Explaining Racial Disparities in Personal Bankruptcy Outcomes

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October 2023

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 et al. 2014; Bayer et al.; 2017, Butler et al., 2021; Barlett et al., 2022)
  - Black household consumption falls 50% more in response to the same income shock (Ganong Jones Noel Farrell Greig Wheat, 2020)

This Paper

- **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 trustees

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- **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 trustees
- **Main findings:**
  - Black filers' cases are more likely to be dismissed (without debt discharge) on average
    - Chapter 7: 3 pps more often ($2\times$ higher than average)
    - Chapter 13: 16 pps more often (26% higher than average)
  - Observable variables reduce disparities to 0.5 and 9 pps for Chapters 7 and 13
  - Random assignment to White trustees $\Rightarrow$ Ch 13 dismissal rate $\uparrow$ 7.2 pps for Black filers
  - Inaccurate statistical or taste-based discrimination alter Black filers' outcomes

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 et al. (2001); Anwar and Fang (2006); Alesina and La Ferrara (2014); Arnold, Dobbie, and Yang (2018); Arnold, Dobbie, and Hull (2020); Canay, Mogstad, and Mountjoy (2020); Hull (2021); Bohren, Hull, and Imas (2022)
  - New results formalizing how **homophily** can 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 common 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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  - 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

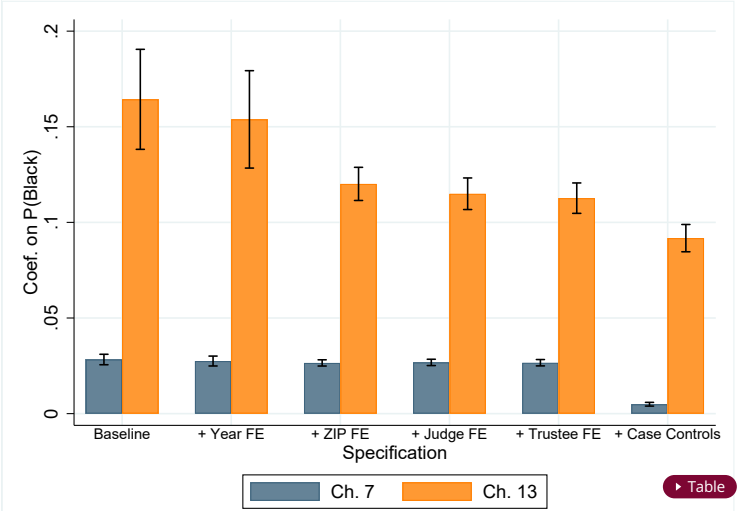
Bankruptcy and Race Data

- **Lexis Nexis** bankruptcy case data
  - Filer names and addresses, chapter, events during case, case outcomes, and DM names
  - 32M 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
- **L2 Data:** self-reported race for 36M registered voters from AL, FL, GA, LA, NC, SC, TN
  - Used to train and test deep-learning race-imputation model (based on Kotova, 2022)
  - Use full names and local race composition; achieves 88% accuracy (84% for Black people)
- Merged dataset with full race info and all controls: 8.5M obs

▸ Imputation Details ▸ Imputation Model Performance ▸ ROC and AUC

Racial Disparities in Bankruptcy Dismissals

Racial Disparities in Dismissal Rates



Unconditionally, Black filers are 3% and 16% more likely to be dismissed in Chapters 7 and 13 (respectively)

Avg. Ch 7: 3%
Avg. Ch 13: 61%

▸ Table ▸ Controls ▸ Chapter Choice ▸ Dismissal Timing

Homophily and Bias: Decision & Econometric Model

Decision Model (Overview)

- A decision-maker (DM) observes a filer's race and a **non-race characteristic** x
  - DM makes binary decision $D = 1[\text{dismiss}]$ affecting **vector of uncertain outcomes** Y
  - DM utility depends on Y; her decision maximizes her **subjective expected** utility
  - Econometrician does not observe Y **($\Rightarrow$ outcome test not possible)**
  - Objective can be **abstract or complex:** no restriction on size nor contents of Y

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- Decision D can be influenced by three forms of bias...
  1. **Taste-based:** differential **preferences** wrt Y by filer race (β)
  2. **Inaccurate statistical:** differential **prediction error** wrt Y by filer race (μ)
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- Paper decomposes decision $D =$ $\underbrace{\widetilde{D}}_{\text{decision w/ only acc. stat. disc.}} + \underbrace{\widetilde{\beta\mu}}_{\text{influence of } \mu \text{ and } \beta}$

Causal Parameters of Interest

- We want to learn how filer race affects case outcomes
  - Does $\beta\mu$-racial bias change dismissals on average for Black filers?

- **Identification challenges:**
  1. **Selection:** non-race char. that affect dismissal are also corr. with race (x corr. with r_i)
  2. **Isolating $\beta\mu$-racial bias** (i.e., netting out influence of accurate statistical racial bias)

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

  (differences between Black and White filers across Black and White DMs)

▸ Bias Definitions

Key Result: Homophily, Parallel Disparities, and Total Bias

- **Prop. 1:** Homophily (τ) identifies the average difference in (total) bias between Black and White DMs IFF **Parallel Disparities (Assumption 1)** holds
- **Assumption 1 (Parallel Disparities)** :

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

In words: if, counterfactually, Black filers were White, the disparity between Black and White filers assigned to White DMs would be the same as those assigned to Black DMs

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- What could violate **Parallel Disparities**?
  - **OK:** filer race can be correlated with non-race characteristics
  - **Not OK:** DM race corr. with x's that affect decision (possible if filers could choose DM)
  - **OK:** DM strictness can be correlated with DM race
  - **Not OK:** DMs react differently to x's corrrelated with filer race

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- What could violate **Parallel Disparities**?
- These threats motivate two falsification tests:
  - Falsification Test 1: do filer characteristics, including race, predict DM race?
  - Falsification Test 2: does the relationship between Dismissal and x vary with DM race?

Key Result: Detecting $\beta\mu$-Racial Bias

- **Prop. 2:** Under **Parallel Disparities** , homophily (τ) identifies the avg. diff. in $\beta\mu$-**racial bias** IFF: **Parallel Accurate Statistical Discrimination (Assumption 2)**
  - In words: if DMs made decisions based only on accurate stat. discrimination, the effect of a Black filers' race on dismissal would be the same for both White and Black DMs on avg.
  - The same falsification tests help to support this assumption

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  - Quantifying bias requires additional assumptions (more on this later)

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- Under assumptions 1-2, homophily yields a **test for the presence of $\beta\mu$-racial bias**
  - Quantifying bias requires additional assumptions (more on this later)
- Homophily can detect bias in many settings (lending, legal system, real estate, etc.)
  - In practice, likely need quasi-random assignment to DMs to use
  - Two falsification tests can support identifying assumptions
  - Can use when outcome test isn't feasible due to unobserved or abstract DM objectives

Details

Racial Homophily in Bankruptcy

Estimating DM Homophily

- We focus on dismissals and Black-White homophily between filers and trustees

- Using case-level data, we estimate

$$1[\text{Dismissed}_i] = \beta_1 Pr(BlackFiler_i) + \beta_2 \left[Pr(BlackFiler_i) \times \Pr(WhiteTrustee_i)\right] + X_i\gamma + \varepsilon_i$$

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

- **Controls:** 1[Pro Se], 1[Prior Filing], 1[Asset Case], 1[Homeowner], 1[Joint Filing], ln(Assets), Leverage, Secured Debt (%), and ln(Income)

Identification: Assignment Mechanism & Falsification Tests

- Chapter 7 trustees are assigned to cases via a blind rotation system
  - Morrison, Pang, and Zytnick (2019): evidence attorneys manip. Ch 7 trustee assignment
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  - 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

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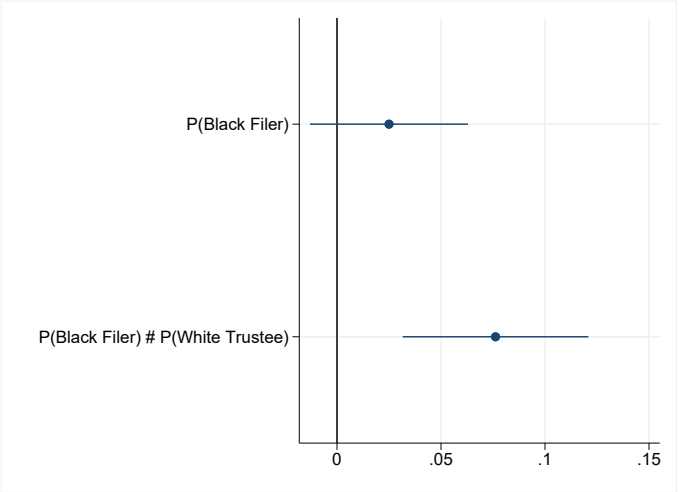
  - E.g., assume Florida is not more likely to have a Black Chapter 13 trustee at times when unobserved factors make dismissal less likely for Black filers
- Supporting evidence:
  - Filer-trustee pairings by race are consistent with random assignment ✓
  - **Balance Test 1:** filer race and non-race characteristics do not predict trustee race ✓
  - **Falsification Test 2:** trustee race interacted w/ non-race char. generally small & insig. ✓

▸ Pairings ▸ Balance Test ▸ Interaction Test

Dismissal Homophily Estimation Results

Ch 13: assignment to White trustees increases Pr(dismissal) **7.2%** for Black filers



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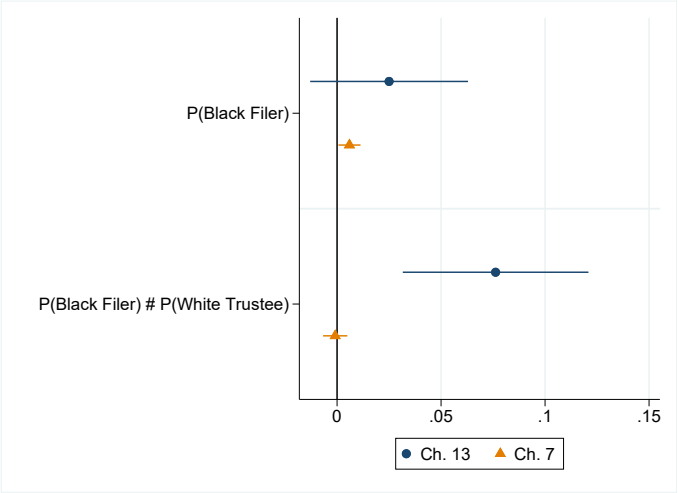

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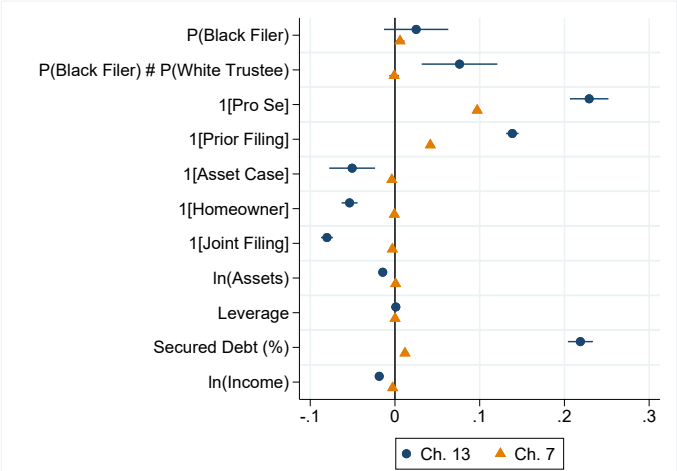


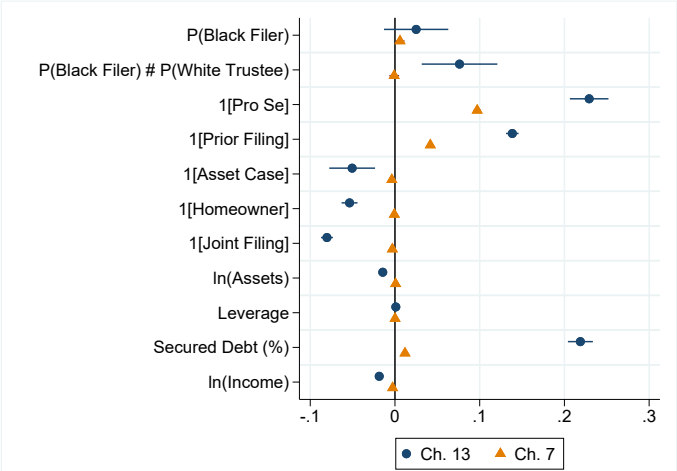
Bounding Details

Dismissal Homophily Estimation Results

Ch 13: assignment to White trustees increases Pr(dismissal) **7.2%** for Black filers

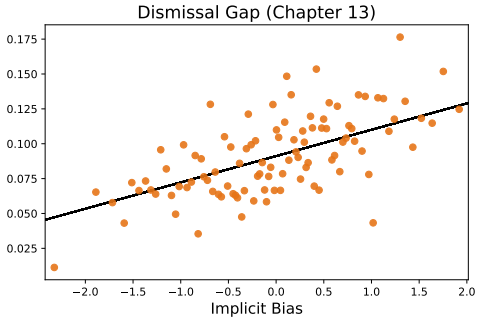
Ch 7: assignment to White trustees increases Pr(dismissal) **0%** for Black filers

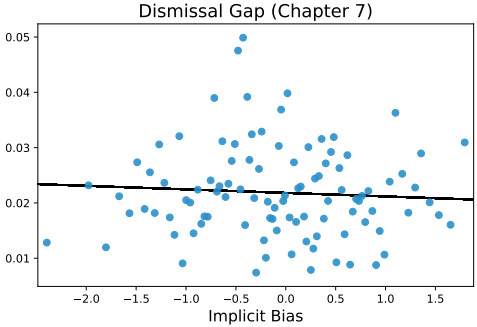
If non-White trustees are weakly biased against Black filers on avg. $\Rightarrow$ **$\beta\mu$-racial bias explains $\geqslant$ 36%** of the initial 16.4% Ch 13 disparity



Bounding Details

Black-White Dismissal Gap Correlates with IAT Scores





Note: IAT = Implicit Association Test. X-axis plots scores for White respondents required to take the test for either school or work. Underlying data is aggregated to a county-year level for 2010–2020. IAT scores are z-score normalized prior to plotting.

Conclusion

Conclusion

- Black bankruptcy filers experience significantly higher bankruptcy dismissal rates
  - Observables explain most Ch 7 disparities, but only ~50% for Ch 13
- Formalize when **homophily** can detect and quantify ($\beta\mu$) racial bias
  - Method can be applied to a variety of other settings, including those in which an outcome test may not be feasible
- Black Ch 13 filers assigned to white trustees see **7.2% higher dismissal rates**
  - Indicates presence of **taste-based or inaccurate statistical discrimination**
- **Bias among bankruptcy DMs may limit Black households' access to debt relief**

Thanks!

Race Data

Go Back

- **Limitation:** bankruptcy records do not report filer nor DM race
- **Solution:** impute race via supervised deep-learning model based on Kotova (2022)
- Model predicts race from *full* name and address
  - **Names:** split names into bigrams (e.g., "sa", "as", "sh", "ha")
  - **Filer location:** relate to census block's race composition (ACS data)
  - **DM location:** for now, we're using their office location's city
  - *In progress:* applying to DMs using home addresses collected via WhitePages

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  - *In progress:* applying to DMs using home addresses collected via WhitePages
- Train model on L2 voter data; achieve 88% accuracy (84% for Black people)
  - Bayesian Improved Surname Geocoding achieves about 50% accuracy for Black people

Race Imputation Performance Stats

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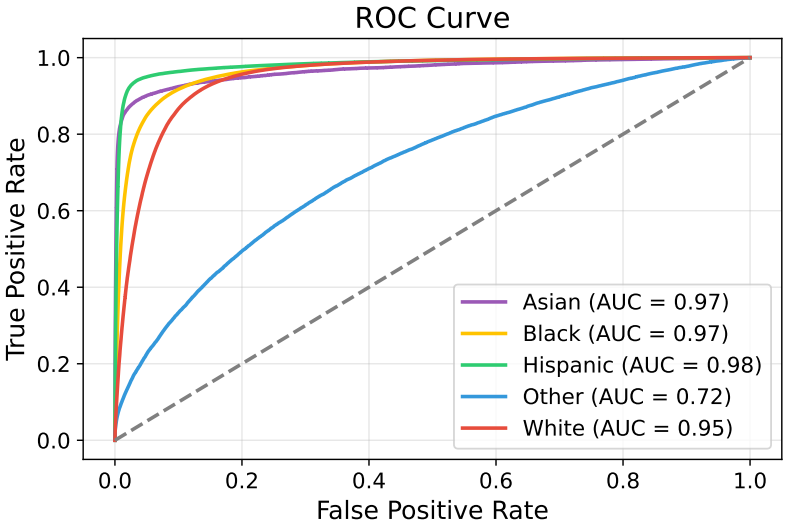
Accuracy: 88%

Race	Precision	Recall	F1-Score
Asian	0.68	0.81	0.74
Black	0.84	0.84	0.84
Hispanic	0.83	0.89	0.86
Other	0.73	0.02	0.04
White	0.91	0.94	0.92

Accuracy: % correctly predicted
Precision: % true positives among all identified positives
Recall: % true positives among all actual positives
F1-Score: harmonic mean of precision and recall

ROC Curves and AUC



Prediction Success: Black

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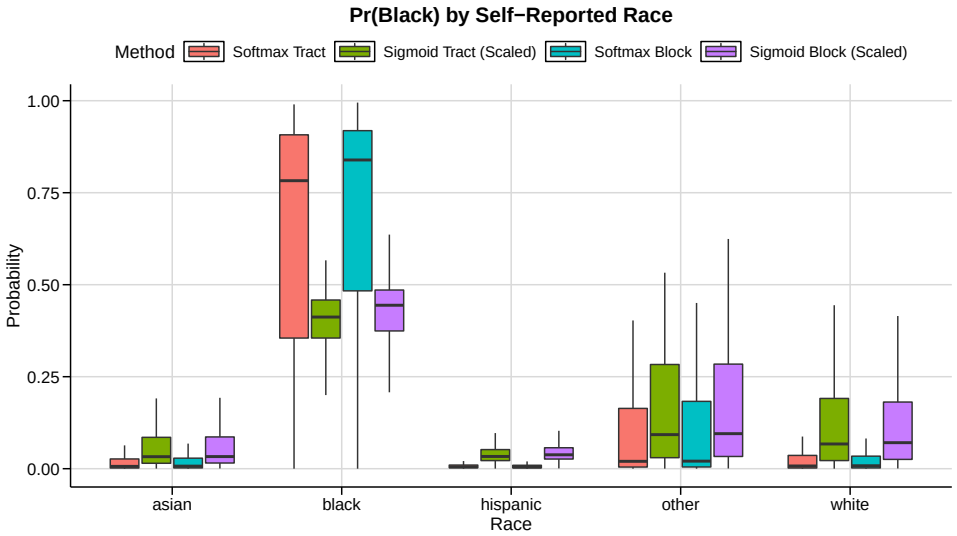

Prediction Success: Asian

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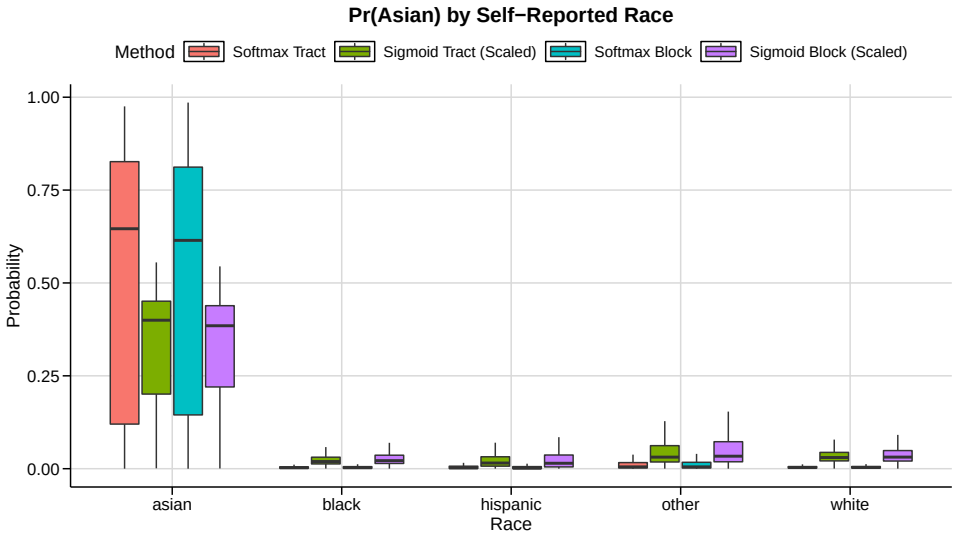

Prediction Success: Hispanic

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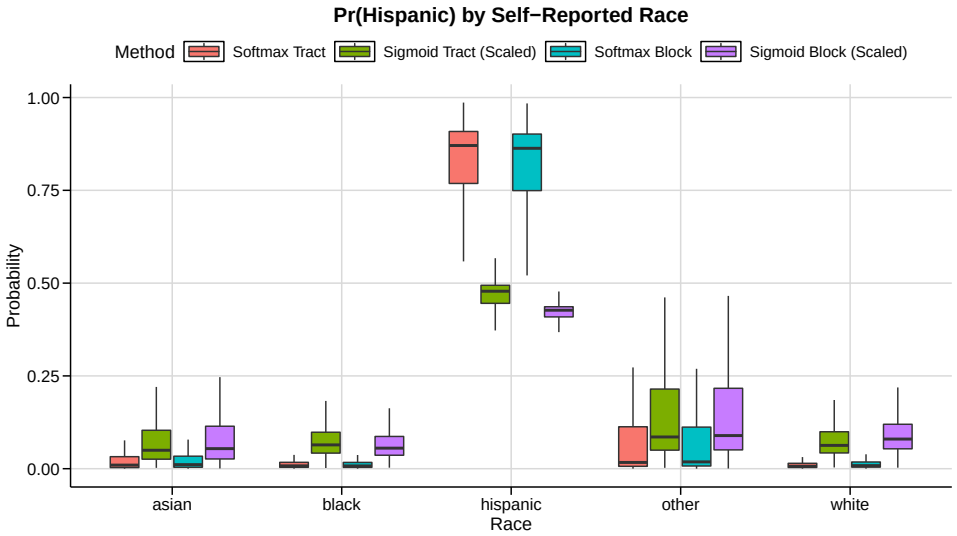

Prediction Success: White

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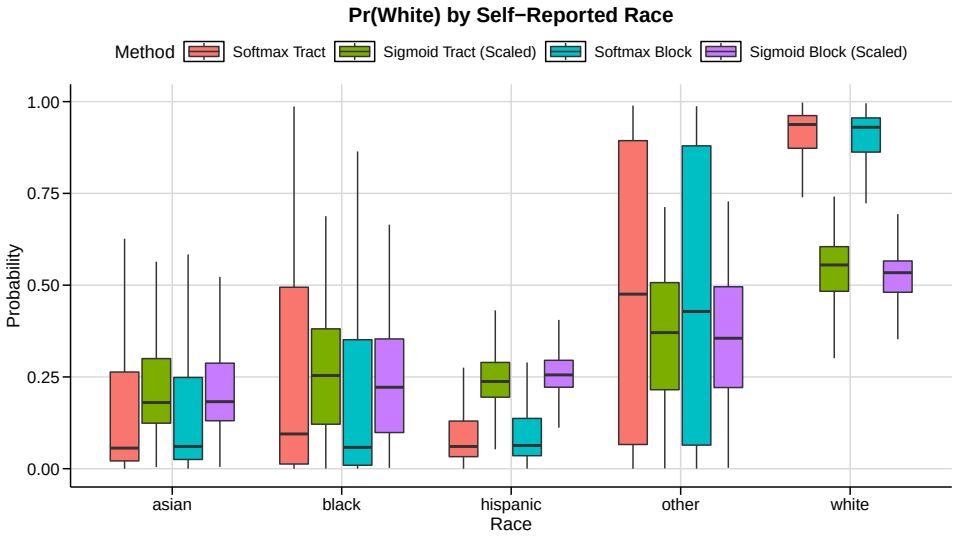

Prediction Success: Other

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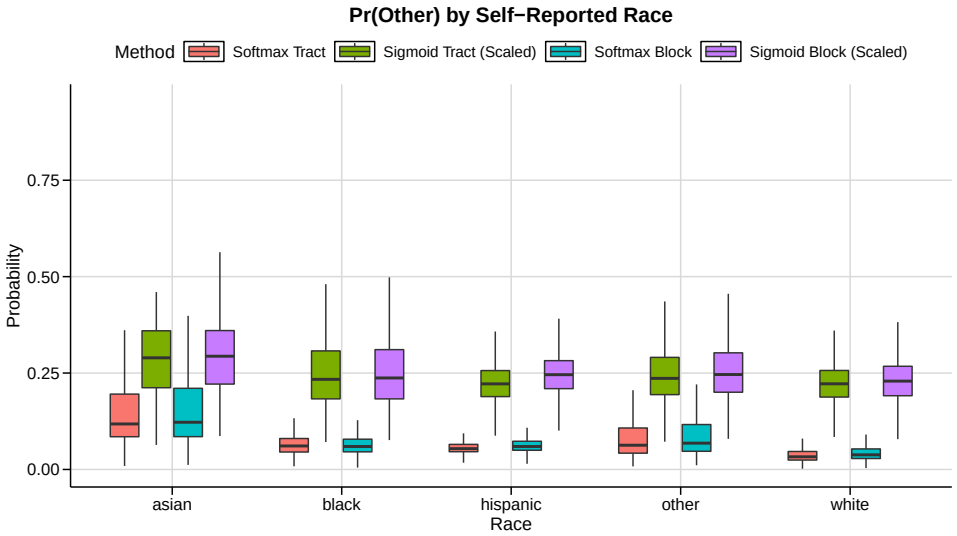

Racial Disparities in Dismissal Rates

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Chapter 7 (μ = 0.029)						
Pr(Black Filer)	0.029***	0.028***	0.025***	0.025***	0.025***	0.013***	0.004***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(5e-04)	(5e-04)
Num.Obs.	18,219,599	18,219,597	14,507,556	13,910,832	13,910,493	7,297,369	7,300,083
R2	0.002	0.005	0.124	0.119	0.124	0.018	0.052
	Chapter 13 (μ = 0.611)						
Pr(Black Filer)	0.171***	0.160***	0.118***	0.112***	0.110***	0.126***	0.089***
	(0.015)	(0.014)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
Num.Obs.	6,667,799	6,667,798	5,517,052	5,371,214	5,370,748	2,591,974	2,591,969
R2	0.016	0.042	0.227	0.258	0.277	0.217	0.257
Year FE		✓	✓	✓	✓	✓	✓
Zip FE			✓	✓	✓	✓	✓
Judge FE				✓	✓	✓	✓
Trustee FE					✓	✓	✓
FJC Controls							✓

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

Racial Disparities in Dismissal Rates (Controls)

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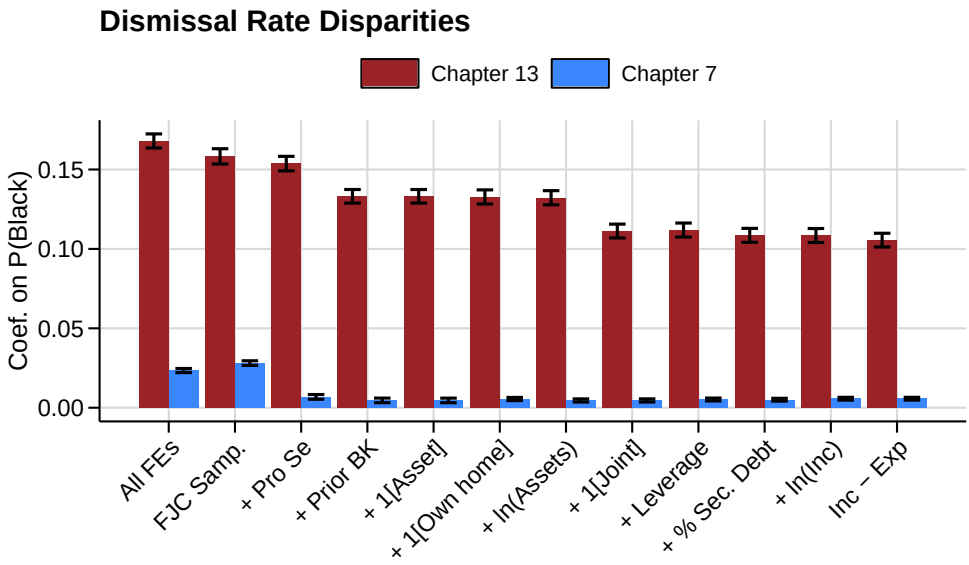

Racial Disparities: Chapter 13 Dismissal Rate Over Time

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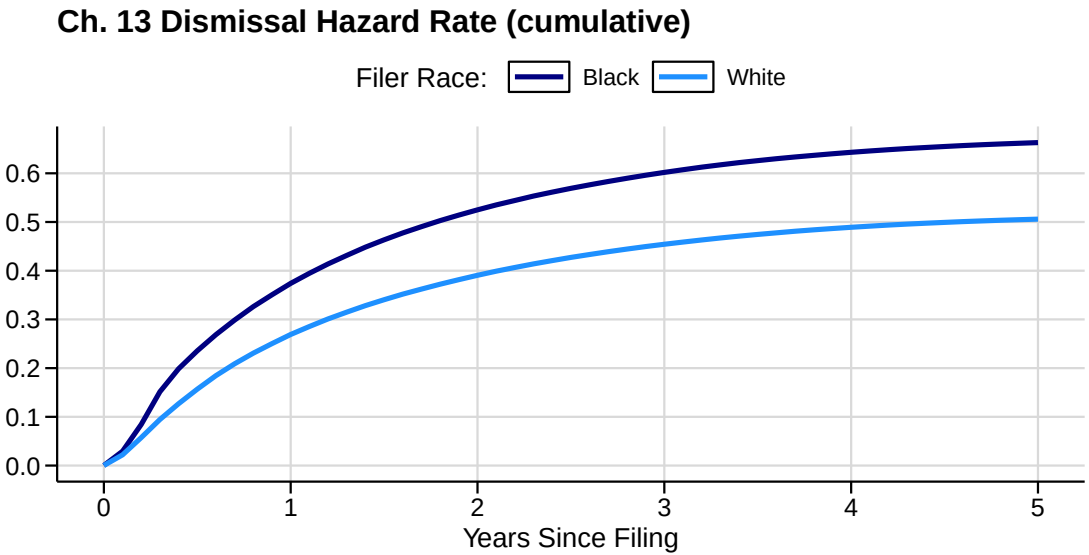

Racial Disparities in Dismissal Rates

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	Chapter 7 (1)	Chapter 13 (2)
Pr(Black Filer)	0.005*	0.025
	(0.003)	(0.020)
Pr(Black Filer) x Pr(White Trustee)	-0.0007	0.0742***
	(0.003)	(0.024)
Observations	6,004,449	2,044,884
R2	0.052	0.256

Fixed Effects: year, 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); **Clustering:** ZIP and Trustee (two-way); **Statistical significance:** 10%*, 5%**, 1%***

Homophily: Additional Interactions

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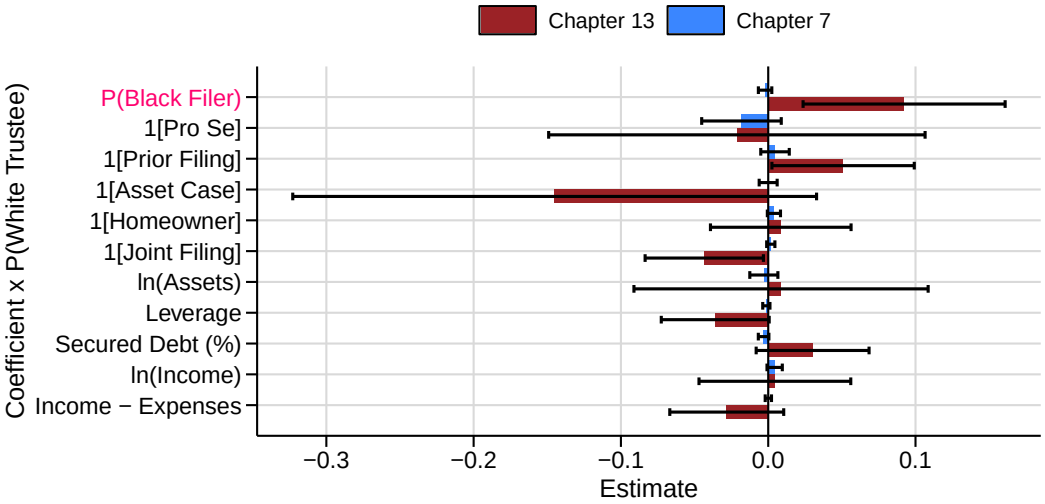

Quantifying Disparities Attributable to Bias

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- 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:** $\tau_{13} = 0.074$ and $1 - p = 0.83$ imply $\delta_{13}^{\beta\mu} \in [0.06, 0.99]$
  $\Rightarrow$ **> 36% of the 17 pp Chapter 13 dismissal disparity is due to $\beta\mu$-racial-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 racial bias in Chapter 7**

Causal Parameters of Interest

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Consider a case with a DM j and a filer with race $r_i \in \{b, w\}$ and non-race characteristic x

- 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 and Parallel Disparities

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

- **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

- More formally, parallel disparities can fail if either...
  - Conditional distribution of $x|r_i$ varies with DM race
    $\Rightarrow$ Falsification Test 1: do filer characteristics, including race, predict DM race?
  - Black/White DM decisions respond diff. to non-race chars corr. w/ race
    $\Rightarrow$ Falsification Test 2: does relationship between D and x vary with DM race?

- **Prop 1:** IFF (Parallel Disparities) holds, the homophily estimand identifies the average difference in total racial bias between Black and white DMs: $\tau = \delta_W^{ATT} - \delta_B^{ATT}$

Homophily and Parallel Disparities

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- Parallel disparities is similar to parallel trends:
  - **OK**: level differences in non-race characteristics x across races (e.g. Black filers have lower income than White filers)
  - **OK**: level differences in DM overall strictness (e.g. White trustees dismiss filers at higher rates than Non-White trustees)
  - **NOT OK**: DMs respond differently to x (e.g. White trustees react more strongly to income level than Non-white Trustees, and income is correlated with race)

Isolating $\beta\mu$-Racial Bias

- **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 made decisions based only on accurate statistical discrimination, the effect of a Black filers' race on dismissal would be the equal across both White and Black DMs

- Generally, PASD and parallel disparities face same threats $\Rightarrow$ same falsification tests are useful!

Isolating $\beta\mu$-Racial Bias

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- Generally, PASD and parallel disparities face same threats $\Rightarrow$ same falsification tests are useful!

- **Prop 2:** Under (Parallel Disparities) , IFF (PASD) holds, the homophily estimand identifies the avg. diff. in $\beta\mu$-racial bias btwn Black/White DMs: $\tau = \delta_W^{\beta\mu} - \delta_B^{\beta\mu}$

Quantifying Bias

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- Under parallel disparities & PASD , the 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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  - Black patients exhibit higher WTP for white doctors vs. Black doctors (Chan, 2022)
- Under Assumptions 1-2 and Assumption 4, homophily partially identifies the amount of disparity due to $\beta\mu$-racial bias:

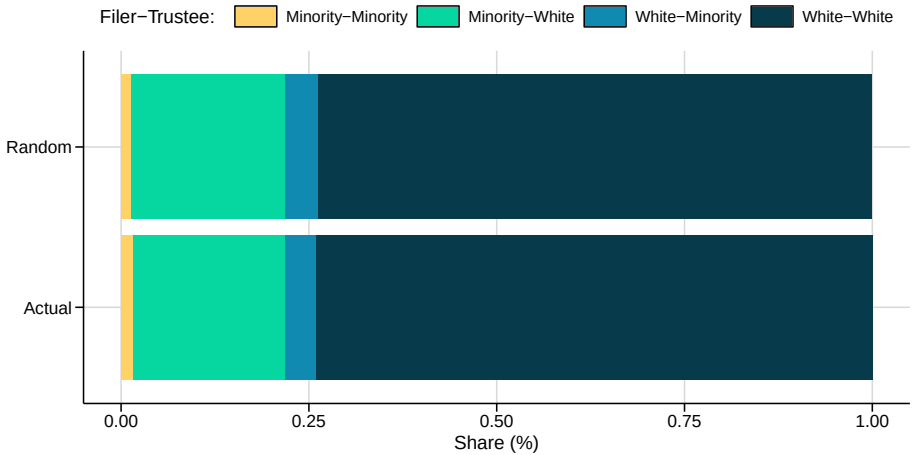
$$\delta^{\beta\mu} \in [(1-p)\tau, 1-p\tau]$$

where $1-p = Pr(r_j = w)$, i.e., the proportion of white DMs

  - Paper details (weaker) lower bounds obtained under weaker assumptions

Plausibility of Random Assignment

1. Pairing of filer-trustee by race consistent with random assignment



Plausibility of Random Assignment

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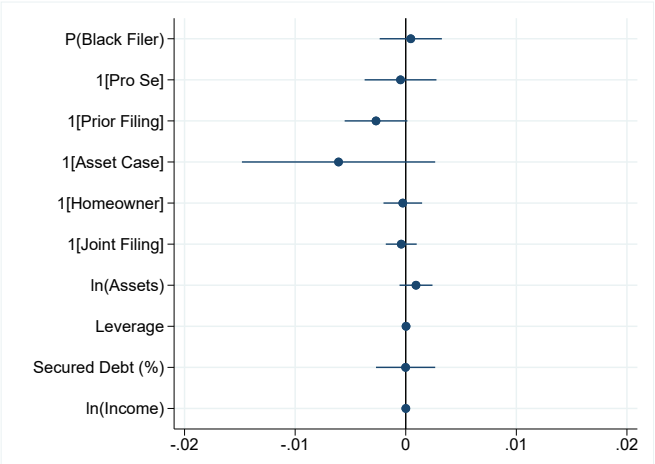
1. Pairing of filer-trustee by race consistent with random assignment
2. **Balance Test:** filer characteristics do not predict Pr(White Trustee)

Table



Falsification Test 2: Homophily and Additional Interactions

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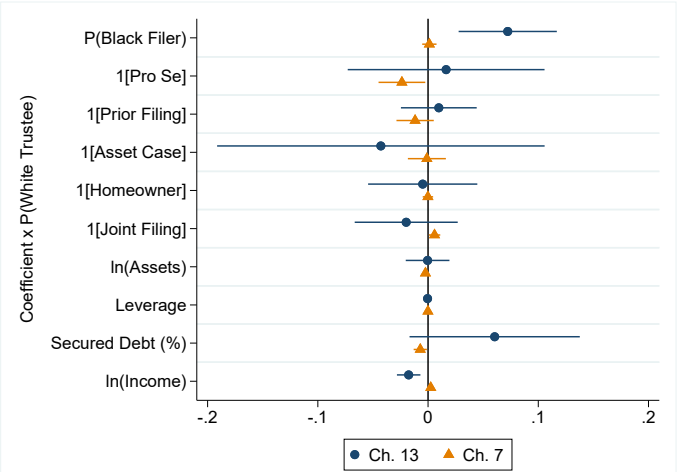

Trustee race generally does not distort trustee decision-making process (except in relation to filer race)