The Green Value of BigTech Credit

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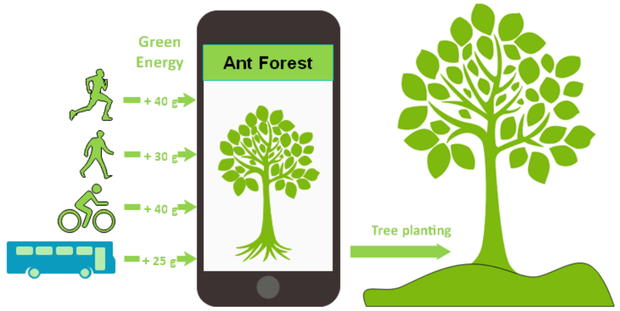
1. Abstract

We study an incentive-compatible mechanism that embeds financial rewards into eco-friendly actions to align societal goals with private incentives. Using a novel dataset from the world's largest individual carbon-footprint tracking platform, we show that linking green behaviors to credit limits increases environmental engagement and lowers default risk, as costly green actions signal conscientious borrowers. Our structural model estimates an annual green value of $413.20 million. This incentive-based approach yields larger welfare gains than mandates or subsidies, especially when public green awareness is low. Our findings highlight the screening role of green actions and the value of alternative data in lending.

2. Institution Background

- **Ant Forest**: World's Largest Personal Carbon Account Program
- Embedded within **Alipay;** over 600 million frequent users
- **"Green energy"** points for eco-friendly activities such as using public transportation, reducing paper and plastic waste, and recycling (based on the carbon emission reduction)
- **Financial incentives: increase credit score and credit limit of virtual credit card (i.e., Buy-now-Pay-Later) through green behaviors**



3. Data

- A monthly panel of 100,000 randomly selected Ant Forest users from Jan 2019 to Dec 2022
- Ant Forest has a detailed documentation of various green actions
- Matched with Alipay data to get credit limit, credit usage, and default info

4. Empirics

The Incentive-Compatible Design

The Underlying Rationale: The Screening Role of Costly Green Actions

1. A one-kilogram increase in green energy production by the same user is associated with a 0.17% rise in their credit limits—equivalent to roughly 24.65 yuan (approximately 3.52 dollars).
2. The Underlying Rationale: The Screening Role of Costly Green Actions.
3. The key assumption behind this is that although users differ in unobservable characteristics such as environmental consciousness and financial prudence, these two characteristics are positively correlated.
4. High-type users, who are both environmentally and financially responsible, face lower psychological or opportunity costs of engaging in green actions, and thus are more likely to invest in costly green behaviors. While the platform cannot observe user types directly, it can observe green engagement ω, which it uses to assign credit limits.

It Works For Individuals

1. Users strategically increase green actions when close to credit constraints.
2. 1% increase in credit usage rate corresponds to an approximate 0.13% increase in green energy production.
3. Borrowing-constrained users engage in 23.92% higher levels of green actions compared to unconstrained users.
4. Analyzes varying levels of credit usage using the binned indicator regression: The coefficient estimates for these ranges are all positive and significant, and more importantly, increase monotonically. Users in the highest credit usage bin (80% — 100%) generate 32.02% higher levels of green actions compared to the baseline group with credit usage below 20%.

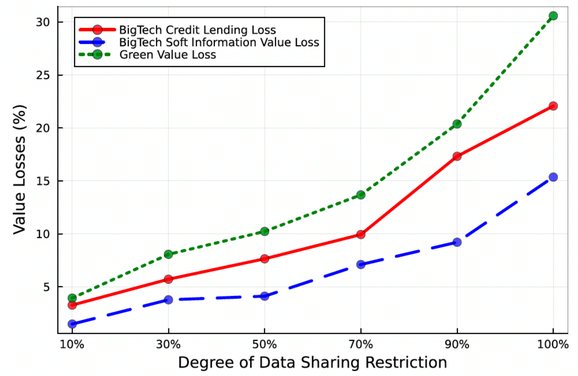
It Works For the BigTech

1. Whether linking credit limit increases to green behaviors introduce any credit risk?
2. One additional kilogram of green energy production is linked to a 17.17 yuan drop in overdue balance.
3. The significant and negative relationship between green energy production and default is most evident among borrowing-unconstrained users.
4. Among constrained users, green activities do not significantly predict default.
5. Consistent with the theoretical model, highlight the strategic value of green behaviors for BigTech platforms: allow platforms to expand credit access without raising default risk.

5. Structural Model

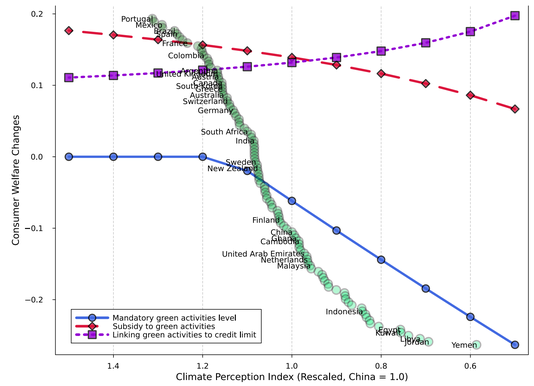
Quantifying the Green Value of BigTech Credit

1. Profits from BigTech lending decline substantially as the credit-green linkage weakens.
2. Weakening the green-credit connection leads to a sharp reduction in equilibrium green capital stock.

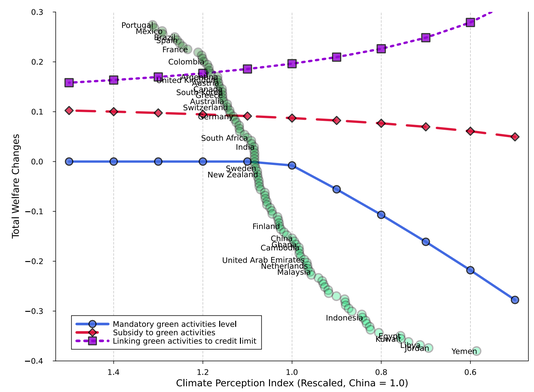


Welfare Analysis and Policy Implications

1. Total welfare: sum of consumer welfare and BigTech lending profits.
2. Mandatory green action levels are not effective under any circumstances.
3. The subsidy policy is more effective in enhancing consumer welfare in countries with high climate awareness, but not as effective in raising total welfare.
4. Our proposed Green Credit Signaling Framework significantly enhances both consumer and total welfare, especially in countries with low climate awareness.



Consumer welfare



Total welfare