

Discussion of : Measuring Bias in Consumer Lending

Will Dobbie, Andres Liberman, Daniel Paravisini, and Vikram Pathania

Bronson Argyle¹

IDC, June 2020

¹Brigham Young University

What's the Basic Idea?

- Build a model to contrast between different flavors of bias:
 - preference-based bias
 - statistical discrimination
 - incentive-based bias
- Use data from a large high-cost lender in the U.K. to show that **Incentive-based bias exists in consumer lending.**

Comments Outline

- This paper is very mature and developed.
- Outline for my thoughts:
 - Literature backdrop/contribution
 - Counterfactual/null hypothesis
 - Suggestions & proposals

Literature Touching Discrimination 1/3

- The Boston Fed Study (1990) used a litany of borrower controls, married to the HMDA data, to show that black and Hispanic applicants are 82% more likely to be turned down than virtually identical white borrowers. The DoJ Study (Siskin & Cupingood, 1993) found similar results.
 - These studies was criticized by Carr and Megbolugbe (1993), Rachlis and Yezer (1993), Munnell, Browne, McEneaney, and Tootel (1996) ,Glennon and Stengel (1994, 1999), and Ross and Yinger (2002).

Literature Touching Discrimination 1/3

- The Boston Fed Study (1990) used a litany of borrower controls, married to the HMDA data, to show that black and Hispanic applicants are 82% more likely to be turned down than virtually identical white borrowers. The DoJ Study (Siskin & Cupingood, 1993) found similar results.
 - These studies was criticized by Carr and Megbolugbe (1993), Rachlis and Yezer (1993), Munnell, Browne, McEneaney, and Tootel (1996) ,Glennon and Stengel (1994, 1999), and Ross and Yinger (2002).
- Everyone builds on the same Becker (1971) intuition that no discrimination implies equal marginal profitability (Ferguson & Peters, 1995 point out that unequal credit characteristics and equal denial rates imply discrimination), but **this papers get the marginal profitability calculation right.**

Literature Touching Discrimination 2/3

- Correlations between target group membership and credit access/terms have been widely identified:
 - Evidence shows that ethnic minorities have less access to mortgage funding (Holmes and Horvitz (1994), Bradbury, Case and Dunham (1989) ,Phillips-Patrick and Rossi 1996; Siskin and Cupingood 1996; Ross and Yinger 1999),
 - are more likely to be subject to predatory lending practices (Calem, Gillen, and Wachter 2004; Williams, Nesiba, and McConnell 2005; Dymski 2006),
 - have higher mortgage application rejection rates and are offered less attractive terms (Black, Schweitzer, and Mandell 1978; Munnell et al. 1996; Ross and Yinger 1999),
 - and pay more (Courchane and Nickerson 1997; Oliver and Shapiro 1997; Black, Boehm, and DeGennaro 2003) than whites with similar credit and other features.
 - Outside the mortgage market, studies on consumer credit have also found that loan approval rates are lower for minorities (Duca and Rosenthal 1993; Edelberg 2007; Lin 2010, Solomon et al. 2016).
 - Perle, Lynch, & Horner (1993) and Phillips-Patrick & Rossi (1996) and others point out the endogeneity of this approach.

Literature Touching Discrimination 2/3

- Correlations between target group membership and credit access/terms have been widely identified:
 - Evidence shows that ethnic minorities have less access to mortgage funding (Holmes and Horvitz (1994), Bradbury, Case and Dunham (1989) ,Phillips-Patrick and Rossi 1996; Siskin and Cupingood 1996; Ross and Yinger 1999),
 - are more likely to be subject to predatory lending practices (Calem, Gillen, and Wachter 2004; Williams, Nesiba, and McConnell 2005; Dymski 2006),
 - have higher mortgage application rejection rates and are offered less attractive terms (Black, Schweitzer, and Mandell 1978; Munnell et al. 1996; Ross and Yinger 1999),
 - and pay more (Courchane and Nickerson 1997; Oliver and Shapiro 1997; Black, Boehm, and DeGennaro 2003) than whites with similar credit and other features.
 - Outside the mortgage market, studies on consumer credit have also found that loan approval rates are lower for minorities (Duca and Rosenthal 1993; Edelberg 2007; Lin 2010, Solomon et al. 2016).
 - Perle, Lynch, & Horner (1993) and Phillips-Patrick & Rossi (1996) and others point out the endogeneity of this approach.
- Statistical discrimination?
 - Stiglitz & Weiss (1991) Guttentag & Wachter (1980), Lang & Nakamura (1993).

Literature Touching Discrimination 3/3

- Second wave:
 - FinTech ML discriminates less on the basis of race than face-to-face Bartlett et al (2019), but Fuster et al (2018).
 - Racial discrepancy is mortgage pricing: Cheng, Lin & Liu (2015), Ghent, Hernandez-Murillo, & Owyang (2014), Bayer, Ferreira, & Ross (2018), and Reid, Bocian, Li & Quercia (2017)
 - Correspondence experiment: Hanson, Hawley, Martin, and Liu (2016), and Harkness (2016)

What's the Null Hypothesis?

- The paper claims that the model “can more easily explain why bias would persist in a competitive lending market,” but I think this is begging the question. **Why do these examiner contracts persist in a competitive lending market** is then the right question to answer.

What's the Null Hypothesis?

- The paper claims that the model “can more easily explain why bias would persist in a competitive lending market,” but I think this is begging the question. **Why do these examiner contracts persist in a competitive lending market** is then the right question to answer.
- It's hard for me to think about this paper as telling me something about bias and not just telling me that loan officers respond to incentives (Gee & Tzioumis, 2020, Agarwal & Ben-David, 2018).
 - I guess the counterfactual is that an examiner loans to all people on a risk-adjusted basis without bias **regardless of the effect it has on his or her own compensation?** That would surprise me. Do we have a strong prior that examiner's preferences for equality would lead them to ignore differences in short-term default that affect compensation? The conclusion that employees respond to contracting incentives is not surprising unless one thinks that examiner utility functions put great weight on equal treatment of borrowers.

What's the Null Hypothesis?

- The paper claims that the model “can more easily explain why bias would persist in a competitive lending market,” but I think this is begging the question. **Why do these examiner contracts persist in a competitive lending market** is then the right question to answer.
- It's hard for me to think about this paper as telling me something about bias and not just telling me that loan officers respond to incentives (Gee & Tzioumis, 2020, Agarwal & Ben-David, 2018).
 - I guess the counterfactual is that an examiner loans to all people on a risk-adjusted basis without bias **regardless of the effect it has on his or her own compensation?** That would surprise me. Do we have a strong prior that examiner's preferences for equality would lead them to ignore differences in short-term default that affect compensation? The conclusion that employees respond to contracting incentives is not surprising unless one thinks that examiner utility functions put great weight on equal treatment of borrowers.
- Should I think of this paper as an existence proof of a violation of Becker (1971) - if incentives are not aligned between principal and agent then long-term profitability can vary across groups even without taste-based bias?

What's the Null Hypothesis?

What's the Null Hypothesis?

- Showing that bias can be induced through incentives is less interesting to me than both **the microfoundation of the contracting** (Is this contracting representative of other high cost U.K. lenders? How does this persist? Does it persist?) and **why there is cross-sectional variation in short-term default rates across target and reference groups** (what's the microfoundation? Language barriers? Assimilation? How to understand the age results then?).

Why Aren't Employee Contracts Profit-Maximizing in Equilibrium?

- Even if the examiner turnover is high (and this is an endogenous outcome), the most obvious question to me is why this seemingly irrational wedge in contracting persists.
- Why does the lender compensate examiners in a way that is not profit-maximizing for the lender?
 - More importantly, how does this persist in equilibrium in a seemingly competitive market?

Why Aren't Employee Contracts Profit-Maximizing in Equilibrium?

- Even if the examiner turnover is high (and this is an endogenous outcome), the most obvious question to me is why this seemingly irrational wedge in contracting persists.
- Why does the lender compensate examiners in a way that is not profit-maximizing for the lender?
 - More importantly, how does this persist in equilibrium in a seemingly competitive market?
- The bizarre contracting makes me wonder even more about the external validity of this sample and leads me to want a lot more on the specifics of the contracting and why it is at odds with the (seemingly easy to contract on) long-term profits of the lender. There is a penalty for early default, but what does the profit-maximizing behavior of the examiner look like? Is there a wedge between the theoretical optimal behavior and the observed behavior? If yes, what's the friction?

Why are Short-Term Default Rates Different Across Target and Reference Groups?

- Search costs?
- Labor market differences?
- Differences in shadow financial safety net (can or cannot borrow from friends/relatives)?
- Differences in liquidity?
- Differences in information/understanding of lending contract?

Poking at the Identification

- Unemployment and earnings only collected when likely to approve, but these are essential controls. I worry about the selection bias of the paper's sample.
- Specialization of examiners. What about bias from time of the day that examiners work - would varied shifts allow for borrower selection?
- Is this language/ethnicity based? The ethnic background/language is self-reported? What about multiple language speakers?
- Are borrower characteristics randomly distributed across examiners? Conditional on ethnicity, examiner FEs should be insignificant with borrower characteristics on the LHS.

Other Proposals and Thoughts

- Look at this behavior as a function of competition – look at branches in more vs. less competitive areas.
- Look at this behavior not only with tenure, but with experience with the target group.
- Can we use online/phone applications for something cool? Is there selection into who uses the online/phone application process? How much of the sample uses physical branches vs. online?
- Surprised that everyone has a credit history, makes me wonder about external validity.
- really cool figures.

Conclusion

- I think this is a helpful paper organizing our thoughts on bias and showing that bias can be induced through incentives by a lender in the U.K.
- I think the authors' model is helpful in training our intuition to look for differences in marginal profitability.
- The focus of the paper is not as natural to me as **why the current contracting persists in a competitive, profit-maximizing, lending markets** and **why there are cross-sectional differences in short-term default rates** between target and reference groups.

References

- Agarwal, S. and Ben-David, I. (2018). "Loan prospecting and the loss of soft information" *Journal of Financial Economics*, 2018.
- Becker, G. S. (1971). "The Economics of Discrimination", Chicago: University of Chicago Press, second edition.
- Bartlett, R., Morse, A., Stanton, R., and Wallace, N. (2019). "Consumer-Lending Discrimination in the FinTech Era" NBER Working Paper
- Bradbury, K., Case, K. and Dunham, C. (1989). "Geographic Patterns of Mortgage Lending in Boston, 1982–87", *New England Economic Review*, 3–30.
- Carr, J., and Megbolugbe, I. (1993). "The Federal Reserve Bank of Boston Study on Mortgage Lending Revisited" *Journal of Housing Research*, 4(2): 277-313.
- Cheng, P., Lin, Z., and Liu, Y. (2015). "Racial Discrepancy in Mortgage Interest Rates" *Journal of Real Estate Finance and Economics*,
- Fuster, A., Goldsmith-Pinkham, P., Ramadorai, T., and Walther, A. (2018) "Predictably unequal? the effects of machine learning on credit markets", Working Paper
- Gee, M., and Tzioumis, K. (2020). "Nonlinear incentives and mortgage officers' decisions" *Journal of Financial Economics*, 2020.
- Glennon, D., and Stengel, M. (1994) "An Evaluation of the Federal Reserve Bank of Boston's Study of Racial Discrimination in Mortgage Lending." Working Paper
- Glennon, D., and Stengel, M. (1999). "Evaluating Statistical Models of Mortgage Lending Discrimination: A Bank-Specific Analysis," *Real Estate Economics*, 27: 299-334.
- Ghent, A., Hernandez-Murillo, R., and Owyang, M. (2014). "Differences in Subprime Loan Pricing Across Races and Neighborhoods" Federal Reserve Bank of St. Louis Working Paper No. 2011-033C.
- Harkness, S. (2016). "Discrimination in Lending Markets: Status and the Intersections of Gender and Race" *Social Psychology Quarterly* 79(1) 81-93.
- Holmes, A. and Horvitz, P. (1994). "Mortgage Redlining: Race, Risk, and Demand" *Journal of Finance*, 49, 81–99.
- Munnell, A. H., L. Browne, J. McEneaney, and G. Tootel, 1996, Mortgage lending in Boston: Interpreting HMDA data, *AER* 86, 25–54
- Perle, E., Lynch, K., and Horner, J. (1993). "Model Specification and Local Mortgage Market Behavior", *Journal of Housing Research*, 4, 225–43.
- Phillips-Patrick, F., and Rossi, C. (1996). "Statistical Evidence of Mortgage Redlining?. A Cautionary Tale" *Journal of Real Estate Research* 11: 13–24.
- Rachlis, M., and Yezer, A. (1993). "Serious Flaws in Statistical Tests for Discrimination in Mortgage Markets" *Journal of Housing Research*. 4.
- Ross, S., and Yinger, J. (2002). "The Color of Credit: Mortgage Discrimination, Research Methodology, and Fair-Lending Enforcement" MIT Press.
- Siskin, B., and Cupingood, L. (1996). "Use of Statistical Models to Provide Statistical Evidence of Discrimination in the Treatment of Mortgage Loan Applicants: A Study of One Lending Institution" In *Mortgage Lending, Racial Discrimination, and Federal Policy*, 451–468. Urban Inst. Press.
- Deku, S., Kara, A., and Molyneux, P. (2016) "Access to consumer credit in the UK" *The European Journal of Finance*, 22:10, 941-964