Explaining Racial Disparities in Personal Bankruptcy Outcomes

Bronson Argyle  
BYU

Sasha Indarte  
Wharton, UPenn

Ben Iverson  
BYU

Christopher Palmer  
MIT & NBER

August 2022
Motivation

• Bankruptcy is a major source of debt relief in the US
  ▶ 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?
  ▶ Quantify *racial homophily* between filers and judges/trustees
  ▶ Develop framework to formalize how homophily can detect and quantify *racial bias*

• **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
This Paper

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

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

• **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); Barlett, Morse, Wallace, and Stanton (2019); Fuster et al. (2020); Morse and Pence (2020); Blattner and Nelson (2021); Begley and Purnanandam (2021); Goldsmith-Pinkham, Scott, and Wang (2021)
  - New focus on racial disparities in bankruptcy and drivers

- **Impact of legal decision-makers:** Anwar et al. (2012, 2019a, 2019b); Arnold, Dobbie, and Yang (2018); Arnold, Dobbie, and Hull (2020); Iverson (2020); Iverson, Madsen, Wang, and Xu (2020)
  - Highlight 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); Bohren, Hull, and Imas (2022)
  - Formalize link between homophily and bias
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; facilitates payments to creditors
  
  ▶ **Attorney**: advises filer on Chapter choice and reporting
The Bankruptcy Process

Chapter 7

Filer initiates by submitting schedules

Meeting of Creditors (run by trustee)
The Bankruptcy Process

Chapter 7

Filer initiates by submitting schedules

Meeting of Creditors (run by trustee)

Trustee recommends discharge

Trustee recommends converting chapter

Trustee recommends dismissal

Refile under Ch 13
The Bankruptcy Process

Chapter 13

Filer initiates by submitting schedules

Meeting of Creditors (run by trustee)

Trustee recommends discharge
Trustee recommends converting chapter
Trustee recommends dismissal
The Bankruptcy Process

Chapter 13

Filer initiates by submitting schedules

Meeting of Creditors (run by trustee)

Trustee recommends discharge

Trustee recommends converting chapter

Trustee recommends dismissal

Filer completes payments

Filer doesn’t complete payments

Refile under Ch 7
The Bankruptcy Process

Chapter 13

Filer initiates by submitting schedules

Meeting of Creditors (run by trustee)

Trustee recommends discharge

Trustee recommends converting chapter

Refile under Ch 7

Trustee recommends dismissal

Filer completes payments

Filer doesn’t complete payments
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 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
Race Data

• **Limitation:** bankruptcy records do not record 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 tract’s race composition (ACS data)
  ▶ **DM location:** for now we’re using their office location’s city
  ▶ **In progress:** collecting DM addresses via WhitePages

• Train on model on Florida Voter Registration Data ( > 20 mil. obs.)
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
Racial Homophily in Bankruptcy
To investigate the scope for bias, we examine **homophily**

- **Homophily**: how filer outcomes vary when facing same vs. different race DMs
- Today, we focus on Black-white homophily between filers and trustees

Using case-level data, we estimate

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

**Fixed effects**: disposition year, district, filer ZIP, judge, and trustee
• **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
Pairing of filer-trustee by race consistent with random assignment

**Balance Test:**
Filer characteristics do not predict trustee race

<table>
<thead>
<tr>
<th>Share (%)</th>
<th>Minority–Minority</th>
<th>Minority–White</th>
<th>White–Minority</th>
<th>White–White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual</td>
<td>0.00</td>
<td>0.25</td>
<td>0.50</td>
<td>0.75</td>
</tr>
<tr>
<td>Random</td>
<td>0.25</td>
<td>0.50</td>
<td>0.75</td>
<td>1.00</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

**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);

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

---

**Graph Description:**
- **Y-axis:** Coefficient
- **X-axis:** Estimate
- **Bars:** Represent coefficients for different variables:
  - **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**

**Chapter 13**
Homophily Estimation Results

- **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)

Table: Add'l Interactions

- Argyle Indarte Iverson Palmer – Explaining Racial Disparities in Personal Bankruptcy Outcomes
Homophily Estimation Results

**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 and Bias: Econometric Theory
Notion of Bias

- Let $Y(B, X)$ and $Y(NB, X)$ denote potential outcomes (e.g., $= 1$ if dismissed) if a filer with characteristic $X$ is Black or non-Black (respectively).

- **Definition:** A filer’s outcome is due to bias if $Y(B, X) \neq Y(NB, X)$
  - i.e., their outcome changes when only their race changes.

- Identification challenge: the avg. disparity is the sum of avg. bias and selection effects (similar to notions of direct vs. indirect/systemic bias in Bohren, Hull, and Imas, 2022)


**ATT (avg. disparity due to bias)**

$$E[Y(B) - Y(NB)|B]$$

**Selection effects**

$$E[Y(NB)|B] - E[Y(NB)|NB]$$
Notion of Bias

• Let $Y(B, X)$ and $Y(NB, X)$ denote potential outcomes (e.g., $= 1$ if dismissed) if a filer with characteristic $X$ is Black or non-Black (respectively)

• **Definition:** A filer’s outcome is **due to bias** if $Y(B, X) \neq Y(NB, X)$
  ▶ I.e., their outcome changes when only their race changes

• **Identification challenge:** the avg. disparity is the sum of avg. bias and selection effects (similar to notions of direct vs. indirect/systemic bias in Bohren, Hull, and Imas, 2022)


$\text{ATT} \ (\text{avg. disparity due to bias})$  $\text{selection effects}$
Notion of Bias

• Let $Y(B, X)$ and $Y(NB, X)$ denote potential outcomes (e.g., $= 1$ if dismissed) if a filer with characteristic $X$ is Black or non-Black (respectively)

• **Definition:** A filer’s outcome is due to bias if $Y(B, X) \neq Y(NB, X)$
  ▶ I.e., their outcome changes when only their race changes

• **Identification challenge:** the avg. disparity is the sum of avg. bias and selection effects (similar to notions of direct vs. indirect/systemic bias in Bohren, Hull, and Imas, 2022)

\[
\]

  \[\text{ATT (avg. disparity due to bias)}\]
  \[\text{selection effects}\]

• What can homophily tell us about the role of bias? I.e., the ATT?
• The homophily estimand $\tau$ is the difference in outcomes when assigned to white ($Y_W$) and non-white ($Y_{NW}$) DMs across Black and non-Black filers

$$
\tau = E[Y_W - Y_{NW}|B] - E[Y_W - Y_{NW}|NB]
$$

Assumption 1 (Parallel Disparities):

$E[Y_W(NB) - Y_{NW}(NB)|B] = E[Y_W(NB) - Y_{NW}(NB)|NB]$ 

I.e., the change in outcomes when moving from non-white to white DMs would be the same for Black and non-Black filers if they were all non-Black

▶ Weaker than random assignment of DMs (e.g., allows harsher white DMs on average)

▶ Violated if impact of non-race filer/case characteristics on decision corr. with DM race (i.e., if systemic bias, in the sense of Bohren, Hull, and Imas, 2022, varies with DM race)
The homophily estimand $\tau$ is the difference in outcomes when assigned to white ($Y_W$) and non-white ($Y_{NW}$) DMs across Black and non-Black filers

$$\tau = E[Y_W - Y_{NW}|B] - E[Y_W - Y_{NW}|NB]$$

**Assumption 1 (Parallel Disparities):**

$$E[Y_W(NB) - Y_{NW}(NB)|B] = E[Y_W(NB) - Y_{NW}(NB)|NB]$$

I.e., the change in outcomes when moving from non-white to white DMs would be the same for Black and non-Black filers if they were all non-Black

- Weaker than random assignment of DMs (e.g., allows harsher white DMs on average)
- Violated if impact of non-race filer/case characteristics on decision corr. with DM race (i.e., if systemic bias, in the sense of Bohren, Hull, and Imas, 2022, varies with DM race)
• **Proposition 1:** If parallel disparities (Assumption 1) holds, the homophily estimand identifies the average difference in DM bias:

\[ \tau = \beta^W - \beta^{NW} \]

where

\[ \beta^W = E[Y_W(B) - Y_W(NW)|B] \quad \text{(ATT for white trustees)} \]

\[ \beta^{NW} = E[Y_{NW}(B) - Y_{NW}(NB)|B] \quad \text{(ATT for non-white trustees)} \]

• **Remark 1:** Non-zero homophily (\( \tau \neq 0 \)) implies that at least one DM exhibits bias
Quantifying Anti-Black Bias

- **Assumption 2**: non-white DMs are weakly biased against Black filers on average

- How plausible is Assumption 2?
  - 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)

\[ \beta \in \left( (1 - p) \tau, 1 - \tau p \right) \]

For Chapter 13:

\[ \tau = 0.10 \quad \text{and} \quad 1 - p = 0.83 \]

imply \( \beta > 0.08 \) \( \Rightarrow \) > 40% of the 21 percentage point Chapter 13 dismissal disparity is due to bias
Quantifying Anti-Black Bias

- **Assumption 2:** non-white DMs are weakly biased against Black filers on average

- How plausible is Assumption 2?
  - 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)

- **Result 2:** Under Assumption 2, homophily identifies a lower bound for the amount of a disparity due to bias:

\[
\beta \in [(1 - p)\tau, 1 - \tau p]
\]

where \( p = Pr(R_{DM} = NW) \) (the proportion of non-white DMs).
Quantifying Anti-Black Bias

**Assumption 2:** non-white DMs are weakly biased against Black filers on average

**How plausible is Assumption 2?**
- 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)

**Result 2:** Under Assumption 2, homophily identifies a lower bound for the amount of a disparity due to bias:

\[
\beta \in [(1 - p)\tau, 1 - \tau p]
\]

where \( p = Pr(R^{DM} = NW) \) (the proportion of non-white DMs).

**For Chapter 13:** \( \tau = 0.10 \) and \( 1 - p = 0.83 \) imply \( \beta > 0.08 \)

\( \Rightarrow \) > 40% of the 21 percentage point Chapter 13 dismissal disparity is due to bias
Dismissal Rate vs Average IAT Score (County-Year Level)

Difference in Dismissal (Black – White) vs Average IAT Score (White Respondents)
Conclusion

• Black filers’ experience significantly higher bankruptcy dismissal rates

• Observables explain most Ch 7 disparities, but only ~50% for Ch 13

• Black filers assigned to white trustees see significantly higher dismissal rates

• Formalize link between homophily and bias

• Bias among bankruptcy DMs may limit Black households’ access to debt relief
Thanks!
## Racial Disparities in Dismissal Rates

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

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<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>
</tr>
<tr>
<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>
</tr>
<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>
</tr>
</tbody>
</table>

### Chapter 13 ($\mu = 0.559$)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<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>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
<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>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Specification</th>
<th>Coef. on P(Black)</th>
<th>Chapter 13</th>
<th>Chapter 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>All FEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FJC Samp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Pro Se</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Prior BK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ 1[Asset]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ 1[Own home]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ ln(Assets)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ 1[Joint]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Leverage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ % Sec. Debt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ ln(Inc)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inc − Exp</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Argyle Indarte Iverson Palmer – Explaining Racial Disparities in Personal Bankruptcy Outcomes
<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>
</tr>
<tr>
<td></td>
<td>(0.043)</td>
<td>(0.002)</td>
<td>(0.031)</td>
</tr>
<tr>
<td>1[Chapter 7]</td>
<td>-0.562***</td>
<td>-0.003</td>
<td>0.101***</td>
</tr>
<tr>
<td></td>
<td>(0.070)</td>
<td>(0.003)</td>
<td>(0.035)</td>
</tr>
<tr>
<td>Pr(Black Filer) x Pr(White Trustee)</td>
<td>0.128***</td>
<td>-0.003</td>
<td>0.101***</td>
</tr>
<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>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.044)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pr(White Trustee) x 1[Chapter 7]</td>
<td>0.111</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.079)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pr(Black Filer) x Pr(White Trustee) x 1[Chapter 7]</td>
<td>-0.130***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.049)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>13,373,013</td>
<td>9,815,556</td>
<td>3,557,457</td>
</tr>
<tr>
<td>R2</td>
<td>0.460</td>
<td>0.052</td>
<td>0.306</td>
</tr>
</tbody>
</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%***
Homophily: Additional Interactions

- P(Black Filer)
- 1[Pro Se]
- 1[Prior Filing]
- 1[Asset Case]
- 1[Homeowner]
- 1[Joint Filing]
- ln(Assets)
- Leverage
- Secured Debt (%)
- ln(Income)
- Income − Expenses

Estimate

Coefficient x P(White Trustee)

Chapter 13  Chapter 7