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 ⇔ $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)
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 judges/trustees

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Argyle Indarte Iverson Palmer—Explaining Racial Disparities in Personal Bankruptcy Outcomes
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 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 ⇒ Ch 13 dismissal rate ↑ 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., dismissal)
  - 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
Bankruptcy Outcomes

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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

- **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
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

Chapter 13 Chapter 7

Baseline + Year FE + District FE + ZIP FE + Judge FE + Trustee FE + Case Controls

Coef. on P(Black)

Table Controls
• 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 $D(j, r_i, x) = 1\{E_j[\Delta(j, r_i, x)|r_i, x] \geq 0\}$.
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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- Denote taste for discrimination: \( \beta(j, r_i, x) \equiv E[\Delta(j, w, x)|r_i, x] - E[\Delta(j, b, x)|r_i, x] \)

- We can decompose the DM’s payoff:
  \[
  E_j[\Delta(j, r_i, x)|r_i, x] = E[\Delta(j, w, x)|r_i, x] - \mu(j, r_i, x) - 1[r_i = b] \beta(j, b, x)
  \]
  - acc. stat. disc.
  - inacc. stat. disc.
  - taste-based disc.
Sources of Bias/Discrimination

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- We can similarly decompose the drivers of the DM’s decision:
  $$D(j, r_i, x) = \underbrace{\tilde{D}(j, r_i, x)}_{\text{decision w/ only acc. stat. disc.}} + \underbrace{\tilde{\beta} \mu(j, r_i, x)}_{\text{influence of} \ \mu \ \text{and} \ \beta}$$

  where $\tilde{D}(j, r_i, x) \equiv 1\{E[\Delta(j, w, x)|r_i, x] \geq 0\}$ and $\tilde{\beta} \mu(j, r_i, x) \equiv D(j, r_i, x) - \tilde{D}(j, r_i, x)$
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 $\tilde{\beta}\mu(j, b, x) > \tilde{\beta}\mu(j, w, x)$
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 $\tilde{\beta}_\mu(j, b, x) > \tilde{\beta}_\mu(j, w, x)$

- 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:** 
  \[ \delta^{\beta_\mu} \equiv E[\tilde{\beta_\mu}(j, b, x) - \tilde{\beta_\mu}(j, w, x)|r_i = b] \]

- **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: \( \tau \equiv \{E_{bw}[D] - E_{ww}[D]\} - \{E_{bb}[D] - E_{wb}[D]\} \)
  - racial disparity w/i white trustees  
  - racial disparity w/i Black trustees

  ▶ To minimize notation, we write: \( E[D|r_i, r_j] = E_{r_ir_j}[D] \) and suppress \( D \)'s dependencies

- 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

  ▶ 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 \( r_j \)?

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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:

  \[
  \tau = \delta^{ATT}_W - \delta^{ATT}_B
  \]

- \( \Rightarrow \) 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):**
  
  $$E_{bw} [\tilde{D}(b) - \tilde{D}(w)] = E_{bb} [\tilde{D}(b) - \tilde{D}(w)]$$

  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.

- **Faces similar possible violations as parallel disparities**
  - Hence same tests can help falsify this assumption
• **Assumption 2 (Parallel Accurate Statistical Discrimination, AKA PASD):**

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• Faces similar possible violations as parallel disparities
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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:** \( \delta_B^{\beta|\mu} \geq 0 \) (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
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

\[
1[\text{Dismissed}_i] = \beta_1 \Pr(\text{BlackFiler}_i) + \beta_2 \Pr(\text{WhiteTrustee}_i) \\
+ \beta_3 [\Pr(\text{BlackFiler}_i) \times \Pr(\text{WhiteTrustee}_i)] + X_i \gamma + \epsilon_i
\]

- **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
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

- **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

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

![Chart showing plausibility of random assignment]

<table>
<thead>
<tr>
<th>Filer–Trustee:</th>
<th>Actual</th>
<th>Random</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minority–Minority</td>
<td>0.00</td>
<td>0.25</td>
</tr>
<tr>
<td>Minority–White</td>
<td>0.50</td>
<td>0.75</td>
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<tr>
<td>White–Minority</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>White–White</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Plausibility of Random Assignment

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

2. **Balance Test**: filer characteristics do not predict trustee race

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)

![Graph showing coefficient estimates for various factors including P(Black Filer), 1[Ch7], 1[Pro Se], 1[Prior Filing], 1[Asset Case], 1[Homeowner], 1[Joint Filing], ln(Assets), Leverage, Secured Debt (%), ln(Income), Income − Expenses.]
Homophily Estimation Results

- **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**

**Fixed Effects:** disposition year, district, filer ZIP, judge and trustee; **Obs:** 9.8M (Ch. 7), 3.6M (Ch. 13);
**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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Homophily Estimation Results

- $P(\text{Black Filer})$
- $P(\text{Black Filer}) \times P(\text{White Trustee})$
- $1[\text{Pro Se}]$
- $1[\text{Prior Filing}]$
- $1[\text{Asset Case}]$
- $1[\text{Homeowner}]$
- $1[\text{Joint Filing}]$
- $\ln(\text{Assets})$
- $\ln(\text{Income})$
- $\text{Income} - \text{Expenses}$

**Fixed Effects:** disposition year, district, filer ZIP, judge and trustee; **Obs:** 9.8M (Ch. 7), 3.6M (Ch. 13);
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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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\Rightarrow > 40\%$ of the 21 percentage point Chapter 13 dismissal disparity is due to bias

- **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)

Argyle Indarte Iverson Palmer—Explaining Racial Disparities in Personal Bankruptcy Outcomes
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

<table>
<thead>
<tr>
<th>Race</th>
<th>Precision</th>
<th>Recall</th>
<th>F1-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>0.67</td>
<td>0.60</td>
<td>0.63</td>
</tr>
<tr>
<td>Black</td>
<td>0.79</td>
<td>0.69</td>
<td>0.74</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.82</td>
<td>0.89</td>
<td>0.85</td>
</tr>
<tr>
<td>Other</td>
<td>0.40</td>
<td>0.04</td>
<td>0.07</td>
</tr>
<tr>
<td>White</td>
<td>0.87</td>
<td>0.95</td>
<td>0.91</td>
</tr>
</tbody>
</table>

**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)

Race
- Asian
- Black
- Hispanic
- Other
- White

Probability

Argyle Indarte Iverson Palmer—Explaining Racial Disparities in Personal Bankruptcy Outcomes
Prediction Success: Asian

Pr(Asian) by Self-Reported Race

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

Race
- Asian
- Black
- Hispanic
- Other
- White

Probability

Argyle Indarte Iverson Palmer—Explaining Racial Disparities in Personal Bankruptcy Outcomes
Prediction Success: Hispanic

Pr(Hispanic) by Self-Reported Race

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

<table>
<thead>
<tr>
<th>Race</th>
<th>Probability</th>
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<tbody>
<tr>
<td>Hispanic</td>
<td>0.75</td>
</tr>
<tr>
<td>Other</td>
<td>0.25</td>
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<tr>
<td>Other</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Argyle Indarte Iverson Palmer—Explaining Racial Disparities in Personal Bankruptcy Outcomes
Pr(White) by Self-Reported Race

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

Race
- asian
- black
- hispanic
- other
- white

Probability

Argyle Indarte Iverson Palmer—Explaining Racial Disparities in Personal Bankruptcy Outcomes
Prediction Success: Other

Pr(Other) by Self–Reported Race

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

Probability

Race
- asian
- black
- hispanic
- other
- white

Argyle Indarte Iverson Palmer—Explaining Racial Disparities in Personal Bankruptcy Outcomes 6
### Racial Disparities in Dismissal Rates

**Chapter 7 ($\mu = 0.023$)**

<table>
<thead>
<tr>
<th></th>
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<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pr(Black Filer)</td>
<td>0.030***</td>
<td>0.028***</td>
<td>0.029***</td>
<td>0.024***</td>
<td>0.024***</td>
<td>0.023***</td>
<td>0.006***</td>
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<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(5e-04)</td>
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<tr>
<td>R2</td>
<td>0.002</td>
<td>0.004</td>
<td>0.008</td>
<td>0.280</td>
<td>0.283</td>
<td>0.289</td>
<td>0.055</td>
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**Chapter 13 ($\mu = 0.559$)**

<table>
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<th>(2)</th>
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<th>(5)</th>
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<tr>
<td>Pr(Black Filer)</td>
<td>0.209***</td>
<td>0.204***</td>
<td>0.173***</td>
<td>0.174***</td>
<td>0.169***</td>
<td>0.168***</td>
<td>0.106***</td>
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<tr>
<td></td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.002)</td>
<td>(0.002)</td>
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<tr>
<td>R2</td>
<td>0.019</td>
<td>0.064</td>
<td>0.097</td>
<td>0.406</td>
<td>0.417</td>
<td>0.424</td>
<td>0.305</td>
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- **Disp. Year FE**: ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
- **District FE**: ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
- **Filer ZIP FE**: ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
- **Judge FE**: ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
- **Trustee FE**: ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
- **FJC Controls**: ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓

**Clustering**: ZIP; **Statistical significance**: 10%*, 5%**, 1%***
Racial Disparities in Dismissal Rates (Controls)

Dismissal Rate Disparities

Chapter 13  Chapter 7

Argyle Indarte Iverson Palmer—Explaining Racial Disparities in Personal Bankruptcy Outcomes
### Racial Disparities in Dismissal Rates

<table>
<thead>
<tr>
<th></th>
<th>Full Sample (1)</th>
<th>Chapter 7 (2)</th>
<th>Chapter 13 (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pr(Black Filer)</td>
<td>0.044</td>
<td>0.009***</td>
<td>0.015</td>
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<tr>
<td></td>
<td>(0.043)</td>
<td>(0.002)</td>
<td>(0.031)</td>
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<tr>
<td>1[Chapter 7]</td>
<td>-0.562***</td>
<td>-0.003</td>
<td>0.101***</td>
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<td>(0.070)</td>
<td>(0.003)</td>
<td>(0.035)</td>
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<tr>
<td>Pr(Black Filer) x Pr(White Trustee)</td>
<td>0.128***</td>
<td>-0.003</td>
<td>0.101***</td>
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<tr>
<td></td>
<td>(0.049)</td>
<td>(0.003)</td>
<td>(0.035)</td>
</tr>
<tr>
<td>Pr(Black Filer) x 1[Chapter 7]</td>
<td>-0.043</td>
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<tr>
<td></td>
<td>(0.044)</td>
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<tr>
<td>Pr(White Trustee) x 1[Chapter 7]</td>
<td>0.111</td>
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<tr>
<td></td>
<td>(0.079)</td>
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<tr>
<td>Pr(Black Filer) x Pr(White Trustee) x 1[Chapter 7]</td>
<td>-0.130***</td>
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<tr>
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<td>(0.049)</td>
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<tr>
<td>Observations</td>
<td>13,373,013</td>
<td>9,815,556</td>
<td>3,557,457</td>
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<tr>
<td>R2</td>
<td>0.460</td>
<td>0.052</td>
<td>0.306</td>
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</table>

**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%***