bank's risk management decisions are only as good as the information and analytic tools they have at their disposal. Where such information is lacking—or, worse, where well-established ways of measuring risk are potentially biased or misleading—banks may shy away from doing business with certain customers or markets, leaving already underserved populations without vital access to financial services and missing out on business opportunities.

This phenomenon has manifested internationally over the past two decades, as many global banks have reassessed their risk exposure and tolerance regarding financial crime and sanctions. This has resulted in terminated or restricted business relationships with remittance companies and banks, primarily in developing or politically unstable countries perceived to be high risk for financial crime. Lacking a sufficiently granular and nuanced understanding of the risk that individual institutions and their customers present, global banks have at times opted to "de-risk" bluntly from entire regions, jurisdictions, or customer types, hindering global financial inclusion, reversing progress in reducing remittance prices and fees, and pushing higher-risk transactions into more opaque, informal channels.[1]

A similar dynamic is also undermining access to financial services closer to home. Relying on incomplete and often inaccurate tools for measuring creditworthiness and other risk factors, banks in the United States have long tended to avoid—rather than manage—the risks of providing services to the 53 million Americans who lack a credit score from a nationwide consumer reporting agency or the 56 million more whose credit scores are subprime.[2] Customers without a traditional credit score struggle to obtain mortgages, credit cards, or other bank loans and often must resort

[1] The World Bank, "De-Risking in the Financial Sector," October 7, 2016, available at: https://www.worldbank.org/en/topic/financialsector/brief/de-risking-in-the-financial-sector.

[2] AnnaMaria Andriotis, "Need Cash? Companies Are Considering Magazine Subscriptions and Phone Bills When Making Loans," *The Wall Street Journal*, September 12, 2019, available at: https://www.wsj.com/articles/need-cash-companies-are-considering-magazine-subscriptions-and-phone-bills-when-making-loans-11568280601?mod=article_inline.

to high-cost loans that may not help build a credit history, even when successfully repaid.[3] Even where consumers have a traditional credit history, more than one in five has a "potentially material error" in their credit file.[4]

The problem of inadequate credit scoring disproportionately impacts Black or Hispanic borrowers, who have not had equal access to homeownership and other sources of generational wealth, and those who live in low-income neighborhoods. It also impacts some recent immigrants, young people just getting started in the job market, and those who are recently widowed or divorced and lack a sufficient credit history on their own.[5] Moreover, even mission-driven banks such as community development financial institutions (CDFIs) and minority depository institutions (MDIs), which serve low-income and minority communities at higher rates than mainstream banks, may find it difficult to accurately risk-rate a largely "credit-invisible" customer base and price credit products accordingly — a challenge exacerbated as the COVID-19 pandemic has substantially weakened these banks' balance sheets and further strained profitability.[6]

In this paper, we outline how a new model K2 Integrity and Giant Oak pioneered with Consilient to help banks worldwide discover and manage their illicit finance risks could be deployed to enable small- and mid-sized banks in the United States—particularly CDFIs and MDIs—to better understand, assess, and manage the risks of serving customers who lack traditional credit scores or whose credit scores may inaccurately reflect their true credit risk. The **Consilient** solution is driven by an innovative technology and governance model known as **"federated learning,"** whereby a machine-learning algorithm accesses and interrogates data sets across different institutions without ever moving or extracting the underlying data, thus enabling collective learning while safeguarding sensitive customer data.

Supported by ongoing and expert human oversight and appropriate governance, this technology would learn from the behavior of customers across a consortium of CDFIs and MDIs to identify those who have payment histories that indicate they are low-risk from a credit perspective despite being "credit-invisible" or historically rated as higher risk. By learning from these cases, Consilient can help inform a more nuanced and accurate approach to risk scoring these customers and managing credit risk. Alternatives or complements to the traditional credit score-based model would allow CDFIs, MDIs, and other financial institutions to expand and more accurately price services to their existing customer base and reach new customers previously shut out of the formal financial system altogether.

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[3] Grovetta Gardineer, "Expanding Financial Inclusion for Credit Invisible Consumers and Businesses," *Project REACh: A Look Back at the First Year*, at pp. 5-6, available at: https://www.occ.treas.gov/topics/consumers-and-communities/minority-outreach/project-reach-anniversary.pdf.

[4] Aaron Klein, "The Real Problem with Credit Reports Is the Astounding Number of Errors," September 28, 2017, available at: https://www.brookings.edu/research/the-real-problem-with-credit-reports-is-the-astounding-number-of-errors/.

[5] Consumer Financial Protection Bureau, "CFPB Explores Impact of Alternative Data on Credit Access for Consumers Who Are Credit Invisible," February 16, 2017, available at: https://www.consumerfinance.gov/about-us/newsroom/cfpb-explores-impact-alternative-data-credit-access-consumers-who-are-credit-invisible/.

[6] Federal Reserve Bank of San Francisco, "Minority Banks during the COVID-19 Pandemic," August 2, 2021, available at: https://www.frbsf.org/economic-research/publications/economic-letter/2021/august/minority-banks-during-covid-19-pandemic/.

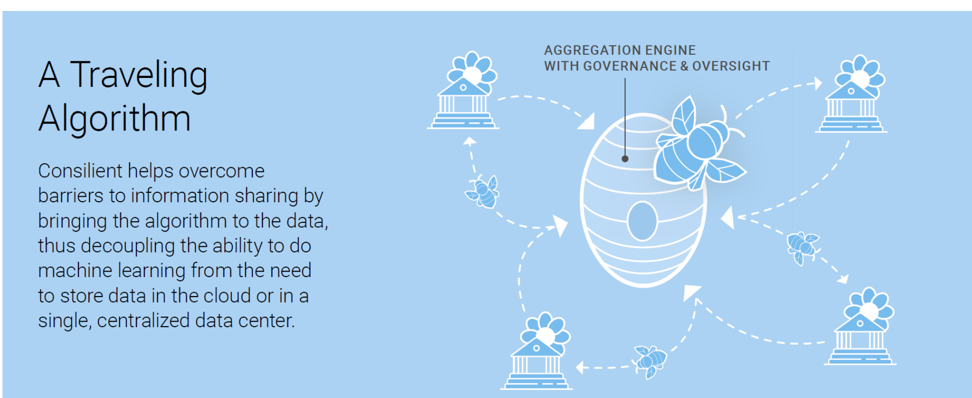
PART II: The Consilient Solution: Secured Federated Learning

Consilient is the product of a partnership between K2 Integrity, the world's premier strategic advisory firm dedicated to financial integrity and security, and Giant Oak, a leading technology company that combines behavioral science and machine learning to build software solutions that combat illicit activity.[7] Originally developed to predict and detect money laundering, fraud, and other illicit finance threats to the financial system, Consilient's technology and federated governance framework can also be deployed to help governments and financial institutions manage a wider range of risks—uncovering not just bad actors attempting to abuse the financial system but legitimate, profitable customers inaccurately rated as "high risk."

At the core of Consilient's technology is the principle of federated machine learning, which allows different institutions to gain insights from one another's data, not by moving the data into a centralized repository, but by moving an analytic algorithm to the various local data environments. As the Consilient algorithm travels across a consortium of participating banks, it ingests, trains on, and learns from each institution's data—adjusting the model's weights and parameters as it is fitted to the local data, and sending encrypted updates to a secure aggregation engine without removing any data from its local source. As an added safeguard, both the data and the model are protected from theft, snooping, or tampering by Intel's Software Guard Extensions (Intel® SGX) technology, a hardware-based trusted execution environment that helps isolate and protect the confidentiality and integrity of code and data at each step of the federated learning process.[8]

Aggregating data insights via secured federated learning is particularly useful when trying to collaboratively analyze or verify sensitive financial data, such as data related to income verification or other markers of credit risk, as banks are naturally reluctant to reveal raw data to competitors and may be subject to data privacy or data localization rules that prevent them from transferring this information to other institutions or to a public cloud. The Consilient solution overcomes these barriers to information sharing by bringing the algorithm to the data, thus decoupling the ability to do machine learning from the need to store data in the cloud or in a single, centralized datacenter.

Consilient's Traveling Algorithm



[7] K2 Integrity, "K2 Intelligence Financial Integrity Network and Giant Oak Collaborate with Intel to Launch Consilient," October 29, 2020, available at: https://www.k2integrity.com/en/newsroom/news-releases/k2-intelligence-fin-and-giant-oak-collaborate-with-intel-to-launch-consilient.

[8] For additional details, see Gary Shiffman, Juan Zarate, Nikhil Deshpande, Raghuram Yeluri, and Parviz Peiravi, "Federated Learning through Revolutionary Technology," available at: https://www.intel.com/content/www/us/en/financial-services-it/federated-learning-solution.html.

PART III: The Advantages of Federated Learning for CDFIs and MDIs

Three features of the federated learning model make it especially well-suited to help CDFIs and MDIs safely and cost-effectively expand access to financial services:

- The right partners: Lacking insight into other institutions' data or their experience with comparable customer bases, CDFIs and MDIs are frequently left with an unattractive choice: either limit themselves to their own customers' past transaction histories as a basis for assessing future risks, or rely on a third-party credit scoring model that may be unreliable and even biased against the very populations these institutions are designed to serve. The federated learning alternative would allow CDFIs and MDIs from across the country to partner in a consortium of like-minded, mission-driven institutions, both expanding the pool of relevant customer data available for analysis and leveraging their unique understanding of the financial services in greatest demand — as well as the barriers to access historically faced — by low-income and minority communities.
- The right training data: Traditional credit scoring models rely on consumers' history of repaying debts such as mortgages and bank loans, together with records reflecting whether the consumer has any bills in collection or a history of liens, judgments, or bankruptcies. Yet these data sources paint at best an incomplete picture of a consumer's creditworthiness and neglect a range of other well-documented, measurable indicators of credit risk and past payment history. The Consilient algorithm would fill these critical data gaps by training on so-called "alternative data," including a consumer's history of paying monthly rent, utilities, and cell phone bills, as well as consumers' general management of deposit account cash balances, which can show a track record of meeting obligations that may not turn up in a traditional credit history.[9]
- Drawing on this expanded range of data sources — not just at a single institution but across the full consortium of participating banks — the machine-learning algorithm can identify risk attributes that may not have been weighted accurately in past credit decisions and apply the corrected model to the assessment of prospective customers and lending opportunities.[10] Just as importantly, the Consilient model is dynamic, meaning it updates continuously to account for new data and the evolving significance of individual data points, allowing banks to more accurately track consumers' changing behavior and financial circumstances. Traditional credit models, by contrast, often remain static until the model is periodically reviewed, refreshed with a new data set, and manually revised.[11]
- A cost-sharing model: Although there is widespread recognition among some experts that an improved risk-scoring solution presents a potentially transformative business opportunity for banks—allowing them to reach new customers and expand services through existing relationships—creating a new model from scratch requires time, data, technical expertise, and other resources that may not be available to most small- or mid-sized financial institutions. Indeed, resource constraints, as we have seen, may be especially acute at CDFIs and MDIs, which disproportionately serve low- and middle-income customers and have faced higher loan

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[9] See Karan Kaul, "Adopting Alternative Data in Credit Scoring Would Allow Millions of Consumers to Access Credit," March 15, 2021, available at: https://www.urban.org/urban-wire/adopting-alternative-data-credit-scoring-would-allow-millions-consumers-access-credit. Preliminary findings from FinRegLab show that cash-flow underwriting outperforms traditional scoring models on its own, and when combined with traditional models is even more predictive; see FinRegLab, *The Use of Cash-Flow Data in Underwriting Credit: Empirical Research Findings*, July 2019, available at: https://finreglab.org/wp-content/uploads/2019/07/FRL_Research-Report_Final.pdf.

[10] In addition to training on customer and transaction data from participating banks, the consortium could also partner with relevant government-sponsored entities, such as Fannie Mae or Freddie Mac, to obtain additional training data that could further improve the accuracy of the scoring model. On Fannie Mae and Freddie Mac's openness to alternative credit scoring models, see Andrew Ackerman, "Fannie, Freddie to Consider Alternatives to FICO Scores," *The Wall Street Journal*, August 13, 2019, available at: https://www.wsj.com/articles/fannie-freddie-to-consider-alternatives-to-fico-scores-under-new-rule-11565719353.

[11] See Bank Policy Institute and Covington & Burling LLP, *Artificial Intelligence: Recommendations for Principled Modernization of the Regulatory Framework*, September 14, 2020, at 4, available at: https://bpi.com/wp-content/uploads/2020/10/Artificial-Intelligence-Recommendations-for-Principled-Modernization.pdf.

losses and lower profits than mainstream banks in the wake of the COVID-19 crisis.[12] Importantly, however, the federated learning model is also a cost-sharing model, allowing participating institutions not only to learn from one another's data but to pool expertise and resources in a way that dramatically reduces the cost of piloting such a solution alone.

Based on more and better data, informed by practitioner expertise, and driven by machine learning technology, the federated learning model would bring CDFIs and MDIs into an active partnership to improve their understanding of risks and expand financial access to creditworthy, profitable, yet traditionally underserved customer populations.

PART IV: Preventing Bias through Governance and Oversight

Governance and oversight are key elements of the Consilient model because we recognize that although the use of machine learning technology can help to overcome many of the gaps and inaccuracies in traditional credit scoring models—shortcomings that have disproportionately disadvantaged minority and low-income consumers—these same analytic tools, left to operate on their own, could also exacerbate existing bias and further entrench historical patterns of discrimination. For example, traditional metrics for assessing risk such as location of residence closely track racial and socio-economic categories due to historical patterns or policies of discrimination, such as housing segregation and mortgage "redlining." In the absence of expert monitoring and intervention, machine learning algorithms may naturally assign risk-relevance to factors that, although apparently neutral, are in fact proxies for race or other "suspect variables."[13] As research by the Brookings Institution's experts observes, "Proxy discrimination by AI [artificial intelligence] is even more concerning because the machines are likely to uncover proxies that people had not previously considered."[14]

It would clearly undermine the objectives and mission of CDFIs and MDIs if they were to utilize a machine learning algorithm that reproduced or enhanced—while perhaps also obscuring—the very biases and barriers to financial inclusion they are seeking to uproot. It is therefore essential that any application of the federated learning model be subject to rigorous governance and oversight mechanisms, including routine intervention by human experts to uncover proxy discrimination or other biases imposed or perpetuated by the technology.[15]

Following the governance framework Consilient has instituted for other federated learning consortia, appropriate subject-matter experts, both internal as well as those within the Consilient network, such as participating banks and any sponsoring government agency or non-governmental organization, would be consulted and engaged for governance and oversight, including: (i) reviewing and filtering data sets to prevent the consideration of prohibited attributes or known proxies for prohibited attributes; (ii) identifying and addressing clear indications that data sets are not representative of the relevant population; and (iii) regularly tuning the model to discourage the reproduction of bias. As such, the Consilient approach to governance would be informed by experts in credit risk and financial inclusion and supported by Consilient's in-house technical experts to ensure ongoing oversight and the implementation of testing and assurance processes that would complement traditional fair lending testing and model

[12] Federal Reserve Bank of San Francisco, "Minority Banks during the COVID-19 Pandemic," August 2, 2021, available at: https://www.frbsf.org/economic-research/publications/economic-letter/2021/august/minority-banks-during-covid-19-pandemic/.

[13] Anya E.R. Prince and Daniel Schwarcz, "Proxy Discrimination in the Age of Artificial Intelligence and Big Data," *Iowa Law Review*, vol. 105 (2020), available at: https://ilr.law.uiowa.edu/assets/Uploads/ILR-105-3-Prince-Schwarcz-6.pdf.

[14] Aaron Klein, "Reducing Bias in AI-Based Financial Services," July 10, 2020, available at: https://www.brookings.edu/research/reducing-bias-in-ai-based-financial-services/.

[15] See Gary Shiffman, "We Need a New Field of AI to Combat Racial Bias," July 3, 2020, available at: https://techcrunch.com/2020/07/03/we-need-a-new-field-of-ai-to-combat-racial-bias/.

testing and validation practices already under way at participating banks, ensuring that the new model can be explained and justified to supervisors.[16]

PART V: Conclusion

Implementing Consilient's federated learning model within a consortium of CDFIs and MDIs has the potential to transform the way financial institutions approach lending to "credit invisible" and historically underserved populations and to dramatically expand access to financial services. By working with carefully selected data from CDFIs and MDIs who already serve these populations, implementing a federated model, and ensuring governance and oversight of the machine learning algorithm, the Consilient model helps to overcome many of the traditional barriers to implementing transformative new technologies in this space — a dearth of data on which to train machine learning models, data privacy, security, and competitive concerns, high costs, worries about unintentionally reinforcing existing biases or introducing new biases, and challenges associated with the explainability and defensibility of new approaches. This new approach has the potential to enable financial inclusion, security, and equity.

[16] For additional examples of how AI credit underwriting systems could mirror standards that apply to conventional systems, see Bank Policy Institute and Covington & Burling LLP, *Artificial Intelligence: Recommendations for Principled Modernization of the Regulatory Framework*, September 14, 2020, at 17, available at: https://bpi.com/wp-content/uploads/2020/10/Artificial-Intelligence-Recommendations-for-Principled-Modernization.pdf.

Can Technology Solve for Inclusion in the Housing Industry and Affect Equitable Wealth Building?

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Head of Strategy & Product Development, Finlocker
Brian Vieaux, President, FinLocker

Access to credit and housing is increasingly detached from those who need the most assistance -- new entrants and reentrants. Approximately 63 million adults in the US are unbanked or underbanked with no on-ramps into the financial system.[1] Reasons for not banking are mostly related to perceptions of qualification (~51%) and mistrust (~30%).[1,2] The unbanked and underbanked often rely on alternative financial products like pay cards, pawn shop loans, payday loans, etc., even if they have a bank account.

Housing offers an especially stark case in point. The percentage of Americans owning a home was 64.8% in Q3 2020. And among those owning a home, racial disparities are enormous: 75.8% of non-Hispanic whites own homes, as compared to just 46.4% black alone householders.

Historically, challenges facing inclusion in the housing industry could be traced back to New Deal-era redlining. More recently, however, historically low housing supply coming out of the 2009 Financial Crisis, combined with a low-interest-rate environment, drove up housing prices, putting homeownership out of reach for millions of consumers. Since then, the COVID-19 crisis has only exacerbated the problem, hitting low-to-moderate income families hard, just as the housing stock appreciated dramatically. The rental market has not fared much better, and for many renters, housing is north of 50% of their total monthly income.

In short, our country's financial inclusivity efforts continue to fall short, and CDFI/MDI partnerships with Fintech companies can help close the inclusivity gap.

We at FinLocker, a St. Louis-based financial technology firm focused on financial fitness, see a myriad of opportunities for technology to help solve for inclusion in the housing industry. While our emphasis has centered on the development of a digital platform and an app to increase the mortgage eligibility of low-to-moderate consumers, broadly, we see five areas of opportunity for financial technology to boost financial inclusion, especially in the housing industry:

- Affordability,
- Inadequate levels of financial literacy
- Hyper-optimized and transactional nature of housing finance
- Slow adoption curve of alternative data sources and technologies, and
- Consumer control of their data, including portability, privacy, and protection

While we are optimistic as to the power of technology to solve all the above-mentioned problem spaces, we will focus on a sub-set of the opportunity areas in this paper

1. Getting consumers mortgage ready, accelerating 'approvability',
2. Helping consumers avoid "gotchas" with contextual, contemporary and timely education and tools, and
3. Supporting decline-to-approval by moving our industry from optimizing transactions to serving longer-term relationships.

Given the focus of this particular forum, we will also discuss applications of technology and data for advancing the cause of financial inclusivity, particularly for the mission-driven Community Development Financial Institutions (CDFIs) / Minority Depository Institutions (MDI) community.

Getting consumers ready, accelerating 'approvability'

While our secondary market-driven housing finance industry has its advantages, it also creates and pushes some of the complexity and uncertainty between lenders and investors down to the consumer. There is little middle-ground between a binding "approval" that is tied to a lender-borrower-full loan application combination and a 'mortgage calculator' that has no real value. An intermediate is overdue.

Readiness for a mortgage loan is more than an Underwriting Approval stage of the loan process. Readiness is a deeper concept of ensuring a full understanding of the mortgage process and, more importantly, the financial implications of securing the right product at the right price.

What if we can assist borrowers to get 'ready' – well before they enter the mortgage origination process? What if borrowers were empowered to carry their "readiness" to a mortgage outlet when they were ready instead of finding a home and then looking for mortgage approval?

With a readiness-focused view, could the system be able to serve consumers who "self-select" out of the mortgage process either due to lack of objective information or have had other negative experiences with lending in their past?

FinLocker proposes mortgage lenders change their approach by serving their consumers with deep customer centricity, driven by consumer financial life events and progression. This approach contrasts with the mortgage company marketing machines reacting to triggers and courting borrowers with 'you may already be approved' messaging that puts both themselves and their borrowers through the grind. FinLocker believes that next-generation mortgage technology should address this problem better by guiding and nurturing the borrowers of tomorrow, well before they enter a search query online.

Avoiding 'gotchas' – You don't know what you don't know – the impact of Financial Literacy

Housing forms the anchor for wealth building for a majority of the middle-class in the US. Access to safe and sustainable housing finance is imperative for consumer's financial well-being. Financial education, packaged and delivered in contemporary settings, is an important investment that our industry should make to bring more consumers into the market.

Uncertainty of 'getting a good deal' on a dream home is an anxiety driver for many homebuyers. Exploring 'what-ifs' or options for product/price to understand what it takes to get a mortgage and the cash flow implications for a household are fraught with digital intrusion with marketers mining their digital exhaust and over-whelming homebuyers with offers. There are few safe spaces for consumers to explore, understand and learn their position for credit with their real data.

The stakes for smart policy are high. Studies from TransUnion®[12] and NerdWallet[11] predict that anywhere between 20-28 million first-time homebuyers will be entering the US housing market in the next five years. This is by far the most diverse homebuying population our industry has ever seen.

But according to a Fannie Mae study[4], only a fraction of consumers knows the required credit scores or down payment amount to qualify them for a mortgage. Here are some Homebuying Myths the study debunked:

- **MYTH:** Lenders require a 20% or 12% down payment.
  FACT: Your down payment can be as low as 3%, or in some cases, if eligible for a VA loan, possible to get with no down payment.
- **MYTH:** Lenders require a credit score of 650 or above.
  FACT: A homebuyer could qualify for a mortgage with a credit score of 620 (for conventional) and lower scores for FHA and VA loans.
- **MYTH:** Lenders are looking for a homebuyer's max debt-to-income ratio (DTI) to be under 40%.
  FACT: DTI can be as high as 50%. Flexible underwriting with FHA and VA loans can allow higher DTIs in some instances.[3, 4]

Low levels of financial literacy with affordability challenges, alternative banking/credit product usage, and the rising student debt trends in the consumer population, collectively create scenarios where consumers incorrectly self-select out of credit markets, especially the mortgage market. Solutions, meanwhile, are far from straightforward. Industry studies often question the real impact of financial education solutions. Further, generic headline-grabbing solutions that offer free homebuying education have low levels of credibility with consumers for fear of being marketing traps

What is, however, clear, is that there is a place for contextual and timely advice that drives outcomes for consumers. However, not all financial literacy is created equal. What would be most beneficial for the consumer of tomorrow is personalized advice that is relevant to their financial circumstances provided by a trusted source. Against this backdrop, CDFIs and MDI's can play an important role in this area of advocacy and literacy as a trusted brand, partner, and advisor to the community to help them understand their options and achieve readiness in a safe space, and watching out for their longer-term financial well-being. And it is our view that CDFIs and MDIs partnering with fintechs emphasizing long term perspective, and longer life-cycles of client relationships, *can deliver the intended lift at scale and at a low cost per consumer.*

What do we do about an Industry hyper-optimized for 'gain on sale'?

Let's look at the highly transactional nature of the industry and how a shift to 'customer for life' can provide inclusivity. Unlike other consumer financial actions where there is a high degree of certainty between a consumer's financial preparedness and product selection or purchase, housing finance seems to do things in the exact opposite way.

In most non-mortgage lending, consumer, price, and product match happen more directly, and any secondary market investor concerns are not visible or passed on to the consumer. In the mortgage industry, borrowers find a home, often get emotionally attached, and then get into the financial planning and preparation work with much wait and guess activities in between.

Existing players in the mortgage market remain hyper-optimized for transactions and volumes. Our financial markets have rewarded this business model, as evidenced by a number of independent mortgage banks generating sizeable valuations in the equity markets over the last 2-4 years. While the current state of the mortgage industry is profitable, results in homeownership rates show that the model is not serving all segments of our society equitably.

It is not a big surprise that our transaction gain-on-sale driven industry does not particularly have investments in helping those that have either been turned down or otherwise are just not ready to go through the mortgage process.

Investments and innovations that cure, nurture and prepare a consumer or a turned-down consumer on a path to approval are limited.

There is a significant opportunity here for CDFIs/MDIs to offer a better product, one that optimizes for the financial well-being of the consumer as the primary outcome, and gain-on-sale as secondary – with the notion that a financially healthy customer-for-life will generate more value for a financial institution than a one-time mortgage transaction.

Fintech, and its relevance for CDFI/MDIs:

As the OFN survey from 2017[8] observes, technology solutions are a critical force in helping Community Development Financial Institutions (CDFIs) increase efficiencies, better serve clients, and monitor financial and social impact performance. However, many CDFIs face challenges in selecting the appropriate solutions[8]. We believe the most effective loan management systems available for CDFIs are those that are built bottom-up to reflect the uniqueness and depth of the mission these institutions have, and the consumer segment they look to serve. Traditional transaction-focused loan underwriting systems retrofitted to the continuously evolving needs of CDFIs/MDIs may not fit the bill in addressing the challenge ahead of these institutions.

There are numerous articles, white papers, and studies on the power of new technology approaches, alternative sources of data, and emerging concepts like Artificial Intelligence (AI) / Machine Learning (ML) in affecting better inclusivity outcomes. Instead of a technical discussion on the nature of the new technologies, algorithms and their veracity, we will highlight briefly the types of CDFI/MDI-specific solution paths that can be developed with better data and advanced technology.

Technology can help us identify the problem

Data that highlight the disparities in income, credit, and housing affordability have been a significant driver in drawing attention to the problem and bringing much-needed public-private partnerships and solutions to bear. CDFI's and MDIs can continue to use data to identify the problem space, segment appropriately, and develop custom solutions for each segment.

For example, the solution set for the credit impaired may or may not be the same as it is for the cash flow constrained. FinLocker's partnership with eCredable, a tool for monitoring and raising credit scores, has brought to light a tight challenges faced by self-employed, underserved borrowers who themselves may operate and own microbusiness. Solutions for this segment may be different for a wage employee first-time homebuyer. As a notable study from the University of New Hampshire[9] points out, CDFIs have unique capabilities that could help them continue to be relevant and impactful players in the business lending space, especially the ability of CDFIs to provide borrower education and technical assistance[9]. CDFI/MDI technology solutions should include features that allow them to segment their consumers better and serve with relevance for their individual needs.

Newer Data Can Serve Unbanked/Under-Banked Better

Technology can introduce opportunities to leverage newer data sources like rental and utilities and augment the historical credit score models. This innovation should help address credit score disparities for minorities and low-income families with thin files for very low traditional credit scores. Loan management systems used by CDFI/MDIs should have a robust feature set for the thin-file/no-file consumer segment, with capabilities to draw from and integrate their payment patterns from a variety of sources and institutions, not just traditional banking.

Innovation in data standards, open banking, and data portability can make housing finance more inclusive

For data-driven innovation to accelerate, our industry should look to implement standards that reduce friction or barriers for transparent and consented movement of data between consumers and the financial services ecosystem. Initiatives like Open-Banking and organizations like Financial Data Exchange[10] are important infrastructural elements in making next-generation data-driven innovation possible through the fintech ecosystem and do so with consumer consent and control. Standards-based movement of consumer financial data can further drive innovation by complimenting conventional credit scoring and models with contemporary data sources that look at employment stability, cash flows, and net income could help alleviate some of the imbalance in making credit available. The mortgage industry has seen the benefit of such activities when the mortgage industry standardized the appraisal data forms early last decade and generated innovation[5] like Fannie Mae's PIW and Freddie Mac's ACE… both products reducing cost and cycle time from the mortgage process and lowering the costs to close for many borrowers. CDFI/MDI technology solutions should be forward-looking in the power and potential of open-banking initiatives and how those solutions can level the playing field in terms of data/information access and eventually sustainable credit product access for their consumer base.

High-Touch with High-Tech

Technology can cure, nurture and coach in a contextual, personalized manner and at scale. Technology helps level the playing field and opens the market by providing education, supportive engagement tools, and seamless access to lending institutions. Financial technology companies can help the CDFI/MDI community step more easily into the role of an advisor to help more underserved consumers overcome the hurdles of buying a home, qualifying for a mortgage, and allow us to look at mortgage qualification differently.

- Improve and expand financial education, housing counseling, and homeownership preparation to renters and younger generations
- Provide tools to educate prospective borrowers on the importance of checking their credit report and addressing mistakes, paying all bills on time, and lowering their credit utilization rate
- Helping renters gain access and understanding of homeownership tools at an earlier age
- Broadening access to down payment assistance and low down payment lending programs
- Strengthen post-purchase counseling so homebuyers establish the financial habits to maintain successful ownership of their home

No one solution or technology can solely address the underserved markets. FinLocker believes a combination of technology developments, together with deep partnerships across the industry, especially those in the CDFI/MDI community, will be essential. As Robert F. Smith[6] calls them, "CDFI's are the capillary banking system." This segment of our financial services community working with Financial technology companies to develop a set of tools and methods to address deep-rooted financial inclusivity problems – of access and true lifetime financial mentorship — will have the most impact.

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VISA

Towards Digital Equity:

Empowering Black and Brown-owned Banks

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Between 1945 and 1960, consumer credit simply exploded, going from $2.6 billion to $45 billion. A decade later, it stood at $105 billion. It was as if the entire middle class was betting that tomorrow would be better than today.

— **Joe Nocera**, "The Day the Credit Card Was Born," The Washington Post (1994)

There were two groups that did not rely on consumer credit in postwar America: the very wealthy and the poor black population — the wealthy because they did not need it, and blacks who desperately did need it but were excluded from the credit card market.

— **Mehrsa Baradaran**, The Color of Money: Black Banks and the Racial Wealth Gap (2017)

The gap in access to financial services for Black and Brown consumers is a well-documented reality that requires coordinated efforts among public policy and private initiatives.[1] While the social and moral costs of this inequity are evident, these barriers also impose substantial economic costs on individuals, families, communities, and society as a whole. For individuals and households, the cost is extraordinary: A recent McKinsey study[2] shows that increasing access to basic banking services could save individual Black Americans up to $40,000 over their lifetime. Socially, the cost of this gap is even more staggering: closing the racial wealth gap could add $1 to $1.5 trillion to US GDP by 2028.[3]

At the same time, new technological and financial innovations are providing new pathways to wealth-building and economic empowerment. A new generation of fintech entrepreneurs is poised to make the digital transformation of commerce a flywheel for equity and inclusion. Minority Depository Institutions (MDIs), Community Development Finance Institutions (CDFIs), fintech companies, and software developers with firsthand experience of racial and

[1] See, for example, CFPB 2020, FDIC 2019, Hernandez Kent et al, 2019, Hofheimer et al 2019 and McIntosh et al, 2020.
[2] Florant, 2020.
[3] Noel, 2019.

social inequity are proving that overcoming barriers can be a viable business model. The key to accelerating financial inclusion and building a more equitable digital economy is to enable these inclusive financial services companies to scale. One of the fastest ways to scale-up is to partner with a global network.

The three critical challenges for scaling financial products

For decades, MDIs and other community banks have played a crucial role in their communities. What distinguishes MDIs is their community presence and deep understanding of their customers, based on knowledge of the unique challenges and opportunities that their communities face. MDIs can tailor the availability of products and services to meet the various needs of their Black and Brown customers. The diversity of these needs is key to understanding the nature of the problems that confront these communities: one size does not fit all when tailoring financial services for Black and Brown communities, a reality that MDIs understand well.

Successful providers of financial products and services, including MDIs, usually must navigate three basic challenges effectively. First, firms must understand market conditions to ensure that the products and services they offer fit those conditions. Being able to assess the right conditions for a particular product to scale is essential for providing the right value for the individual communities in which they operate. However, the conditions under which MDIs undertake such efforts can be challenging. With generally fewer resources, and customers who often hail from communities that have been underserved, and often ignored, the effort at times required for getting the information needed for effective product design diverges significantly from contexts often associated with large retail banks servicing high income clients. Ultimately, those efforts can and do effect meaningful change for minority households as well as the institutions that serve those needs in support of those institutions' bottom line.[4]

Second, these products and services must also comply with regulations, which may change as market and technology conditions evolve. Even when regulations are designed to protect the most vulnerable, they can create compliance costs that weigh more heavily on financial institutions with more meager resources. Designing mission-oriented products, or products with features designed to meet the needs and priorities of minority citizens, while ensuring their compliance with rules that do not always take into consideration mission-oriented work, can be difficult. Additional resources may be needed to assess, and then design products for regulatory environments that often change. Despite their unique strengths, their size makes them more susceptible to challenges associated with increased supervision and operational costs, and heightened regulatory compliance costs.

Finally, a successful product must be safe to use, consistently available, and secure. Resilience and security are the foundations on which other experiences are built: this is no place for shortcuts.

Enabling Innovation at Scale: Programmatic Planning and the Technology Stack

Visa takes a multi-pronged approach to enabling innovation in general, and the success of MDIs in particular; additionally, various tools in our stack could be deployed in ways to assist MDIs to scale.

MDIs face longstanding problems in a world where new solutions are becoming possible through the leveraging of new technologies. Against this backdrop, some leading companies have established sandboxes and innovation hubs and developed resources for fintechs that could well support innovation by MDIs and should be considered by leadership looking to endogenously expand their capabilities. In our case, the Visa Fintech Fast Track program has since 2018 focused on developing and then launching innovative solutions and scalability. From supporting the simplification of cross-border remittances for consumers, to helping create innovative payment solutions for on-demand delivery service to facilitating financial services to underbanked customers across the world, Visa's

[4] Hofheimer et al, 2018.

partnerships aim to bridge existing gaps and to encourage new modes of commerce and new ways to pay for new customers. In the context of MDIs, support systems like the Fast Track program are ideal for MDIs seeking to do everything from enabling better options for immigrant customers seeking to send money abroad to establishing KYC/AML onboarding tools designed to service Black and Brown communities.[5]

Another strategy worth considering for financial technology companies is evaluating their own products, and exploring how they might be deployed in innovative ways so as to assist MDIs (and other financial institutions servicing minority communities). One important gap that exists today in financial services is the disproportionate “credit invisibility” among Black and Brown consumers. Research by the Consumer Financial Protection Bureau shows that roughly 45 million consumers are denied access to credit because they do not have scoreable credit records[6]. This issue affects Black and Brown Americans disproportionately.

Access to credit is key to economic health and survival for individuals and businesses, particularly micro and small businesses. As a 2020 Business Roundtable report points out, the ability to pay expenses, save for the future, weather unexpected shocks, and grow wealth is essential to being able to access economic opportunity. This is true for individuals, for families across generations, and for Black and Brown communities at large.

Adopting new methods for determining creditworthiness is also key to increasing small business lending, particularly given that the number of new small and micro businesses has risen significantly during the pandemic. Many of these new businesses are sole proprietor businesses, which may face difficulties obtaining traditional credit once small business assistance and stimulus funds taper off. New technologies allow these businesses’ creditworthiness to be assessed in a more holistic manner and based on a record of behavior.

At Visa, we have worked with fintechs and financial institutions to address this need by enhancing an existing product — the secured credit card — and innovating to develop solutions that can be implemented quickly and in a targeted manner.

Secured credit cards provide new-to-credit cardholders access to credit, with a security deposit acting as a collateral on the account. This enables issuers to offer a credit card to someone who otherwise has underdeveloped or poor credit history. Over time, a secured card could provide a path towards graduation that enables secured credit accountholders to access unsecured credit products and financial services from their card issuer. In addition, the use of the secured card is reported to the credit bureaus, helping the consumer to build a credit score that may qualify them for additional financial products at other providers.

For example, the country’s first all-digital nationally-chartered bank, Varo, launched the Varo Believe Program to help the 45 million “credit invisibles” qualify for a credit card or loan. The program includes a Visa card and credit monitoring. No upfront minimum security deposit is required and cardholders determine their security deposit amount. There are no monthly or annual fees. Varo reports the cardholder’s payment history to the three major credit bureaus.

New secured credit cards, when developed as an effort to fulfil a social need, can become an effective tool of financial innovation. These facilities can be paired with financial literacy training apps or other features, such as the ability to earn points on purchases or to earn cash back on transactions.

The new features of these cards overcome some of the main barriers to adoption faced by traditional secured cards, including high fees or deposits, or non-transparent processes and conditions.[7]

[5] Visa Fintech Fast Trade Program https://partner.visa.com/site/programs/fintech-program.html

[6] CFPB, 2015

[7] Center for Financial Services Innovation, 2016

Other areas in which an innovative partnership can help MDIs achieve optimal growth include enabling access to specialized technology. For example, Visa has partnered with First Boulevard, a digitally native neobank focused on building generational wealth for Black communities. First Boulevard will be the first partner to pilot Visa's new suite of crypto APIs, which will enable their customers to purchase, custody and trade digital assets held by Anchorage, a federally chartered digital asset bank. The pilot will serve as a key first step in supporting API capabilities that help additional Visa clients access and integrate crypto features into their product offering.

Education and financial literacy support.

Another important area for consideration is leveraging financial literacy support in ways to bolster the reach and impact of MDI interventions. Research indicates that financial literacy can help overcome significant barriers to wealth accumulation, especially in Black and Brown communities.[8] There is a strong link between financial literacy and financial wellness: greater financial literacy enables better planning and saving for retirement. Consumers with good financial literacy skills tend to have more non-retirement savings and to better manage their debt. They are less likely to be financially fragile. And they are more likely to understand their rights as customers. With nearly two decades of experience in developing financial literacy programs in over 30 countries, Visa has worked hard to build its capacity in this area. These programs are all designed with one goal in mind: To ensure that as individuals gain access to financial services, they do so with a sound understanding of money management.

Although what financial literacy means can diverge from country to country, the basics of financial literacy and market understanding are very similar.[9] We are currently exploring how such programs might be developed to support the customer education efforts MDIs undertake, and whether and how companies working in innovation can add financial technology awareness to the efforts undertaken to educate disadvantaged persons about, and prepare them for, modern finance and markets.

Support for small businesses.

Another important way to support MDIs is to empower the communities in which they operate. This includes helping the small businesses that make up a large part of their customer (and depositor) base. Surveys conducted by the Visa Economic Empowerment Institute indicate that during the Covid-19 pandemic, more small businesses want improved internet connectivity, assistance with digital commerce, and help with cybersecurity than want direct financial support from governments.[10] Support for digitization of Black and Brown businesses, particularly in the short term, is key. Visa has committed to digitally enabling 50 million small businesses.[11] The Visa Foundation has pledged nearly $5 million in capital to minority-led small and micro businesses.[12] Through partnerships such as with Black Girl Ventures, Visa is working with local organizations and influencers to identify their most pressing technological needs and provide them with access to the products and education they need to help them thrive.[13]

Develop the pipeline.

Finally, it is necessary to note that one of the most effective ways to increase equitable and inclusive products lies in diversifying the ownership, leadership, and staff in organizations that create and deliver technology- enabled products

[8] Yakoboski et al, 2020.

[9] See Visa. Practical Money Skills.

[10] Harper, 2021

[11] See Visa to Digitally Enable 50 Million Small Businesses to Power Recovery in Communities Worldwide, June 22, 2020.

[12] See Visa and Visa Foundation Extend Support of Minority-led Small Businesses, December 16, 2020.

[13] See Visa Partners with Black Girl Ventures to Digitally Enable Black and Women-Owned Small Businesses Across the United States, March 4, 2021

and services. Visa has established goals to increase the number of employees in the U.S. from underrepresented groups at the vice president level and above by 50 percent in three years, and to increase the number of employees from underrepresented groups at all levels in the U.S. by 50 percent in five years.[14] The Visa Black Scholars and Jobs Program aims to bring Black and Brown students into the payments world and to grow representation in this industry. These are important steps in making a long-term investment in Black and Brown students and increasing Black and Brown representation at Visa.

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[14] See Visa commits to developing the next generation of Black leaders in tech, December 1, 2020.

CDFIs and MDIs: Connecting Deserving Communities to Resources in the Digital Economy

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1. Rethinking CDFIs, MDIs and Technical Assistance

CDFIs and MDIs provide much needed and often scarce resources to underserved communities. They fill knowledge gaps and provide capital support in communities that typical financial institutions often overlook. In many underserved communities, CDFIs and MDIs are connectors to an ecosystem that allows many of its customers access to capital through their services, which include wrap-around technical assistance and guidance on graduating the unbankable to bankable clients for financial instructions. These mission-driven banks play a vital role in the financing continuum.

While their role as facilitators has proven to be a successful model for CDFIs and MDIs, and the underserved communities they serve, the pandemic forced many banks to close their branches and move their services online[1] — shifting face-to-face interactions and relationship-based services to the Internet. In this challenging time, MDIs and CDFIs experienced unprecedented challenges just when their customers needed them most.[2]

And yet, while COVID-19 has disrupted our daily norms, it has also created an opportunity to rethink how transactions are processed and customers who depend on financial institutions, CDFIs and MDIs for technical assistance, guidance, and access to capital are supported. Prior to COVID- 19, many larger banks had already begun to transition their product offerings online or to a digital platform to more efficiently connect customers to their services. The pandemic has accelerated how all sectors, including the financial services industry, interact with their customers, generating new opportunities to leverage innovation in the service of inclusion.

[1] Retrieved 22 September 2021 from https://www.npr.org/2021/03/26/979284513/what-are-we-going-to-do-towns-reel-as-banks-close-branches-at-record-pace

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2. Leveraging the State Small Business Credit Initiative

At the height of the pandemic, over 20,000,000 jobs were lost in the U.S economy. The job losses had a disproportionate impact on rural and minority communities where CDFIs and MDIs typically serve. This begs the question, "What if mission-driven banks could leverage emerging technologies to build operational capacity and accelerate the deployment of capital in LMI communities? How many businesses and jobs could be saved or even created?" As the U.S. shifts to a minority-majority population demographically, access to resources in underserved communities has become a key public policy issue.

One viable solution, or at a minimum tool for solution-building, is the State Small Business Credit Initiative (SSBCI), reauthorized through the American Rescue Plan. This public-private initiative provides eligible jurisdictions (states, the District of Columbia, territories, and Tribal governments) $10 billion of funding to support the economic disaster from the pandemic and increase equitable opportunities to underserved communities by providing access to capital for small businesses.[3]

During its initial programming (2010-2017), SSBCI identified best practices– one of which was partnering with CDFIs. As mission-driven banks, CDFIs and MDIs can participate in SSBCI by helping states meet their SSBCI leverage targets and access additional loan capital. CDFIs can act as lenders to receive credit support, as contractors administering state programs, and even participate as borrowers themselves as well.[4] In addition to the state allocations awarded under SSBCI, the Biden Administration is intentionally leveraging SSBCI to provide $1.5 billion in funding to support Socially Economic Disadvantaged Communities (SEDI) businesses.[5]

It is our view that CDFIs and MDIs should have increased participation with SSBCI and other federal, state, and local funding initiatives — and to do so with an eye towards digital transformation and strategy. **The ability to identify gaps within their local jurisdictions, provide wrap-around technical assistance, and fund small businesses can be augmented if mission-driven banks utilize a FinTech platform to enhance their overall business operations and strategic performance**.

CDFIs and MDIs are trusted advisors and connectors to the entrepreneurial ecosystem. At a time when trust and transparency in the financial services industry is lagging, there is a unique opportunity for CDFIs and MDIs to leverage their relationships within the communities they support to gain the lion share of an untapped market by leveraging FinTech to support and create new flexible capital products for customers.

3. The Importance of Artificial Intelligence and Machine Learning

Artificial intelligence (AI) refers to the ability for a computer to imitate human intelligent behavior and perform human-like tasks. AI software performs tasks that require human intelligence, such as thinking, reasoning, learning from experience, and making informed decisions. Machine learning (ML) is the subset of AI that deals with the ability to automatically learn from the data without explicitly being programmed.

For CDFIs and MDIs, AI and ML have the potential to increase internal operational efficiency, reduce processing and interaction times for providing customers the tools they need, and optimize core functions, and to accelerate progress towards achieving their missions.

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[3] Retrieved 22 September 2021 https://home.treasury.gov/system/files/256/SSBCI-General-Info.pdf

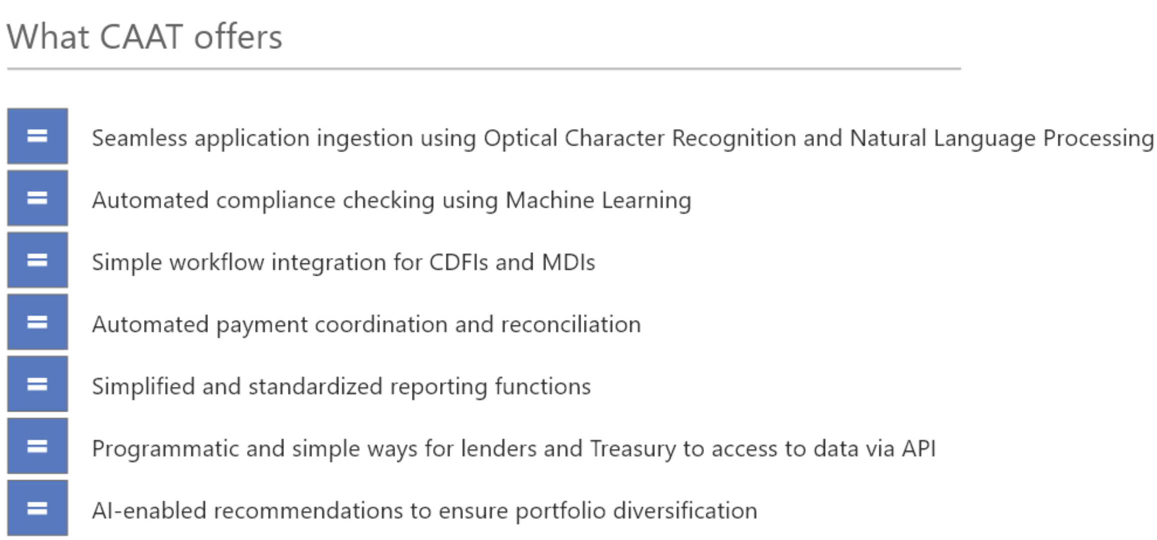
[4] Jennifer Vasiloff, State Small Business Credit Initiative (SSBCI) "Best Practices from Participating States: Partnering with Community Development Financial Institutions (CDFIs), U.S. Department of the Treasury, February 2015 pages 3-5

[5] American Rescue Plan Act of 2021, H.R. 1319. 3301, 117 Cong. (2021) https://www.congress.gov/117/bills/hr1319/BILLS-117hr1319enr.pdf

MStreetX, a place-based FinTech platform, provides a technology stack that leverages AI and ML that would enable CDFIs and MDIs to be smarter, more efficient, and more responsive to their clients. The platform has components that focus on application processing, capital discovery, and business resource optimization.

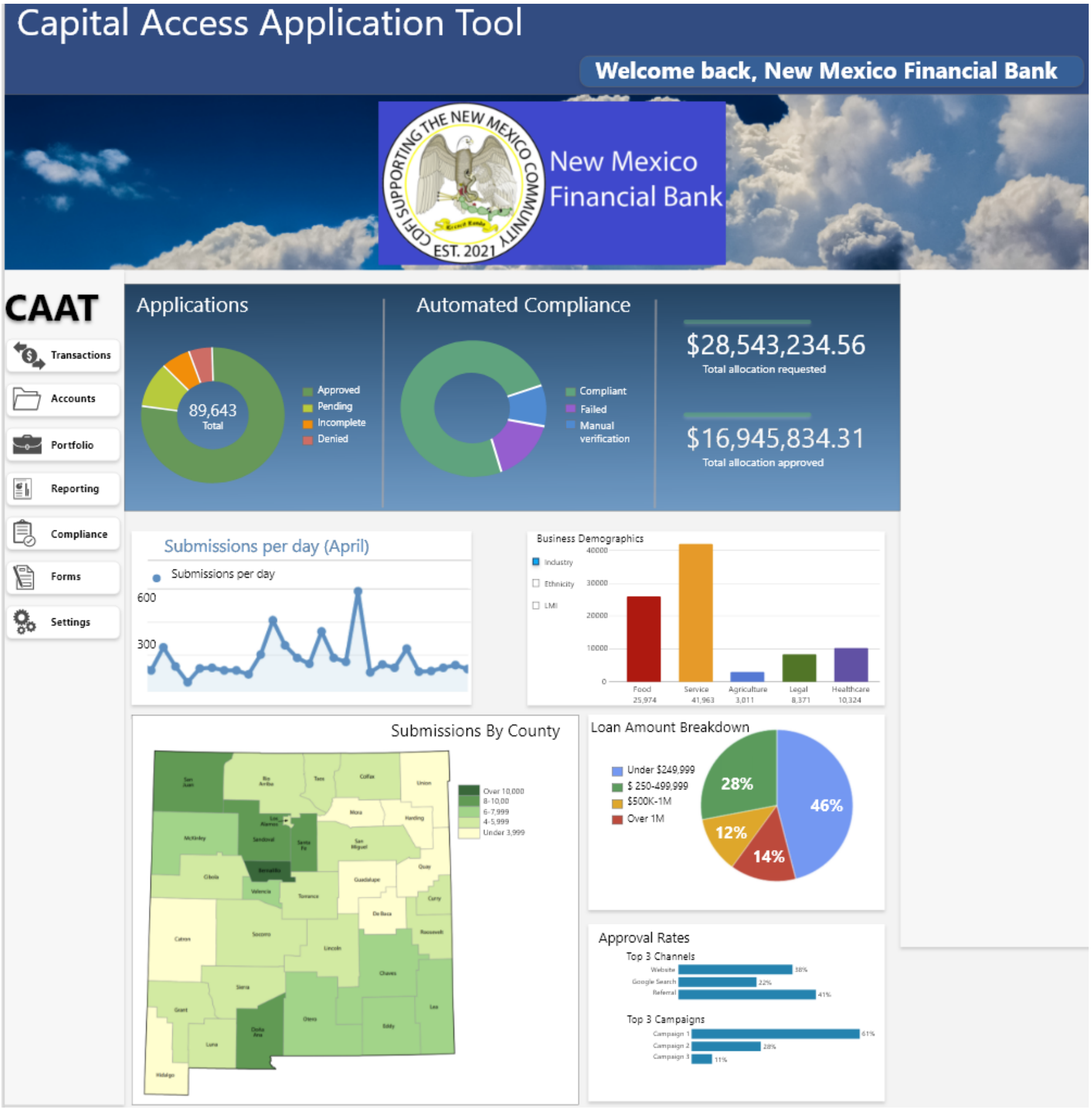
As an example, MStreetX's Capital Access Application Tool (CAAT), streamlines the process of a CDFI or MDI receiving, securing, processing and storing applications for capital access programs. CAAT leverages its secure Application Program Interface (API) to intake application documents and uses AI technologies to extract content from the document and perform compliance checks required by the CDFI or MDI. The tool securely stores the information in a Cloud-native database and presents it to authorized CDFI or MDI staff for further examination. CAAT's AI also provides CDFIs and MDIs with the ability to detect anomalies in its portfolio. With CAAT, CDFIs and MDIs have the ability to perform real-time, ad-hoc queries that generate reports on demand. Figure 1 shows some of the features of the CAAT tool.

Figure 1: A Screenshot from the CAAT prototype home page



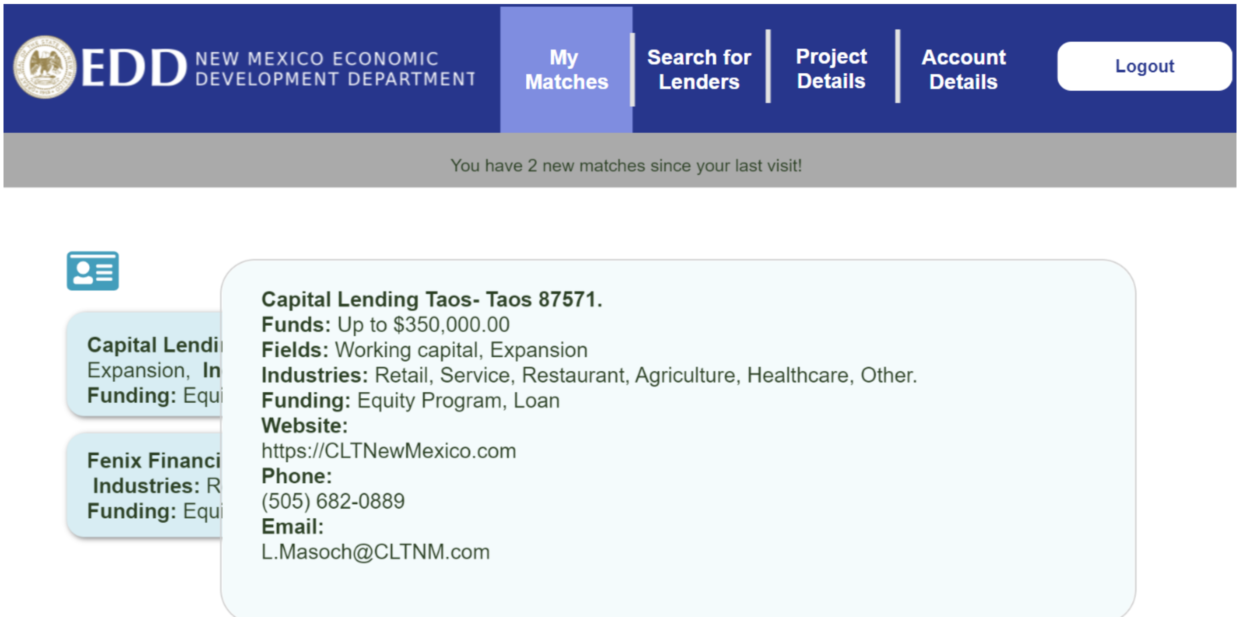
In terms of practical use of the CAAT tool, following is an example scenario: An MDI operating in New Mexico logs into the CAAT tool and is immediately brought to their personalized dashboard (Figure 2). The MDI sees analytics on the applications received and processed by the platform, the number of applications that have passed CAAT AI's compliance checks (and those that require attention), and other useful insight that can guide what needs focus and what decisions need to be made.

Figure 2: Dashboard for a New Mexico MDI



On the client side, a New Mexico business can use the Business Finance Finder component of the MStreetX technology stack to see the CDFIs and MDIs that match their needs (Figure 3).

Figure 3: Business Finance Finder Matches for a New Mexico business



New Mexico clients can also use the tool to perform ad-hoc searches for CDFIs and MDIs (Figure 4) and get results that meet their search criteria (Figure 5).

Figure 4: Business Finance Finder Search for Lenders for a New Mexico business

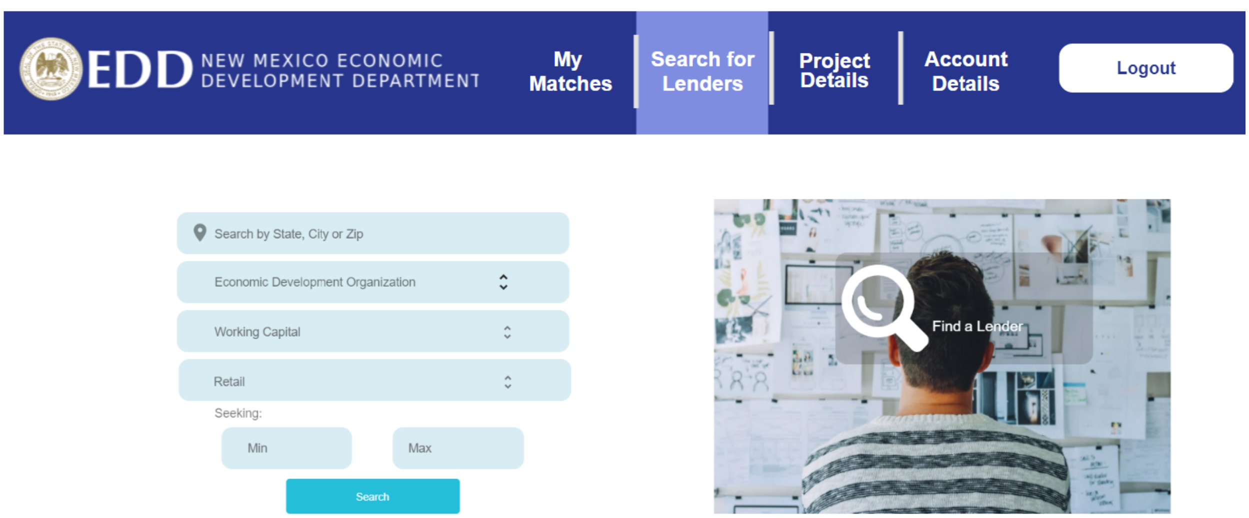
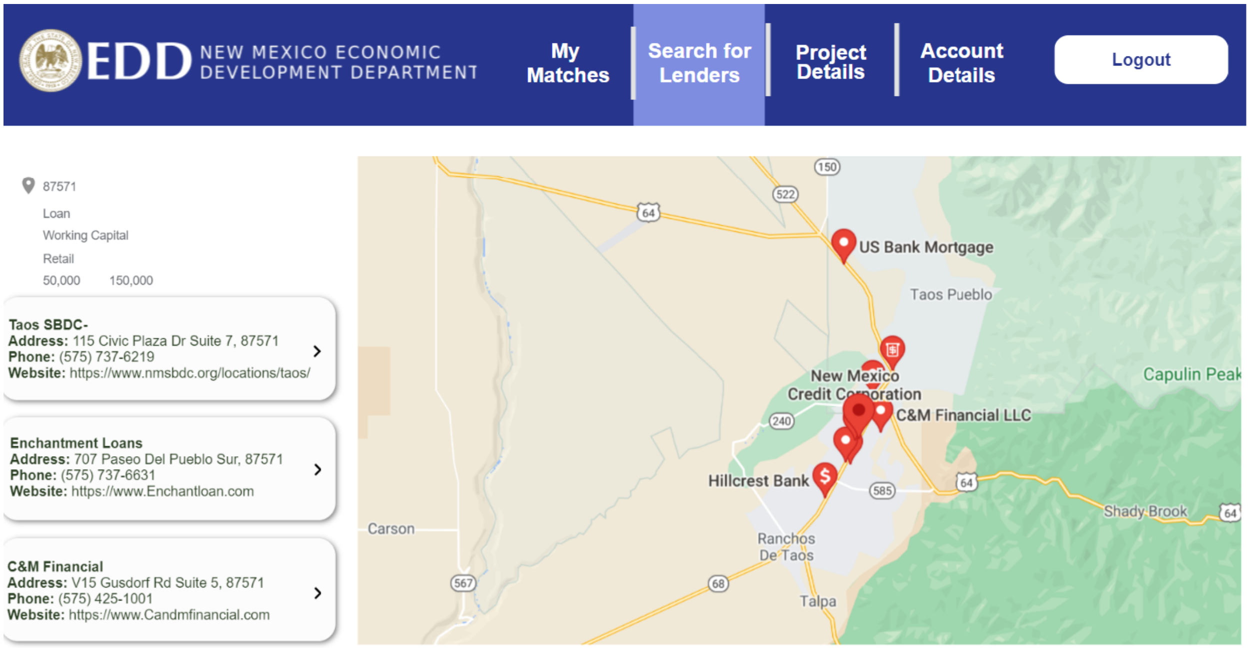


Figure 5: Business Finance Finder Results for a New Mexico business



4. Recommendation

Mission-driven banks are anchors of support in the communities they serve. In addition to fostering entrepreneurship, CDFIs and MDIs provide a plethora of services, including capital and technical assistance to enhance small business growth and facilitation of affordable housing. In a nation where one's zip code can be a great predictor of one's success, emerging technologies such as AI and machine learning have the ability to level the playing field for the underestimated communities that CDFIs and MDIs support. Access to capital is abundant if you know where it is and how to access it. FinTech Platforms, such as MStreetX, should be leveraged to support the FDIC and its newly established Mission-Driven Bank Fund to augment CDFIs and MDIs ability to provide new services. The opportunity to democratize access to resources is a collective effort that requires participation from public and private sectors to ensure the most deserving communities are aware of the resources available to them so they can fully participate in the economy.

Square

Defining a Racial Equity and Social Impact Strategy through MDIs and CDFIs: A Case Study

Ola Williams, Head of Federal Policy, Square

The fintech industry, like other industries in the country, was faced with obvious challenges in the aftermath of George Floyd's death, which along with Brianna Taylor's and others made ignoring racial inequality impossible for most Americans. The facts on the ground led to new questions being asked of everyone about their role in contributing to the undeniable problem of persistent inequality and what actions they may and should take to address it.

For Square, an essential aspect of our response was to leverage both resources and aspects of the technology stack for Community Development Financial Institutions (CDFIs)[1] and Minority Depository Institutions (MDIs).[2] These institutions are crucial to the economic livelihood of many underserved communities as they provide funding and offer services to people who seek to partake in the American Dream. And yet, both entities have not received the adequate amount of investment and resources to expand their reach and usefulness. MDIs have experienced considerable decline over the last three decades, but particularly since the last financial crisis, driven both by undercapitalization and the pressures of digitalization that have emerged in the wake of the COVID-19 crisis.

As in most areas of innovation, there was plenty of unchartered territory. MDIs and CDFIs have not always (and still do not) attract the attention and familiarity of larger institutions. But we believe there are enormous lessons in just undertaking the process, both for ourselves and for other firms contemplating making similar inroads with critical infrastructures in all of the country's diverse communities. In this memo, we share our journey to implement a racial equity investment program. We believe it is critical to ensure that access to financial services is not reserved for those with privilege, and this investment is just one way we're committed to driving change. We aim for this memo to illuminate the process for other organizations looking to make similar investments.

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[1] According to the U.S. Department of the Treasury CDFI Fund, CDFIs can be banks, credit unions, loan funds, microloan funds, or venture capital providers. CDFIs are helping families finance their first homes, supporting community residents starting businesses, and investing in local health centers, schools, and community centers. They strive to foster economic opportunity and revitalize neighborhoods.

[2] According to the FDIC, the term "minority depository institution" is any depository institution with 51 percent or more of the stock owned by one or more "socially and economically disadvantaged individuals."

Our Approach to Social Impact

The challenges facing MDIs and CDFIs, though reflecting resource constraints, have very different drivers. The most obvious is that of capitalization, something institutionally we had recognized prior to the Death of George Floyd. In 2019, we began working with CDFIs and MDIs — organizations dedicated to offering responsible, affordable financial services to communities that have historically seen less investment — by placing deposits in several CDFIs and MDIs across the U.S. In short, by banking with community and minority owned institutions, firms — including fintech firms — could help to offer critical support and relationships with minority institutions. By providing more capital to CDFIs and MDIs in the form of deposits, those same institutions would have more resources to lend forward to underserved communities, and in the process assist more families seeking to buy their first homes, and launch small businesses.

This work took on increased urgency in the wake of George Floyd's murder and the Black Lives Matter protests around the world. Furthermore, once we saw data on how minority communities have been disproportionately affected by the COVID-19 pandemic, there was a clear need to take more action. The centerpiece of our efforts was a $100 million commitment to invest in minority and underserved communities to further the goal of economic empowerment.

Defining Goals

Our process was deliberative, and necessarily multifaceted. As in any investment, a comprehensive social impact strategy was needed. We needed, in short, to clarify and identify from the start our aspirations in order to develop a plan of action. This process, in our view, should not just include the boardroom, and we encourage other firms considering social impact strategy to collaborate with employees, community groups and stakeholders. This allows the company and its investment recipients to partner on concrete action.

In our case, we distilled a series of goals focusing on our strengths and experience as a payments company and participant in both the real and financial economy:

- Allow CDFIs and MDIs to increase their capacity to make loans to local small business owners. (An extension of our 2019 strategy)
- Help minority-owned small businesses grow through finance.
- Enable economic empowerment by providing unbanked individuals with access to savings and other financial tools that have historically been limited to those with privilege.

The latter two goals reflected our belief that it is critical to ensure that access to financial services is not reserved for those with privilege. Racism and structural inequality are historical facts, and have been in various instances codified into U.S. law and advanced by legacy financial institutions;[3] the innovation community should and can play a role by addressing pressure points like small business formation and banking where they have particular technical expertise.

As other companies think through defining goals, we encourage collaborating with community groups and considering specific ideal outcomes for the communities you are serving. This allows the company and its investment recipients to partner on concrete action.

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[3] Kraus MW, Onyeador IN, Daumeyer NM, Rucker JM, Richeson JA. The Misperception of Racial Economic Inequality. Perspectives on Psychological Science. 2019;14(6):899-921. doi:10.1177/1745691619863049

Establishing Investment Parameters

Once we established goals, we solidified the investment parameters. After a review of our balance sheet and liquidity position with senior leadership, we landed on $100 million as the appropriate commitment at that time — it's meaningful enough to drive impact, and it's a responsible amount as a percentage of our liquidity. We specified that we would look for opportunities that align with our stated goals as well as provide reasonable assurance of capital preservation through risk management capabilities. Additionally we targeted a maturity date of 10 years or fewer for all investments. 10 years is enough time to be ambitious, and to demonstrate seriousness of attention and focus. Any company considering a strategy like this should complete a similar process to review liquidity needs and risk tolerance levels.

Cross-Functional Coordination

A commitment of this magnitude requires coordination across the company. We sourced input from numerous teams across Square, as each investment opportunity presented itself with different risks and impacts that needed to be assessed by a cross-functional team. We worked closely with the following teams across our organization:

- **Treasury** – Treasury functions are core to most corporations. For sound policy development, we requested that our in-house experts review our balance sheet to determine responsible asset allocation as part of due diligence on potential opportunities.
- **Policy/Community Affairs** – The next important step was to think about how to actually execute the plan. We needed to help communicate our strategy as policy to the outside world, and to vet possible partnerships with community groups. Critical in this part of the process was our policy and community affairs specialist.
- **Legal** – Review all documentation to advise on structure, terms, etc., and ensure compliance with policies, procedures, and regulations.
- **Tax** – Evaluate target investments for tax implications unique to the company.
- **Accounting** – Analyze target investments for accounting considerations that could affect financial reporting.
- **Communications** – Ensure clear communication of program goals with both internal and external stakeholders.
- **Inclusion & Diversity and ESG** – Attest that program goals align with other internal and external efforts around diversity and inclusion and environmental, social, and governance initiatives.
- Securing the appropriate levels of approval for a corporation should also be considered in addition to the investing approach. Some social impact investments may already fit within a company's established corporate investment policies. For example, many companies mandate that all cash not needed for immediate operations be invested in a short-term security that receives at least a market rate of return without undue risk to the principle. Some impact funds meet those same investment standards, requiring minimal additional lift to invest in them. Meanwhile, more risky funds, funds with lower expected yields, or funds with longer maturity terms may require a reassessment of the company's investment policy—or the investment can be seen as a business decision that exists separately from the standard investment program, and therefore can deviate slightly if it's in service of other goals, like social and racial equity. It is also important to have support from the chief financial officer and check with Legal on requirements to inform the Board of Directors or seek Board approval for a particular type of investment.

Sourcing Opportunities

With these parameters in mind and approvals secured, we began sourcing opportunities. We leveraged the strong relationships built by our Policy/Community Affairs team over the years with community partners at CDFIs and MDIs. Through these conversations, we learned the needs of the industry and how Square could most meaningfully contribute. Many MDIs had a need for direct, non-deposit investments, and we wanted to tackle that issue in a scalable way.

This led us to the MDI Keeper's Fund,[4] an investment sponsored by the National Bankers Association. We also leaned on the work that other companies have done in the space — namely joining the Black Economic Development Fund[5] pioneered by the Local Initiatives Support Corporation (LISC) and Netflix. The diligence we performed on each opportunity weighed the potential impact of the fund against various risk factors. Key considerations included the financial strength and track record of the fund, underlying loan quality, the composition and collective experience of the management team, sources of investment capital, and regional focus. The investments we chose represent a spectrum of risk vs. impact that best protects Square from loss while maximizing impact — companies big and small can similarly cater their investments within this spectrum to meet their individual needs.

$25 Million Allocation

With a portion of the previously unallocated $25 million of our commitment, Square set aside $10 million for the Entrepreneurs of Color Fund,[6] managed by LISC. Additionally, as racial and social inequity are not limited to the U.S., we've earmarked $10 million to work with international organizations that support our goals. We'll also focus on increased financial access through bitcoin with the newly created Square, Inc. Bitcoin Endowment,[7] aimed at providing grants to organizations and individuals working on financial education and bitcoin access in historically under-resourced communities across the globe.

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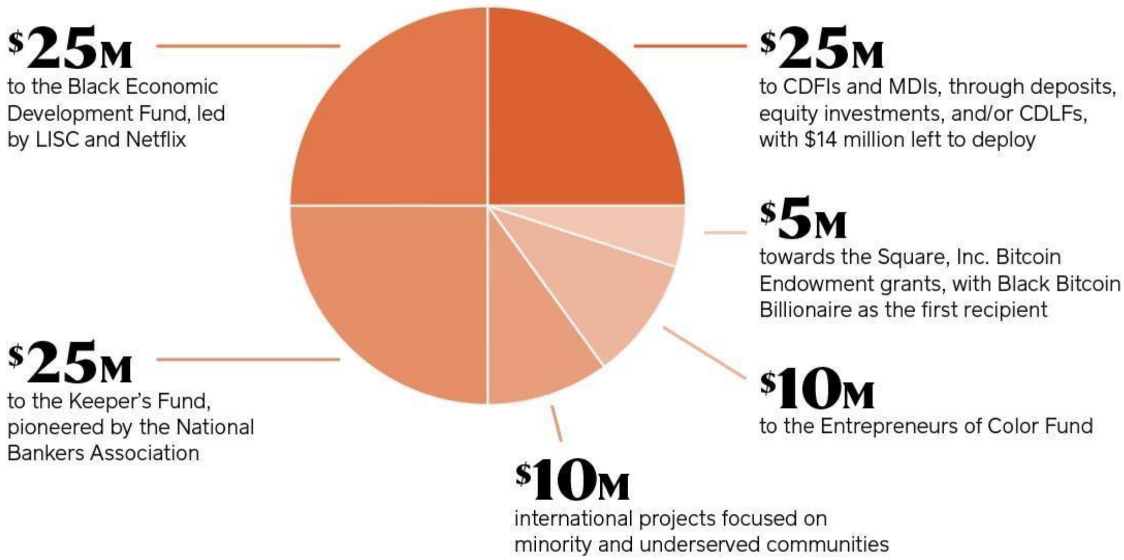
[4] The MDI Keeper's Fund is a national CRA-Social Impact MDI Capital Fund providing capital investments to qualifying institutions, allowing them to increase lending to lower- and middle-income individuals and communities.

[5] The Black Economic Development Fund (BEDF), managed by LISC, is one of the country's largest and most impactful social enterprises supporting projects and programs to revitalize communities, bring greater economic opportunity to residents, and facilitate financing of Black-owned businesses. Learn more about it here.

[6] The Entrepreneurs of Color Fund is designed to not only get much-needed capital directly into the hands of African American, Latinx, and other small business owners, but also provide critical support such as coaching, operational guidance, and training. Learn more about it here.

[7] We lent a portion of our corporate bitcoin holdings to Genesis, a digital currency lender, to earn a nominal yield on the capital. Square will use the interest income for grants to selected applicants. Learn more about Genesis here



Tracking Impact

As we finalized the initial opportunities most aligned with the spirit and goals of our commitment, we also needed to ensure a level of accountability. Our partners are held accountable to their impact goals through annual reporting on metrics including jobs created or protected, affordable housing units created or protected, number of small business loans provided, etc. We have high-level oversight on fund performance through the information we receive for financial reporting each quarter. We also remain in regular contact with our fund partners and receive quarterly updates on the projects they've invested in, like Dantes Partners.[8] Additionally, we hold ourselves accountable by transparently communicating these results to our company on an annual basis and keeping our Board and Square Communities (our employee resource groups) updated on our work. Employees are passionate about the work that we're doing and are committed to ensuring that we act as good stewards of Square, Inc.'s financial resources.

Looking Forward

We continue to identify ways to partner with CDFIs and MDIs across the country. At the request of our CDFI and MDI partners, we've renewed and extended Certificates of Deposit to increase those institutions' lending capacity. Of note, not all CDFIs and MDIs have a need for deposits and, in some situations, they could be harmed by a high deposit ratio.[9] When considering how to partner with a CDFI or MDI, it is important to do it in a way that makes sense for both parties to achieve their goals, whether that be through capital and/or equity investments. Square is also investing in individual Community Development Loan Funds (CDLFs), which target economic growth in a specific state or geographic region, making low-interest loans to small business owners and entrepreneurs who might not qualify for a bank loan. These funds fulfill direct lending needs and tackle important local projects that assist

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[8] Dantes Partners' goal is to facilitate and enhance local urban economic development by designing and structuring innovative funding and financing solutions for affordable, workforce, and mixed-income housing and community-based real estate initiatives. The BEDF investment will enable Dantes Partners to preserve or create ~3,000 units of affordable housing in Washington, D.C., and NYC. Learn more about it here.

[9] Investing in the Future of Mission-Driven Banks, Federal Deposit Insurance Corporation, Washington, D.C. (October 2020), https://www.fdic.gov/mdi.

marginalized populations.[10] Square decided to invest in individual CDLFs in response to calls from local partners, elected officials, and community leaders. Investment in individual CDLFs also allows for targeted investment in disproportionately disadvantaged small business owners, including Native American and AAPI communities. Furthermore, we remain committed to the work ahead and continue to have ongoing dialogue with other organizations about future work.

Resources

- List of Certified CDFIs in the United States
- Racism and the Economy, Federal Reserve Bank of Minneapolis
- Equity vs. Equality, George Washington University Milken Institute School of Public Health
- Impact in Place: Emerging Sources of Community Investment Capital and Strategies to Direct It at Scale, Commissioned by the Federal Reserve Bank of New York
- Finance Justice Fund
- Inclusiv
- Clear Vision Impact Fund
- AEO

[10] Learn more about CDFL here.

Inclusive AI in Consumer Lending

Jay Budzik, Chief Technology Officer
Teddy Flo, General Counsel and Head of Corp. Affairs

MDIs and CDFIs are foundational lifelines for minority and rural communities. As technology and innovation accelerate, so do the opportunities and challenges facing these important institutions. Many of these new technologies reward early adopters by allowing them to gain market share, improve profitability, and increase efficiency more rapidly than their less progressive peers. Thus, MDIs and CDFIs who seek out and adopt them ahead of less agile larger institutions stand the best chances of using them to make a positive impact. Perhaps the most critical such technologies are artificial intelligence and machine learning (AI/ML).

As we discuss, AI and ML provide a once-in-a-generation opportunity for MDIs and CDFIs to realize key operational benefits while making their services even more fair to their core constituencies. Particularly in the area of consumer lending, AI and ML enable lenders to extend credit to more borrowers--keeping them away from costly subprime lending products. Notably, the new borrowers that are included by ML-powered lending programs are commonly minorities, women, and "credit invisibles" who were previously left without fair credit options.

Unpacking the Data & Underwriting Challenge

Despite decades of focused effort by banks, legislators, and regulators, America's consumer lending industry still struggles to develop predictive credit models that minimize disparate impact while accurately assessing credit risk.[1] Underwriting approaches that unfairly perpetuate bias deprive protected groups of capital and hurt the lives of real people. They mean entrepreneurs not starting businesses; newlyweds not getting home loans; or moms not getting help in emergencies. We can do better.

History is the biggest driver of that bias. Much of the data used to build models and underwrite loans reflects the historical mistreatment of blacks and women in financial services. As a result, tens of millions of Americans lack

[1] Natalie Campisi, *From Inherent Racial Bias to Incorrect Data—The Problems With Current Credit Scoring Models*, Forbes (Feb. 26, 2021), available at https://www.forbes.com/advisor/credit-cards/from-inherent-racial-bias-to-incorrect-data-the-problems-with-current-credit-scoring-models/.

sufficient credit history for a traditional credit score to be computed.[2] And for those who do have credit bureau data, legacy underwriting models and scoring are known to heavily correlate with race and ethnicity.[3]

Generations of systemic racism and bias are baked into the data and traditional credit scores.[4] And, for the most part, legacy players have been unable to remove them. As a result, only a fifth of Black households have credit scores over 700, compared to half of all white households. This leads lenders to deny mortgages for Black applicants at a rate 80% higher than that of white applicants. The share of Black households with a mortgage would increase nearly 11 percentage points if their credit score distribution was the same as the distribution for white households.[5]

The responsible adoption and inclusion by banks, including MDIs, and CDFIs, of explainable ML-powered underwriting models for consumer loans and mortgages offers a practical way to break the cycle of credit discrimination in America. In the past few years, Zest AI has been able to demonstrate that AI/ML can solve these problems in the real world. The Zest approach uses adversarial debiasing techniques to reduce underwriting model reliance on credit bureau data known to correlate with protected class characteristics, while holding the accuracy and predictiveness of the model nearly constant.[6] This allows for more fair lending outcomes and the financial health and stability of the lending institution.

For instance, last year Zest entered a partnership with Freddie Mac to make the dream of homeownership a reality for *tens of thousands of minority borrowers* in the coming years. Consumer lenders of all sizes are switching to AI/ML lending — from credit-card giant Discover to a $500 million (assets) credit union in Nederland, Texas. By leveraging inclusive AI models, consumer lenders can achieve gains in fairness and inclusion. One Zest client saw approval rates for women jump by 20% after using a Zest AI-powered model. Another generated a model that shrank the approval rate gap between Black and white borrowers by 50%.

Zest AI is built to partner with financial institutions to improve the fairness and accuracy of consumer lending. We've worked seamlessly with dozens of banks, credit unions, specialty lenders, and regional banks to expand their reach and impact. We desire to do even more with MDIs and CDFIs looking to widen their footprint, serve their mission, and offer better and more fair services to their customers.

The Need for Modern Race Approximation Tools

Another often overlooked, but critically important element in ensuring fairness in lending is having accurate race estimation tools. Lenders are required by law to prove they don't discriminate intentionally or accidentally based on race and other protected status.[7] Yet in most cases, mortgage lending being the big exception, they're legally forbidden to ask the race of the applicant. Even in mortgage lending, about 30% of applicants decline to disclose their race and ethnicity.[8]

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[2] CFPB, *Who are the Credit Invisible?* (Dec. 12, 2016), available at https://www.consumerfinance.gov/about-us/blog/who-are-credit-invisible/.

[3] Aaron Klein, *Reducing bias in AI-based financial services*, Brookings (July 10, 2020), available at https://www.brookings.edu/research/reducing-bias-in-ai-based-financial-services/.

[4] Id.

[5] Jung Hyun Choi et al., "Explaining The Black-White Homeownership Gap," Urban Institute, October 2019, available at https://www.urban.org/sites/default/files/publication/101160/explaining_the_black-white_homeownership_gap_a_closer_look_at_disparities_across_local_markets_0.pdf.

[6] Zest AI, *There's A Fix To The Problem Of Biased Algorithms in Lending* (Dec. 16, 2019), available at https://www.zest.ai/insights/theres-a-fix-to-the-problem-of-biased-algorithms-in-lending.

[7] Dept Housing and Urban Dev., Reinstatement of the Discriminatory Effects Standard, 86 Fed. Reg. 33590 (June 25, 2021), https://www.federalregister.gov/documents/2021/06/25/2021-13240/reinstatement-of-huds-discriminatory-effects-standard

[8] Jason Dietrich, "Mortgage Applications with Missing Race Data and the Implications for Monitoring Fair Lending Compliance," Journal of Housing Research, p. 51, Volume 13, Issue 1, 2002, https://www.jstor.org/stable/24833843

To fill in this information gap, lenders, regulators, and lawyers have to make an educated guess about consumers' race. To do so, they generally use an algorithm called Bayesian Improved Surname Geocoding (BISG). BISG (pronounced bizz-gee), considers a borrower's last name and ZIP code or Census tract to estimate the probability they are Black, Hispanic, Asian, or white. BISG has done a lot of good, and it's been the only accepted method to estimate race and ethnicity when that data is missing. BISG was developed by the RAND Corporation twenty years ago to study race discrimination in healthcare. Back then, RAND believed BISG was right at least nine out of 10 times in identifying people as African-American, especially in racially homogenous areas.

But despite its broad adoption and success moving race discrimination analysis forward, limitations soon emerged regarding BISG's accuracy, especially when it was used to estimate race and ethnicity for a particular individual versus a larger population. A 2014 Charles River Associates study on auto loans found BISG correctly identified African-American borrowers a mere 22.4% of the time at an 80% confidence threshold.[9] The CFPB, using a different set of loans, found that BISG undercounts 25% of Hispanic applicants at that same 80% confidence threshold.[10]

Improving the BISG Algorithm

BISG was a pioneering solution. It brings much-needed objectivity to fair lending analysis and enforcement. But, as it stands, BISG gets less accurate every year as neighborhoods diversify and densify and the rate of racial intermarriage goes up, scrambling the predictiveness of surnames.[11] It is now time to update it. A multitude of new datasets and statistical methods since the mid-2000s are reshaping fair lending work and we need to harness those improvements to ensure our equity programs are really working.[12] Given the availability of new AI/ML tools, and our ability to consume large data sets, there is substantial room for improvement in making race estimation more accurate.

Fortunately, many key stakeholders are focusing on how tech can improve consumer lending and ensure fairness. We are now seeking to pull together partners, including MDIs, CDFIs, rural banks, and the DC Fintech Week platform, to get more involved in creating change. CDFIs and MDIs are in a unique position to contribute to the overall fairness of the ecosystem given the data they hold that could help bend the curve towards more inclusive lending.

To this end, Zest AI is developing a free BISG alternative that augments the basic name and location data to create a machine learning model that uses more data variables and computing power to generate the thousands of correlations that produce far more accurate race estimation.

In a test on Florida voter registration data (one of the only publicly available datasets that include ZIP code, name, and race / national origin), Zest's race prediction model identified Blacks with 30% more accuracy than BISG at the 80% confidence threshold. It also cut the numbers of Whites identified as non-White by 70%.[13]

In another test conducted by the Harvard Computer Society's Tech for Social Good program using North Carolina voter data, Zest's algorithm was more than twice as accurate at identifying Blacks and 35% more accurate at

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[9] Arthur P. Baines and Marsha J. Courchane, "Fair Lending: Implications for the Indirect Auto Finance Market," Report by Charles River Associates for the American Financial Services Association, p. 107, Nov 19, 2014.

[10] Consumer Financial Protection Bureau, "Using publicly available information to proxy for unidentified race and ethnicity A methodology and assessment," Agency report, p. 21, Summer, 2014.

[11] Census Bureau, Press Release, "2020 Census Statistics Highlight Local Population Changes and Nation's Racial and Ethnic Diversity," Aug. 12, 2021. https://www.census.gov/newsroom/press-releases/2021/population-changes-nations-diversity.html

[12] Consumer Fin. Prot. Bureau, "CFPB Announces Tech Sprints To Empower Consumers, Reduce Regulatory Burden," (Jun. 29, 2020), https://www.consumerfinance.gov/about-us/newsroom/tech-sprints. A second Tech Sprint occurred in March 2021.

[13] Kasey Matthews, Zest AI Insights blog, "Improving This Algorithm Can Make Lending A Lot Less Racist," (Aug. 4, 2020), available at https://www.zest.ai/insights/improving-this-algorithm-can-make-lending-a-lot-less-racist.

identifying Hispanics than BISG.[14] If those numbers hold up nationwide, better race estimation would change the recorded identifications of tens of millions of people of all races. We would know better the true scope of the challenge of increasing economic equity.

As noted, Zest would welcome partners, including those participating in this conference. We believe that leading MDIs and CDFIs could prove to be ideal partners in our effort to offer a free, open-sourced race estimation tool that can meaningfully improve fair lending testing and outcomes. We also believe there is a related public policy track we could pursue with our partners.

More specifically, we think that Congress should encourage the CFPB to study new approaches to estimating race and other protected-class statuses when that information is not available. Government data could aid such a study. The 2020 US Census data is in the process of being released. The GSEs (Fannie Mae and Freddie Mac) have a vast trove of HMDA mortgage data and, while under federal conservatorship, the FHFA could make it available to federal agencies to study, as they have in a new Fannie Mae program using rental data.[15]

There is an opportunity today to use public data for public good: to protect our most vulnerable populations and create a new generation of credit scoring models that fairly allocate public resources, including the Treasury dollars used to guarantee mortgage loans. We look forward to working with like-minded organizations, including those participating in this Conference to make it happen.

[14] Publication pending, Research from Zest AI and Harvard's Tech For Social Good, Available upon request, July 2021.

[15] Fed. Housing Fin. Auth., press release, "FHFA Announces Inclusion of Rental Payment History in Fannie Mae's Underwriting Process," (Aug. 11, 2021), available at: https://www.fhfa.gov/Media/PublicAffairs/Pages/FHFA-Announces-Inclusion-of-Rental-Payment-History-in-Fannie-Maes-Underwriting-Process.aspx.

Leveraging More Data and Artificial Intelligence for Accurate, Inclusive Underwriting for MDI Communities

Nat Hoopes, Head of Policy, Upstart Network, Inc.
Nicole Elam, CEO, National Bankers Association

In 2020, the FDIC released a report highlighting the impact of Minority Depository Institutions (MDIs).[1] The report found that MDIs help advance economic mobility in Black communities. An estimated six out of 10 people living in the service areas of MDIs are Black, in contrast to only six out of 100 for banks that are not Black-led. Furthermore, these financial institutions have been shown to originate a substantially higher proportion of mortgages and small business loans to Black borrowers than non-minority financial institutions. MDIs are trusted by Black Americans to help meet financial needs of people living in communities historically underserved by traditional financial institutions. As FDIC Chairman Jelena McWilliams has put it:

"MDIs are vital service providers for minority populations. If not for your institutions, individuals in low-and moderate-income communities might not have access to banking services. You help create jobs, grow small businesses, and build wealth. Because of the investments you make in your communities, your customers have a better opportunity to achieve their American dream."

Increasingly, a streamlined digital loan offering is a necessity for banks to serve their communities. A study from Experian found that even before the pandemic, *50% of the US personal loan market was served online* by fintech platforms that work with banks or direct fintech lenders, up from 22% in 2015.[43] Offering technology that allows loan applications directly from smartphones can level the playing eld; according to the Pew Research Center, more than 8 in 10 Black and Hispanic Americans own smartphones today, nearly identical to the percentage of White Americans.[2] More and more consumers are seeking credit and applying for loans from their mobile devices, which could create

[1] https://www.fdic.gov/regulations/resources/minority/2019-mdi-study/index.html

[2] https://www.pewresearch.org/fact-tank/2021/07/16/home-broadband-adoption-computer-ownership-vary-by-race-et hnicity-in-the-u-s/

new opportunities, at the same time that physical branch networks continue to shrink, often placing a burden on low and moderate income areas, rural areas and in communities of color.[3]

Against this backdrop, Upstart and the National Bankers Association (NBA) believe that MDIs can better reach the regions and communities they serve via an affordable online unsecured personal loan offering that relies on artificial intelligence (AI) and machine learning (ML) for underwriting, using a wider range of data sources. At the same time, one of the challenges for financial technology companies in serving very small banks is lack of scale and opportunity cost. The common refrain is that it can take as much time and manpower for the service provider to get through diligence and onboarding with a $100 million asset size bank as it does with a $10 billion or $100 billion institution, without the associated revenue scale benefits at the end. In addition to that basic challenge, smaller MDIs may be burdened by the legacy of societal inequality and often lack the resources or staff expertise to implement expensive technology offerings to modernize their services. The large core bank technology providers do not have an incentive to tailor their products to the unique needs of MDIs.[4]

In order to establish a successful revenue generating partnership for MDI/Community Development Financial Institutions (CDFIs) that solves the scaling issue and supports small loans, Upstart is offering special implementation pricing, tailored volume minimums, and unit pricing on small loans to NBA members to help achieve these three core objectives:

- Reduce the typical cost/scale barriers MDIs face in adopting new technology (in this case, full support of automated digital unsecured personal loans).
- Tailor the 'Powered by Upstart' online unsecured loan product pricing to the MDIs' anticipated unique applicant pool that may skew towards smaller loans.
- Tap network effects of the innovation committee and the NBA to increase the efficiency of the due diligence process with aligned MDIs/CDFIs.

Banks using the Upstart platform can offer loans starting as low as $1,000, with pricing of all loans below 36% APR. By partnering with the NBA Innovation Committee and its members, Upstart can scale its work with a number of small banks during the critical early diligence phase of the third party vendor review process. In doing so, Upstart also hopes to show that building relationships with smaller MDIs/CDFIs can be scalable and sustainable for a lending technology provider.

NBA members have good reasons to believe that they will have unique needs when it comes to a personal loan technology partner. NBA members need a partner who is flexible and willing to understand the unique requirements of MDIs/CDFIs and their customers. By partnering with the NBA's Technology and Innovation Committee, Upstart and NBA members hope to show that an MDI-technology partnership can achieve scale, with MDIs using responsible digital credit offerings to make a difference in minority communities. Based on experiences at branches, the NBA's MDIs have shared the key insight that they believe that online loan applications received through their own marketing channels will skew heavily towards smaller loan sizes, and they need a structure that makes such loans sustainable.

[3] National Community Reinvestment Coalition Bank Branch Closure Update 2017-2020. https://ncrc.org/research-brief-bank-branch-closure-update-2017-2020/

[4] Insight from Project REACh / National Bankers Association

Improving Access to Credit in Minority Communities

Study after study has found that access to fair, affordable credit is critical for economic mobility.[5]Finding and pricing underserved borrowers who need credit is not easy. The Wall Street Journal reported in July that some 53 million U.S. adults lack traditional credit scores because they have a "thin" or nonexistent history of borrowing.[7] Similarly, in 2017, the Consumer Financial Protection Bureau (CFPB) "estimate[d] that 26 million Americans are 'credit invisible,' meaning they have no credit history at all," and "another 19 million people have credit histories that are too limited or have been inactive for too long to generate a credit score" under traditional credit scoring models.[6]

Furthermore, the CFPB has found that Black and Hispanic Americans, often served by MDIs, are more likely than white or Asian Americans to be credit invisible or to have un-scored records and typical approaches to building strong credit les – for example, "[t]he use of co-borrowers and authorized user account status – [are] notably less common in lower-income neighborhoods."[7] To promote fair access to credit for all individuals, including those in these circumstances, federal regulators have recognized that credit underwriting is an area where AI and ML and their use of alternative data can be particularly effective. The CFPB, for instance, has reported that:

"In addition to the use of alternative data, increased computing power and the expanded use of machine learning can potentially identify relationships not otherwise discoverable through methods that have been traditionally used in credit scoring. As a result of these innovations, some consumers who now cannot obtain favorably priced credit may see increased credit access or lower borrowing costs."[10]

But the challenge today is more than just using data and technology to price these customers fairly for credit based on their true risk; in 2021, serving borrowers who need access to unsecured credit increasingly means offering convenient, fairly priced products *online*, *enabled for applications from mobile devices*.

Given these dynamics, Upstart is the right type of technology partner for MDIs for a number of reasons. The automation of the loan application process provides a more streamlined and effcient process that benefifis both financial institutions and consumers. Approximately 71% of loans originated through Upstart's platform by bank partners are fully automated, with more than [65%] fully completed on a mobile device. Second, the Upstart AI/ML-powered credit underwriting model, relying on more than 1,000 data points, has demonstrated how alternative data use can significantly expand fair credit availability in a fair and responsible manner, consistent with fair lending laws and regulations, while also potentially improving bank safety and soundness.[8] The model has been proven to (1) be more accurate than traditional underwriting models, and (2) allow for greater access to credit at lower rates of loss.[9] Upstart's validation testing has consistently shown, using measures of statistical accuracy like AUC, that the model improves accuracy by at least two times compared to that of a traditional model.[10] An internal study comparing the

[5] https://equitablegrowth.org/race-and-the-lack-of-intergenerational-economic-mobility-in-the-united-states/ [7]Andriotis, A. (2021, July 24). FICO Score's Hold on the Credit Market Is Slipping. Wall Street Journal. https://www.wsj.com/articles/fico-scores-hold-on-the-credit-market-is-slipping-11627119003.

[6] Schmidt & Stephens, supra note 8, at 141-142. 24 See id. 25 Cordray, supra note 1; see also Kenneth P. Brevoort, et al., CFPB Office of Research, "Data Point: Credit Invisibles," and https://files.consumerfinance.gov/f/201505_cfpb_data-point-credit-invisibles.pdf

[7] See Kenneth P. Brevoort & Michelle Kambara, CFPB Office of Research, "Data Point: Becoming Credit Visible," *available at* https://files.consumerfinance.gov/f/documents/BecomingCreditVisible_Data_Point_Final.pdf. [10] *"An Update on credit access and the Bureau's first No-Action Letter,"* CFPB Blog (Aug. 6, 2019), *available at* https://www.consumerfinance.gov/about-us/blog/update-credit-access-and-no-action-letter/.

[8] Regulators have consistently identified the importance of more accurate credit underwriting for safety and soundness of financial institutions: https://www.minneapolisfed.org/article/2014/underwriting-standards-lessons-from-the-past

[9] https://www.upstart.com/about#results-to-date-3

[10] Based on an internal studies comparing Upstart's model with a hypothetical lending model formulated using Upstart's approximation of credit score variables used in traditional simple rules-based lending models and additional variables including loan amount, debt-to-income ratio, monthly income, number of credit inquiries and number of trade accounts.

Upstart model to that of several large U.S. banks found that their model could enable these banks to lower loss rates by almost 75% while keeping approval rates constant.[11]

Further, an access-to-credit review by Upstart of its 2020 data using comparison methodology specified by the CFPB, showed that their AI model approved 26% more borrowers than high-quality traditional lending models at 10% lower APRs.[12] This follows on the heels of what the CFPB has highlighted about Upstart in 2019 – that the reported data and testing suggests a credit expansion is inclusive: "..this reported expansion of credit access reflected in the results provided occurs across all tested race, ethnicity, and sex segments."[13]

How the Upstart/MDI Partnership Supports Smaller Loans

Upstart helps banks and credit unions lend as little as $1,000 in a traditional installment form with all rates below 36% APR. Upstart's offering for the NBA's small MDIs has **two** critical components, with both being utilized in the partnership. The first is the *Upstart Referral Network*, where Upstart markets and sources new customers for the banks; the second is the *Personal Loans Powered by Upstart* where the member banks can market the product themselves and cross-sell to existing customers using Upstart's underwriting and verification technology powering their own branded website. This combination enables MDIs to build a pro table and broad-based regional personal loan portfolio, while also offering a direct branded resource to the immediate communities they serve.

The MDIs in the NBA expect that when marketing their new Upstart-powered online loan product themselves, they will attract online applicants seeking lower loan amounts than the typical bank that Upstart might power. To address this possibility, Upstart has tailored the National Bankers' Powered by Upstart program to ensure sustainable per-loan pricing if that does indeed occur. Here are the basics on the two programs: *Upstart Referral Network*

The Upstart Referral Network benefits MDIs by expanding access to customers outside of their immediate business footprint. Upstart partnered with the NBA to allow a lower minimum commitment of funded loans, allowing them to find borrowers within their risk tolerance across each of their specific footprints. Upstart is not only an industry leader in underwriting personal loans, it is also a leading marketer. This allows MDIs with smaller marketing teams and budgets to capitalize on the learnings and reach of Upstart's marketing program.

Personal Loans Powered By Upstart

The Personal Loans Powered by Upstart platform allows financial institutions to easily launch a digital lending program across multiple consumer lending products. This solution allows lenders to offer an industry leading customer experience by leveraging Upstart's lending application process. They are also able to offer their customers lower rates and higher approval rates by leveraging Upstart's constantly improving underwriting and pricing engine. Upstart's model natively approves more Black and Hispanic borrowers, at lower APRs. By partnering with the NBA,

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[11] In an internal study, Upstart replicated three bank models using their respective underwriting policies and evaluated their hypothetical loss rates and approval rates using Upstart's applicant base in late 2017. To compare the hypothetical loss rates between Upstart's model and each of the replicated bank models, Upstart held approval rates constant at the rate called for by each bank's respective underwriting policy. The results represent the average rate of improvement exhibited by Upstart's platform against each of the three respective bank models.

[12] Approval numbers compare the 2020 loan approval rate by the Upstart model and a hypothetical traditional credit decision model. The APR calculation compares the two models based on the average APR offered to borrowers up to the same approval rate. The hypothetical traditional model used in Upstart's analyses was developed in connection with the access-to-credit reporting requirements under its CFPB No- Action Letters, is trained on Upstart platform data, uses logistic regression and considers traditional application and credit file variables.

[13] *"An Update on credit access and the Bureau's first No-Action Letter,"* CFPB Blog (Aug. 6, 2019), *available at* https://www.consumerfinance.gov/about-us/blog/update-credit-access-and-no-action-letter/

they have further modified the pricing structure to allow them to offer even more favorable rates – especially in lower loan amounts.

We believe this can help keep customers out of the treadmill cycle of debt perpetuated by payday loans and high-rate installment lenders. Since the majority of loans on the Upstart platform are used to consolidate existing debt, we believe this benefits customers by creating a more stable financial pathway.

Both Upstart and the NBA have a deep commitment to working on ways to enable low-income borrowers to recover from a short-term setback in a financially sustainable manner, and to avoid debt traps. For those who really need it the most, the only capital available for urgent needs is typically extremely expensive (i.e., payday loans). Upstart and the NBA know that while they are marketed as a one-time quick x, the average payday loan borrower can take out eight loans a year, with lenders charging $15-$20 per $100 borrowed – an approximate of 400%+ APR.[14] Upstart and the NBA members are actively working through how the partnership can help NBA banks better serve borrowers who have a history of being denied credit and who may need even smaller sized loans.

Possible *Future* Areas for Collaboration between NBA MDIs and Upstart: Fairer Auto Loans

Auto loan debt is one of the largest categories of household debt, after mortgages and student loans.

Americans owe $1.37 trillion in auto loan debt and an average auto loan balance of $19,865 in 2020.[15] Most consumers finance their auto purchase through either direct or indirect lending. Borrowers can obtain auto loans directly from banks/credit unions that have no connection to an auto dealer. Buyers can also secure financing indirectly at a car dealership, in this instance a dealer would share a borrower's financial data with lenders who decide whether to make a loan. In this scenario, a dealer markup can occur if the indirect lender allows the dealer to charge a higher interest rate than the one originally provided.

Nearly all American households own at least one vehicle and depend on it to go about their daily lives. An auto often provides not only physical mobility but also economic mobility. In many places across the country reliable public transportation is not a viable option and a vehicle is needed to get to work, take children to school, or make it to a doctor's appointment. Autos are also very expensive to purchase. In 2021, the average price of a used car soared to an all-time high of $25,453[16] – almost $3,000 higher than the previous year – and the average interest rate for a consumer with subprime credit buying a used car was 17.26%.[17]

Americans almost always borrow money to purchase a car and their loan terms often vary by income, age, location and unfortunately race. An auto loan with a high interest rate could be devastating to an individual or family who is barely making ends meet. A recent study found that Black and Hispanic borrowers were 1.5 percentage points less likely to be approved for a loan and they pay 0.7% higher interest rates, regardless of their credit history.[21] The same study also found that although bank loans were much less likely to be discriminatory, tens of thousands of Black and

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[14] Upstart research and CFPB Report: "Consumer use of payday, auto title, and pawn loans" https://www.consumerfinance.gov/data-research/research-reports/consumer-use-of-payday-auto-title-and-pawn-loan s-insights-making-ends-meet-survey/

[15] Lembo Stolba, Stephen. "U.S. Auto Debt Grows to Record High Despite Pandemic" Experian. https://www.experian.com/blogs/ask-experian/research/auto-loan-debt-study/

[16] Naughton, Nora, "Looking to Buy a Used Car? Expect High Prices, Few Options," Wall Street Journal, https://www.wsj.com/articles/looking-to-buy-a-used-car-expect-high-prices-few-options-11620639000.

[17] Zabritski, Melinda. "Auto Finance Insights: State of the Automotive Finance MArket, Q1 2021." https://www.experian.com/content/dam/noindex/na/us/automotive/finance-trends/q1-2021-state-of-auto-finance.pdf

[21] Butler, Alexander W. and Mayer, Erik J. and Weston, James Peter, "Racial Discrimination in the Auto Loan Market." https://ssrn.com/abstract=3301009 [22] Ibid.

Hispanic borrowers are denied loans they would have been approved for had they been White.[22] At Upstart we believe that non-prime borrowers especially are often paying too much for their auto loans. These individuals, priced less accurately by traditional lending models and credit scores, have an opportunity to reduce their monthly expenses via Upstart's AI lending platform. Many of these would-be borrowers are often left out of fair auto financing because of biases that do not reflect their true risk or ability to repay.

Upstart recently examined the auto lending market and existing loan volume using the AI lending platform. We discovered that more than 25% of existing auto loans, or one in four, could be refinanced at a lower rate to save borrowers at least $20 a month.[18] That can translate to hundreds of billions of dollars in potential savings for consumers, significantly impacting those with higher interest rates. There are three ways to tackle this problem: better direct auto loans; better indirect auto loans, and online auto loan refinancing options.

Appendix – The Upstart Technology Platform

Upstart is a leading AI lending platform designed to improve access to convenient and affordable credit while reducing the risk and costs of lending for bank and credit union partners. More than half of all loan applications powered by the Upstart platform begin on the borrower's smartphone. By leveraging Upstart's AI platform that harnesses over 1,000 data points, Upstart-powered banks can o er higher approval rates and experience lower loss rates, while simultaneously delivering the exceptional digital-first lending experience their customers demand. Upstart's platform helps to improve the borrower experience along two important dimensions.

While many fintech companies have decided to compete with banks or become a bank themselves through either a charter application or acquisition of a bank, Upstart has chosen the decidedly different path of partnering with banks and credit unions. Upstart provides the technology to banks and credit unions that allows them to offer fully digital experiences across multiple consumer lending products. Importantly, Upstart's platform allows lenders to launch and maintain top-rated digital lending experiences without a substantial investment in technology and personnel that would be out of reach for all but the largest financial institutions. Upstart's credit underwriting platform, now eight years old, harnesses AI and ML and uses data that goes beyond traditional credit scores, helping financial institutions of all sizes identify creditworthy consumers online and price risk more accurately.

Well regulated partnerships between financial institutions and technology companies, like Upstart, are critically important today for the financial health of consumers and the banking system. Working with Upstart helps banks do more than convert a traditional loan product into a digital offering. Because of Upstart's use of additional data and AI/ML techniques, the banks and credit unions that work with them are able to offer loans to more consumers who might not qualify using traditional underwriting methods. Among other things, this enables them to increase the percentage of consumer loans that are made to low-and-moderate income borrowers.[19] Upstart has demonstrated that helping financial institutions lend money safely to more consumers, or alternatively, reduce their credit losses, is an area uniquely suited to the use of AI and alternative data.[20]

There also are fair lending benefits to AI/ML credit underwriting models compared to traditional credit underwriting models. Upstart has worked proactively with the CFPB to demonstrate that using AI technology in lending can

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[18] This information is estimated based on consumers who qualified for a rate through Upstart. As of 7/1/2021, at least 25% of consumers received a rate that would allow them to save at least $20 a month when refinancing their vehicle.

[19] Through March 31, 2020 45.5% of loans made relying on the Upstart model go to individuals who would meet the definition of being low or moderate income. LMI calculations in this internal analysis are approximate using Upstart borrower data: reported individual borrowers' income were used in lieu of household income and zip codes were used as a proxy for census tract information. Upstart By The Numbers. https://www.upstart.com/blog/upstart-by-the-numbers

[20] See Upstart.com Results To Date. https://www.upstart.com/about#results-to-date-3 [26] An update on credit access and the Bureau's first No-Action Letter.

https://www.consumerfinance.gov/about-us/blog/update-credit-access-and-no-action-letter/

improve credit access and reduce interest rates for borrowers in all demographic groups, when compared to traditional underwriting approaches.[26] Upstart's quarterly fair lending test results to date indicate that AI models can be used without generating unlawful disparate treatment of, or disparate impact on, protected-class borrowers. In addition to the quantifiable benefits of AI/ML credit underwriting models, the results also demonstrate the qualitative benefits to this technology as compared to traditional credit underwriting models. In particular, the use of AI/ML technology can help eliminate unconscious or conscious human bias in the credit underwriting process through the use of AI/ML credit underwriting models that require little, if any, human intervention.

While these quantitative and qualitative benefits of AI/ML credit underwriting models make a compelling case for use of this technology in any economic environment, the COVID-19 pandemic has intensified the need for the critical role that AI/ML credit underwriting models can play during an economic recovery. For example, Upstart has experienced only half the increase in payment impairments – both at the peak of COVID-19 pandemic, and to date – compared to the industry standard, despite the fact that borrowers of Upstart-driven loans have a 25 point lower average FICO score.[21] A significant part of the success of Upstart's AI/ML credit underwriting model under these circumstances can be attributed to the model's ability to quickly incorporate unemployment data and other economic forecasts, which Upstart feels will be especially valuable to fair and accurate underwriting by MDIs.

[21] Based on a comparison of Upstart payment impairment rates to industry impairment rates provided in "dv01 Insights COVID-19 Performance Report Volume X," dated as of March 31, 2021 (the "dv01 Report"). The dv01 Report analyzed over 2.5million active loans with a weighted average FICO score of 720, which is 50 points higher than the weighted average FICO score of Upstart borrowers. Payment impairments include both hardships and delinquencies.

Supporting CDFIs and MDIs via Open Finance

Nell Malone, FinRise Program Director, Plaid
John Pitts, Global Head of Policy, Plaid

CDFIs and MDIs should be able to offer their customers the same experience as Wall Street Banks. Here's how.

Background

Many Americans face serious financial challenges: Three quarters live paycheck-to-paycheck. Only a quarter report being financially healthy. More than a quarter with incomes below $30,000 reported spending down their savings to manage the ongoing effects of the pandemic. These statistics are even more concerning when viewed within the context of stagnating wages and growing income inequality.

It's important to note that these experiences are not shared equally: on average, white families have eight times the wealth of the average Black family and five times the wealth of the typical Latinx family. Black and Latinx households are five times as likely to be unbanked as White households. And the majority of Black Americans report experiencing bias and discrimination across all financial services sectors. The issue of inequitable access to financial services is significant and widespread. While niche and personalized services are improving outcomes, we will continue to see these trends accelerate if access to these services is not equally distributed across the financial sector.

Community Development Financial Institutions and Minority Financial Institutions have consistently been at the forefront of addressing economic equity and financial inclusion by focusing their services on communities that have been historically excluded from or underserved by the traditional financial services sector. CDFIs and MDIs work to provide equitable services in a system where racial bias and discrimination and predatory financial products targeting low-income communities are still prevalent.

They do so, however, with constrained resources often reflecting both poorer communities and historical barriers that have long driven income and wealth inequality. As a result, they are not always positioned to provide the same suite of customer experiences as established Wall Street institutions. This in turn exacerbates risks of customer flight, higher churn, and inability to successfully scale.

Digitization Changes the Landscape

Over the past decade, the financial system has undergone significant transformation driven by technology and shifting consumer expectations based on new technologies. Consumers are increasingly turning to digital applications and services to manage their finances, a trend that has accelerated significantly as a result of the COVID-19 pandemic. Use of these digital services, often called fintech, has increased dramatically over the past year. According to a Harris poll, most Americans (59%) now report using fintech to manage their money, from budgeting and saving, to investing and paying off debts. Two thirds of Americans (69%) say fintech has been a "lifeline" during the pandemic and that they could not have kept up with their finances during the pandemic without the digital apps, products, and services they rely on. And bankers report that improvements to digital products enhance their ability to serve their customers against the backdrop of increased digital adoption.

These advancements in technology have the potential to create a more equitable financial system. Consumers are already recognizing the benefits of fintech — the same Harris poll found that 82 percent of Americans say they get better results when they use technology to manage their finances. Authorized third-party data access has enabled the development of niche products and services that may otherwise be too resource intensive for financial institutions to develop in-house. For example, Esusu enables consumers to bolster their credit score by reporting rent payments to credit bureaus. Other popular fintech use cases include automating savings and investments (e.g., Acorns), which have helped consumers save billions of dollars, and alternatives to costly, short-term small-dollar credit (e.g., Walnut).

A New Challenge for CDFI and MDI Institutions

As consumers increasingly rely on fintech apps and services to manage their finances, providing an exceptional banking experience in 2021 means ensuring seamless access to those services. This is particularly important for the consumers that CDFIs and MDI's serve. While engagement in traditional financial services sees stark differences along racial and ethnic lines, fintech usage appears much more egalitarian among several key demographics: while 17% of Black households are unbanked, compared to 3% of whites, Blacks (59%) and Latinos / Hispanics (62%) reported using fintech at even greater rates than whites (56%).

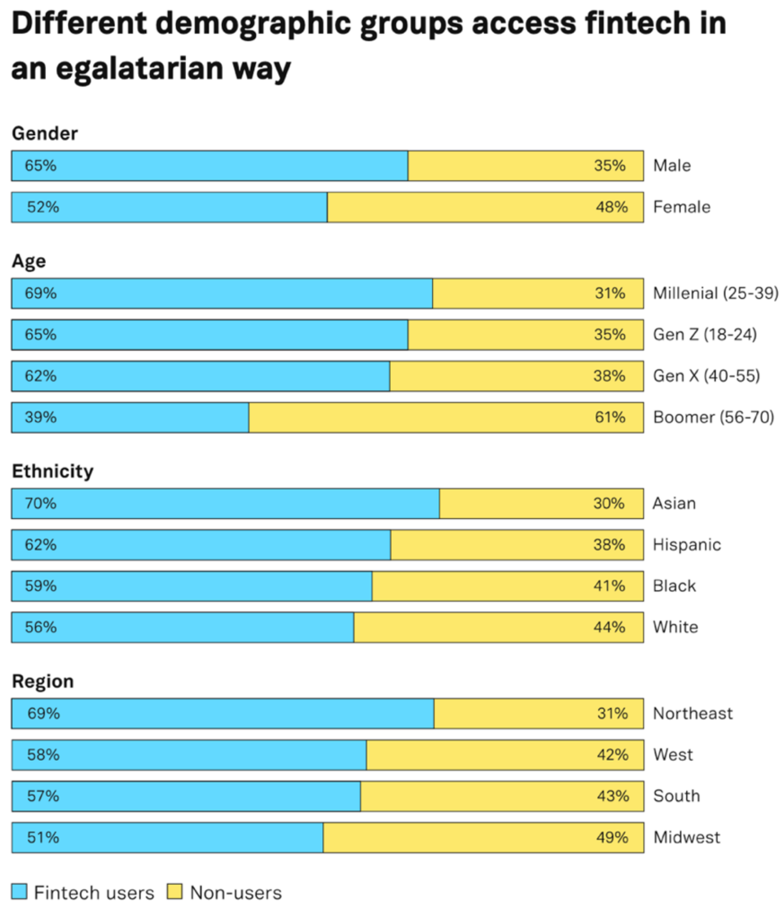
Furthermore, early results from a 2021 Harris poll indicate that trends in fintech adoption have continued, if not accelerated: adoption last year among women, people making under $100k, and Hispanics each increased 35%. Additionally, Black consumers and consumers making under $50k reported increased confidence in using fintech to manage finances at a rate of 14% and 13% respectively.

Figure 1

Fintech use is evenly distrbuted among different genders, ages, and ethnicities. Women use fintech slightly less than men (52%, 65%), but in both groups just about half of consumers are fintech usesrs. the Northeast region has the greatest proportion of fintech users, but the South, Midwest, and West use fintech equally.

Nearly half of Blacks and Latinos/ Hispanics who used to bank manually (by phone, by mail, or in person) now do it digitally (46%, 49%). Blacks in particular reported that fintech lowered cost barriers to accessing tools like savings products. Nearly half of Blacks said savings habits were too expensive until they started using fintech (47%).

Rural consumers use fintech apps at nearly the same rate as urban consumers. That includes banking (45%, 50%), fintech payments apps (52%, 59%), and investing did not know where to start investing before fintech, as compared to just three in ten urban consumers.



The graphs and text on this page leverage data from the joint 2020 Harris Poll.

It's also notable that fintech has provided an "on-ramp" for consumers who had previously struggled to access financial services. Our joint study found that one in seven consumers making less than $50,000 annually started banking for the first time using fintech (14%). This is especially relevant as lower-income consumers are far less likely to be banked over all: 93% of unbanked households make less than $50,000 annually.

Maintaining CDFIs and MDI's significant role in advancing financial outcomes of those who are underserved by the current financial system means adapting to these new entrants and technologies. Expanding CDFI and MDI impact means embracing this "open" financial ecosystem and the broad adoption and utilization of fintech solutions, so that your institution becomes the hub of your customer's digital financial life, and their access point to the broader digital financial world. It is vital that CDFI and MDI technology stays on pace with industry standards to better compete with larger financial institutions and to continue meeting the needs of the communities they serve.

Open Finance as a Technology Tool for CDFIs and MDIs

Open Finance is an ecosystem in which consumers have control over the full range of their financial data, which they can use to improve their financial health. At its core, open finance allows consumers to engage with the full range of available financial services and gives financial institutions powerful insights into how and where consumers manage their finances. This exchange enables financial institutions to build better products and services that meet customer needs, attract newer segments including consumers that are skeptical of traditional financial services, and retain account primacy by connecting to products and services that consumers need the most.

Open banking is a term that largely became adopted because of the second Payment Services Directive (PSD 2) in Europe, and the subsequent technology structure built on top of that directive in the UK called Open Banking. Currently in the United Kingdom, individual consumers only have access to payments data from current accounts and can only share data from banks to third-parties. Thus, for many people open banking describes a world in which consumers have access to a fairly limited scope of bank data and sharing is one-directional. Open finance refers to a world in which consumers can access not only their bank account data but also their investments, liabilities, and assets data. It also incorporates the ability of consumers to share data in multiple directions, including from fintechs to banks.

Open finance is about giving consumers the full picture of all of their finances and creating a digital level playing field where any company can use financial data, with the consumer's consent, to generate new products, services, and use cases for their customers. This is a complex ecosystem, with large banks spending billions of dollars a year building the infrastructure to engage with it. That can make it difficult for smaller institutions to get started. Fortunately, independent companies like Plaid have built the open finance infrastructure that thousands of banks and fintechs rely on.

Plaid's Technology Stack and Open Finance Solution

Plaid helps people connect their bank accounts to the apps and services they want to use. For almost a decade, Plaid has powered the modern fintech ecosystem, enabling consumers to access a network of over 11,000+ financial institutions and 5,500+ fintech apps and services across the US, Canada, the UK, and Europe. Over that time period, we have witnessed accelerated consumer adoption of fintech solutions. Today, 1 in 3 US adults have linked an account with Plaid.

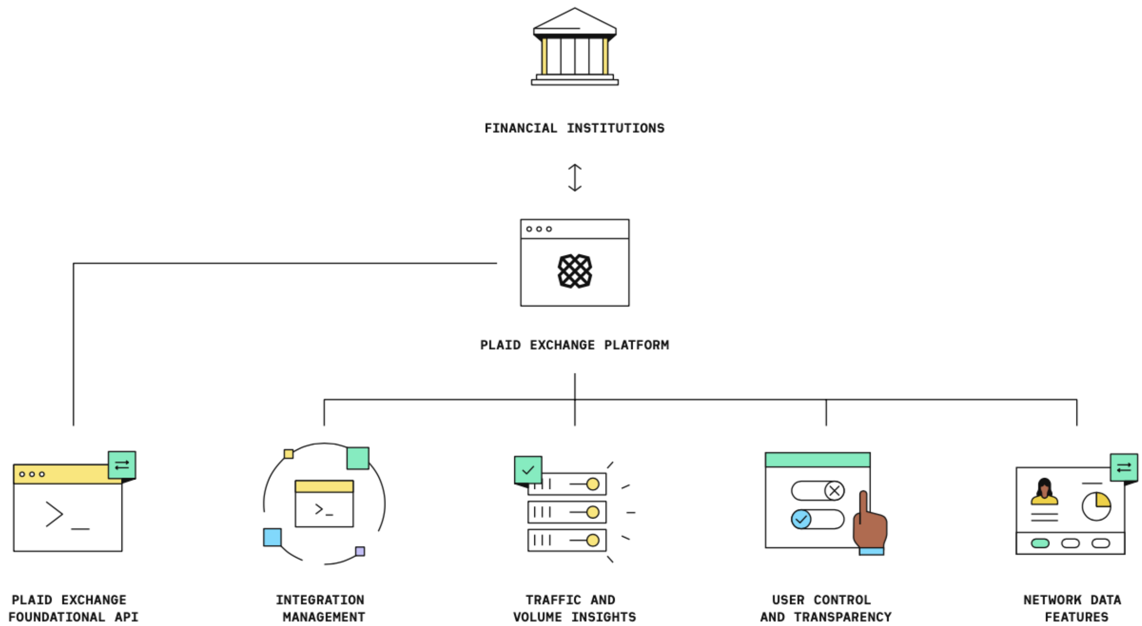
We are strong supporters of open finance and have long advocated that consumers own their data and should be able to use it to access competitive providers, recognizing that differences in available data may impact a consumer's ability to engage with a financial technology provider, resulting in a fragmented and unfair financial ecosystem. As part of our broader efforts to support authorized access, we have developed Plaid Exchange, an innovative open finance platform to help financial institutions become open finance experts too.

Today's consumers want their financial institution to provide fast and seamless digital connectivity to their favorite apps. Integrating into Plaid Exchange can help CDFIs and MDIs acquire and retain customers by allowing them to seamlessly connect to their favorite apps and services. Plaid Exchange is the easiest way to become a supported institution on the Plaid network. It is a comprehensive open finance platform that gives financial institutions the tools needed to help ensure data access for the growing number of people using digital financial services.

After users linked an account to a fintech app through Plaid, we observed:

- 28% increase in monthly average card spend
- 7% increase in transaction frequency
- 9% increase in users depositing their payroll into their linked account

Figure 2



At the core of the Plaid Exchange is an API that connects your institution to the Plaid network of 5,500+ fintech apps and services.

The platform also features value-added services that you can access and build on top of the initial integration. These include:

- **Improve customer satisfaction and retention** by enabling users to easily and reliably connect their accounts to financial applications and services that use Plaid (like Cash App, Acorns, and more).
- **Drive revenue** with increased customer engagement (e.g., transactions, spend, deposits)
- **Help inform your roadmap** with 360° insights into connected fintech apps.
- **Offer users increased control and transparency** through the ability to more easily build a **data control portal**, allowing customers to view, manage, and monitor apps they've connected to their financial accounts at your institution
- **Access network-exclusive features** that enable improved data quality, including transactions categorization, and the ability to give users a one-click referral link to other apps in Plaid's network.

Plaid has developed deep expertise in open finance, having created and maintained fast and secure connections to the most popular fintech apps for almost a decade. CDFIs and MDIs can leverage Plaid Exchange, Plaid's open banking API, to plug into the full fintech ecosystem, deepening the impact that CDFIs and MDIs already have in the communities they serve by ensuring access to essential fintech apps and services and using the insights of how consumers manage their money to develop even better financial products.

What's next?

Consumer adoption continues to accelerate, especially among financially vulnerable populations and those who have never participated in financial services. Given the outsized role that CDFIs and MDIs play in supporting the economic growth and financial health of traditionally underserved communities, embracing open finance and ensuring access to the full financial ecosystem is a vital step in expanding economic opportunity.

Open finance is a critical tool that can be leveraged to help MDIs and CDFIs better serve their customers, and in the process preserve and even scale their businesses. We at Plaid are committed to making the best technology available to critical institutions like MDIs and CDFIs. Please reach out if you are interested in getting up and running on our platform and our team will support you and your core provider through the process.

Strategic Questions and CDFI/MDI Partnerships

Fabrice Coles, PayPal

The mission of democratizing access to financial services and commerce took on renewed vigor and salience in the aftermath of the murder of George Floyd and others that sparked a movement during a historic global pandemic. Although the problems of inequality and exclusion predate 2020, these events catalyzed a long overdue conversation about what more can be done to invest in underserved communities.

To this end, Minority Depository Institutions (MDIs) and Community Development Financial Institutions (CDFIs), which are mission driven and focused on underserved communities, are natural instruments for increasing access for historically disadvantaged, and marginalized groups. And financial technology can be an essential tool for them to maximize their impact. And financial technology firms—long experienced in meeting unmet demand (and overlooked customers)—can serve as key partners.

Yet in fostering these partnerships, it is critical to understand that one size does not fit all. There are a range of considerations in forming effective partnerships, ranging from legal to tech to marketing. Given the diversity of potential partners and areas of focus, there are many opportunities for fintech firms and MDIs/CDFIs to explore collaborations. The ultimate beneficiaries will be the historically underserved, so long as the partnerships are structured thoughtfully toward ensuring that good outcomes for the households and small businesses in those communities are at the heart of the engagement.

This paper represents an inventory of the conversations underway at PayPal to explore tactical solutions in partnership with the CDFI/MDI sector. PayPal sees additional opportunities to expand its engagement in this sector beyond the large investments it has made over the past 18 months. Fintechs can offer world class innovation and experience with nimble product and project development that can scale. As a prelude to any next steps, the firm has taken the time to understand some of the key strategic, technological, operational and general business challenges of potential MDI/CDFI partners.

The scale of the demand for financial services is significant and PayPal knows that support for the communities that MDIs/CDFIs serve will take the combined efforts of various business, government and non-profit partners. MDIs and CDFIs have been successfully serving the families and businesses within their footprint, but given the level of demand and the historic underinvestment in the MDI/CDFI sector, an ecosystem of partners is needed to scale and sustain economic growth for underserved communities. PayPal is excited to be a part of the fintech industry's efforts to help fill needed gaps in conjunction with MDI/CDFI partners. We are hopeful this paper highlights key considerations in our process in hopes that is helpful to others who are on the same journey to partner with these impactful institutions in order to do their part to invest in the closure of intractable income, wealth and opportunity gaps.

Needs of Communities and the CDFIs/MDIs that Serve Them. CDFIs served close to 4.6 million individual customers in 2020. These customers are overwhelmingly concentrated in financially underserved communities and the MDIs' and CDFIs' operations help drive financial inclusion and increased wealth. Close to 85% of funding from CDFIs go to underserved markets according to the most recent data from the CDFI Fund.[1] 17% of lending was in rural areas, and 17% of CDFI lending was done in persistent poverty counties, which are defined as any county that has had 20% or more of its population living in poverty over the past 30 years. CDFIs provided loans at affordable interest rates, ranging on average, between 5% and 12%, and very low origination fees, ranging on average between 0.3% and 2.5% of the loan amounts.[2]A September 2021 University of Miami study demonstrated conclusively that minority depository institutions were critical to helping promote wealth creation in those communities, citing evidence from the negative impact of *closed* MDIs and their the resulting decline in local homeownership rates and credit extension**.**[3] Clearly these institutions are needed and the demand for their services outstrips their existing capacity to meet the demand levels.

The total net worth of the CDFI sector, consisting of more than 1000 certified CDFIs, is just over $21 billion. This sample includes the various CDFI business models: loan funds, depositories, credit unions and venture capital funds. All of these entities are doing impactful work but their service delivery could be optimized if they had more support. A recent Federal Reserve survey of CDFIs found that more than 75% of survey respondents indicated they were unable to provide all the products or services they would like to offer on a sustained basis, most citing limited staffing or capital constraints as the relevant impediments.[4] CDFIs want to offer more mortgages, SBA and small business loans, online accounts or lending services and technical assistance or financial coaching to better serve their communities. They are in close touch with their customers and know that those customers are turning to fintech providers for innovative tools and services if their financial institution does not provide them.[5] These firms are financial access lynchpins in their community and help drive positive outcomes for people that have been intentionally excluded from our financial system. PayPal saw that it could make an impact by getting further involved with this sector to make a contribution to improving the lives of those in these communities. In 2020, due to the historic impact of the pandemic on minority communities, combined with the historic uprising for racial justice, PayPal decided to make a big investment in addressing the needs of historically underserved communities.

What PayPal has Done So Far- $535 million for racial equity investment-$235 million of which went to MDIs/CDFIs. To help address economic inequality and do our part to help close the racial wealth gap, PayPal made a $535 million commitment to support Black- and minority-owned businesses and minority communities in the U.S., especially those hit hardest by the pandemic. Of these investments**,** we partnered with various national and local organizations to distribute more than $15 million in grants to black owned businesses. PayPal also partnered with CDFI the Local Initiatives Support Corporation (LISC) to establish the $50 million Black Economic Development Fund. We also partnered with Optus Bank in South Carolina with $50 million in deposits.

Building on our investments in LISC and Optus Bank, we deposited $135 million in several minority-owned and focused financial institutions, including Hope Credit Union, OneUnited Bank, Self-Help Federal Credit Union, CNote's Wisdom Fund, and various smaller institutions through a CNote Promise Account.[6]

While these investments are sorely needed and are already having positive impact on the financial capabilities and service provision of MDIs and CDFIs, PayPal, and other fintech partners, could and should be doing more. Meaningful business partnerships with CDFIs and MDIs can provide all involved with tangible benefits. Communit*y* organizations benefit from the ability to tap innovative tools that can help them better execute on their business models by helping reduce costs, improving service, increasing revenue and achieving efficiencies. A responsible fintech company can derive benefits including new customer relationships and the ability to take part in the necessary heavy lifting of eradicating the effects of financial exclusion and neglect in many underserved communities. These partnerships come at a critical time for MDIs and CDFIs due to the broader competitive dynamics in the financial services industry vis a vis the technological capabilities of smaller financial services providers. These partnerships also come as more attention is being given to the MDI/CDFI sector, including more capital investments, which need to be channeled into ensuring that these firms can provide robust services deep into the next few decades.

The Urgent Technology Need. Demand for CDFI/MDI services has spiked during the historic pandemic with mission driven lenders (a category that includes CDFIs and MDIs) facilitating over 1.6 million loans of over $30 billion in PPP loans according to data from the Small Business Administration. Technology has proven to be a key differentiator and value add as business models have evolved to meet customer expectations during the pandemic, which saw digital engagement for financial services grow significantly. A study from the most recent FDIC Quarterly references call report data and emphasizes the importance of action amidst this backdrop.

The study detailed several relevant findings. First, it found that there was a correlation between community bank size and the level of resources available to deploy for technology investments, with larger community banks better able to invest. Second, it found that there was less technology investment at banks located in areas with high rates of COVID-19 infection. Third, it found that banks that invested more in technology were less likely to have had lending and deposit taking curbed during the pandemic. Relatedly, it found that these banks that had invested in tech prior to the pandemic had stronger loan growth in 2020, due in part to preparedness to scale PPP lending thanks to tech readiness. It also found that banks that invested more heavily in tech were able to provide PPP loans across greater geographic scope, even in markets they had not previously served. Lastly, the study found that banks making tech investments were also able to achieve deposit growth during the pandemic.[7]

These findings may not be completely unexpected but reinforce the conclusion that an expected inflection point has accelerated further thanks to the dynamics created by the pandemic. COVID-19 hit communities served by mission-driven MDIs and CDFIs incredibly hard and continues to serve as a drag on local economies and households. If MDIs and CDFIs did not come into 2020 with robust tech investments, it is likely they fell behind during the ongoing pandemic given the dynamics described in the FDIC report. We are still in relatively early days, but it may be that 2020 was a year of massive digital adoption that may have set in motion existential danger for some institutions absent corrective measures.

So, what can be done?

Partnership Structures. A recent Federal Reserve study framed the universe of partnership tactics under three broad categories:

1. **Operational Technology Partnerships:** In which improvements to banks' systems and processes are made, but not generally in full view of the customer. This helps drive efficiencies for the FI.
2. **Customer Oriented Partnerships:** In which the bank (or other financial institution) engages its customers via digital banking interfaces often built by integrating existing platforms and with programs with proprietary tech from the fintech partner. This model helps improve the FI's customers 'experiences.
3. **Front End FinTech Partnerships:** In which a fintech interacts with customers leveraging banks' (or other FI's) infrastructure, a model commonly known as "Banking as A Service".[8] This model helps the FI increase revenue and expand its customer base leveraging the fintech's platform and branding.

Regulatory Considerations-Third Party Risk Management and Due Diligence. Before even assessing the different tactical options available to them, fintechs, like PayPal, must always respect that some of their potential partners, especially banks, are subject to regulatory regimes. PayPal's experience here has been instructive. We have a long track record of working with and have a view into regulatory expectations and meeting applicable requirements, which helps our bank partners and preserves regulatory confidence in the engagements. These considerations must inform partnership negotiations and drive strategic decisions, especially regarding the key responsibilities of each institution as the partnership germinates. This process cannot be taken lightly as it comes with serious implications for the partner and potentially for the fintech.

This is especially the case when the partner is a CDFI bank, which will need to ensure compliance with regulatory expectations regarding due diligence and information technology and operations risk management related to their relationships with fintech firms. Fintechs should know that, especially for mission driven banks, the requirement to manage risks starts even before the partnership begins. Fintechs that have not had much experience partnering with banks may be surprised by the fact that their partners are required to perform extensive due diligence *prior to* executing a service or product partnership agreement, in addition to an *ongoing requirement* to exercise risk management in third party relationships.

This summer, prudential regulators issued revised third-party risk guidance intended to replace disparate frameworks from each of the agencies. It makes clear that agencies may "pursue appropriate corrective measures, including enforcement actions, to address violations of law and regulations or unsafe or unsound banking practices by the banking organization or its third party service providers."[9] So, the stakes are high.. A successful partnership will rest upon a foundation of robust compliance and so it is worth taking the time to get things right to protect the CDFI/MDI and to protect the fintech partner. Regulatory compliance should be a priority for all involved and merits the time invested to ensure that each step of the partnership journey is supported by a compliant process. At PayPal, engaging in these considerations is a top priority to ensure that our partners and our own interests are aligned in a manner that is compliant as well as beneficial to the communities we serve

Time to Partner: What Should We do? PayPal has engaged in the necessary work of deep, collaborative and creative conversations with CDFI/MDI potential partners to better understand their business models, customers, strategies and gaps. These frank conversations reveal significant opportunities and challenges that should inform partnership negotiations and decision making. These conversations can go on for months as the potential partners work through needed questions about the role of each institution in delivering the product or service in a responsible and compliant fashion that concurrently meets business goals for both entities. PayPal is concurrently engaged in several conversations that it believes will lead to an expanded suite of deep and sustained MDI/CDFI relationships beyond those that have already been established. These conversations are inherently fluid as dynamics in the market are shifting constantly, but as a part of these conversations, PayPal examines its own competitive strengths and discerns how it can add value to MDI/CDFI relationship's business model by asking relevant questions about the synergies of the joint efforts. Currently PayPal's considerations fall into the operational tech and customer-oriented partnership categories.

Customer Acquisition. Could PayPal help its partner use innovative marketing tools to reach underserved communities? Could PayPal help its partner bring efficiencies to the account opening/onboarding process?

Loans. Could PayPal help improve the loan application or underwriting processes and thereby reduce application times and customer abandonment?

Data Analytics Could PayPal help its partner improve its Data Analytics and/or Fraud Detection capabilities?

Payments/Crypto. How can PayPal help its partners improve their payments offerings? Can it help its partner prepare for the coming of FedNow? Are the partners exploring how to responsibly get their customers engaged in cryptocurrency markets?

Impact Measurement. Can PayPal help its partners track and report investments and relevant KPIs?

For all of these considerations, PayPal asks even more questions.

Should we leverage existing tech to support our partners? If so, how does our tech interact with their existing tools and platforms? Can we help partners improve automation beyond the partnership product that is being contemplated? What new products should be considered? Will we need to work with any other service providers to execute a successful partnership? Do we need to provide technical assistance to our partner to ensure delivery due to a lack of relevant personnel or experience with that particular technology? Who will be responsible for what elements in the process flow and what are the regulatory implications of each component? How can we help our partner automate processes on their end to help improve efficiency? Will the partner refer customers to PayPal? Will PayPal refer customers to the partner? What service aspects of the relationship will be retained once the referral has been made? Who will market to the customer? Who will provide customer service?

PayPal intends to ask and answer these questions carefully with a focus on adding value to our partner's operations.

There are several ways to get involved and partner with MDIs and CDFIs that are changing lives in their neighborhoods on a daily basis. We intend to expand our efforts here and encourage our colleagues at other fintechs to engage in these challenging considerations and decisions with us, so that we may all bolster the MDI/CDFI ecosystem in service to those that have been financially left behind.

The demand is great and there is much more work to be done. Time is of the essence.

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