

Chapter 2

Machine Learning in Social Finance: Facilitating Inclusive Finance Approaches

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ABSTRACT

Machine learning (ML) has emerged as a transformative tool in the field of social finance, particularly in enhancing microfinance institutions' (MFIs) ability to address the financial needs of disadvantaged populations. This paper explores the potential of ML to promote inclusive finance by leveraging alternative data sources and advanced algorithms for credit scoring, customer segmentation, and risk assessment. Practical examples demonstrate how ML technologies can optimize operational efficiency, improve loan accessibility, and maintain fairness in decision-making processes. However, the study also highlights ethical challenges, including data bias, transparency issues, and the risk of algorithmic discrimination. By combining hard and soft information, ML has the potential to complement human judgment, enabling a balanced approach to financial inclusion. Furthermore, the paper emphasizes the need for a socially responsible implementation of AI, ensuring that these innovations contribute to the well-being and resilience of marginalized communities. The findings suggest a path forward for integrating ML into microfinance while addressing critical ethical and practical considerations.

1. INTRODUCTION

For a long time, academics and practitioners have questioned the connection between economic development and the financial sector. There is undeniably a deep connection, but causalities are controversial and challenging to establish. Causal relationships are probably in both directions, depending on which variables are considered.

The great hope associated with microfinance was that, with the help of subsidies, it would be possible to create institutions that would finance marginalized people and turn them into micro-entrepreneurs. Their private ventures would generate additional income, significantly improving their living conditions. In short, poverty, understood as a lack of income, should be solved through microcredit.

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Moreover, microfinance was built on the promise that MFIs would break even after a few years and ensure financial inclusion for more and more people. The accuracy of this prediction at the time is still being determined. Microfinance has developed tremendously over the past three decades, leading to more financial inclusion than ever before. However, several initial assumptions have been harshly confronted with reality:

- Firstly, microcredit does not necessarily generate income through entrepreneurial activities, as part of it is used for consumer credit.
- Secondly, the original target group of borrowers, which consists of the poorest of the poor, is challenging to reach.
- Finally, the objective of cushioning the impact of economic shocks proved to be more limited than expected.

Strong but justified criticism was voiced regarding over-indebtedness, the crises in microcredit management, and perverse individual effects. The microfinance industry also faced moral criticism, mainly related to high interest rates. Today, the microfinance community is more nuanced, and the industry has evolved. The original focus on a single product, microcredit, has given way to a broader range of financial services, including micro-savings and micro-insurance. This development explains why 'microfinance' has come to be used instead of 'microcredit.' Currently, however, many scholars use the term 'financial inclusion,' signaling a reframing of the agenda in the wake of harsh criticism of its limited impact.

The question arises of whether artificial intelligence (AI) and machine learning (ML) can impact financial inclusion in microfinance. Technological development can create new opportunities to improve the difficulties of the microfinance sector (Gu et al., 2024). In this article, we use practical examples to discuss how ML can solve these problems and, if necessary, promote improvements. The book chapter presents various use cases (Armenia, India) of how machine learning algorithms support loan officers in improving access to formal credit for the socially disadvantaged. The critical question is whether the processing of hard information by the machine is sufficient to compensate for the general information advantage of loan officers of microfinance institutions (MFIs) with soft information. In addition, we stress the importance of clearly stating the social responsibility of using AI. Addressing potential difficulties and moral dilemmas arising from its use is not just essential, but a moral imperative. These include data bias and fairness issues, explainability, parsimony, model generalization, and human-centered design.

The topic is embedded in the so-called 'inclusive finance paradigm' in the next step. The question is to what extent microfinance—supported by ML technologies—contributes to the 'well-being' of the target group. Well-being defines the ability to achieve the aspects of life that are considered a good life according to people's values. Well-being is multidimensional as it encompasses monetary and financial outcomes and outcomes related to health, relationships, social networks, education, housing, security, and general stability.

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