

A good sketch is better than a long speech: evaluate delinquency risk through real-time video analysis

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1. What are the research questions?

- Can borrowers' facial expressions during loan applications help predict future delinquency likelihood?

2. Why are the research questions interesting?

- Proper evaluation of delinquency risk is needed to access to financial services
- However, the usefulness of historical data to assess borrowers' creditworthiness can be constrained.
- Fintech lenders may use facial cues in real-time video to better assess borrowers' creditworthiness

3. What is the paper's contribution?

- Literature on consumer credit markets
 - Prior: credit bureau scores, digital footprint data, friendship networks, income verification, ethnicity...
 - Ext: based on applicants' micro-facial expressions during the application process
- Literature on video analysis and facial information
 - Prior: managers' video information...
 - Ext: video analysis with respect to individual borrowers in credit markets
- Literature on the use of alternative data
 - Prior: focus on investors and managers,
 - Ext: prove the usefulness of borrowers' alternative data

4. What hypotheses are tested in the paper? list them explicitly

- H1: Borrowers' happiness during application is negatively linked to future delinquency.
- H2: Borrowers' fear during application is positively linked to future delinquency.

(a) Do these hypotheses follow from and answer the research questions?

Yes

(b) Do these hypotheses follow from theory or are they otherwise adequately developed?

- Assumptions:

$$I \sim N(\mu_I, \sigma_I), \quad W = I - (1 + r)L, \rightarrow W \sim N(\mu_I - (1 + r)L, \sigma_I)$$

- Likelihood of loan delinquency

$$P(W < 0) = \frac{1}{\sigma_I \sqrt{2\pi}} \int_{-\infty}^0 \exp\left(-\frac{(x - \mu_I + (1 + r)L)^2}{2\sigma_I^2}\right) dx.$$

- Conclusion
 - Happiness is positively associated with the expected future income, $\mu_I \uparrow \rightarrow P(W < 0) \downarrow$
 - Fear is positively related to the uncertainty of future income, $\sigma_I \uparrow \rightarrow P(W < 0) \uparrow$
5. **Sample: comment on the appropriateness of the sample selection procedures**
 - A special setup to avoid possible problems.
 6. **Dependent and independent variables: the appropriateness of variable definition and measurement**
 - Consider splitting the data to train a new model
 7. **Regression/prediction model specification: the appropriateness of the regression/prediction model specification**
 - Missing borrower ability-related variables, such as education level.
 8. **What difficulties arise in drawing inferences from the empirical work**
 - The sample includes only approved fintech loans, limiting its representativeness of all borrowers.
 9. **Describe at least one publishable and feasible extension of this research**
 - A good sketch is better than a long speech: evaluate delinquency risk through real-time video analysis
 - Study if borrowers alter their micro-expressions strategically when aware of video analysis.
 - On the Rise of FinTechs: Credit Scoring Using Digital Footprints
 - Other dataset: Alipay Consumption Score
 - Silent Suffering: Using Machine Learning to Measure CEO Depression
 - The depression of e-commerce live-streaming hosts: facial and audio modality, the relationship between the host's depression, the quality of the products being sold, and the sales revenue.
 - The depression of e-commerce live-streaming controllers
 10. **Relationship of three paper**
 - On the Rise of FinTechs& A good sketch is better than a long speech
 - Focused on consumer credit, aiming to assess borrowers' credit status and provide new insights for lending decisions.
 - Silent Suffering:
 - Focusing on the impact of leadership mental health on corporate risks and individual careers.