Explaining Racial Disparities in Personal Bankruptcy Outcomes

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Motivation

- Personal bankruptcy is a major source of debt relief for US households
  - 1 in 10 Americans have filed at some point in their life (Keys, 2018)
  - Average $149k per filer $\Leftrightarrow$ $832/adult/year discharged annually (US Courts, 2019)

- There are significant racial disparities in financial outcomes in the US
  - Median wealth of white households is 10x Black and Hispanic wealth: ($171k vs. $17k) (2016 SCF)
  - Minorities pay higher interest rates than whites with the same credit score (Ghent Hernández-Murillo Owyang, 2014; Bayer Ferreira Ross, 2017, Butler Mayer Weston 2021)
  - Black household consumption falls 50% more in response to the same income shock (Ganong Jones Noel Farrell Greig Wheat, 2020)

- **Question:** What racial disparities exist in personal bankruptcy? And why?

- **Approach:**
  - ▸ What observable filer characteristics explain disparities in bankruptcy outcomes?
  - ▸ Develop framework to formalize how **homophily** can **detect and quantify racial bias**
  - ▸ Estimate racial homophily between filers and judges/trustees

This Paper

- **Question:** What racial disparities exist in personal bankruptcy? And why?

- **Approach:**
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  - Develop framework to formalize how **homophily** can **detect and quantify racial bias**
  - Estimate racial homophily between filers and judges/trustees

- **Main findings:**
  - Black filers' cases are more likely to be dismissed (without debt discharge) on average
    - Chapter 7: 3 pps more often (167% higher) than non-Black filers
    - Chapter 13: 21 pps more often (41% higher) than non-Black filers
  - Observable variables reduce disparities to 0.6 and 11 pps for Chapters 7 and 13
  - Random assignment to white trustees $\Rightarrow$ Ch 13 dismissal rate $\uparrow$ 10 pps for Black filers

Contributions to Related Literature

- **Racial disparities in household finance:** Munnell, Browne, McEneaney, and Tootel (1996); Braucher et al. (2012); Reid Bocian, Li, and Quercia (2017); Bayer et al. (2018); Bartlett, Morse, Wallace, and Stanton (2019); Fuster et al. (2020); Morse and Pence (2020); Blattner and Nelson (2021); Begley and Purnanandam (2021); Dobbie Liberman Paravisini (2021); Goldsmith-Pinkham, Scott, and Wang (2022)
  - ▸ New focus on racial disparities in **bankruptcy** and its drivers

- **Impact of legal decision-makers:** Anwar et al. (2012, 2019a, 2019b); Arnold, Dobbie, and Yang (2018); Morrison et al. (2019); Arnold, Dobbie, and Hull (2020); Iverson (2020); Iverson et al. (2020)
  - ▸ Evidence on role of bias and importance of bankruptcy **trustees**

- **Methods for detecting and quantifying bias:** Becker (1957, 1993); Knowles, Persico, and Todd (2001); Anwar and Fang (2006); Arnold, Dobbie, and Yang (2018); Arnold, Dobbie, and Hull (2020); Canay, Mogstad, and Mountjoy (2020); Hull (2021); Bohren, Hull, and Imas (2022)
  - ▸ New results formalize how can **homophily** detect and quantify bias
  - ▸ Homophily can detect bias in **cases where outcome tests are infeasible**

Background and Data

What is Personal Bankruptcy?

- Discharge unsec. debt (credit card, medical, etc.); make partial payments to creditors

- Households file under one of two Chapters:
  - ▶ **Chapter 7:** discharge received upon initial legal ruling (∼3 month process)
  - ▶ **Chapter 13:** discharge received after completing 5 year repayment plan

- Three important legal decision makers (**DMs**):
  - ▶ **Judge:** ultimately decides case outcomes (e.g., dimissal)
  - ▶ **Trustee:** evaluates filer's accuracy and honesty; makes recommendations to judge
  - ▶ **Attorney:** advises filer on Chapter choice and reporting

Bankruptcy Outcomes

- Possible case outcomes: **discharge**, **conversion** of chapter, and **dismissal**

- What are the main reasons for **dismissal**?
  - Fraudulent reporting by filer (e.g., concealing property)
  - Failure to make promised payments in Chapter 13 over 5-year period

- **Trustees** and **judges** make **subjective** evaluations of filers
  - Procedural error vs. intentional fraud?
  - Did Chapter 13 payments stop due to severe hardship beyond filer's control?
  - Assessment of feasibility of filer's Chapter 13 repayment plan

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  - ► Procedural error vs. intentional fraud?
  - ► Did Chapter 13 payments stop due to severe hardship beyond filer's control?
  - ► Assessment of feasibility of filer's Chapter 13 repayment plan
  - ► Outcomes test isn't **feasible** when outcome(s) DM values are unobserved by researcher

Bankruptcy Data

- **Lexis Nexis** bankruptcy case data
  - Filer names and addresses, chapter, events during case, case outcomes, and DM names
  - Near universe of US bankruptcy cases: > 63 million cases
  - Full coverage of US Jan. 2010 – Jun. 2022

- **Federal Judicial Center (FJC)** case data
  - Additional case info for 2008+
  - Includes filer assets, liabilities, and income

- **2021 FL Voter Registration Records:** 20M obs, used to predict filer and DM race
  - Used to train and test deep-learning race-imputation model (based on Kotova, 2022)
  - Use full names and addresses (tract-level race composition); achieve 85% accuracy

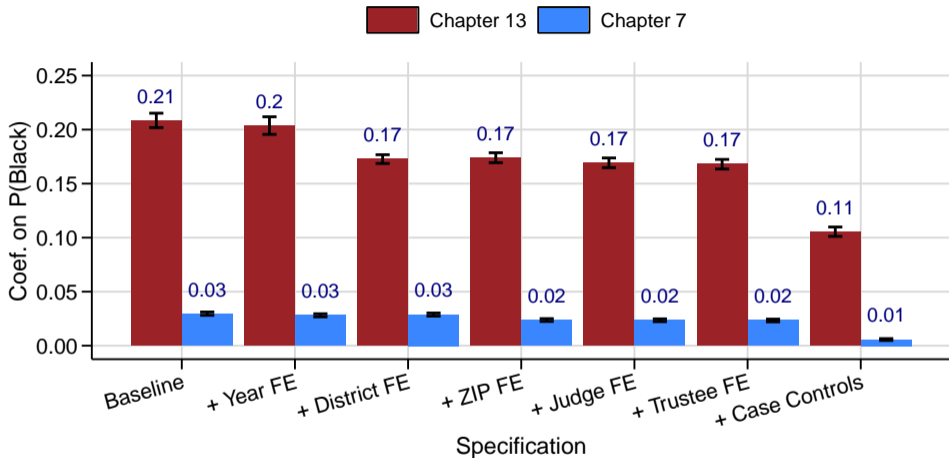▸ Model Perf. Stats   ▸ Model Perf. Graphs

Racial Disparities in Bankruptcy Dismissals

Racial Disparities in Dismissal Rates

Obs: 39M–12M (Ch. 7), 14M–4M (Ch. 13); **Clustering:** ZIP (95% confidence interval shown); **Case controls:** 1[pro se], 1[prior filing], 1[nonexempt assets], 1[homeowners], 1[joint filing], ln(assets), debt/assets, % secured debt, ln(income), and income - expense gap

▸ Table   ▸ Controls

Homophily and Bias: Decision & Econometric Model

Decision Model: Setting and Notation

- A DM j with race $r_j \in \{b, w\}$ observes filer i's race $r_i \in \{b, w\}$ and non-race char. x

- The DM chooses whether to dismiss $D \in \{0, 1\}$ to maximize her expected utility

- Her decision D affects a vector of outcomes $Y_D \in \mathbb{R}^M$, on which her utility depends

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- The DM solves: $\max_{d \in \{0,1\}} E_j[u(Y_d; j, r_i, x)|r_i, x]$
  - The DM takes expectation wrt to her beliefs

- Denote her payoff from dismissing: $\Delta(j, r_i, x) \equiv u(Y_1; j, r_i, x) - u(Y_0; j, r_i, x)$

- Her optimal decision is $D(j, r_i, x) = 1\{E_j[\Delta(j, r_i, x)|r_i, x] \geqslant 0\}$

Sources of Bias/Discrimination

- Denote the DM's prediction error: $\mu(j, r_i, x) \equiv E[\Delta(j, r_i, x)|r_i, x] - E_j[\Delta(j, r_i, x)|r_i, x]$
  - Differential prediction error by filer race can lead to inaccurate statistical discrimination

- Denote taste for discrimination: $\beta(j, r_i, x) \equiv E[\Delta(j, w, x)|r_i, x] - E[\Delta(j, b, x)|r_i, x]$

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- We can similarly decompose the drivers of the DM's decision:

$$D(j, r_i, x) = \underbrace{\widetilde{D}(j, r_i, x)}_{\text{decision w/ only acc. stat. disc.}} + \underbrace{\widetilde{\beta\mu}(j, r_i, x)}_{\text{influence of } \mu \text{ and } \beta}$$

where $\widetilde{D}(j, r_i, x) \equiv 1\{E[\Delta(j, w, x)|r_i, x] \geqslant 0\}$ and $\widetilde{\beta\mu}(j, r_i, x) \equiv D(j, r_i, x) - \widetilde{D}(j, r_i, x)$

Types of Bias

- A case exhibits total racial bias against Black filers if $D(j, b, x) > D(j, w, x)$

- A case exhibits $\beta\mu$-racial bias against Black filers if $\widetilde{\beta\mu}(j, b, x) > \widetilde{\beta\mu}(j, w, x)$

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- Motivation for focus on $\beta\mu$-racial bias:
  - Changing dismissal decisions to reduce taste-based and inaccurate statistical discrimination increases average DM welfare (net of tastes for discrimination)

  - Changing decisions due purely to accurate statistical disc. reduces average DM utility

Causal Parameters of Interest

- Average total racial bias: $\delta^{ATT} \equiv E[D(j, b, x) - D(j, w, x)|r_i = b]$

- Average $\beta\mu$-racial bias: $\delta^{\beta\mu} \equiv E[\widetilde{\beta\mu}(j, b, x) - \widetilde{\beta\mu}(j, w, x)|r_i = b]$

- **Identification challenges:**

  1. Average difference in dismissal rates could reflect selection (x correlated with r_i)

  2. Isolating $\beta\mu$-racial bias from total racial bias

Homophily Estimand & Parallel Disparities Assumption

- Homophily estimand: $\tau \equiv \underbrace{\{E_{bw}[D] - E_{ww}[D]\}}_{\text{racial disparity w/i white trustees}} - \underbrace{\{E_{bb}[D] - E_{wb}[D]\}}_{\text{racial disparity w/i Black trustees}}$

  ▸ To minimize notation, we write: $E[D|r_i, r_j] = E_{r_i r_j}[D]$ and suppress D's dependencies

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- **Assumption 1 (Parallel Disparities):**

$$E_{bw}[D(w)] - E_{ww}[D(w)] = E_{bb}[D(w)] - E_{wb}[D(w)]$$

I.e., the difference in Black/white filer outcomes due to non-race characteristics, which may be correlated with race, is the same among filers assigned to white or Black DMs

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- Could fail if conditional distribution of $x|r_i$ varies with DM race (in practice, this could arise if DM and filers could choose to work together)
  ▶ Falsification test: do r_i and case observables predict r_j?

- Could fail if Black/white DM decisions respond diff. to non-race chars corr. w/ race
  ▶ Falsification test: does relationship between D and case chars vary with DM race r_j?

Identifying Total Racial Bias

- **Prop 1:** IFF Assumption 1 (Parallel Disparities) holds, the homophily estimand identifies the average difference in total racial bias between Black and white DMs:

$$\tau = \delta_W^{ATT} - \delta_B^{ATT}$$

- $\Rightarrow$ testing $H_0 : \tau = 0$ serves as test for the presence of total racial bias
  - If $\tau \neq 0$, at least one DM exhibited total bias
  - Note: test has exact size, but may fail to reject when total bias is present

Parallel Accurate Statistical Discrimination

- **Assumption 2 (Parallel Accurate Statistical Discrimination, AKA PASD):**

$$E_{bw}[\widetilde{D}(b) - \widetilde{D}(w)] = E_{bb}[\widetilde{D}(b) - \widetilde{D}(w)]$$

I.e., if DMs make decisions based only on accurate statistical discrimination, the effect of a Black filers' race on dismissal would be equal across both white and Black DMs

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  - ▸ Hence same tests can help falsify this assumption

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- **Prop 2:** Under Assumption 1 (Parallel Disparities) , IFF Assumption 2 (PASD) holds, the homophily estimand identifies the avg. diff. in $\beta\mu$-racial bias btwn Black/white DMs:

$$\tau = \delta_W^{\beta\mu} - \delta_B^{\beta\mu}$$

- $\Rightarrow$ testing $H_0 : \tau = 0$ serves as test for the presence of $\beta\mu$-racial bias

Quantifying Bias

- Under parallel disparities and PASD , homophily estimand captures **relative bias**

- **Assumption 4:** $\delta_B^{\beta\mu} \geqslant 0$ (*on avg.*, Black DMs weakly exhibit bias against Black filers)

- Is Assumption 4 plausible?
  - ▶ Psychology research documents pro-white implicit bias among US minorities
    (Nosek et al., 2002; Livingston, 2002; Ashburn-Nardo et al., 2005)
  - ▶ Black patients exhibit higher WTP for white doctors vs. Black doctors (Chan, 2022)

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- Under Assumptions 1-2 and Assumption 4, homophily partially identifies disparity due to $\beta\mu$-racial bias:
  $$\delta^{\beta\mu} \in [(1-p)\tau, 1 - p\tau]$$

  where $1 - p = Pr(r_j = w)$, i.e., the proportion of white DMs
  - ▸ Paper details (weaker) lower bounds obtained under weaker assumptions

Racial Homophily in Bankruptcy

Estimating DM Homophily

- To investigate the scope for bias, we examine **homophily**
  - Today, we focus on Black-white homophily between filers and trustees

- Using case-level data, we estimate

$$1[Dismissed_i] = \beta_1 Pr(BlackFiler_i) + \beta_2 Pr(WhiteTrustee_i)$$
$$+ \beta_3 \left[Pr(BlackFiler_i) \times Pr(WhiteTrustee_i) \right] + X_i \gamma + \varepsilon_i$$

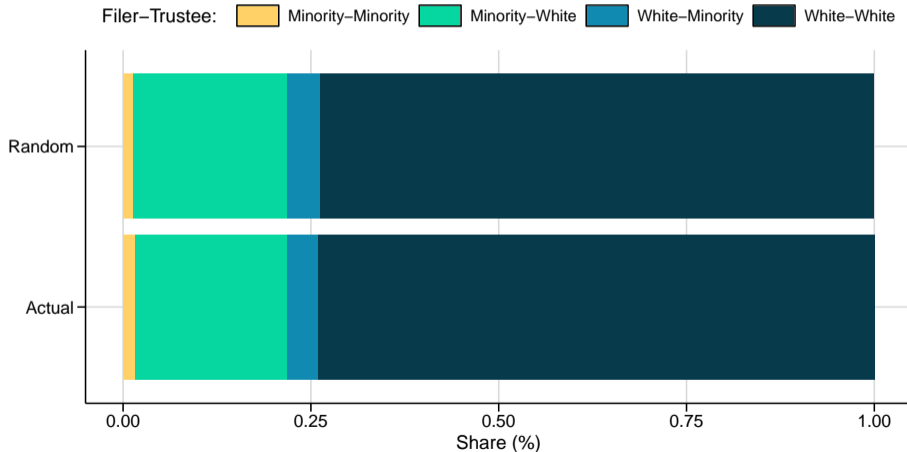- **Fixed effects:** disposition year, district, filer ZIP, judge, and trustee

Identification: Random and Quasi-Random Assignment of Trustees

- Chapter 7 trustees are assigned to cases via a blind rotation system
  - Morrison, Pang, and Zytnick (2019): evidence attorneys manip. Ch 7 trustee assignment
  - Trustee fixed effect mitigates this concern, accounting for typical trustee behavior

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- Chapter 13 Standing Trustees hired by local US Trustees Office

  ▸ Each court has at most *several* Ch. 13 trustees at a given time; seem rotated

  ▸ Time variation in local trustee race distribution ⇒ quasi-random assignment to filers

  ▸ E.g., assume Florida is not more likely to have a Black Chapter 13 trustee at times when unobserved factors make dismissal less likely for Black filers
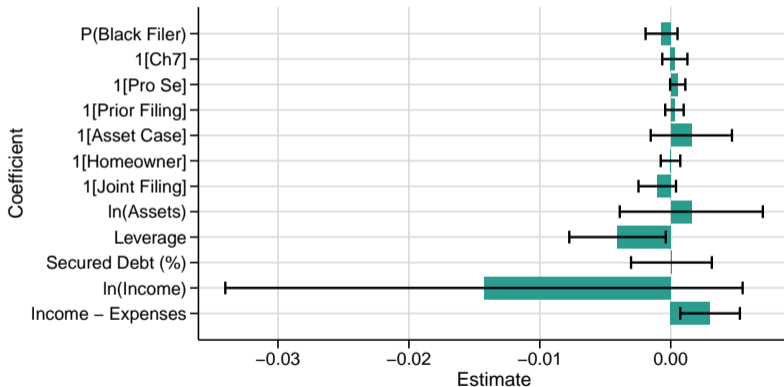
Plausibility of Random Assignment

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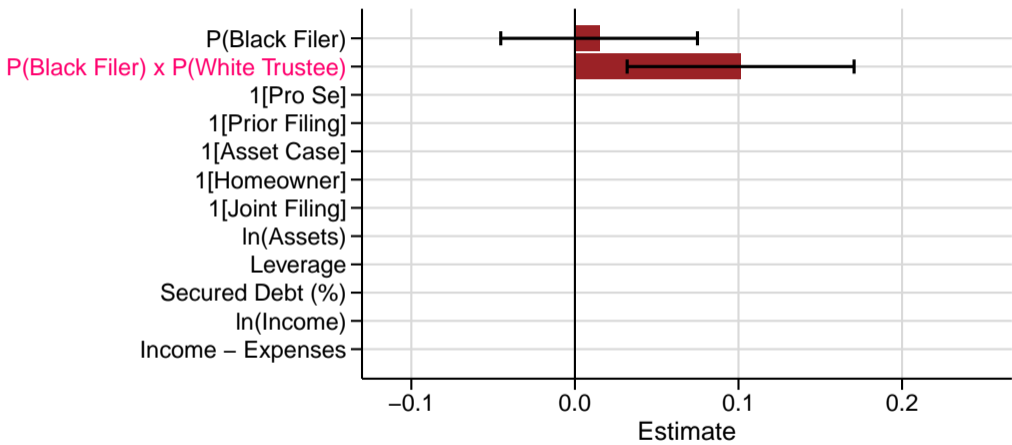❷ **Balance Test:** filer characteristics do not predict trustee race

▸ Table

Outcome: Pr(Black Trustee); **Fixed Effects:** disposition year, district, filer ZIP, judge and trustee; **Obs:** 13.6M;
Clustering: ZIP & Trustee (two-way, 95% confidence interval shown)
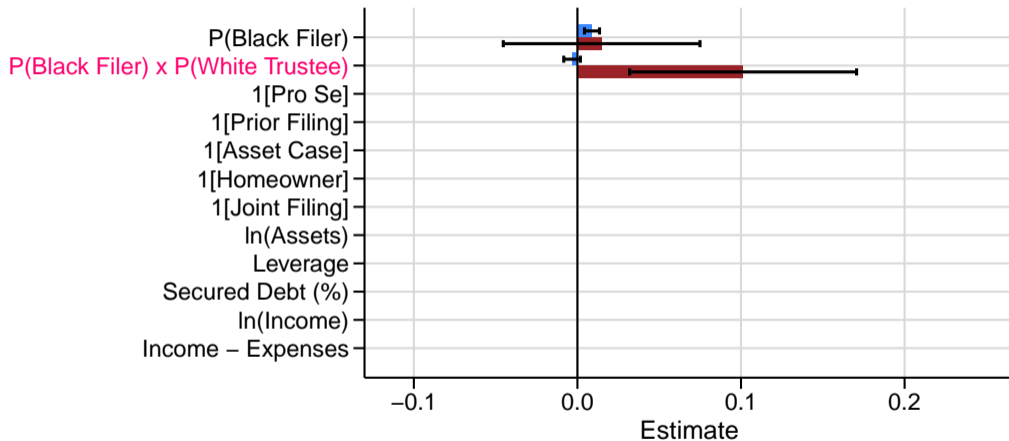
Homophily Estimation Results

Fixed Effects: disposition year, district, filer ZIP, judge and trustee; **Obs:** 9.8M(Ch. 7), 3.6M (Ch. 13);
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▸ Table   ▸ Add'l Interactions

Homophily Estimation Results

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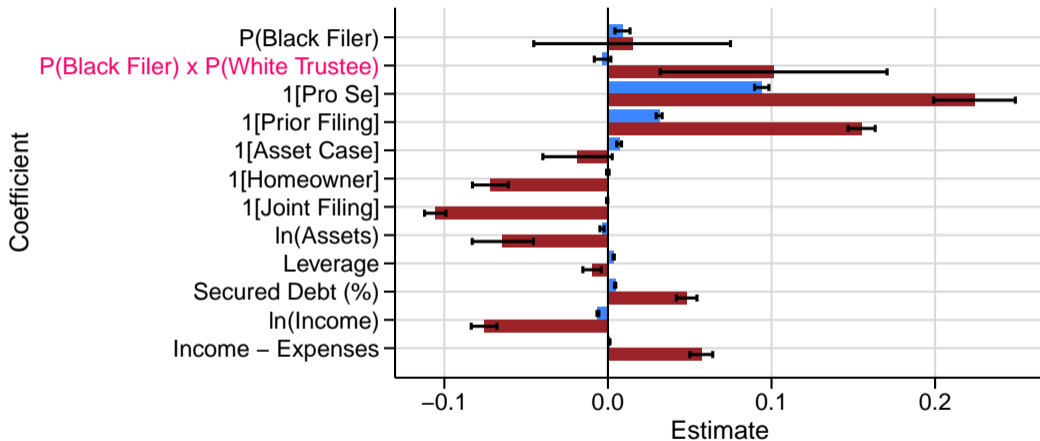**Clustering:** ZIP & Trustee (two-way, 95% confidence interval shown)

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Homophily Estimation Results

Legend: Chapter 13, Chapter 7

Coefficient (y-axis):
- P(Black Filer)
- P(Black Filer) x P(White Trustee)
- 1[Pro Se]
- 1[Prior Filing]
- 1[Asset Case]
- 1[Homeowner]
- 1[Joint Filing]
- ln(Assets)
- Leverage
- Secured Debt (%)
- ln(Income)
- Income – Expenses

Estimate (x-axis): –0.1, 0.0, 0.1, 0.2

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Quantifying Disparities Attributable to Bias

- Under...
  - ▸ Assumption 1: parallel disparities
  - ▸ Assumption 2: parallel accurate statistical discrimination
  - ▸ Assumption 4: non-white DMs weakly biased on average against Black filers

  ... we can bound the share of disparities due to $\beta\mu$-racial bias

- **Chapter 13:** $\tau_{13} = 0.10$ and $1 - p = 0.83$ imply $\delta_{13}^{\beta\mu} \in [0.08, 0.98]$
  $\Rightarrow$ > 40% of the 21 percentage point Chapter 13 dismissal disparity is due to bias

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- **Chapter 7:** $\tau_7 = 0$ and $1 - p = 0.83$ imply $\delta_{13}^{\beta\mu} \in [0, 1]$
  $\Rightarrow$ find no evidence of bias in Chapter 7

Black-White Dismissal Gap Correlates with Measure of Implicit Bias

Dismissal Rate vs Average IAT Score (County–Year Level)
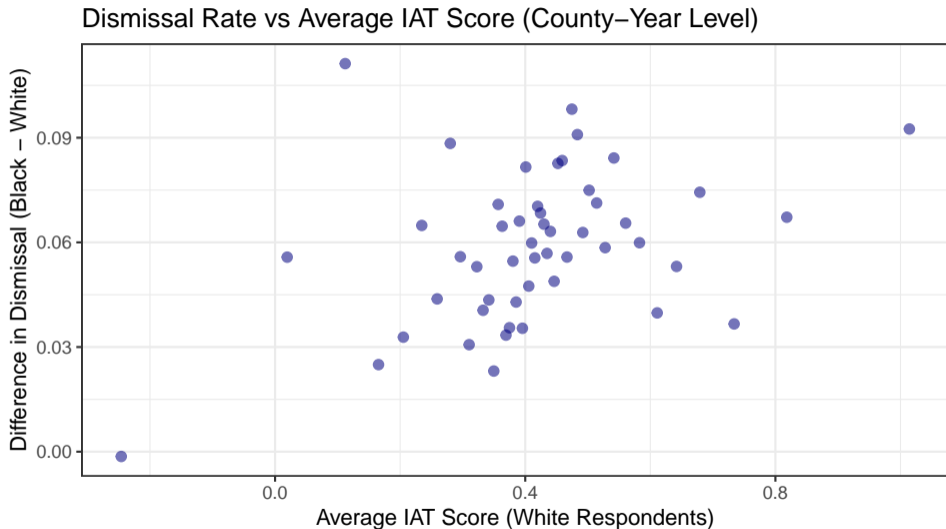
Conclusion

Conclusion

- Black bankruptcy filers experience significantly higher bankruptcy dismissal rates
  - Observables explain most Ch 7 disparities, but only ~50% for Ch 13

- Formalize how **homophily** can detect and quantify ($\beta\mu$) racial bias

- Black Ch 13 filers assigned to white trustees see **10% higher dismissal rates**

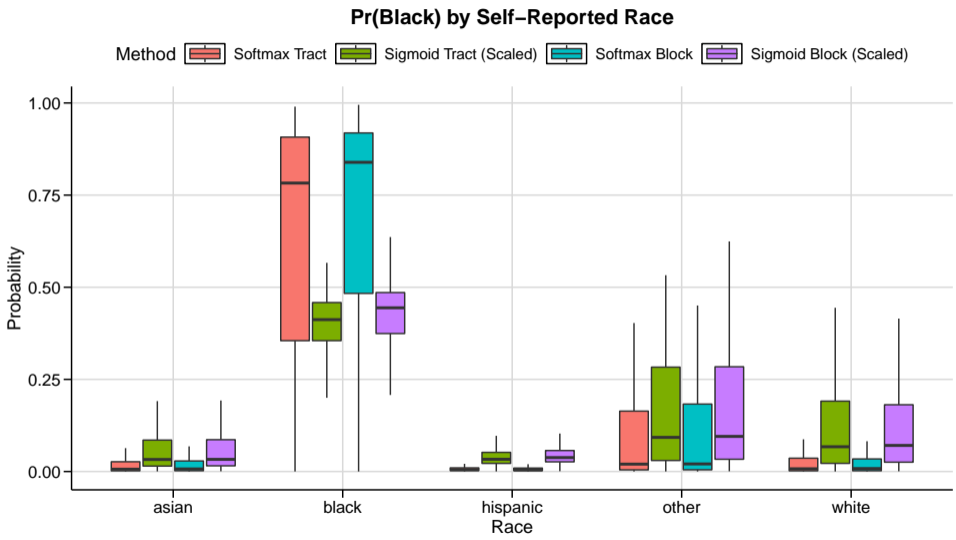- **Bias among bankruptcy DMs may limit Black households' access to debt relief**

Thanks!

Race Imputation Performance Stats

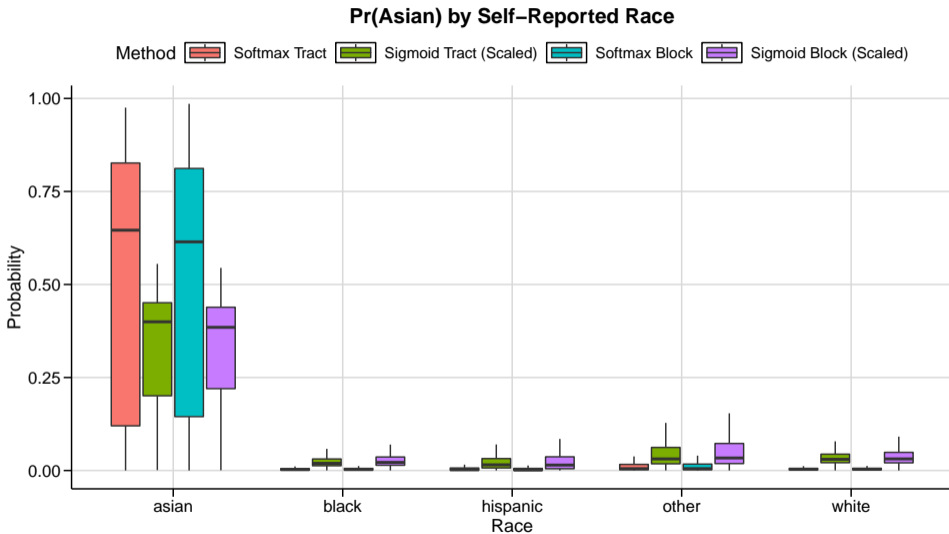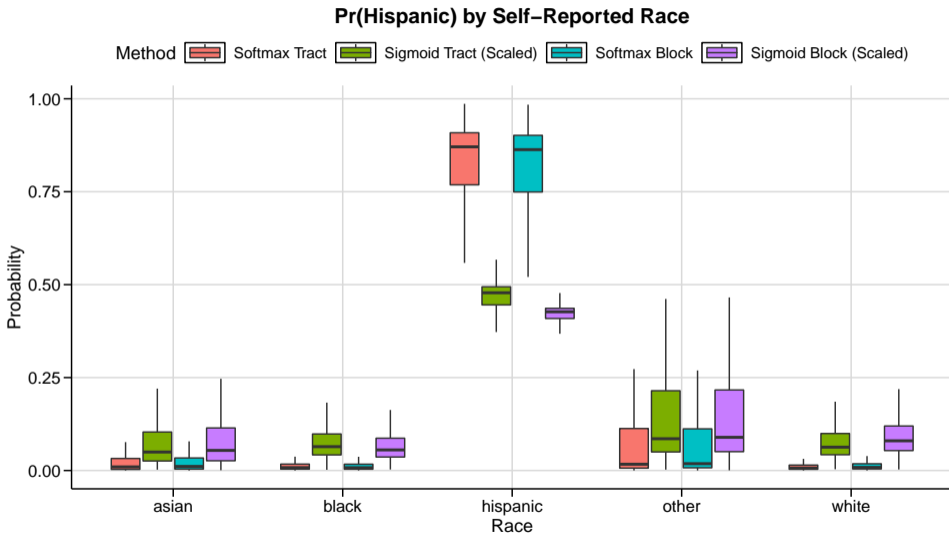| Race	Precision	Recall	F1-Score
Asian	0.67	0.60	0.63
Black	0.79	0.69	0.74
Hispanic	0.82	0.89	0.85
Other	0.40	0.04	0.07
White	0.87	0.95	0.91

Accuracy: % correctly predicted
Precision: % of predicted identifications that are correct
Recall: % of actual positives that are correctly identified
F1-Score: harmonic mean of precision and recall

Pr(Black) by Self−Reported Race

Method: Softmax Tract | Sigmoid Tract (Scaled) | Softmax Block | Sigmoid Block (Scaled)

Pr(Asian) by Self−Reported Race

Method — Softmax Tract — Sigmoid Tract (Scaled) — Softmax Block — Sigmoid Block (Scaled)

Pr(Hispanic) by Self−Reported Race

Method: Softmax Tract, Sigmoid Tract (Scaled), Softmax Block, Sigmoid Block (Scaled)

Pr(White) by Self−Reported Race

Pr(Other) by Self−Reported Race

Method ▭ Softmax Tract ▭ Sigmoid Tract (Scaled) ▭ Softmax Block ▭ Sigmoid Block (Scaled)
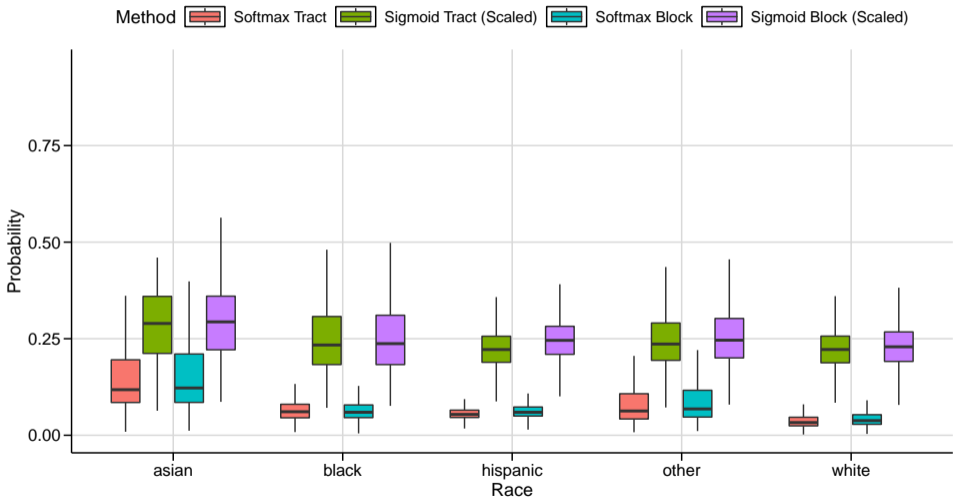
Racial Disparities in Dismissal Rates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Chapter 7 ($\mu = 0.023$)						
Pr(Black Filer)	0.030***	0.028***	0.029***	0.024***	0.024***	0.023***	0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(5e-04)
Num.Obs.	39,002,506	38,985,463	38,985,463	38,985,463	38,985,463	38,985,463	11,977,436
R2	0.002	0.004	0.008	0.280	0.283	0.289	0.055
	Chapter 13 ($\mu = 0.559$)						
Pr(Black Filer)	0.209***	0.204***	0.173***	0.174***	0.169***	0.168***	0.106***
	(0.003)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Num.Obs.	14,122,752	14,114,534	14,114,534	14,114,534	14,114,534	14,114,534	4,487,022
R2	0.019	0.064	0.097	0.406	0.417	0.424	0.305
Disp. Year FE		✓	✓	✓	✓	✓	✓
District FE			✓	✓	✓	✓	✓
Filer ZIP FE				✓	✓	✓	✓
Judge FE					✓	✓	✓
Trustee FE						✓	✓
FJC Controls							✓

Clustering: ZIP; **Statistical significance:** 10%*, 5%**, 1%***

Dismissal Rate Disparities

Racial Disparities in Dismissal Rates
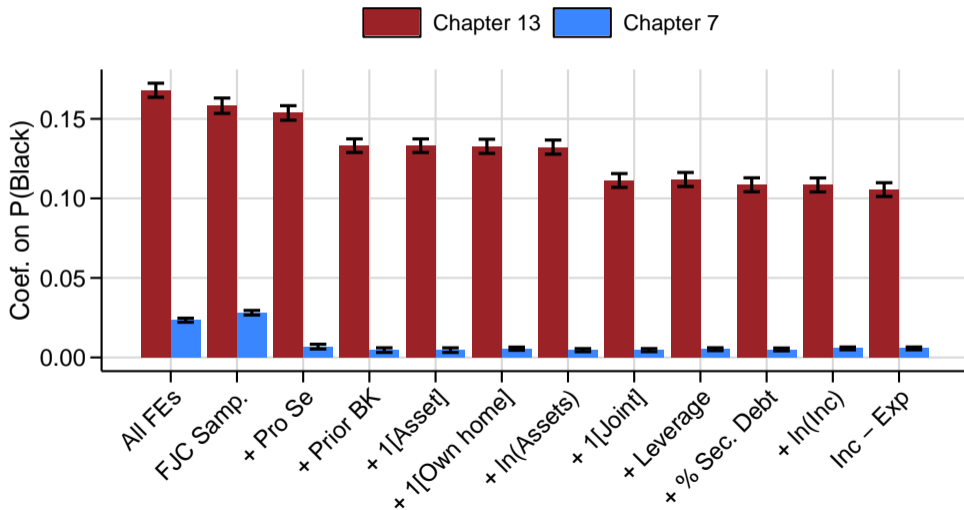
	Full Sample (1)	Chapter 7 (2)	Chapter 13 (3)
Pr(Black Filer)	0.044	0.009***	0.015
	(0.043)	(0.002)	(0.031)
1[Chapter 7]	-0.562***		
	(0.070)		
Pr(Black Filer) x Pr(White Trustee)	0.128***	-0.003	0.101***
	(0.049)	(0.003)	(0.035)
Pr(Black Filer) x 1[Chapter 7]	-0.043		
	(0.044)		
Pr(White Trustee) x 1[Chapter 7]	0.111		
	(0.079)		
Pr(Black Filer) x Pr(White Trustee) x 1[Chapter 7]	-0.130***		
	(0.049)		
Observations	13,373,013	9,815,556	3,557,457
R2	0.460	0.052	0.306

Fixed Effects: disposition year, district, filer, ZIP, judge, and trustee; **Case controls:** 1[pro se], 1[prior filing], 1[nonexempt assets], 1[homeowners], 1[joint filing], ln(assets), debt/assets, % secured debt, ln(income), and income - expense gap; **Clustering:** ZIP and Trustee (two-way); **Statistical significance:** 10%*, 5%**, 1%***