

College Enrollment and Earnings: Examining the Impact of Two Federal Drug Acts

Ray Huang^{*}

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Abstract

(aspirational abstract) I examine the impact of two federal drug acts on college enrollments and earnings among black males by using a variety of counterfactual groups. The Anti-Drug Act of 1986 transformed the formerly rehabilitation-focused justice system into a punitive one, imposed sentencing minimums and disparities. The Fair Sentencing Act of 2010 undid many of these policies. I construct estimates of the impact of these two acts on black males aged 18-24 using three unique counterfactual groups: 1) white males, 2) black females, and 3) black men aged 28-34. I also leverage the variation between high and low drug arrest states. I estimate that the Anti-Drug Act of 1986 resulted in a change in college enrollment rates between XX and XX and a change in earnings between XX and XX. For this subpopulation, this implies estimates of economic returns to education ranging from XX to XX.

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Introduction

Anti-Drug Act of 1986:

- Created minimum sentencing laws re possession of many drugs.
- Crack/powdered cocaine was particularly relevant (significantly harder rules on crack, which was cheaper and used by minorities much more, 100-1 ratio)
- The law led to an increase in the average time imprisoned for drug crimes from 22 months to 33 months (Shewan)

Fair Sentencing Act of 2010:

- Reduced the disparity between the amount of crack cocaine and powder cocaine needed to trigger certain federal criminal penalties from a 100:1 weight ratio to an 18:1 weight ratio
- Eliminated minimum sentencing for crack cocaine
- Congressional Budget Office has estimated that implementing the Fair Sentencing Act of 2010 will reduce the prison population by 1,550 person-years over the time period from 2011–2015, creating a monetary savings of \$42 million during that period

Existing literature:

- The Labor Market Consequences of Incarceration- Western, Kling, Weiman (2016)
- Juvenile Incarceration, Human Capital, and Future Crime: Evidence from Randomly Assigned Judges - Aizer, Doyle (2015)
- Evan Rose papers: The Impact of Incarceration on Employment and Earnings, etc

Data

- CPS October supplement
- UCR from ICPSR (missing data problem, many counties failed to report arrest rates for the relevant crimes)
- ACS

Empirical/Econometric Methods, Hypotheses tested

Counterfactual groups

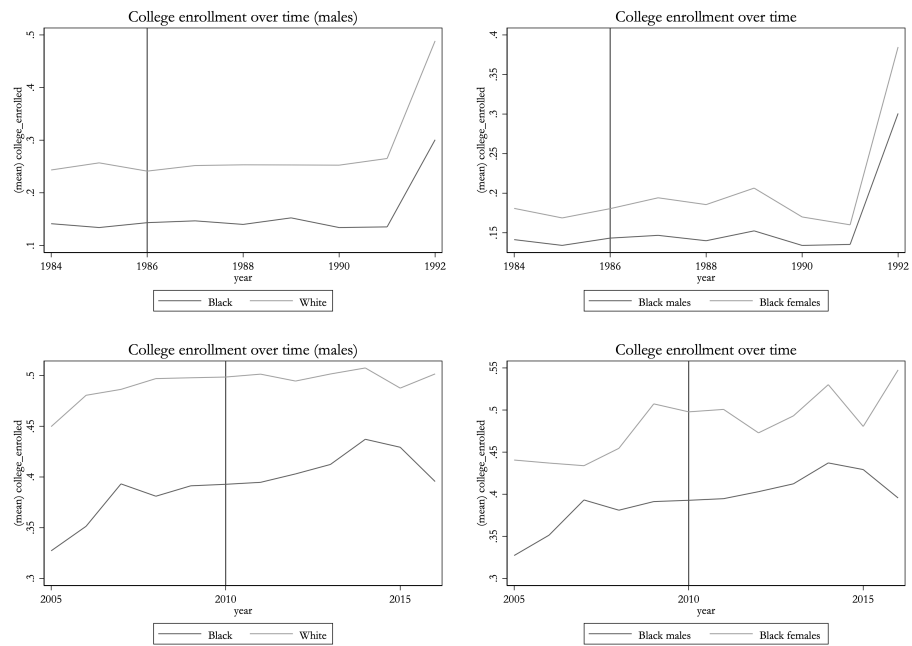
- Black males vs white males
 - Identifying assumption: absent of the Anti-Drug Abuse Act of 1986, black and white male educational outcomes would have trended similarly.
- Black males vs black females
- Black males aged 18-24 vs black males aged 28-34 at the time of the act
- High vs low drug use

Empirical tools:

- DiD / DDD / Event study.
- – Using Roth's pretrend & honest did suggestions
- DDIV

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Note: all figures are limited to ages 18-24 inclusive.



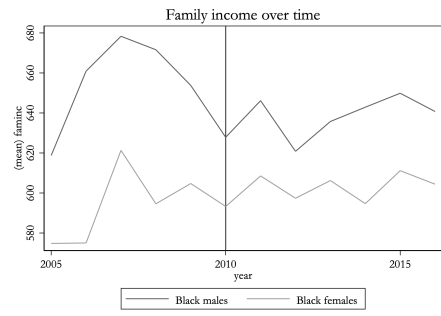
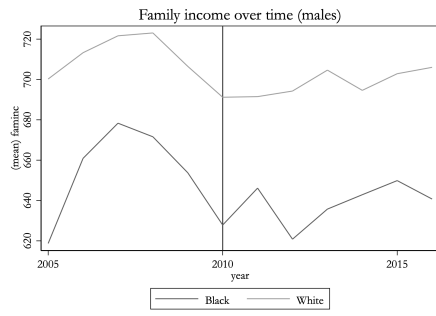
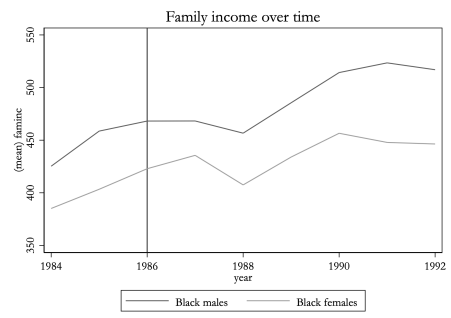
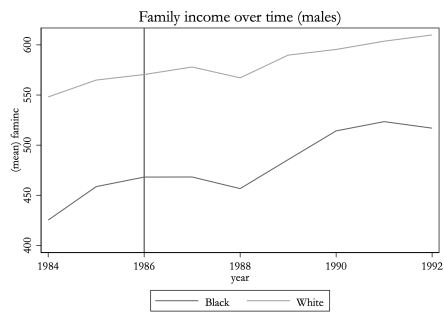


Figure 1: College enrollment overtime 1986

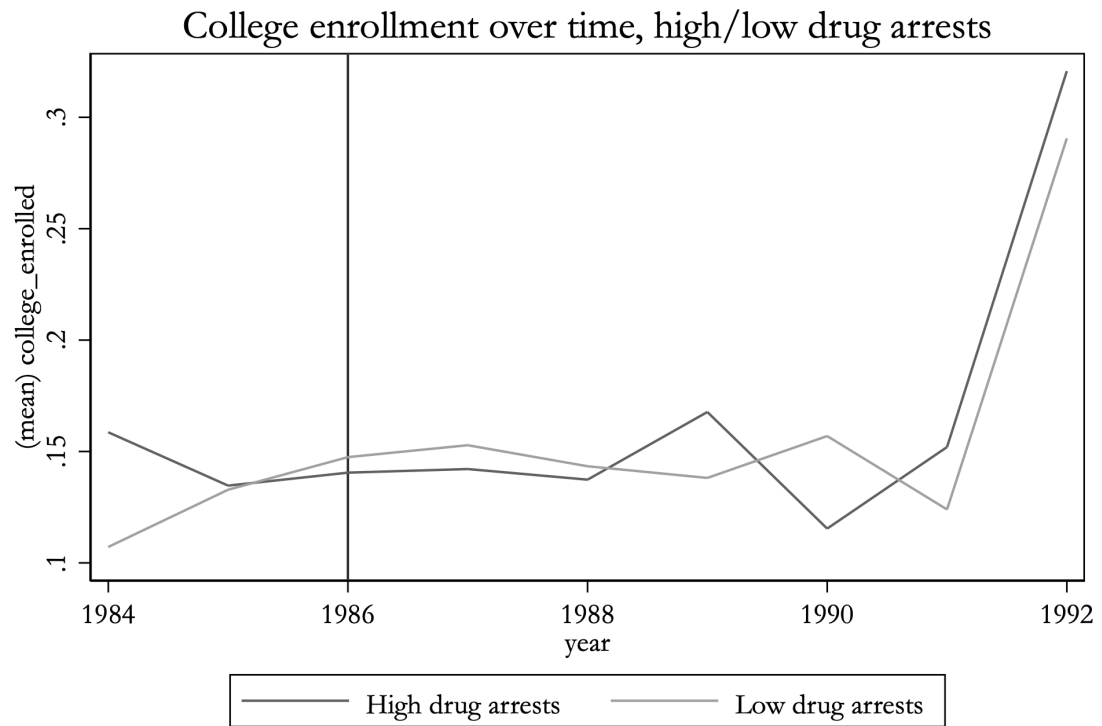


Figure 2: College enrollment overtime 2010

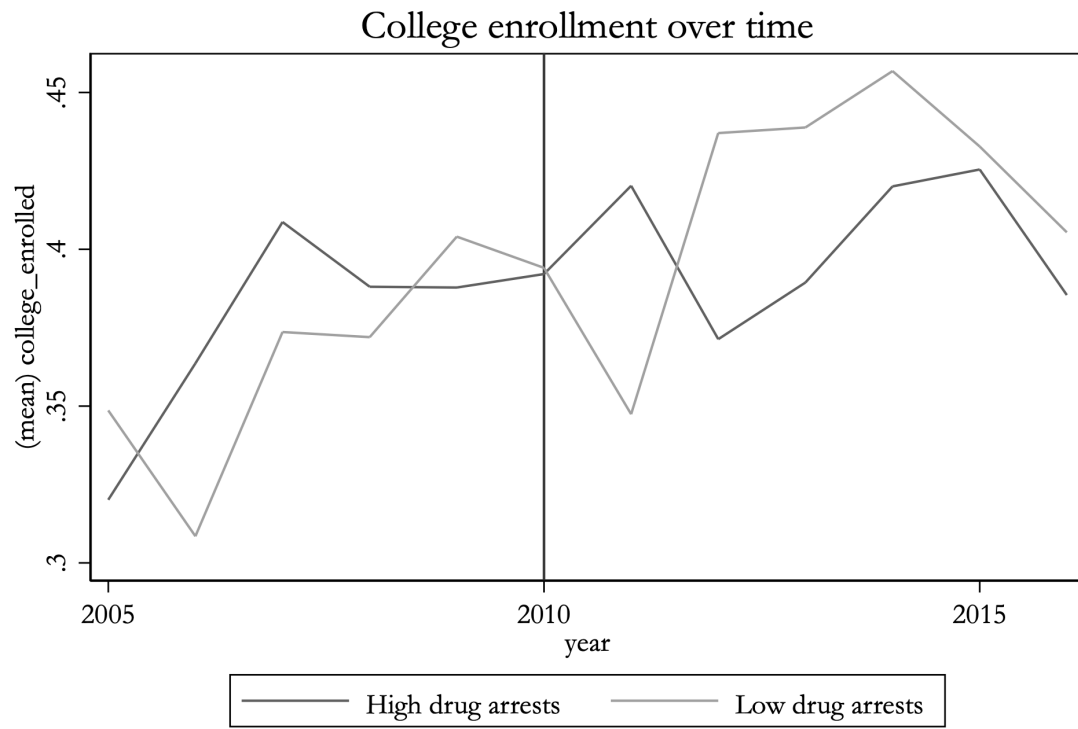
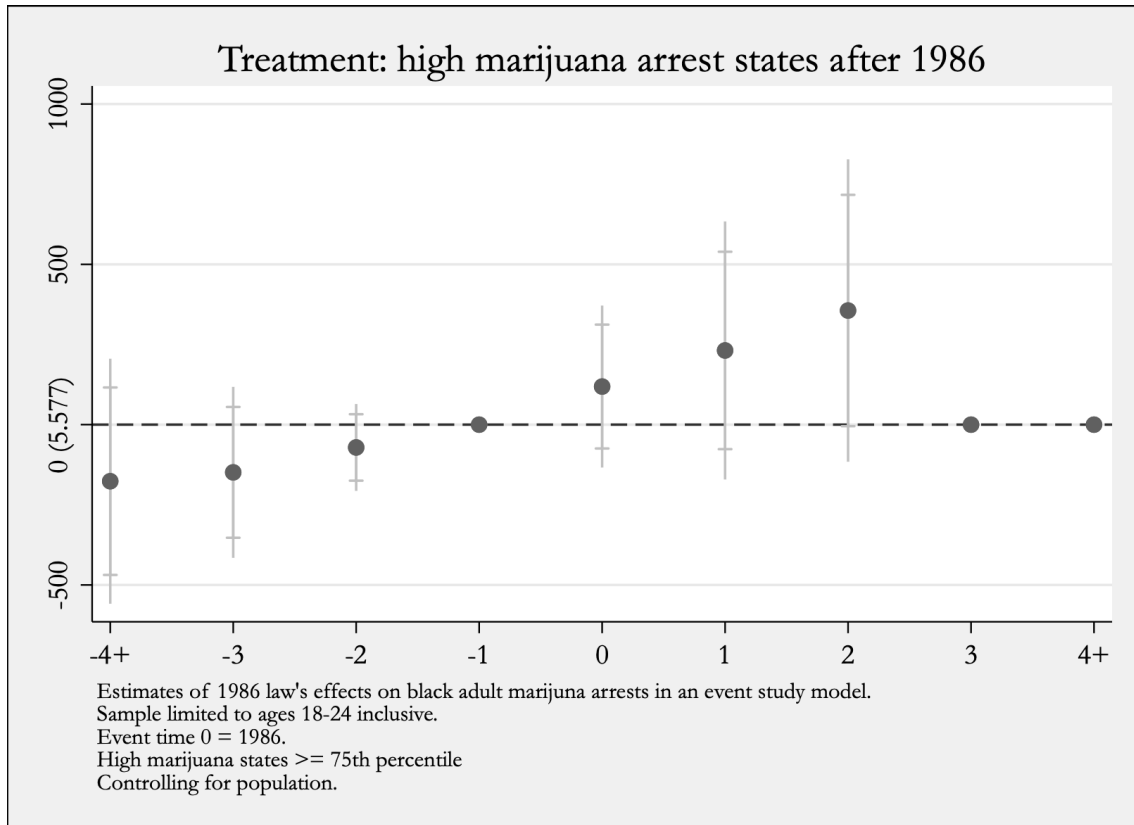


Figure 3: Event study 1986, AB arrest rate 18F



Power: 0.499. Bayes.Factor: 0.550. Likelihood.Ratio: 2.024

Figure 4: Pretrends for Event study 1986, AB arrest rate 18F

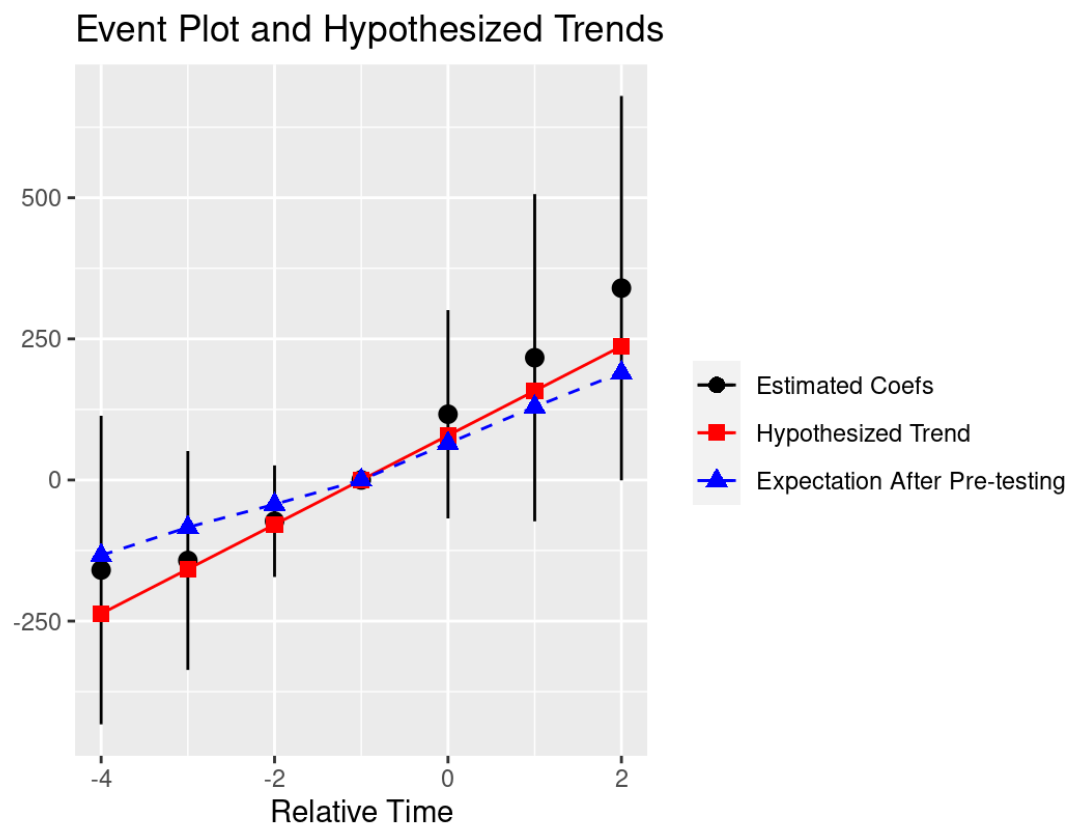


Figure 5: Event study 2010, AB arrest rate 18F

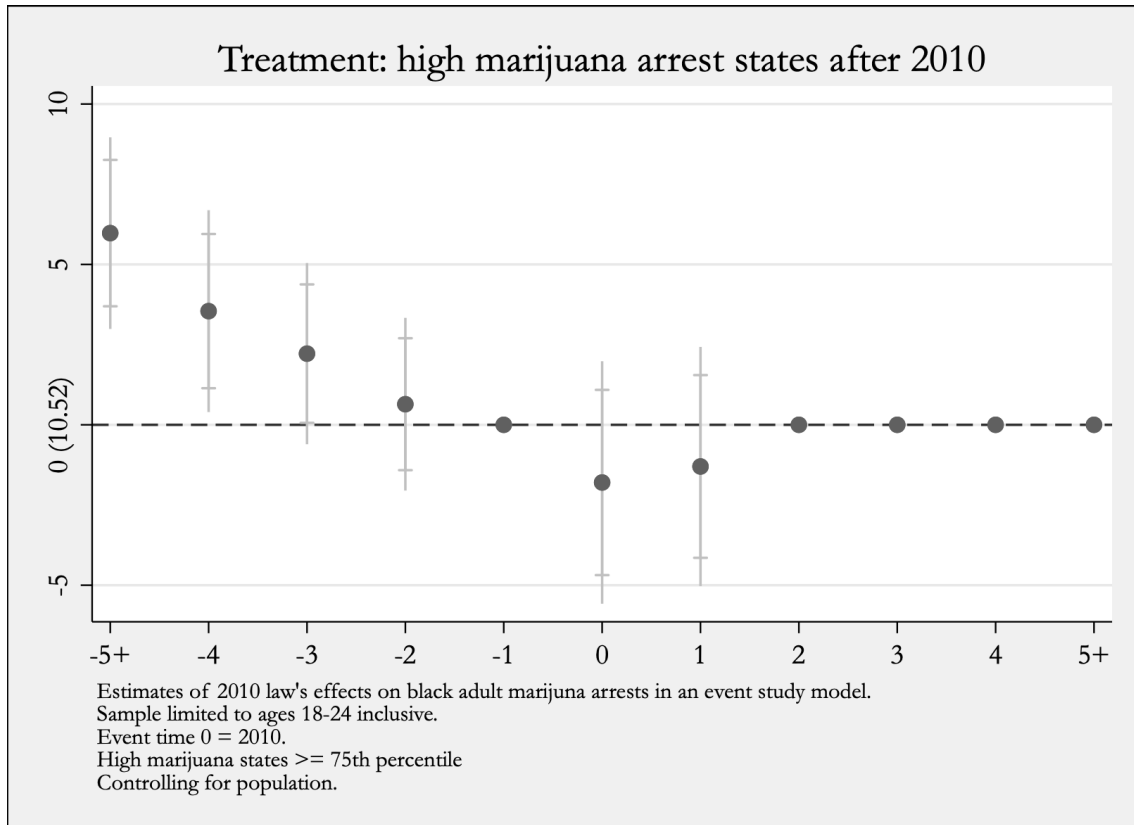


Figure 6: Event study 1986, college enrollment 18



to be evaluated

Table 1: Summary Statistics CPS

| | (1) | (2) | (3) | (4) |
|---------------------------------------|-----------------|------------------|-----------------|------------------|
| | Pre-period 1986 | Pre-period 1986 | Pre-period 2010 | Post-period 2010 |
| Male | 0.49 (0.500) | 0.49 (0.500) | 0.50 (0.500) | 0.50 (0.500) |
| Black | 0.13 (0.341) | 0.14 (0.342) | 0.13 (0.340) | 0.15 (0.356) |
| HS Graduate | 0.82 (0.384) | 0.81 (0.390) | 0.83 (0.377) | 0.86 (0.344) |
| Enrolled in college | 0.24 (0.428) | 0.29 (0.453) | 0.50 (0.500) | 0.55 (0.498) |
| Enrolled in college (Black males) | 0.02 (0.146) | 0.03 (0.160) | 0.06 (0.228) | 0.07 (0.254) |
| Enrolled in college (Non-Black males) | 0.22 (0.414) | 0.26 (0.440) | 0.45 (0.497) | 0.48 (0.500) |
| Enrolled in 2-year coll. | 0.00 (0) | 0.01 (0.0856) | 0.05 (0.215) | 0.05 (0.228) |
| Enrolled in 4-year coll. | 0.24 (0.428) | 0.28 (0.450) | 0.46 (0.498) | 0.49 (0.500) |
| Observations | 43962 | 73286 | 94188 | 72859 |

SD in (). Sample limited to ages 18-24. Observations missing education data were dropped.

Table 2: UCR 1986 black adult arrests related to marijuana

| | (1) AB |
|----|-----------|
| 1 | 3.08 |
| 2 | 4.35 |
| 3 | 2.06 |
| 4 | 6.00 |
| 5 | 13.24 |
| 6 | 5.56 |
| 7 | 7.48 |
| 8 | 125.75 |
| 10 | 5.16 |
| 11 | 1.00 |
| 12 | 2.38 |
| 13 | 4.63 |
| 15 | 3.31 |
| 16 | 1.80 |
| 17 | 5.16 |
| 18 | 1.00 |
| 19 | 8.51 |
| 20 | 5.44 |
| 21 | 2.30 |
| 22 | 4.87 |
| 23 | 2.44 |

Table 3: Britton Table 2

| | (1) | (2) | (3) |
|----------------------|------------------------|------------------------|------------------------|
| after1986 | .04188*** (.006151) | .04589*** (.005317) | 0 (.) |
| Black | -.1011*** (.01359) | -.06511*** (.01135) | -.06979*** (.01352) |
| interaction | -.01214 (.01479) | -.01307 (.01234) | -.01602 (.01257) |
| Constant | .2484*** (.008537) | -8.257*** (.4292) | -8.118*** (.4412) |
| Observations | 56931 | 56931 | 56931 |
| Adjusted R^2 | 0.009 | 0.122 | 0.146 |
| State_yr_FE | N | N | Y |
| Demographic_controls | N | Y | Y |

Standard errors in parentheses

Weights used. Males only. SEs clustered at state level. Still missing some demographic controls.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Britton Table 2, control experiment

| | (1) | (2) | (3) |
|----------------------|------------------------|------------------------|------------------------|
| after1986 | .04917*** (.004768) | .02436*** (.004581) | 0 (.) |
| Black | -.1725*** (.01418) | -.07984*** (.01254) | -.07543*** (.01337) |
| interaction | .001168 (.01403) | -.006155 (.01161) | -.0002534 (.01097) |
| Constant | .4341*** (.01579) | -1.111*** (.1924) | -1.056*** (.1909) |
| Observations | 116850 | 116850 | 116850 |
| Adjusted R^2 | 0.012 | 0.119 | 0.136 |
| State_yr_FE | N | N | Y |
| Demographic_controls | N | Y | Y |

Standard errors in parentheses

Weights used. Males only. SEs clustered at state level. AGES 35-50.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Britton Table 3

| | (1) | (2) | (3) |
|----------------------|-----------------------|------------------------|------------------------|
| after1986 | .03604** (.0135) | .03418** (.01357) | 0 (.) |
| male | -.02688** (.01257) | -.03805*** (.01177) | -.03881*** (.01187) |
| sex_interaction | -.006302 (.01727) | -.006314 (.01722) | -.005527 (.01769) |
| Constant | .1742*** (.009481) | -4.791*** (.5178) | -4.668*** (.5423) |
| Observations | 13463 | 13463 | 13463 |
| Adjusted R^2 | 0.003 | 0.104 | 0.125 |
| State_yr_FE | N | N | Y |
| Demographic_controls | N | Y | Y |

Standard errors in parentheses

Weights used. SEs clustered at state level. Still missing some demographic controls.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Britton Table 3, control experiment

| | (1) | (2) | (3) |
|----------------------|-----------------------|-----------------------|----------------------|
| after1986 | .06631*** (.01001) | .04722*** (.00956) | 0 (.) |
| male | .02948*** (.01043) | -.009405 (.01261) | -.01201 (.01217) |
| sex_interaction | -.01598 (.01246) | -.007654 (.01302) | -.005321 (.01298) |
| Constant | .2321*** (.01513) | .9348** (.4424) | 1.015** (.4312) |
| Observations | 22510 | 22510 | 22509 |
| Adjusted R^2 | 0.004 | 0.114 | 0.129 |
| State_yr_FE | N | N | Y |
| Demographic_controls | N | Y | Y |

Standard errors in parentheses

Weights used. SEs clustered at state level. AGES 35-50.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: DiD: Fair Sentencing Act, blacks vs whites

| | (1) | (2) | (3) |
|----------------------|------------------------|------------------------|-----------------------|
| after2010 | .03193*** (.007166) | .02706*** (.006856) | 0 (.) |
| Black | -.1157*** (.01562) | -.1046*** (.01288) | -.1074*** (.01497) |
| interaction | .03255** (.01346) | .02337* (.01291) | .02309* (.01241) |
| Constant | .4821*** (.00888) | -9.869*** (.2646) | -9.756*** (.2759) |
| Observations | 84252 | 84252 | 84252 |
| Adjusted R^2 | 0.006 | 0.086 | 0.094 |
| State_yr_FE | N | N | Y |
| Demographic_controls | N | Y | Y |

Standard errors in parentheses

Weights used. Males only. SEs clustered at state level. Still missing some demographic controls.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: DiD: Fair Sentencing Act, blacks vs whites, control experiment

| | (1) | (2) | (3) |
|----------------------|------------------------|------------------------|------------------------|
| after2010 | .02531*** (.006454) | .03063*** (.006456) | 0 (.) |
| Black | -.08438*** (.01596) | -.04168*** (.01237) | -.03653*** (.01222) |
| interaction | .013 (.008524) | .00668 (.008129) | .007254 (.007676) |
| Constant | .5667*** (.008649) | .2126 (.1277) | .2356* (.1292) |
| Observations | 212279 | 212279 | 212279 |
| Adjusted R^2 | 0.003 | 0.087 | 0.096 |
| State_yr_FE | N | N | Y |
| Demographic_controls | N | Y | Y |

Standard errors in parentheses

Weights used. Males only. SEs clustered at state level. AGES 35-50

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: DiD Fair Sentencing Act, black males vs females

| | (1) | (2) | (3) |
|----------------------|------------------------|-----------------------|-----------------------|
| after2010 | .04733*** (.01311) | .03127** (.01319) | 0 (.) |
| male | -.09605*** (.01095) | -.1066*** (.01104) | -.1086*** (.01067) |
| sex_interaction | .01715 (.01197) | .01744 (.01394) | .01724 (.0136) |
| Constant | .4624*** (.01328) | -7.511*** (.5776) | -7.421*** (.5828) |
| Observations | 18587 | 18587 | 18587 |
| Adjusted R^2 | 0.011 | 0.102 | 0.107 |
| State_yr_FE | N | N | Y |
| Demographic_controls | N | Y | Y |

Standard errors in parentheses

Weights used. SEs clustered at state level. Still missing some demographic controls.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: DiD Fair Sentencing Act, black males vs females, control experiment

| | (1) | (2) | (3) |
|----------------------|-------------------------|------------------------|-------------------------|
| after2010 | .07047*** (.01208) | .06141*** (.01159) | 0 (.) |
| male | -.06115*** (.006214) | -.0847*** (.006658) | -.08569*** (.006556) |
| sex_interaction | -.03216*** (.01178) | -.02729** (.01222) | -.0272** (.01212) |
| Constant | .5434*** (.01219) | -.2652 (.2397) | -.163 (.2573) |
| Observations | 42026 | 42026 | 42026 |
| Adjusted R^2 | 0.009 | 0.096 | 0.104 |
| State_yr_FE | N | N | Y |
| Demographic_controls | N | Y | Y |

Standard errors in parentheses

Weights used. SEs clustered at state level. AGES 35-50

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: DiD 1986, high vs low drug arrest states

| | (1) | (2) | (3) |
|----------------------|------------------------|-------------------------|----------------------------|
| after1986 | .04051*** (.01391) | .04136*** (.01515) | 0 (.) |
| ab | .0001743 (.0001305) | .000093 (.0001289) | .0003241** (.0001209) |
| ab_post_interact | -.0001613 (.000129) | -.0000851 (.0001267) | -.0003237*** (.0001175) |
| Constant | .1462*** (.01264) | -4.896*** (.7747) | -4.821*** (.8231) |
| Observations | 2852 | 2852 | 2848 |
| Adjusted R^2 | 0.002 | 0.080 | 0.100 |
| State_yr_FE | N | N | Y |
| Demographic_controls | N | Y | Y |

Standard errors in parentheses

Weights used. SEs clustered at state level. Dropped obs between 25 and 75th percentile

Controls: age, age squared hispanic, family income, state unemployment.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: DDD 1986

| | (1) | (2) | (3) |
|--------------------------|------------------------|----------------------|-----------------------|
| after1986 | .02781* (.0142) | .04025** (.01624) | 0 (.) |
| Black | -.09434*** (.01786) | -.064*** (.01623) | -.05192** (.02286) |
| high_drug50 | .03844 (.02781) | .02393 (.0243) | 0 (.) |
| post_black_interact | .0167 (.03094) | .01225 (.02467) | .02298 (.03118) |
| high_drug_black_interact | -.04681 (.03317) | -.03696 (.03056) | -.07561** (.02914) |
| high_drug_post_interact | -.01101 (.01903) | -.01327 (.01669) | -.01077 (.01409) |
| triple_interact | .02209 (.03755) | .01293 (.02771) | .005327 (.03683) |
| Constant | .2367*** (.009359) | -8.272*** (.593) | -8.073*** (.622) |
| Observations | 28375 | 28375 | 28375 |
| Adjusted R^2 | 0.008 | 0.116 | 0.145 |
| State_yr_FE | N | N | Y |
| Demographic_controls | N | Y | Y |

Standard errors in parentheses

Weights used. SEs clustered at state level. Highdrug50

Controls: age, age squared hispanic, family income, state unemployment.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Imitation of Panel A in Table 3 of Duflo (2001)

| | College enrollment | | | Fam inc | | |
|--|-----------------------|-----------------|-----------------|-----------------------|--------------------|-------------------|
| | Level of drug arrests | | | Level of drug arrests | | |
| | High (1) | Low (2) | Diff. (3) | High (4) | Low (5) | Diff. (6) |
| Aged 18-24 in 1986 and black | 0.22 (0.03) | 0.20 (0.02) | 0.03 (0.03) | 524.99 (15.53) | 389.35 (11.83) | 135.64 (18.86) |
| Aged 28-34 in 1986 | 0.41 (0.02) | 0.33 (0.01) | 0.07 (0.02) | 632.17 (8.14) | 569.19 (5.09) | 62.98 (8.09) |
| Difference | -0.19 (0.01) | -0.14 (0.02) | -0.05 (0.02) | -107.18 (12.02) | -179.84 (11.29) | 72.66 (16.55) |
| Clustered (state-year) robust standard errors in parentheses | | | | | | |
| CPS education supplement weights used. Males only | | | | | | |