The Relevance of Open Banking for Credit Scoring

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Trends in credit scoring

- Household financial stress has high costs, and early warning signals important
  - Banks,
  - Individuals
  - Society
- Prior studies demonstrate the value of big data in credit scoring using
  - p2p lending platforms
  - call logs and social media apps
  - online shopping information
  - and the types of goods or services purchased
- Another big data development for credit scoring: Open Banking
  Banks must grant any third party access to accounts / payment services if customer consents

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Background: Open Banking

Limited empirical evidence on how credit-relevant OB data is:

- Q: Is OB a substitute or complement for existing credit information (credit scores / internal risk ratings)?
- Q: Can OB help aspiring borrowers underserved by the banking system?

Compared to the traditional banks that build borrower relationships, OB *lenders* differ in

- lending standards
- screening procedures
- different customers,
- different products

Moreover, OB *borrowers* also differ (e.g., information sharing consent): selection problems.

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Empirical Setting

Ideally, one would like to set up an experiment:

1. Obtain predictions of distress from OB lenders
2. Compare to predictions of distress from non-OB lenders.
3. Make sure lenders and borrowers are similar, "apples with apples"
   1. OB and non-OB borrower information (age, income, wealth, risk, etc.)
   2. OB and non-OB lender information (size, funding model, clientele, etc)

We mimic this setup using data from 1 bank:

1. Build predictions of distress from checking accounts "as if" provided under OB
2. Use the bank's internal credit score for non-OB predictions
3. Use internal info on customers, loan products, etc

=> "apples with apples" *within* bank

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$\Rightarrow$ "apples with apples" *within* bank

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Empirical Setting

- We first predict delinquency based on checking account transactions from a mid-sized Canadian bank
  - All Millenials (18-37y)
  - Jun '16-Mar '18 data
  - Bank does not use checking account data for credit scoring
- Compare this with predictions based on
  - within-bank customer information,
  - the bank's internal credit score
  - external ratings (from prior work),
- Use a straightforward statistical model that serves as a lower bound
  - 10-month estimation period
  - 10-month prediction period

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Prediction model

Predict distress in terms of

1. Pre-delinquency: Financial fragility (>95% depleted credit lines)
2. Early-stage delinquency: Payment arrears
3. Late-stage delinquency: Loan arrears

with predictors based on:

1. Internal risk rating ("CRA+")
2. checking accounts data ("pseudo-OB")
   (account amplitude, balance volatility, balance amounts, overdrafts)
3. Customer characteristics
   (income, age, wealth, customer value, nr. of accounts, account tenure)
4. All of the above

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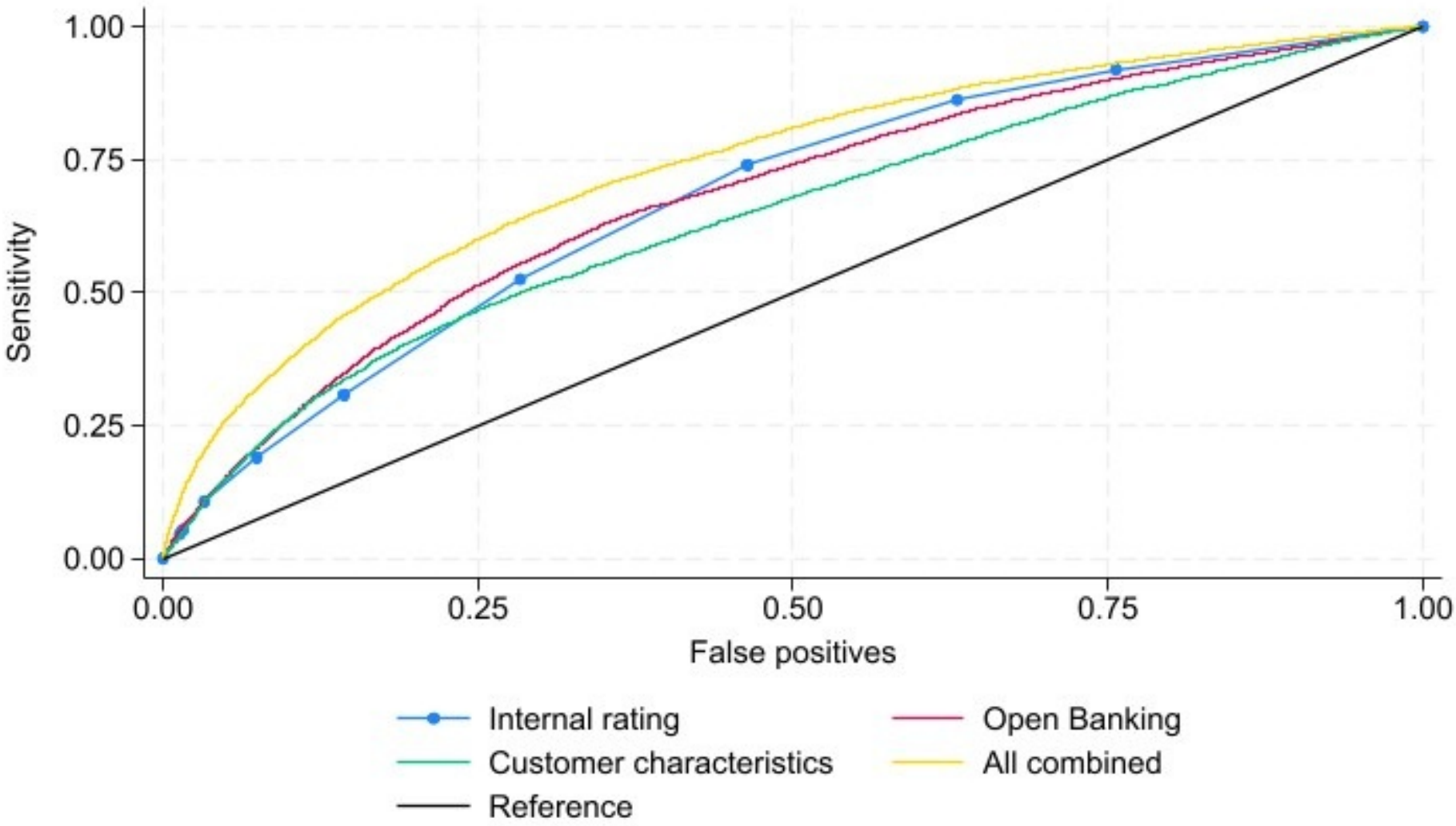
Predictions substitute *and* complement internal rating

Predicting financial distress in terms of financial fragility



Predictions substitute *and* complement internal rating

- Predictive power of OB similar to internal credit rating
- Holds for different measures of financial distress

	Fragility$_{t+1}$	Late payments$_{t+1}$	Arrears $_{t+1}$
	(1)	(2)	(3)
Internal rating	0.6750	0.5727	0.8448
Open Banking	0.6786	0.5748	0.8176
Customer characteristics	0.6520	0.5406	0.7185
All of the above	0.7381	0.6163	0.9224

- AUC of 67% similar to external ratings
  - 66.5% AUC from German savings banks in Puri et al. (2017)
  - 68.3% AUC from the credit bureau score in Berg et al. (2020)

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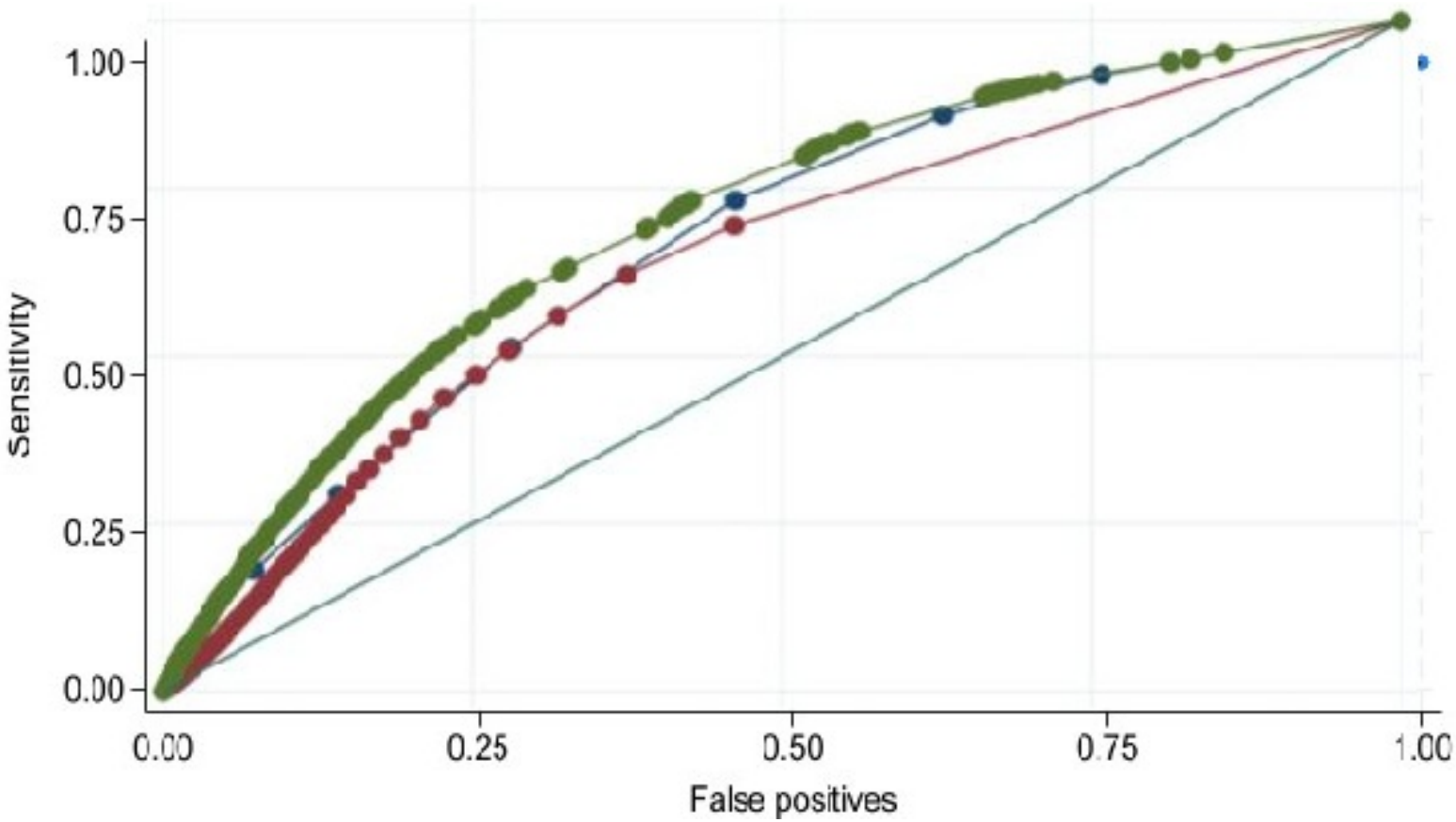
Similar findings with 3-mo (GDPR) retention period



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Can OB increase access to credit?

OB may help scoring bank loan applicants with an incomplete credit history

Millenials under 25 have incomplete credit score (and more likely denied credit):

- 30% of FICO score comes from seven-year payment history
- Without it, one can get denied credit even with spotless payment behavior
- One can only obtain credit from 18 years of age
- Let's look at people just above/below this cutoff (24-26yo)

	Loan granted$_{t+1}$	ln(Interest rate)$_{t+1}$
Age<25y	-0.209***	-0.016
	(-3.820)	(-0.390)

	Financial fragility$_{t+1}$	Payment delinquency$_{t+1}$
	(1)	(2)
AUC	0.7401	0.6724
Difference AUC = 50%	0.2401***	0.1724***

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Conclusion

OB data can be a substitute or complement to internal/external ratings for predicting financial distress

- Distress: fragility, payment/loan delinquency
- Similar predictive power as in/external credit ratings
- Do you agree or not? Let me know in the poll ☺
- Paper on this should arrive in the coming months
- Questions? Happy to chat! **vanbekkum@ese.eur.nl**

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