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Abstract

Rich monitoring data generated by many anti-poverty programs can be used to assess the credit-worthiness of small and medium entrepreneurs.

We show that households who applied for loans and were approved by the BRAC microcredit program are the better-off group among the beneficiary households from its livestock transfer program.

Self-selection by borrowers and subsequent screening by BRAC jointly lead to a better borrowers' pool.

Subjective information on borrower aspirations is an important predictor of loan approval decision by BRAC.

Context

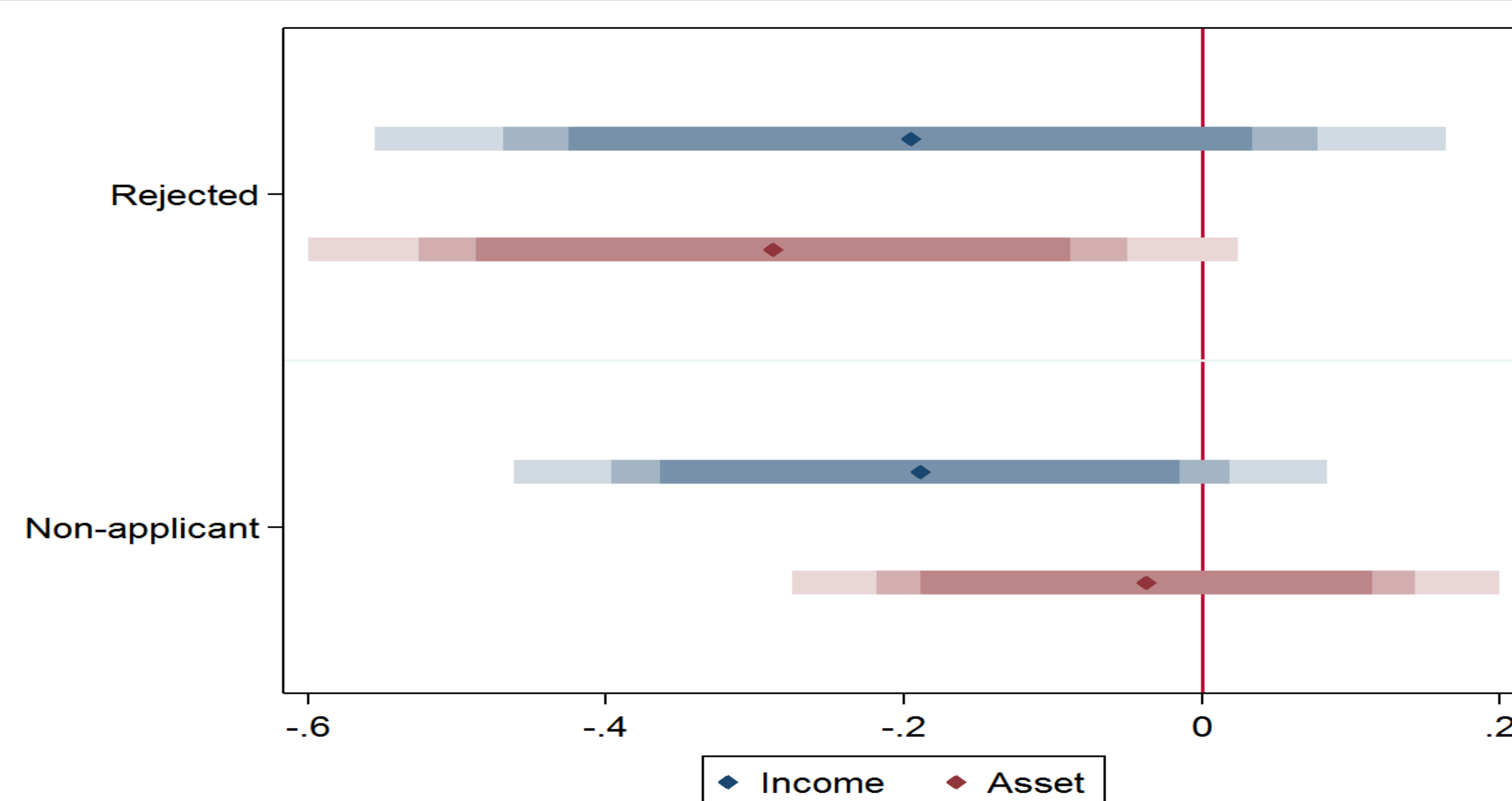
We examine whether BRAC used the performance of beneficiary households from the "Targeting the Ultra-Poor (TUP)" program to target borrowers who have safe credit risks.

- We use data from the randomized control trial (RCT) conducted by Bandiera et al. (2017).
- Among the 3,755 beneficiary households, 36% took at least one loan from the BRAC-microcredit program, another 8% were rejected, and rest of the households never applied for a loan between 2008 and 2011.
- We use households' pre-microcredit objective and subjective information to examine whether the approved households have less credit risk compared to the rejected and the non-application households.

Return to time by household loan status

The marginal revenue product of labor (MRPL) in livestock activities (income) is .19 points lower for the non-applicant compared to the approved households.

MRPL (asset) is 0.30 points lower for the rejected households compared to the approved households.

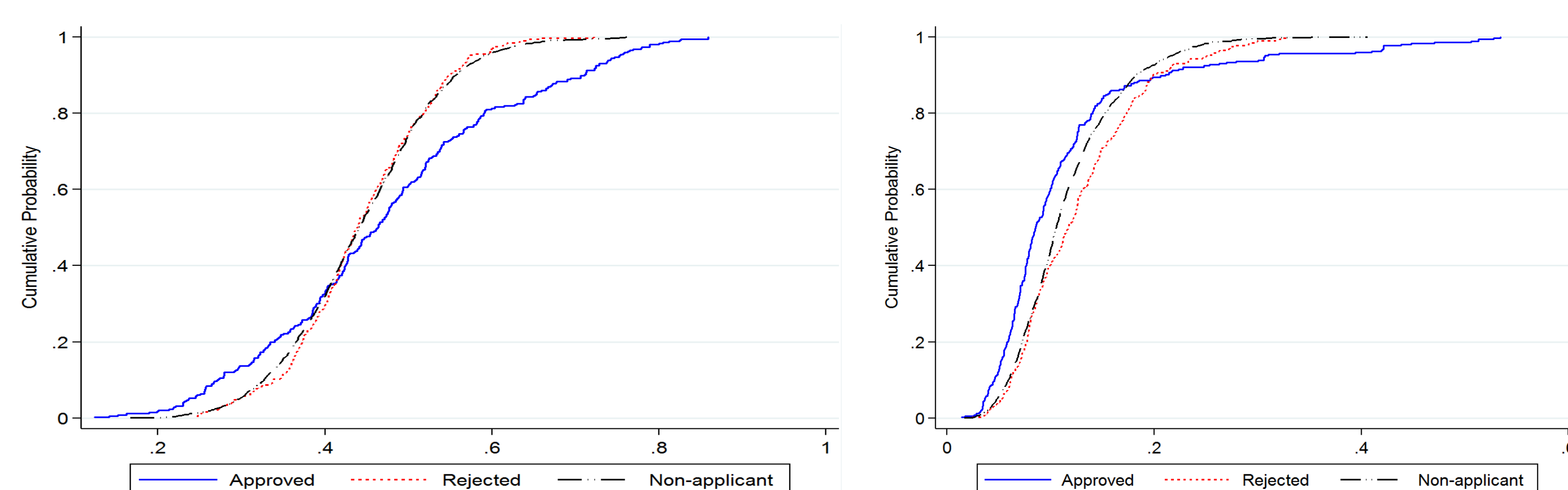


Note: Number of households in the approved, rejected, and non-applicant groups are 783, 312, and 1,633, respectively. Base category is the approved households. Dependent variable is livestock income (USD/PPP) or livestock asset (USD/PPP). Independent set includes BRAC-microcredit status, interactive with time allocated, and their interaction, and set a subjective characteristics.

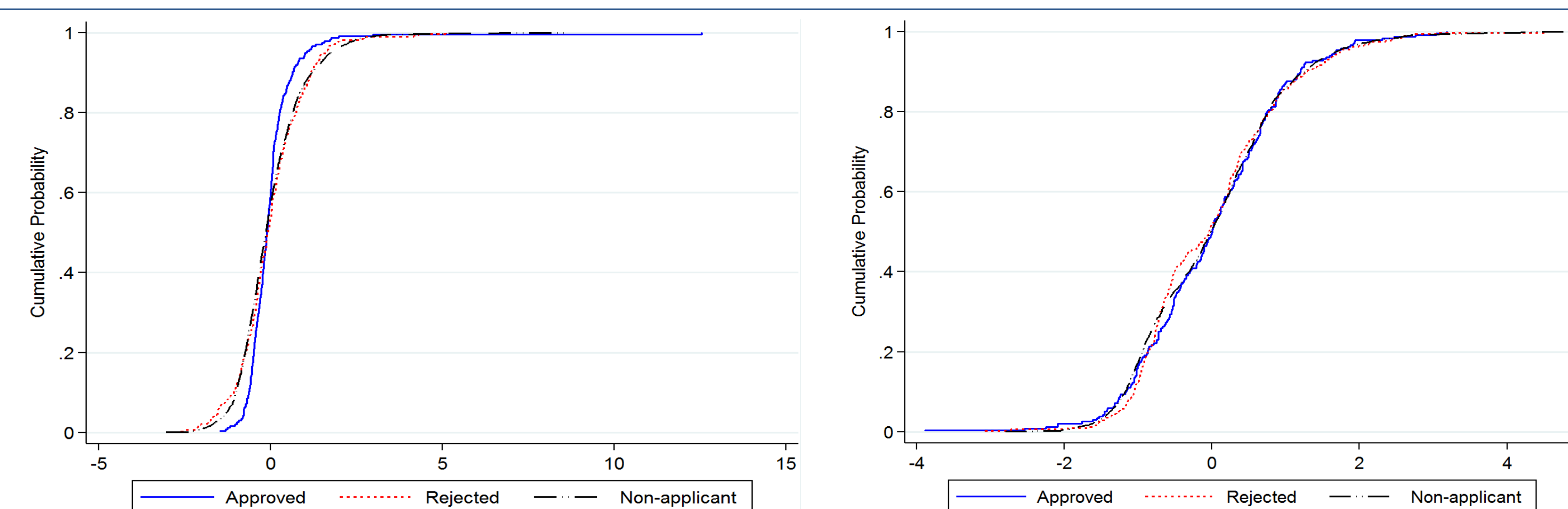
Targeting potentially successful borrowers?

We use the Random Forest (RF) and Extreme Gradient Boosting (XGBoost) supervised machine learning (ML) methods to predict what would be the probability of productive use of a loan and repayment difficulty for the rejected and the non-applicant households had they taken a loan from BRAC.

We use pre- and post-loan information of the approved households to train the ML methods and predict outcomes for the rejected and non-applicant groups.



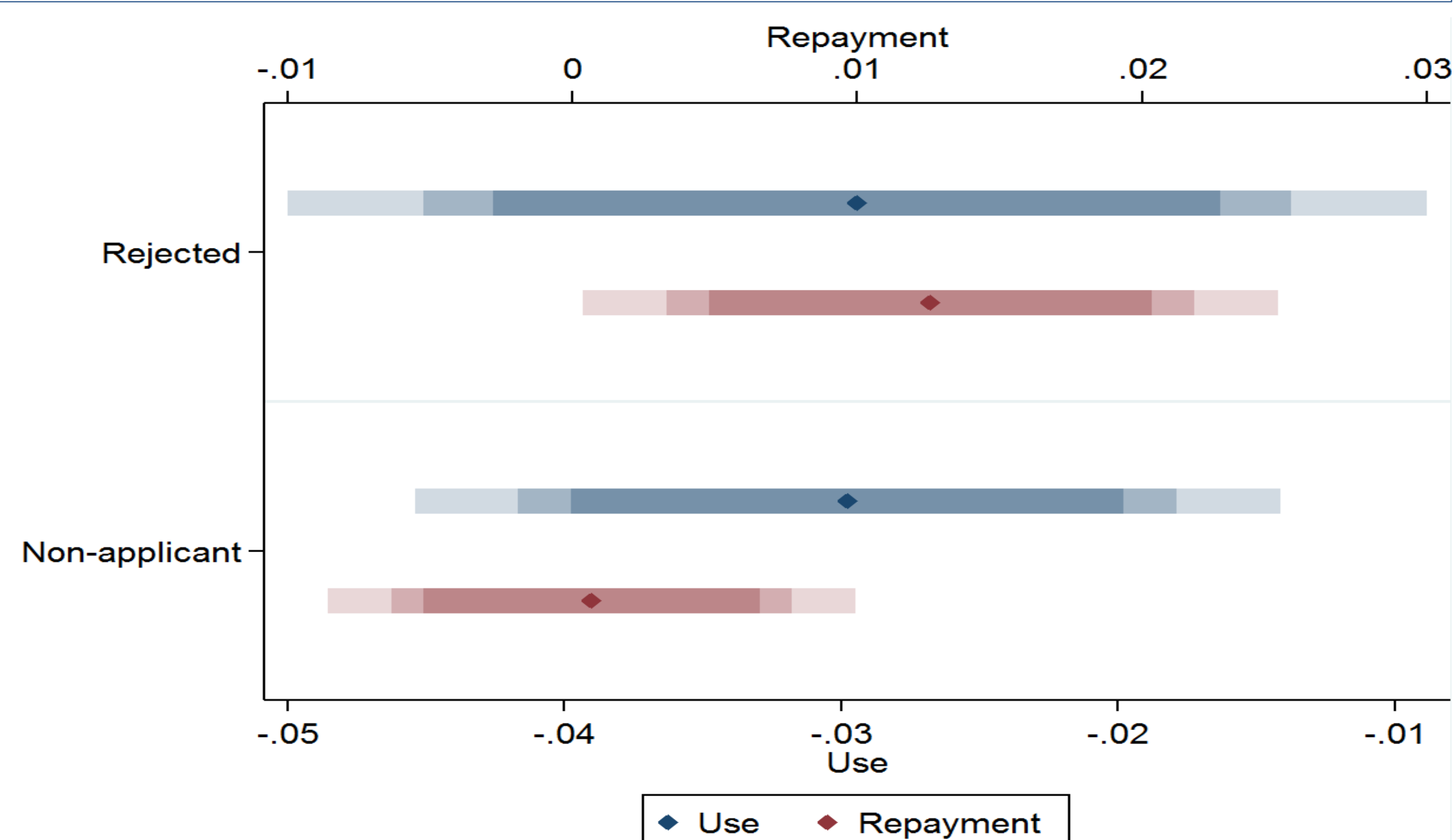
Note: CDFs of predicted probability of using loan in a productive activity (left) and facing difficulty in loan repayment (right) by BRAC-microcredit status (RF method).



Note: CDFs of predicted livestock income (left) and livestock asset (right) by BRAC-microcredit status (RF method).

The probability of productive use of a loan is 3 to 4 percentage points (8-10%) lower for both the rejected and the non-applicant households compared to the approved households.

The predicted probability of repayment-difficulty is 1 to 2 percentage points (14-21%) lower for the rejected households relative to the approved households.



Note: Number of households in the approved, rejected, and non-applicant groups are 342, 312, and 1,633, respectively. Base category is the approved households. Dependent variable is predicted probability of using loan in a productive activity or facing difficulty in loan repayment. Independent variable includes BRAC-microcredit status. Predicted probability is estimated using the RF methods estimated using 5,000 trees.

Conclusions

- The TUP program generated valuable information, both objective and subjective, about the credit worthiness of beneficiary households..
- the importance of subjective information in determining borrower quality casts doubt on the applicability of pure credit-scoring model in the microcredit market.

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References

1. Bandiera, O., Burgess, R., Das, N., Gulesci, S., Rasul, I., and Sulaiman, M. (2017). Labor markets and poverty in village economies. The Quarterly Journal of Economics, 132(2):811-870.