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**Sample Size**

1,421 individual loan applicants

**Research Implemented by IPA**

Yes

# The Impact of Computer-Generated Credit Scores on Lending in Colombia

## Key Finding Summary

Credit scores improved the productivity of credit committees, reduced managerial involvement in the loan approval process, and increased the profitability of lending to SMEs. Credit committee members' effort and output also increase when they anticipate the score becoming available, indicating that scores improve incentives to use existing information.

## Abstract

Small and medium enterprises are seen as promising engines of growth in developing countries but often fail to live up to their potential because of barriers to growth such as limited access to credit. Researchers used a randomized evaluation to measure the impact of introducing computer-generated credit scores on lending to micro and small enterprises in Colombia. The program significantly increased productivity in the loan approval process and improved allocation of credit without affecting average loan amounts and default rates.

## Policy Issue

Small and medium enterprises (SMEs) are thought to be an important source of innovation and employment in developing countries due to their flexibility in responding to new market opportunities and their potential for growth. However, entrepreneurs face a number of barriers to expanding their businesses and employing more workers, including constrained access to credit.

Whereas assessing the credit-worthiness of prospective borrowers has become relatively cheap and easy in developed countries through the use of credit scoring, in developing

countries this process can be cumbersome in the absence of reliable information about the credit or financial history of potential bank clients. The high costs associated with assessing the riskiness of loan applicants can outweigh the financial returns of lending, making banks reluctant or unable to make loans to SMEs. Credit scoring has been used successfully in the United States and other developed countries to reduce the cost of identifying creditworthy applicants, but there is little evidence on whether computer-based credit scoring might work in developing country contexts.

## Context of the Evaluation

Researchers partnered with BancaMia, a for-profit bank that lends to small and medium businesses in Colombia. Prior to this study, BancaMia made all of its lending decisions based on information collected by loan officers. Applications incorporating the collected information were reviewed by a credit committee, who could approve or reject them. In difficult cases, the committee could also refer the application to upper-level managers or postpone their decision until more information was collected. The loan approval process under this system was under the discretion of the committee and was very expensive due to the high number of referrals and rounds of information collection. In an effort to improve its loan approval process, BancaMia developed its own credit scoring software, which produces a credit score based on verifiable client information.

## Details of the Intervention

Researchers, in collaboration with BancaMia, used a randomized evaluation to measure the impact of the credit scoring software on the loan approval process and loan outcomes.

Out of 1421 loan applications that were scored through the new software, 1086 scores were randomly chosen to be revealed to the committee. Scores were revealed either at the beginning of the application review process or after the committee had finished an initial review and made an interim decision about whether or not to offer a loan. Although the committee in the latter case did not know the applicant's exact score, they did know that a score could become available once they reached a decision.

Researchers collected information about various aspects of the loan approval process (e.g., the average time spent evaluating an application, the number of approvals and rejections issued etc.) as well as loan performance and default rates.

## Results and Policy Lessons

### *Impact on Credit Committee Effort and Output:*

Revealing the computer-generated credit scores at the beginning of the application review process increased both the probability of the committee making a decision and the amount of effort put into the review. Seeing the score in advance raised the probability of the committee reaching a decision by 4.6 percentage points from a base of 89 percent. This

change was driven by the reduction in the number of applications referred to bank managers and the number of cases for which the committee requested more information to be collected for a second round evaluation. In addition, the committee spent more time evaluating loan applications, especially the difficult cases (e.g., applicants that requested larger loans).

The committee also became more productive when it knew that a score would become available after the initial evaluation. The anticipation of seeing a score increased the probability of the committee making a decision to approve or reject an application by 3.9 percentage points. This improvement in committee productivity even in the absence of a credit score suggests that the committee might already have had the necessary information to make decisions on difficult applications, but lacked the incentives to use this information efficiently.

#### *Impact on Loan Allocation and Outcomes:*

Although providing computer-generated scores to the committee did not affect loan outcomes such as the average size of loans issued or default rates among borrowers, it did improve credit allocation. Computer-generated credit scores reduced uncertainty about borrowers' creditworthiness, allowing banks to extend larger loans to less risky borrowers and smaller loans to riskier borrowers. As a result, there was no change in average loan size issued, but the bank was better able to match its lending to borrower characteristics.

Considered together, these results show that the credit scoring program had significant impact on the bank's productivity. Specifically, summarizing the credit worthiness of prospective borrowers into a single, easy to understand number increased the quantity of difficult cases that the credit committee resolved. The score also nudged committee members to put in more effort on difficult applications. This could potentially reduce the workload of bank managers and reduce the cost of administering loans for the bank. The increase in productivity without providing new information to the credit committee also implies that banks may need to better incentivize their employees who hold useful information.

## Sources

Paravisini, Daniel, and Antoinette Schoar. "The Incentive Effect of IT: Randomized Evidence from Credit Committees." NBER Working Paper No. 19303, August 2013.

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