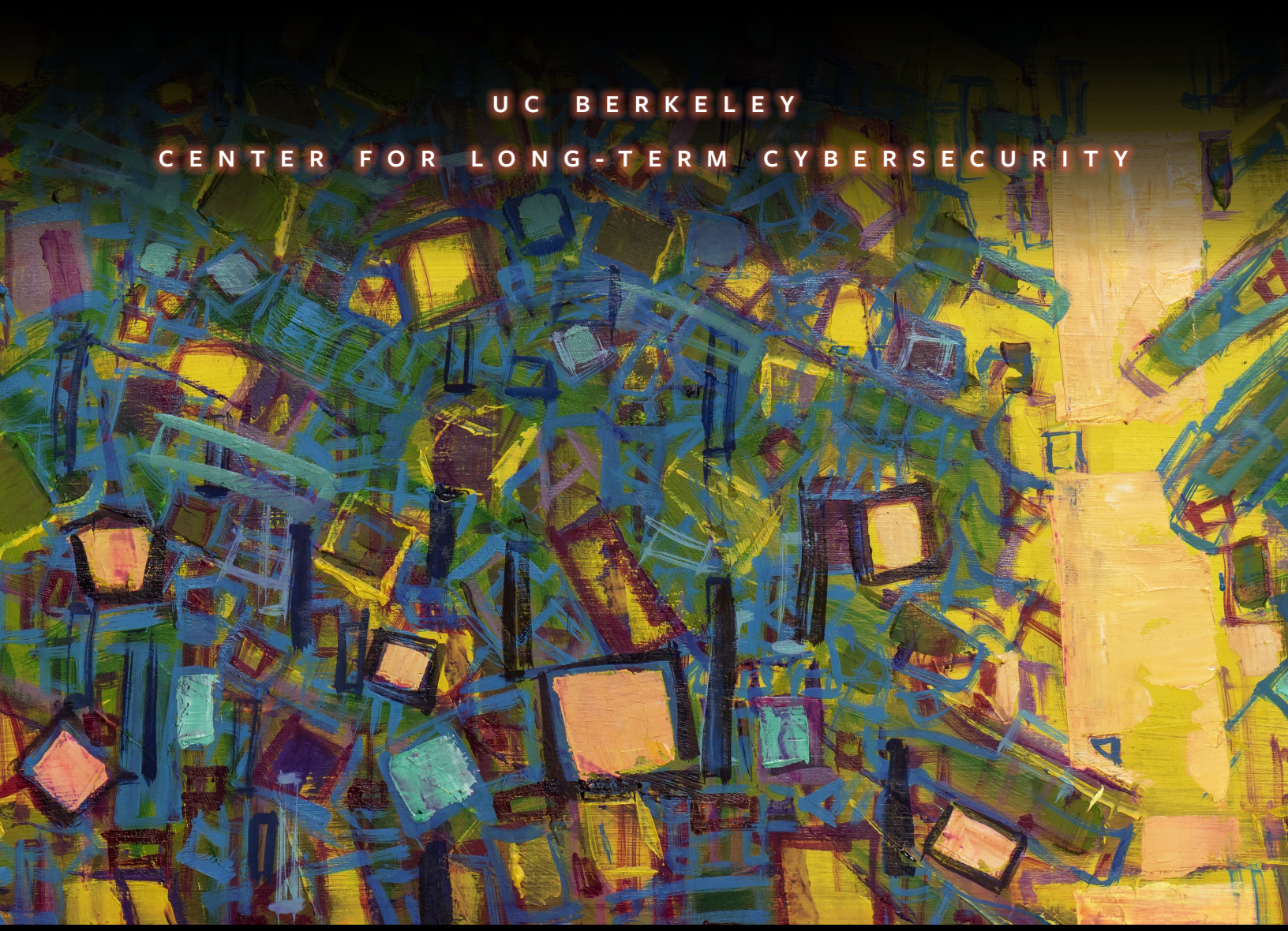

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CLTC WHITE PAPER SERIES

A New Era for Credit Scoring

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Contents

Executive Summary

The last decade has seen a rapid increase in the adoption of internet-enabled mobile phones in developing countries. This trend has sparked hopes among governments and development practitioners that digital platforms could help low-income populations "leap-frog" to access formal credit and other essential services that, in developed countries, took many decades of institutional investment and evolution.

India is among the nations where digital lending has been supported as a means of filling the long-standing gap in institutional lending. At the beginning of the 2010s, less than forty percent of the Indian population had access to a bank account.[1] Proactive government policies to increase bank account ownership through biometric ID (Aadhaar)-based verification and mobile banking led to a doubling in bank account ownership: by 2017, nearly 80% of the population had a bank account.[2] The Indian government's 2016 decision to demonetize the currency meanwhile contributed to the rapid adoption of mobile payment apps for daily transactions.

Digital lending is a natural next step in mobile financial services. Digital lending is not restricted to using apps to simplify the loan application process. Rather, lenders in India aim to execute every step of the lending process — application, assessing credit risk, delivering funds, and even debt recovery — entirely through mobile phones. These lending apps are aimed not at replacing banks, but rather reaching the roughly four out of five Indians whom traditional brick-and-mortar banks have deemed unprofitable to lend to.

Consumers who borrow through digital lending apps may not have formal credit histories and credit scores, but they leave extensive information about themselves through their mobile phone and online activity. Lenders use an array of mobile data — including age, location, and even personal contacts — to gauge an individual's willingness and ability to pay. Digital trails become proxies for financial histories and credit records, and lenders use mobile data for deciding whether to provide credit and the terms under which it is provided.

This report provides an overview of emerging digital lending platforms in India, with an eye toward informing policymakers and financial industry leaders around the world who may be confronted with new risks and opportunities as the finance and technology ("fintech") sector evolves. The rise of digital lending — and more specifically, alternative credit scoring in India

— also provides a useful framework for considering the social and ethical consequences of algorithmic decision-making more broadly, and highlights trade-offs that governments and institutions must consider in weighing factors such as privacy and fairness against access to credit and other social goods.

The example of India highlights how, in an emerging economy with relatively weak institutions and low financial literacy, credit scoring through alternate data creates the possibility for rapid progress in financial inclusion — but under weaker consumer protection standards. The constant threat of exposure of consumer information adds to the challenge, and there is as yet no silver bullet that can enhance financial inclusion without a significant decline in consumer privacy and transparency in lending decisions.

Introduction

The history of credit regulation in the United States reflects why reliance on proxy variables to determine creditworthiness can be problematic. Until the 1960s, credit bureaus collected non-financial details — such as neighborhood of residence, marital status, and employment records — that could be used to make loan decisions. This resulted in gender discrimination in lending, as well as "redlining," racial discrimination based on neighborhood. A number of laws enacted in the 1960s and 1970s, including the Fair Credit Reporting Act, Equal Credit Opportunity Act, and Right to Financial Privacy Act, aimed to remedy discriminatory lending and provide borrowers with greater protections against predatory lending and extortionate debt-recovery practices. These laws constitute a necessary consumer protection framework, and today, over eighty percent of adult Americans own a credit card. Credit scoring remains tightly regulated, and financial institutions are allowed to collect only financial transaction data to generate credit scores.

Concerns around discriminatory and extortionate lending practices remain relevant for credit-risk assessment based on alternate data collected through mobile phones and online activity, which is becoming increasingly prevalent in developing nations. The data generated through a mobile phone is granular and more detailed than what can be gathered through a manual survey. Digital lenders in India can (and do) use data points as far-ranging as individuals' GPS location history and phone contacts as proxies for financial responsibility. These personal details are also in some cases leveraged in debt recovery, as some lenders contact borrowers' friends and families to pressure them to repay debts. Alternative lending enables people to access credit, but with far fewer safeguards than traditional banks would provide.

The emergence of this approach to lending presents a classic "trilemma," as the goals of rapid financial inclusion, consumer protection, and data security are often in conflict. Lending apps and other "fintech" innovations have the potential to generate consumer benefits while boosting competition, improving financial inclusion, and increasing data security, but only in environments with strong institutions and decent financial literacy. The rise of mobile phone-based lending in India demonstrates that, in addition to their benefits, lending applications could present substantial privacy and data protection risks. Understanding these trade-offs will be more important with months (and potentially years) of economic challenges ahead following the COVID-19 pandemic. Lenders (and their regulators) should leverage the power of technology to expand access to credit, but should be wary of enabling lenders to violate borrowers' privacy or allowing potentially discriminatory practices.

The Importance of Credit

Credit is an important lever in macroeconomic policy, as it can increase spending and income levels, GDP, and productivity growth. In his book *Credit to the Community*, author Dan Immergluck described how credit "increases the 'velocity' of money, which then circulates throughout the economy, distributing and magnifying benefits of trade and commerce."[3] Credit is, however, more than a macroeconomic issue. Timely access to credit can enable local business development and home ownership. On the other hand, the absence of credit in emergencies, such as expensive medical procedures, can permanently harm individuals' socio-economic status.

While high-income countries have succeeded in providing some formal credit to the majority of their populations, the vast majority of people in poorer countries rely on informal credit. The lack of accountability in informal credit markets often results in predatory interest rates and uneven loan allocation. Muhammad Yunus, the founder of the microcredit revolution, has urged that access to credit be added to the list of human rights, as it is critical in enabling access to the human rights to food, shelter, and health adopted by United Nations in the Universal Declaration of Human Rights.[4] A call to make credit a fundamental right aims to address historical gaps in access to fair and timely credit.

Lending in the United States

Since its inception, the U.S. government has played a strong hand in regulating credit markets. Federal involvement in mortgage markets increased considerably following the Great Depression. Government policy and civil-society advocacy early in the 20th century led to standardized state regulation of consumer loan businesses. Credit unions were promoted as a model for responsibly meeting the consumer credit needs of working-class populations. Early credit unions were cooperative efforts among creditors in a specific region, operated solely for the benefit of lenders. In addition to capturing individuals' names, addresses, and some loan information, these early agencies in some cases also captured information about records of arrests, promotions, marriages, and deaths.[5]

In a 1961 report on housing, the U.S. Commission on Civil Rights described the "common policy of refusing to lend to Negroes who are the first purchasers in a white neighborhood."[6] The report argued that the Office of the Comptroller of the Currency (OCC) had a legal mandate to act against such discrimination. The Civil Rights Act in 1968 called for the prohibition of discrimination in home lending, and the Truth in Lending Act was passed in the same year. This act did not regulate the terms of credit but enforced standardized disclosure of costs and charges of credit so that consumers could compare different credit options.[7]

Examples of U.S. Laws Protecting Borrowers

Equal Credit Opportunity Act (ECOA): Prohibits creditor practices that discriminate on the basis of race, color, religion, national origin, sex, marital status, or age (provided the applicant has the capacity to contract). The ECOA mandates that creditors provide a statement of reasons for adverse actions.

Fair Credit Report Act (FCRA):[8] Governs the collection and reporting of credit information about consumers. Requires a permissible purpose to obtain a consumer credit report and subjects persons reporting information to credit bureaus to certain accuracy requirements; imposes disclosure requirements on creditors who take adverse action on credit applications based on information contained in a credit report; and requires creditors to develop and implement an identity-theft prevention program.

Right to Financial Privacy Act:[9] Protects confidentiality of personal financial records and restricts government access to information held by financial institutions.

The Fair Credit Reporting Act, enacted in 1970, further regulated the collection, dissemination, and use of consumer credit information. This law limited the information that credit information companies were allowed to collect on their users. Following the National Commission on Consumer Finance and the House of Representatives hearings on access to credit among women, the Equal Credit Opportunity Act (ECOA) was signed into law in 1974, and subsequently amended in 1976. The ECOA prohibited discrimination in lending by race, age, gender, or marital status; it also expanded Title VIII of the Civil Rights Act, known as the Fair Housing Act (FaHA). The Right to Financial Privacy Act, passed in 1978, restricted the government's ability to access a citizen's financial records. While there have been several amendments and other acts that have had a bearing on credit regulation, these early laws formed the foundation of modern consumer credit protection in the United States, and they continue to extend to institutionalized lenders across the nation. While some fintech companies in the U.S. claim to use alternative data points for risk assessment, companies must adhere to principles of reasonable data collection and explainability of credit decisions.

Lending in India

In India, as in many emerging economies, a large percentage of people do not possess a bank account or do not adequately utilize formal financial services.[10] Credit rationing and collateral requirements — methods traditionally used by banks to cope with information asymmetries in the credit market — have led to the exclusion of poor borrowers.[11] With inadequate access to banking services, a large part of the Indian population lacks the financial transaction history needed to generate the CIBIL score provided by the largest credit bureau in India. By the end of 2018, less than four percent (37.8 million) of Indians had access to a credit card.[12] In contrast, in 2017, 83 percent of adults in the United States had at least one credit card.[13] In the absence of alternatives, poor and underserved borrowers in India have tended to turn to local, informal lenders, who often charge extortionate interest rates.

Since the 1980s, several microfinance institutions (MFI) have worked to address the credit needs of excluded borrowers in India and other emerging markets. These organizations evolved to fulfill the dual objectives, or "double bottom line," of assisting the poor while achieving financial sustainability.[14] Micro-credit institutions typically rely on group loans and local social networks to help monitor borrowers and ensure loan repayment. To reduce the costs of default, monitoring, and collection, these loans are typically small and might be for a shorter duration, with more frequent repayment requirements. MFIs have contributed significantly to the financial opportunities of underrepresented populations in India. Several digital credit platforms globally pitch themselves as an extension of microfinance initiatives, with the same dual objectives.

EMERGENCE OF DIGITAL LENDING

Digitization of services has long been part of the policy agenda for the Indian government, and the biometric-based identification platform Aadhaar is the bedrock of these initiatives. In 2009, the Unique Identification Authority of India (UIDAI) was created to implement Aadhaar, which uses biometrics to uniquely identify an individual. Within a year, before anyone had been assigned this biometric ID, an API to authenticate users based on Aadhaar was released.[15] Digital authentication and verification reduced the cost of customer acquisition and opened up payment systems and other financial services to nontraditional players.

The development of Aadhaar was followed more recently by the rapid penetration of the internet in India. In 2018, more than half a billion Indians were using the internet, a sharp rise of 18% over the previous year.[16] With the rapid expansion of internet usage and smartphone adoption, digital lenders, along with other fintech platforms, have significantly expanded their reach. Meanwhile, the Indian government's drive to demonetize currency in 2016 (a process that led to prolonged cash shortages) led to a surge in the uptake of digital payment platforms. In the absence of physical currency, digital payment platforms became the only means of conducting many financial transactions.

If digital payments were the first leg of the fintech boom, the expansion of digital lending serves as the crucial next step for monetization of the digital payments platform. While a handful of fintech players are legally licensed to lend, most fintech players partner with existing financial institutions to extend loans. The relative ease of access to loans has helped borrowers in India, where only half of residents have active bank accounts and financial transactions are carried out primarily via cash,[17] making it impossible to generate traditional credit scores. By assessing and approving individuals that traditional approaches have left out, digital lenders have helped increase access to formal credit. Government policy has encouraged entrepreneurial efforts in this space.

Examples of Indian Regulations Relevant to Digital Lending

Credit Information Companies (Regulation) Act 2005 and 2006,[18] and RBI regulations under the Act: Regulate credit information companies to facilitate efficient distribution of credit. Mandate that a borrower receives a specific reason for rejection in case of a negative credit decision based on credit report.[19]

The Information Technology Rules, 2011: Regulates the manner in which personal data is stored, processed, transferred, and secured.

Personal Data Protection Bill: A bill tabled in the Indian Parliament that has yet to be passed as law, this bill lists credit scoring as a reasonable purpose for non-consensual processing of personal data.[20]

RBI Guidelines on Fair Practices Code: Covers principles on adequate disclosures on the terms and conditions of a loan, and also calls for a non-coercive recovery method by non-banking financial companies.[21]

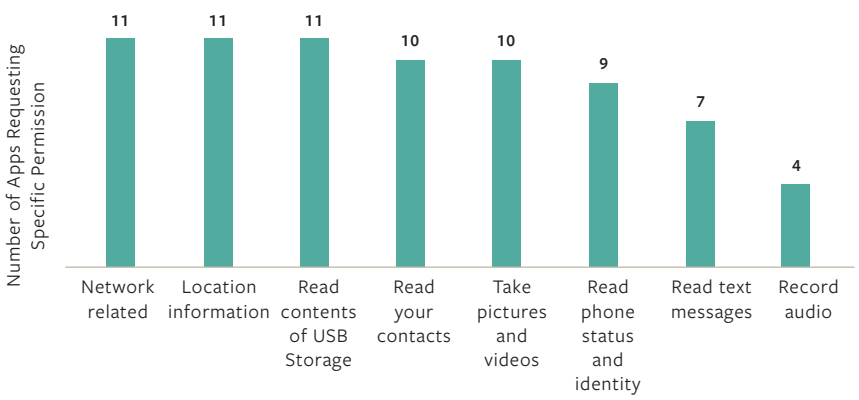
Consumer Protection Concerns with Alternative Credit Scoring

Alternative lending in India takes many forms, and can be targeted toward small businesses or consumers. Some loans are directed toward students in metropolitan cities, while others are provided to salaried individuals in smaller towns. Alternative data — referred to here as data generated by an individual through digital interactions, including browsing history or information passively collected by mobile devices — might be used in conjunction with face-to-face lending, or the entire lending process might be carried out without any in-person interaction, based entirely on data collected from mobile apps and websites.

PRIVACY AND PERMISSION

Individuals' interactions in the digital world can convey a large amount of information: their interests (through the websites they browse), the places they visit (through location trackers in mobile phones), the people they interact with (through contacts on their phone), and even their communication patterns (based on when they make calls and how long they talk). All of these data points are used by alternative lenders in India to make lending decisions.

FIGURE 1: A SURVEY OF INDIA-BASED MOBILE APPS THAT PROVIDE SHORT-TERM LOANS SHOWS THE RANGE OF DATA POINTS THESE LENDERS COLLECT.



On launch, Indian lending apps typically display a splash screen that declares what smartphone permissions are required by the app, and that the data could be collected for lending decisions and loan recovery. While users may consent to data collection when installing these apps, reviews by users show that, especially in the case of adverse decisions (e.g. denial of a loan), the collection of so much personal data is often experienced as a violation of privacy or "data theft."

Borrowers from Lending Apps Commenting on Use of Personal Data for Financial Decisions

"Hello everyone, just to let you know that I don't install and nor used their app. However I used their services in conjunction with Flipkart where they by default given 5000 credit limit that too without any documents. I think they used AI and big data analytics pertaining to my digital footprint and my buying behaviour in Flipkart."

"I would have given it 0 star. You took all the data and details and after that saying that my application has been rejected. Data thief. Don't trust this guys. Fraud."

"worst app ever! they will give you loan 1–2 tes and then they will stop providing you loan even if you made repayment on time it doesn't matter for them. I don't understand why even did they created this app. They will also steal your data present in your mobile. If you install this app this means your privacy is gone.

"Tell me a place to upload a screenshot with my cibil score u bunch of frauds and i ll show u. A real fruad app to collect data and then make frauds. This app is just a data collector."

"*important* *SpamApp* *PrivacyVoilation* Incase you are wondering what's their process with the defaulters. As soon as you install their app, they steal all your personal data. They take all the contacts, spy on your calls, read your text messages. Instead of contacting you or your family, they randomly starts calling to people from your contacts. Which is directly privacy violation. Nobody gives you the right to steal the data. Read their permission section. I've sent many mails to RedCarpet about their privacy policy but they haven't responded to the email yet. Do not install. Even their service is worst."

LACK OF ACCOUNTABILITY IN NON-INTUITIVE AND INSCRUTABLE DECISIONS

The connection between non-financial personal data (such as location history and contacts) and creditworthiness is not obvious. The information collected by lending apps serves as a proxy for other data (such as financial history) more commonly used to assess a person's

ability and willingness to repay a loan. Yet there is little visibility into how these data are used. When the alternative data is fed into an algorithm to determine whether an individual is creditworthy, certain data points may have higher predictive value. But this analysis is often undertaken by complex machine learning models with limited transparency. The absence of an explanation for rejection or pricing of a loan raises legitimate concerns regarding lenders' accountability.

In the United States, the Equal Credit Opportunity Act (ECOA) prohibits discrimination in lending in part by requiring that a statement of reason be provided in case of "adverse action" (including denial of a loan) by a lender.[22] Even though the exact formula used to calculate a credit score is secret, this compels banks to provide a reason for a loan rejection.[23] This also necessitates changes in the overall lending ecosystem; credit bureaus in the U.S., for example, must provide reasons to justify the scores they give to individual lenders.[24]

Comments Asking for Explanations of Decisions

I never got any loan approval. Not even feedback why I am not eligible.

I have only 10k limit for loan, I have applied and got in my bank account after repay I called for customers care and ask them to increase limit. They told like for your salary we will provide only 10k limit in app. After few days my friend joined in ES he got 25k limit . . . even he getting low salary than me. . . . I don't know where is the gaps.

In India, most alternative lending platforms are legally registered as non-banking financial companies, and are excluded from legal responsibility for explaining their lending decisions.[25] Comments on the Google Play Store reflect that users of digital lending apps who are denied a loan often seek explanations for the rejection. Digital lenders in India, however, are not mandated to provide these reasons. The absence of a legal mandate to explain a lending decision allows digital lending platforms to use personal, non-financial data to increase the accuracy of their prediction models. Explainable variables and models come at the cost of accuracy; simpler models may be more explainable, but might not glean all the associations between data points that can indicate a person's willingness and ability to pay. Lower accuracy in assessing risk would lead to more individuals likely to default, which would lower the profitability of the lending operation.

DISCRIMINATION

A major concern with the use of personal, non-financial data for lending decisions is discrimination against individuals based on their race, gender, ethnicity or other protected group membership. In the United States, the ECOA not only regulated all forms of credit but also expanded the scope of anti-discrimination legislation from disparate treatment to disparate *impact*; under this law, a universal credit policy that disproportionately affected protected groups became illegal.

Instead of adopting specific anti-discrimination legislation to regulate lending, India has adopted an approach of setting targets for lending to priority segments.[26] Such measures do not, however, preclude discrimination in a specific lending decision.

Personal data from digital trails, such as location and calling patterns, may correlate with group membership, such as gender. In a country like India, where women predominantly take on household responsibilities and domestic labor, the places women visit will inevitably be different than those visited by men, who are more likely to work in commercial sites. More fundamentally, access to mobile phones, and consequently, the ability to apply for loans via these apps, likely correlates with group membership. Lending decisions based on alternative data thus risks increasing levels of discrimination against already vulnerable and marginalized populations.

Key Takeaways

PLAYING OUT THE FINANCIAL INCLUSION PROMISE

The idea that alternative lending serves as a force for financial inclusion[27] assumes that creating more expansive markets (with weaker consumer protection norms) will enable individuals to move from informal credit to formal credit markets that have strong provisions for consumer protection. In other words, alternative lending is a necessary step in the ladder toward formal credit with strong consumer protection.

However, this narrative raises questions about the long-term viability of alternative lending platforms. Lenders assume higher levels of risk by lending to individuals with little or no credit history, borrowers most traditional banks refuse to serve. Through the digital lending services, alternative lenders provide individuals with a chance to build a credit history with credit bureaus, allowing them to later approach traditional banks that provide more consumer rights, such as privacy and explainability of decisions. By lending to a demographic that is otherwise opaque to credit bureaus, and consequently institutional banks, fintech lenders are laying the groundwork for institutional lenders to step in, at a cost to themselves.

Despite this clear business challenge, fintech lending has steadily grown over the last five years. There could be multiple reasons for this trend. Some fintech lenders might indeed view alternative lending as a short-term venture. Another reason might be fintech lenders' ability to circumvent reporting guidelines in the absence of strong enforcement of regulation. Fintech lenders have strong incentives to report borrowers who default; they have similarly strong incentives to *not* report those who pay back their loans. Not reporting creditworthy consumers keeps these consumers opaque to institutional banks, and to competing fintech lenders. While not reporting their lending history is a violation of Indian laws, fintech lenders may circumvent these laws, thereby improving their profitability.

In the absence of strong monitoring and institutions, the alternative lending sector may perpetuate the same arbitrary lending practices of informal credit markets that they aim to resolve, albeit in a different form. Far from being a one-time fix, alternative lending necessitates long-term monitoring and engagement by regulators.

INCREASED DATA SECURITY RISKS

The four credit bureaus that operate in India are bound by strict regulations. Business expediency, together with the threat of regulatory action, create incentives for these bureaus and large banks to invest in cybersecurity. Alternative lenders, on the other hand, operate as technology start-ups where data security might be deprioritized, if not altogether ignored for other business goals. Still in their early phases, with relatively small customer bases, these alternative lending platforms have largely escaped regulatory scrutiny. As a result, a data breach, or even willful sale of consumer data, would not likely present a risk to these businesses.

This lack of regulation could have profound implications, however: while a data security breach in a credit bureau might result in leakage of individuals' financial data, a breach of an alternative lender's database could result in the leak of far more sensitive details, including users' location histories and phone contacts. Worse still, even when individuals are not approved for a loan, if they allowed a digital lending app to access their phone data at the time of application, their personal data may continue to be stored by the digital lending platform, putting their data at risk.

A data protection bill currently under consideration in the Parliament of India, if passed, would mandate that companies report data breaches and take "appropriate remedial action".[28] It is possible that such regulation could incentivize companies to invest in cybersecurity, but ultimately the companies' behavior would be driven largely by the effectiveness of enforcement. In the meantime, hundreds of thousands of users of online lending in India remain susceptible to small-scale cyber attacks that, unlike attacks on larger institutions, may never be publicly declared.

DEFINING EXPLOITATION IN THE ONLINE WORLD

The personal data collected from smartphones not only feeds into prediction models used by alternative lenders, but also enables novel forms of debt recovery practices. In some cases, if a borrower defaults on a loan, the lenders use the contact information collected from the borrower's phone to reach out to parents and other individuals a borrower might know. One app in particular experimented with using a borrower's mobile phone as collateral; if a borrower failed to repay the loan, the company would report to the police that the phone was stolen, and the phone would then be blocked. Most of the apps included the potential for such practices to be used through their terms and conditions, but such disclosures, typically written

in complex legal language, are largely ineffective in collecting informed and meaningful consent from users.

In the United States, the Consumer Credit Protection Act[29] makes it illegal to contact a borrower's acquaintances. In India and other developing countries, however, social pressure is commonly used to encourage timely repayments of group-based microfinance loans. Digital lending platforms are microcredit institutions, and using personal data allows them to remotely recover loans, thereby reducing the cost of loan recovery and consequently, the loan contract. By targeting sub-prime and infra-marginal consumers, digital lending apps can claim to be operating in the same space as microfinance institutions. Regulation is needed to limit forms of debt recovery emanating from the use of personal data that could be exploitative.

RETHINKING DISCLOSURE NORMS IN DIGITAL LENDING

In both India and the United States, disclosure norms focus on terms such as interest rates, processing charges, and repayment plans. However, when lending decisions are predicated on borrowers sharing personal, non-financial data, consumers should be provided with transparent information to evaluate the costs and benefits *prior* to sharing this data. Lenders should be required to disclose additional information, such as the probability of approval for a loan once the applicant's personal data is considered. Regulators should also limit the storage of data for applicants who are denied loans.

IS ALTERNATIVE LENDING FAIR?

Alternative lending applications may afford consumers greater access to formal credit, but they provide weaker consumer rights than do traditional lending institutions, such as banks. In the United States, the discriminatory impacts of lenders making decisions based on personal data have been well documented. By using data points based on race, ethnicity, and gender, digital lending apps and other alternative lending platforms could easily discriminate against members of groups without just cause. While proponents argue that alternative lending is better than the status quo — and so should be supported in developing countries regardless of these concerns — the potential for discriminatory practices remains high.

The use of black-box algorithms to determine creditworthiness also raises questions. Through these apps, financial inclusion is more likely to become a group-based outcome that averages individual, and sub-group, differences. Alternative lending can increase financial inclusion, while simultaneously discriminating against specific groups and individuals.

Because these algorithms are based on categories of data, alternative lending has potential to widen the disparity in access to credit between groups while making all individuals better off in absolute terms (known as a pareto improvement). As a trivial example, consider a lending platform that assesses creditworthiness based on the number of contacts stored on a person's smartphone. Such an algorithm would likely determine men to be more creditworthy in countries like India, where men have greater social mobility (and likely more phone contacts) than women for socio-cultural reasons. Consequently, women (determined to be higher-risk individuals) would face higher interest rates on the same loan amount. While this disparity is far from ideal, this platform makes credit available to men. This credit might have spillover effects, such as more disposable income for the family, which may benefit women in the household as well. On the other hand, if these platforms make it easier for men but not women to start small businesses, it might reduce women's agency in an already asymmetric power dynamic.[30]

Conclusion

This comparative perspective on alternative lending highlights how two different regulatory jurisdictions can adopt contrasting approaches to an emerging technological intervention, in pursuit of the same goal. In the United States, alternate credit scoring techniques based on a person's digital trail are still disallowed, as they risk exclusion of protected groups. In India, as in many developing countries, alternative lending techniques are supported and sought out as a market-driven solution to a longstanding credit gap.

One approach to regulating alternative lending is to expect the sector to obey the same practices as traditional lenders, such as banks. An approach that better balances the potential for financial inclusion, however, is to rethink how principles of consumer protection in lending, such as fair debt recovery or disclosure norms, can be realized in an era of digital lending. These principles can vary across regulatory jurisdictions.

This comparative analysis can also inform broader discussions about the regulation of algorithmic risk assessment tools. The baseline of comparison changes the evaluation of these decisions. The baseline, even if not explicitly recognized, is assumed in concerns or optimism about algorithmic decision-making, for which tools are shaped by existing legal and regulatory structures, even as they challenge these structures. In India, the provisions of loans by non-banking financial companies are harmonized with the decision-making criteria used by alternative lenders. This has allowed alternative lending to rise without significant regulatory pushback. In the United States, on the other hand, existing regulation enforcing a right to explanation in lending decisions has prohibited the development of such platforms. Arguably, the regulation is intended to prevent such lending practices. The rapid surge of alternative lending in India, however, has also challenged existing regulations; it remains unclear whether the underlying principles of lender accountability and non-coercive debt recovery are honored in the age of digital lending, even if these platforms obey the letter of the law.

More broadly, this comparison suggests that the impacts of algorithmic interventions might not be equally political or sensitive across all geographical or contexts, which affects regulatory and public reception. In the United States, institutional banks' past use of proxy data for determining creditworthiness led to the exclusion of African-Americans and other minority groups from accessing loans — and economic opportunity. This history makes alternative lending appear especially egregious in the United States. On the other hand, institutional banks

have historically catered to such a small segment of the population that any discrimination in their scoring or lending decisions, explicit or inadvertent, has largely gone unnoticed. The possibility of accessing formal credit through alternative lending seems to diminish concerns of discrimination that might ensue in that system.

In an emerging economy with weak institutions and relatively low financial literacy, algorithmic credit scoring creates the possibility of rapid progress in financial inclusion — but at a clear and significant cost to consumer protection. There is no silver bullet in machine learning on alternative data that can move the needle on financial inclusion without a significant cost in privacy and consumer protection, and without expanding risks of loss of data through a cyberattack or other leakage. The traditional approach of growing a credit market — through strong regulation and the development of formal institutions — is slow and grinding, but it might, over time, be better for consumer welfare. The algorithmic "solution" to economic inequality can work, but only if the society is willing to pay a high price in privacy and consumer protection.

Appendix: Methodology

This analysis of lending apps is based on industry reports from India that helped identify prominent Indian fintech players and their strategies. Academic papers and U.S. government publications shed light on regulatory concerns in the U.S., while academic work on microfinance and lending practices in India informed our understanding of historical and existing disparities in lending and the need for financial inclusion.

Following this preliminary research, we held semi-structured interviews with individuals working in or with fintech companies. We interviewed two data scientists and three CEOs at fintech companies. We also interviewed a venture capitalist, a program manager at a prominent microfinance non-profit, and the head of a prominent technology policy think tank in India. The interviewees were deliberately chosen from different domains to understand the perspectives of multiple stakeholders.

Since our research focus was to understand the impact of alternate lending on individuals, we converged on unsecured personal lending as a specific focus within digital lending. Among consumer lenders, we chose to focus on fintechs operating via mobile phone apps, since users' participation in such apps was clear and explicit.

To identify relevant apps, we went through various fintech reports from India from between 2016-2019. We identified 72 fintech lending apps, of which 20 focused on unsecured personal lending. The rest either targeted small- and medium-sized businesses or provided secured loans. In our preliminary analysis of 72 apps, we observed that a number of apps had ceased operation within a year of being launched. We wanted the analysis to reflect longer-term trends in the consumer lending markets, thus we chose to ignore these smaller players. The number of times an app was installed served as a useful metric to gauge the popularity and usage of the app. We thus shortlisted the apps that had been installed at least 500,000 times.

Following preliminary cleaning, we examined a corpus of 70,000 comments. We analyzed this data using standard text mining techniques. Beyond aggregate analysis, comments were queried using relevant keywords and manually vetted to identify themes.

About the Author

Tarunima Prabhakar pursued this work as a research fellow at the University of California, Berkeley Center for Long-Term Cybersecurity. Her research is at the intersection of technology, policy, and global development. More specifically, she studies the impact of machine learning, predictive analytics, and other artificial intelligence technologies on access to credit and other essential services in India. As a practitioner, she has worked with technology and non-profit organizations in Asia and the United States on technology-supported development projects.

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