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Towards a New Credit Evaluation in the Fintech Era: Foundations for an AI-Based Alternative Scoring Model in Uruguay

Joaquín Rubio
Universidad de la República

Noelia de los Santos
Universidad de la República

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Abstract

This research explores the opportunities and challenges of implementing Artificial Intelligence (AI) in credit evaluation systems in Latin America, with a specific focus on Uruguay. The study addresses the gap between the transformative potential of AI technologies and their limited practical adoption in credit scoring. A systematic literature review revealed a concentration of AI applications in customer service, with a lack of effective models specifically oriented toward credit risk evaluation. In Uruguay, current scoring systems remain predominantly reliant on traditional methodologies, particularly linear regression. Fieldwork based on semi-structured interviews with financial sector stakeholders confirmed the absence of AI-based credit scoring implementations, highlighting a sector in an early stage of technological innovation. The paper proposes an integral methodological framework for AI-based credit scoring models, integrating predictive effectiveness, algorithmic transparency, and ethical considerations. The findings conclude that AI has the potential to strengthen financial inclusion, increase predictive accuracy, and promote more equitable relationships between financial institutions and users, but success depends on strategic implementation tailored to Uruguay's regulatory and social context.

Keywords

Credit Scoring; Artificial Intelligence; Financial Inclusion; Explainable AI (XAI); Open Finance; Uruguay

1. Introduction

Artificial Intelligence (AI) has transformed multiple sectors of the global economy, with finance being among the most impacted. In Latin America, and particularly Uruguay, the adoption of AI in credit scoring is still limited despite its potential to enhance predictive accuracy, inclusion, and transparency.

2. Related Work

The literature highlights that AI adoption in Latin American finance has mostly focused on customer service (chatbots, fraud detection), with limited progress in credit scoring. Traditional scoring remains dominant, based on linear regression and structured credit history variables, which systematically exclude informal workers and unbanked populations.

3. Methodology

This study follows an exploratory-descriptive design, combining a systematic literature review, institutional reports (e.g., Central Bank of Uruguay, 2023), and semi-structured interviews with executives, regulators, and fintech leaders. The analysis identifies structural gaps and opportunities for AI adoption in Uruguay's credit scoring system.

4. Findings and Discussion

Key findings show Uruguay's market still relies heavily on traditional scoring (57% of top credit institutions use linear regression, only 14% apply behavioral scoring). Current systems function as 'black boxes,' lacking regulatory transparency. Regional contrasts highlight Brazil's leadership in Open Finance with PIX, Argentina's crypto adoption, and Chile's structured regulatory framework.

5. Proposed Framework

The proposed AI-based credit scoring framework includes six components: (1) Data ingestion (internal + external sources), (2) Preprocessing, (3) Feature engineering, (4) Predictive modeling (ML algorithms such as gradient boosting and neural networks), (5) Explainability (XAI methods such as SHAP and LIME), and (6) Deployment and monitoring.

6. Ethical and Regulatory Considerations

Ethical issues include algorithmic bias and lack of transparency. Regulatory gaps in Uruguay require updates to ensure algorithmic transparency, fair use of alternative data, and appeal rights for automated decisions. Strong data protection (Law 18.331) provides a foundation. Strategies include fairness techniques, continuous monitoring, and regulatory sandboxes.

7. Conclusions and Future Work

Uruguay is in a privileged position to lead responsible AI-based credit scoring in the region. The combination of institutional stability, strong data protection culture, and the need for greater inclusion creates a strategic opportunity. Future work should involve pilot projects, regulatory experimentation (sandboxes), and academia-industry collaboration.

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