

ALGORITHMS FOR INCLUSION: DATA DRIVEN LENDING FOR WOMEN OWNED SMEs



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KEY MESSAGES:

- 1. All over the world, women have less access to credit than men.**
Because of both discriminatory property laws and unwritten social customs, women are less likely than men to own high-value assets that can be used as collateral to secure loans.
- 2. Financial institutions in developing countries rely on heavy collateral requirements because they don't have enough information about their borrowers.** New technologies – many emerging from financial technology (fintech) startups in the Silicon Valley – have the potential to generate data on borrowers that can replace traditional collateral requirements, and unlock finance for women.
- 3. In Ethiopia, we explored introducing fintech that could harness the data that financial institutions are already sitting on.** The technology focuses on digitizing hard-copy loan application files of previous borrowers to identify trends and characteristics associated with repayment, and predict creditworthiness of new borrowers.
- 4. Fintech solutions can viably address the collateral constraint for women borrowers, and can work even in low tech environments.**
But technology adoption isn't easy, and assessing the readiness of financial institutions to adopt fintech and embark on technological change is a critical first step.

Can we find a viable solution to harness data to help financial institutions get around the collateral constraint to reach more women borrowers? A team from the Finance and Markets Global Practice, the Financial Institutions Group, and the Gender Innovation Lab, supported by the SME Launchpad Program, set out to understand the feasibility of digitizing customer data and introducing data-driven lending to improve access to finance for women owned SMEs in two microfinance institutions in Ethiopia.



With limited information on their borrowers, financial institutions utilize heavy collateral requirements to minimize their risk and exposure. However, many of these financial institutions hold a lot of customer data in paper application forms. A single client has dozens of pages of application materials, containing information on everything from the sector and size of their business, inventory and cashflows, assets in the household, education and employment history, marital status, number of children and where they live. However, after the initial loan decision is made, these data points remain mostly in stacks of papers, serving little or no use to the financial institution.

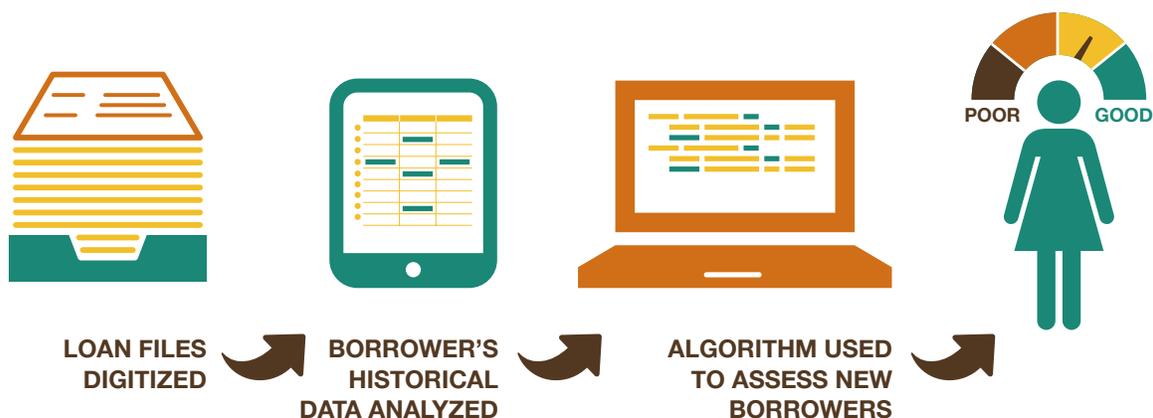
Credit scores serve as a solution to information asymmetry between borrowers and lenders. There is a fundamental inequity between borrowers and lenders because borrowers know how much they are willing and able to pay but lenders do not know this information. A credit score serves the purpose of helping lenders bridge this gap of information and make a determination on someone's probability to default on a loan. Research shows that the data contained in application files such as gender, age, marital status, dependents, having a telephone, educational level, and occupation are widely used in building scoring models.¹ If all these thousands of files could be evaluated across borrowers in order to identify trends or characteristics of good and bad borrowers financial institutions may be able to lend to borrowers with less risk and lower collateral requirements.

WHAT CAN DATA DRIVEN LENDING DO?

In the context of this pilot project, data driven lending involves using available data on previous borrowers and their loan repayment history to identify patterns to understand which customer profiles are likely to repay their loans. Through this analysis a process can be developed called an algorithm that includes a set of rules to be followed when calculating if a client is eligible for a loan. This credit scoring algorithm can then be used to predict the credit-worthiness of new borrowers instead of relying heavily on collateral.

A key to unlocking financial services which can meet the needs of women entrepreneurs is developing innovative and effective loan appraisal mechanisms. In Ethiopia, MFIs have sizeable portfolios of female group loan borrowers², with women forming into groups to secure loans with social collateral. These group loans typically reach a ceiling at about \$1,500 USD, however, and are not sufficient to meet the needs of growth-oriented entrepreneurs. Lending larger, individual loans to these growth-oriented clients is challenging, however, since the main screening tool MFIs have is collateral.

MFIs in Ethiopia see data driven lending as a possible solution to this collateral quandary. Effectively adopting data driven lending will allow financial institutions to lend to previous borrowers who could only receive groups loans, as well as new customers. Improved appraisal will enable MFIs to identify credit-worthy borrowers more accurately and forego requirements for large amounts of loan collateral.



¹ Orgler, 1971; Steenackers and Goovaerts, 1989; Lee et al., 2002; Banasik et al., 2003; Chen and Huang, 2003; Sarija et al., 2004; Lee and Chen, 2005; Hand et al., 2005; Sustersic et al., 2009

² As of March 2016, women represented 41% of the total number of MFI borrowers of MFIs in the Association of Ethiopian Microfinance Institutions (AEMFI).

SME LAUNCHPAD PILOT

Through the SME Launchpad Project, the team explored possible partnerships with five promising fintech firms (First Access, Lenddo, FICO, DemystData and Verde) to explore the opportunity of working in Ethiopia on a data driven lending assessment pilot. The team discussed with the firms how their technologies could work to address the collateral constraint women borrowers and financial institutions were facing alike in Ethiopia. Through these discussions, the team identified one fintech company that was deemed best fit to work towards addressing the collateral challenge in Ethiopia³.

The team then travelled to Ethiopia to meet MFIs operating around Addis Ababa to share the different promising technologies that could be implemented in their institutions to improve their lending to reach new and underserved borrowers. The objective of this activity was to identify high-potential financial institutions interested in adopting technology and data-driven lending.

From these engagements a partnership was born between the World Bank Group, two Ethiopian MFIs and First Access, a fintech alternative credit scoring company. The partners then worked together over the next several months to conduct readiness assessments of the two MFIs and determine next steps towards adopting data driven lending.

READINESS ASSESSMENTS: PROCESS & RESULTS

First Access developed a proprietary readiness assessment tool consisting of a capacity diagnostic and a data diagnostic, as a service provided to financial institutions that are interested in adopting data-driven lending techniques. This tool was developed to determine a lending institution's level of preparedness for developing credit scoring algorithms and a roadmap for data driven lending implementation. This assessment phase is valuable to ensure that financial institutions have a foundation in place to realize the benefits of a credit scoring platform.

Through two types of assessments First Access is able to identify an institution's strengths, weaknesses and opportunities. The capacity diagnostic strives to review capacity across business functions that are relevant for implementing credit scoring and the data diagnostic includes an analysis of the institution's data and technological sophistication.

The assessment serves as a diagnostic tool to identify roadblocks in the adoption of data-driven credit scoring solutions and provides recommendations on where to allocate resources to better position institutions to adopt technology and fully utilize its existing data. It reviews five dimensions of readiness that have been determined as key components of financial institutions business (strategy, leadership, process, technology and information) to help financial institutions understand where they fall on the continuum of readiness for a data-driven future.

PILOT PARTNERS:

First Access: A NYC fintech firm, founded in 2011, offers a customizable credit scoring platform for lending institutions in emerging markets to credit score anyone.

Wasasa Microfinance: A microfinance institution operating in Ethiopia with 80,000 borrowers across 34 branches and 20 rural service outlets, Wasasa is thriving to provide sustainable financial services to the poor in order to employ capital for poverty alleviation.

Buusaa Gonofaa Microfinance: A microfinance institution operating in Ethiopia with 85,000 borrowers across 30 branches, Buusaa works to provide flexible and sustainable financial services to improve the livelihood of the resource poor households, with particular focus on women, the landless youth and smallholder farmers.

World Bank SME Launchpad team: A team of World Bank Group staff working across the IFC and World Bank to investigate the opportunities data driven lending can bring to financial institutions to better reach women borrowers.

³ The identified fintech offered the most suitable product given the current status of the Ethiopian financial sector but other fintechs offer more sophisticated solutions that can potentially be brought into the Ethiopian market in the future.

DIMENSIONS OF READINESS



Figure 1

ETHIOPIAN MFIs ASSESSMENTS

First Access traveled to Ethiopia to evaluate the two MFIs across the five dimensions of readiness (See Figure 1). They held targeted interviews with senior leadership of the financial institutions, observed general operations and studied the loan assessment process. While in Ethiopia, First Access extracted a version of the MFIs’ databases to enable analysis of available data. They later analyzed the quantity and quality of the institutions’ data to evaluate the feasibility of using the data for credit scoring.

The readiness assessment reports then ranked each institutions’ capacity level across the sub dimensions of each of the five dimensions of readiness. The two financial institutions are at similar spots on the readiness spectrum. While they have much work to do to improve compliance and efficiency, they are also praised for their resourcefulness and their ability to power through challenges. Both institutions are tasked with investing in resources to build data and institutional capacity to be able to use the data in a way that will help them. Common strengths, weaknesses and opportunities for the financial institutions can be found in Figure 2.

STRENGTHS, WEAKNESSES AND OPPORTUNITIES TABLE: WASASA AND BUUSAA GONOFAA

STRENGTHS	WEAKNESSES	OPPORTUNITIES
Strong leadership with strategic vision for the future of their business	Limited amount of data is currently digitized (home and business visit data is not digitized)	First mover advantage for data driven lending still exists in Ethiopian microfinance market for institutions willing to invest in technology
Rigorous documentation of credit policies	Database structures are disorganized	Digitally capturing loan application information would allow for increased efficiency greater insight into credit risk
Robust loan application and aspirations to collect demographic, social and geographic data	Under resourced compliance and technology teams	Serving the market demand for individual loans (reducing collateral constraint)

Figure 2

In the context of the Finance and Markets Women Entrepreneurship Development Project (WEDP), the Launchpad team is working with the MFIs to operationalize the roadmap for adopting data driven lending. Throughout the pilot the MFIs have shown enthusiasm for the value data driven lending could bring to their operations. Next steps will include working to codify processes and adopt electronic loan applications. This is expected to have immediate benefits because electronic applications will increase processing speed of applications. This will also produce long term benefits through the collection of systematic data that can be used for data driven lending down the road.

TOOLS NECESSARY FOR THE ADOPTION OF DATA DRIVEN LENDING

Preparedness for data-driven credit scoring is multifaceted. It requires a strong foundation of operational practices and robust historical data. Tools and strategies that are essential to have in place include:

- **Strategic management**

It is important that leadership has experience managing new strategic initiatives and technology solutions. In particular, financial institutions need a project manager who can clearly communicate the value proposition of credit scoring, who has access to senior leadership, decision-making power, knowledge of branch-level operations and a background in technology.

- **Codified business rules**

Strong credit manuals and policies and staff training on these credit policies are key for effective compliance with credit policies.

- **Monitoring and reporting**

Calculating dimensions such as cost per loan and underwriting time per loan is essential to be able to track improvements from adopting data driven lending techniques. Also, keeping timely, granular data on PAR and arrears strengthens the predictive power of credit algorithms.

- **Standardized processes**

Digitizing disbursement data and loan application data and setting up systems to allow for storing multiple records for repeat customers is important for algorithm development. This allows financial institutions to capture data on approved and rejected loan applications and changing personal details in the core banking software.

- **Compliance enforcement**

Digitizing the underwriting process and enforcing policies automatically rather than through human to human management aids in compliance efforts. This is particularly important for geographically dispersed financial institutions. Operational inefficiencies and perceived risks can both be eliminated with better data. However, data cannot substitute for process. Compliance is the first step for data driven lending. Without compliance, an institution will not be able to generate consistent enough data to build effective credit scoring algorithms.

- **Consistent data collection**

Utilizing tools that enforce and support the collection and storage of loan application fields (MIS system, third party software for tablet data collection, etc.) is key. Technology can serve as a valuable enforcer of better compliance and allow financial institutions to realize greater efficiency. Also, it is important to make sure incentive structures are in place for credit officers for compliance in data collection.

- **Effective data storage**

Storing data in a standardized structure with an easy to understand code book is imperative for analysis.

- **Value of Tech Mindset:**

Think of technology as a driver of growth not an afterthought. It is important that the leaders of financial institutions develop a clear plan around messaging about the value proposition of data driven lending to ensure there is buy-in from branch managers and credit officers

LESSONS LEARNED

For Lenders: Ethiopia is an environment with very low levels of digitization. If financial institutions are interested in adopting data driven credit scoring mechanisms, they need to be dedicated to investing in capturing and storing accurate data. Using the current manual process for data capture and storage is not an optimal solution, as human touch will more likely lead to incomplete and possibly inaccurate data capture. Moving to digitized data capture is an important first step for the lenders to consider. Lenders also must consider that good data is not enough to successfully adopt data driven lending. They need to be dedicated to building institutional capacity so they are able to use the data in a way that can help them improve the way their business is run.



“ Before working with the World Bank on this project, First Access had not considered expanding into Ethiopia. Not only have we now determined that Ethiopia is a viable market for our platform, but we also received valuable market feedback to validate our current and future products. We hope to have a significant presence in the country in 2018 and to find more opportunities to collaborate with the World Bank in Ethiopia and beyond. ”

Rohit Acharya,
First Access Chief Data Scientist and Co-Founder



**FINANCIAL
TECHNOLOGY
COMPANIES**



WORLD BANK GROUP



**AFRICAN
FINANCIAL
INSTITUTIONS**

For World Bank Group: There is space for the World Bank Group to serve as a mediator of fintech and financial institutions to establish effective working relationships. Through this pilot project, it became evident that fintechs often need support in operating in developing countries and adapting their technology and procedures. They also often have small teams with limited capacity. Many fintechs are just starting to enter Sub-Saharan Africa and trying to pick new markets for their operations. First Access had not considered the Ethiopian market before this project but now they are developing a new product that was informed by their work in Ethiopia and feel it is a promising market for their work moving forward. On the other hand, financial

institutions often need to be convinced of the value of integrating technology in their operations. The World Bank has the opportunity to play a valuable role in the pairing of fintechs and financial institutions to increase access to finance for underserved populations by providing technical assistance and cost sharing support for financial institutions to pilot innovative interventions.

For all: Conducting thorough feasibility assessments before implementing a fintech pilot is crucial to effectively integrate a fintech initiative in a financial institution's operations. Understanding where a financial institution stands on the spectrum of readiness including the state of their data, their institutional capacity to effectively integrate a credit scoring initiative and their commitment to adopting technology is key. The World Bank Group could add value by establishing its own credit scoring assessment tool kit that can be used across projects and countries to evaluate where financial institutions stand on the readiness spectrum of adopting credit scoring technology. The creation of such a toolkit would enable project teams to spend fewer resources on hiring firms to conduct proprietary assessments and provide valuable information to understand the status quo before embarking on data driven lending initiatives.

THE FUTURE OF DATA DRIVEN LENDING

Technology has a key place in increasing access to finance for underserved populations, including women owned SMEs. The WBG can play a game changing role in demystifying the process of how technology can transform lending practices in developing markets. Adopting data driven lending must be done incrementally and must begin by first evaluating where financial institutions currently stand. Technology adoption is attainable but it has to be done in small steps. If financial institutions are agile, go for the small wins and continuously push incremental change they will see valuable and sustainable changes in their operations and be able to better serve borrowers.

Exposing financial institutions to the most up to date breakthrough technologies encourages them to invest in innovations that support sustainable financial growth. Brokering relationships between financial institutions and the most innovative global financial technology companies will allow the World Bank Group to spark pioneering change to increase access to finance for underserved borrowers, particularly women entrepreneurs.