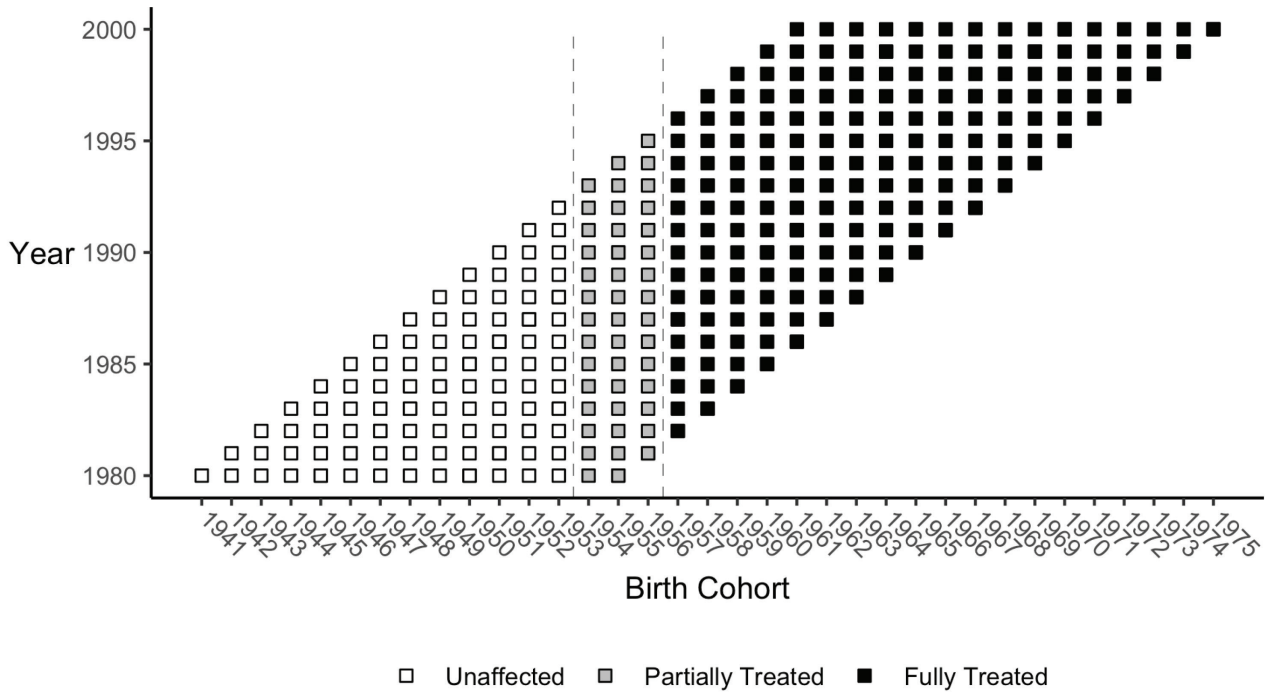


Online Appendix

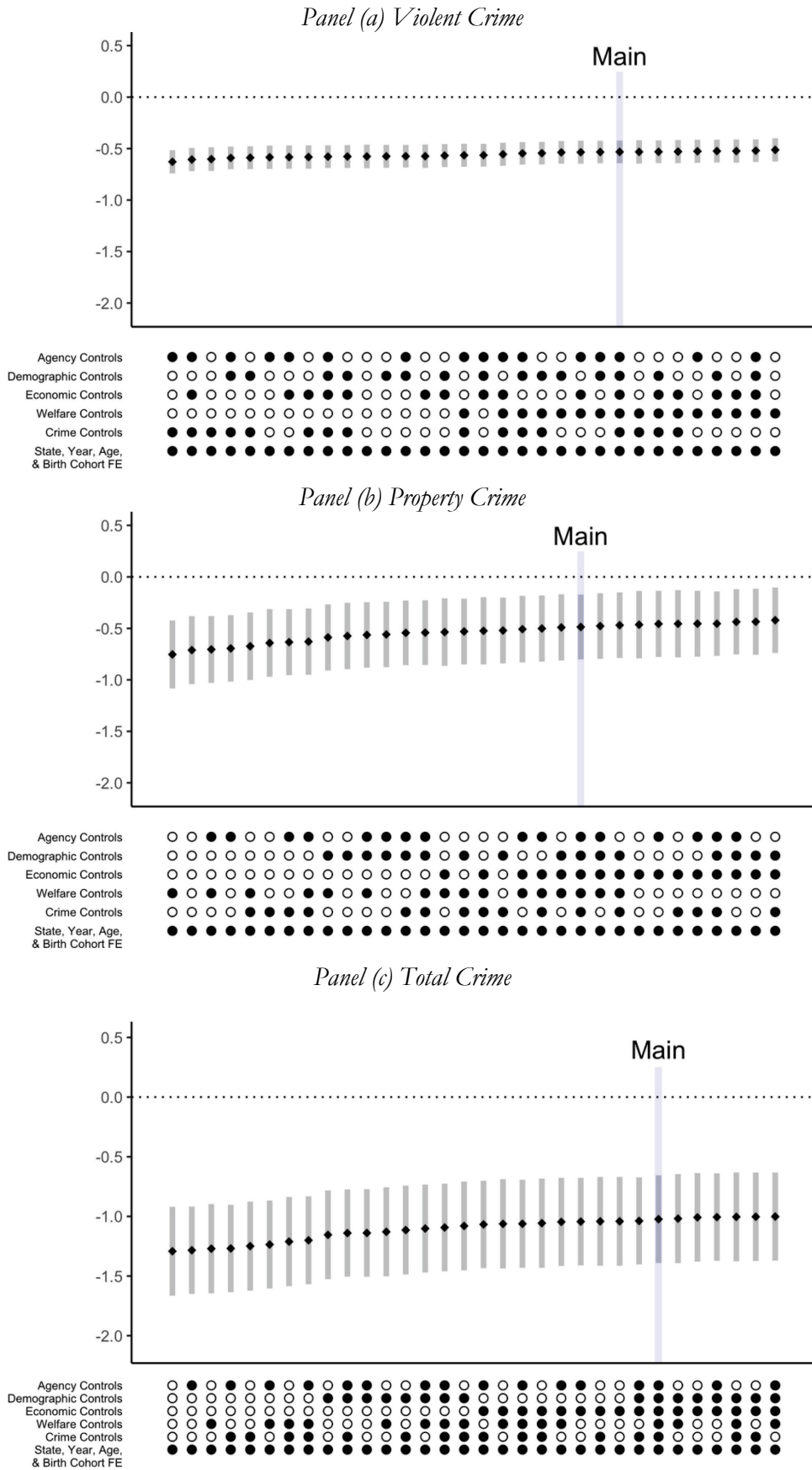
Did Expanding Sports Opportunities for Women Reduce Crime?
Evidence from a Natural Experiment

Drew McNichols, Joseph J. Sabia, and Gokhan Kumpas

Appendix Figure 1. Visually Documenting Birth Cohorts by Arrest Year in Data,
by Fully Treated, Partially Treated, and Untreated Cohorts



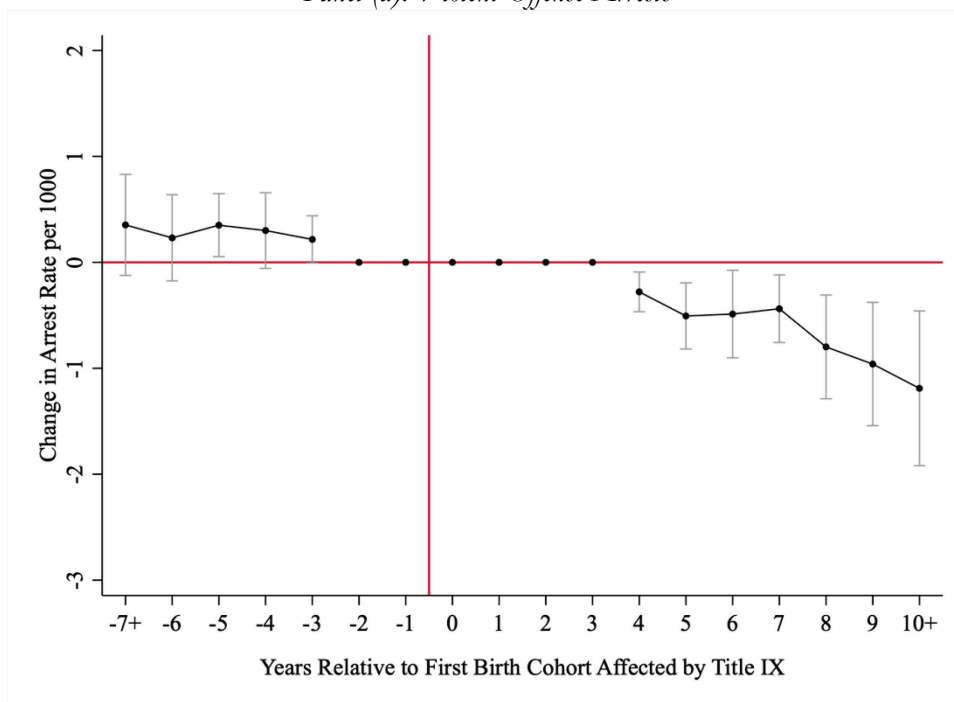
Appendix Figure 2. Sensitivity of Estimated Effect of Title IX on Female Arrests to State-Specific, Time Varying Controls



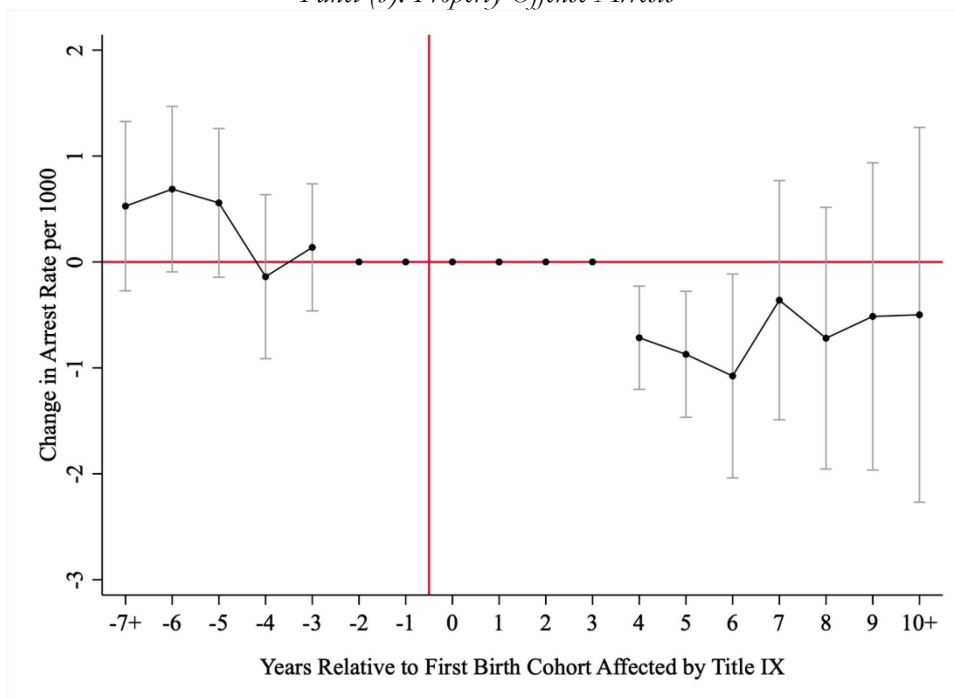
Notes: Grey vertical lines represent 95 percent confidence intervals. The “Main include the full set of controls and are presented in column (3) of Table 3.

Appendix Figure 3. Sensitivity of Event-Study Analyses for Violent and Property Offense Arrests when Drop Partially Treated Cohorts

Panel (a): Violent Offense Arrests



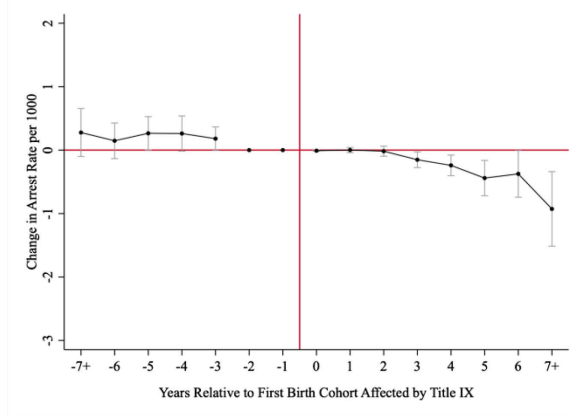
Panel (b): Property Offense Arrests



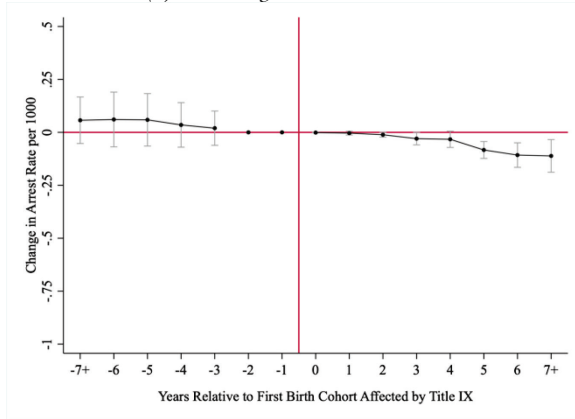
Notes: OLS regressions used to generate the above coefficient estimates include controls for the full set of right-hand-side variables listed in the notes to Table 3. Grey vertical lines represent 95 percent confidence intervals.

Appendix Figure 4. Event-Study Analyses of Effect of Title IX on Individual Part I Violent Offense Arrests

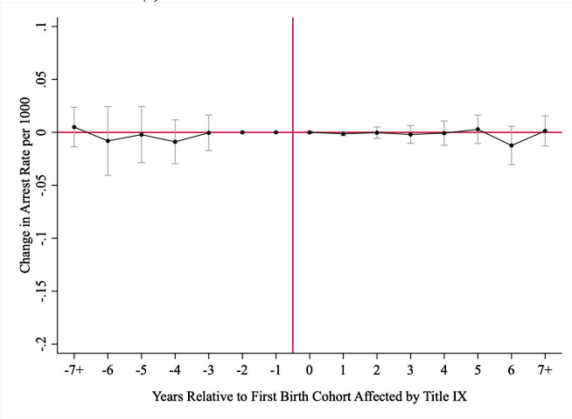
Panel (a): Assault Arrests



Panel (b): Robbery Arrests

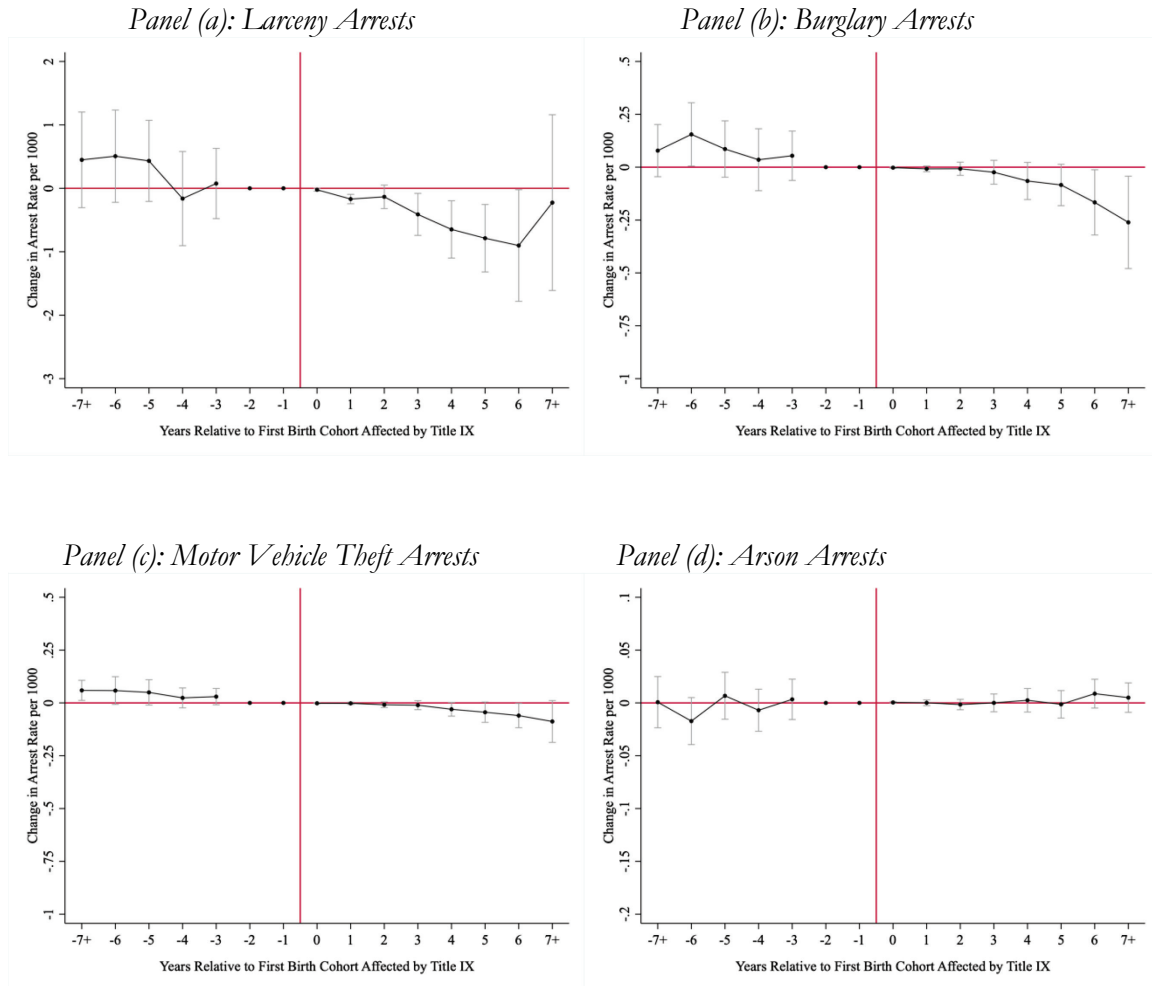


Panel (c): Murder Arrests



Notes: OLS regressions used to generate the above coefficient estimates include controls for the full set of right-hand-side variables listed in the notes to Table 3. Grey vertical lines represent 95 percent confidence intervals.

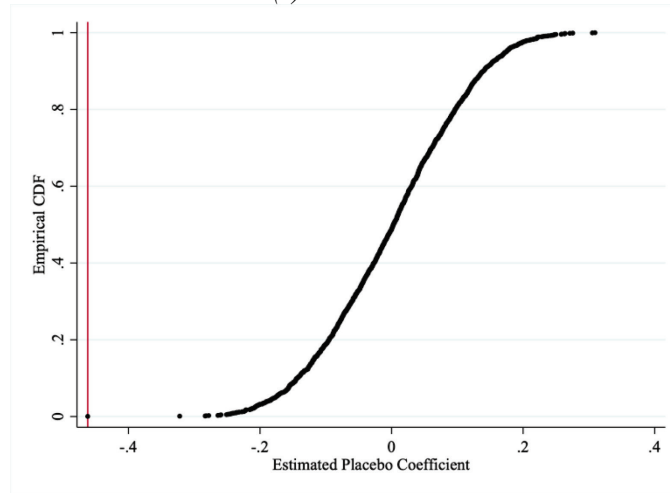
Appendix Figure 5. Event-Study Analyses of Effect of Title IX on Individual Part I Property Offense Arrests



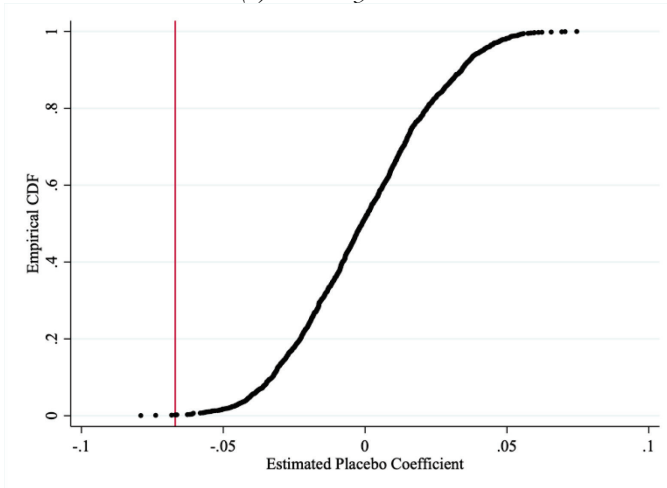
Notes: OLS regressions used to generate the above coefficient estimates include controls for the full set of right-hand-side variables listed in the notes to Table 3. Grey vertical lines represent 95 percent confidence intervals.

Appendix Figure 6. Placebo Tests for Part I Violent Offenses

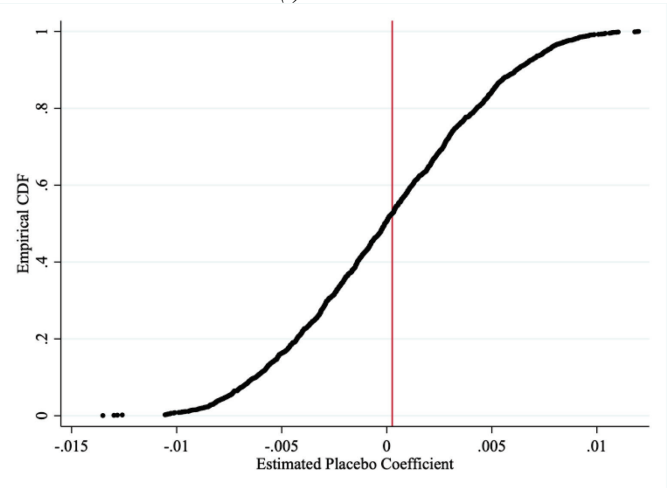
Panel (a): Assault Arrests



Panel (b): Robbery Arrests



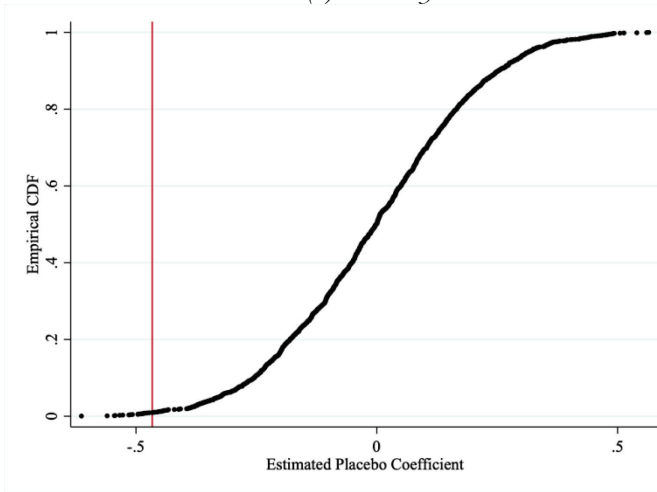
Panel (c): Murder Arrests



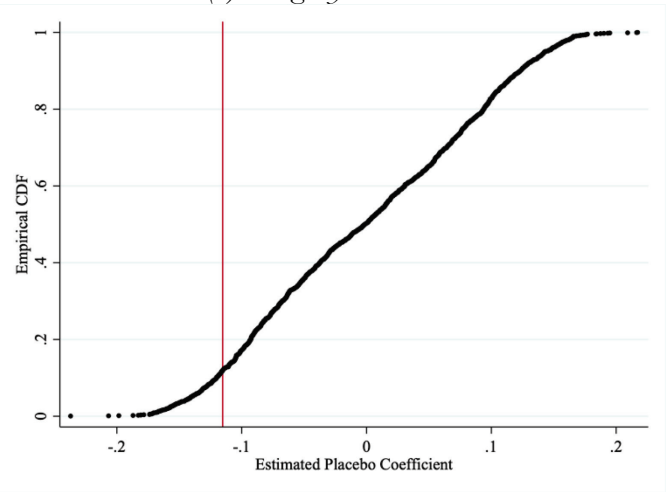
Notes: Red vertical lines denote estimated treatment effects from (3) of Table 3. The black dots are estimates generated from 2,000 placebo estimates in which the 1970 state high school male sports participation rate is randomly assigned across states. All placebo regressions include the full set of controls listed in the notes to Table 3.

Appendix Figure 7. Placebo Tests for Part I Property Offenses

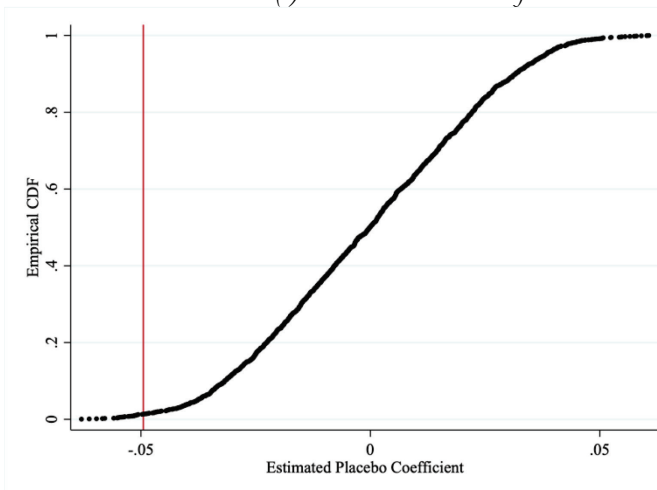
Panel (a): Larceny Arrests



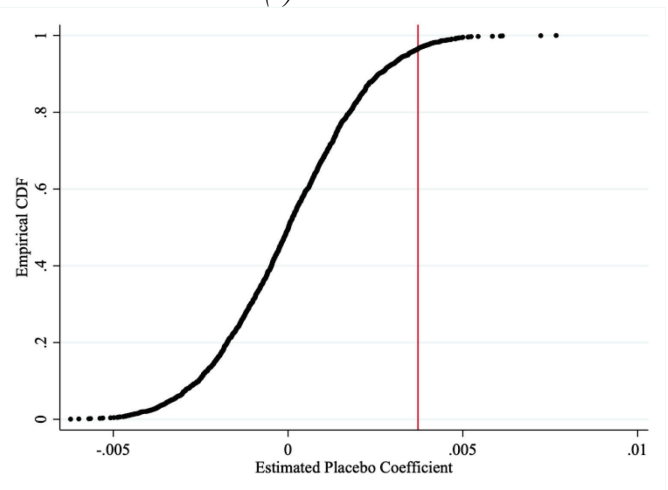
Panel (b): Burglary Arrests



Panel (c): Motor Vehicle Theft Arrests



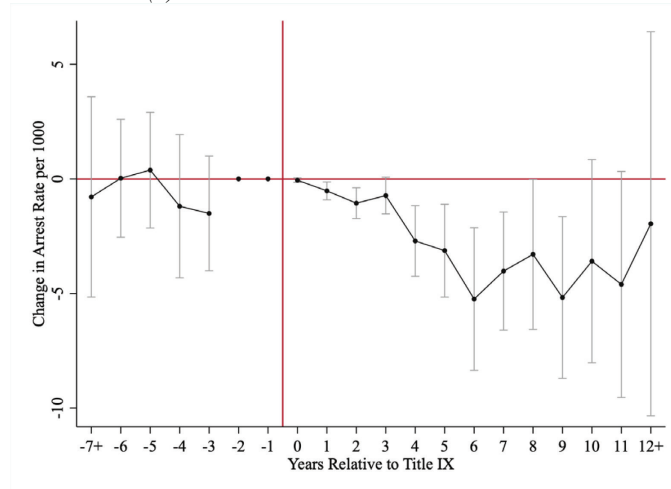
Panel (d): Arson Arrests



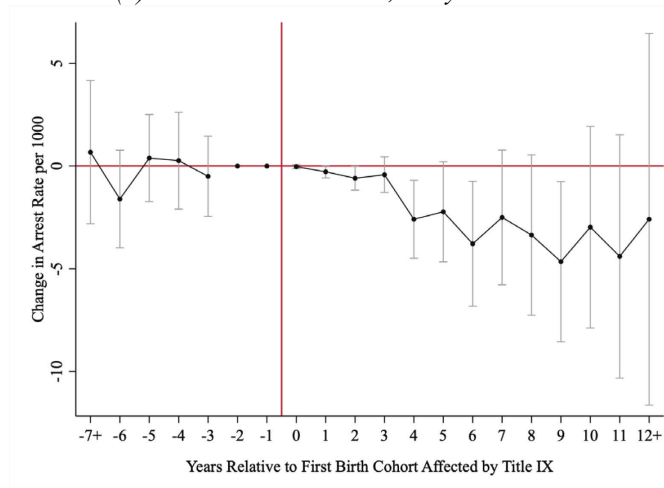
Notes: Red vertical lines denote estimated treatment effects from (3) of Table 3. The black dots are estimates generated from 2,000 placebo estimates in which the 1970 state high school male sports participation rate is randomly assigned across states. All placebo regressions include the full set of controls listed in the notes to Table 3.

Appendix Figure 8. Sensitivity of Estimates to Breadth of Offenses and Extension to Male Arrests

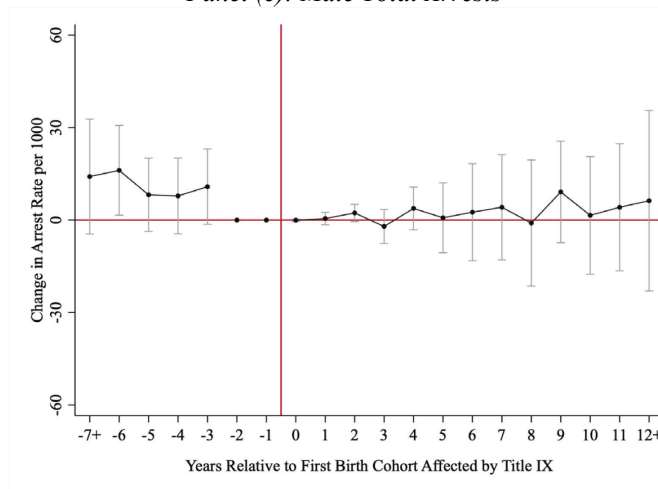
Panel (a): Total Part I and Part II Female Arrests



Panel (b): Total Female Arrests, Fully Saturated Model



Panel (c): Male Total Arrests



Notes: OLS regressions used to generate the above coefficient estimates include controls for the full set of right-hand-side variables listed in the notes to Table 3. Grey vertical lines represent 95 percent confidence intervals.

Appendix Table 1. Exploring Mobility Effects of Title IX

	<i>(1)</i>	<i>(2)</i>
	<i>Share of Female Population</i>	<i>Moved from Birth State</i>
<i>Post Title IX_i * MSPORT_s¹⁹⁷¹</i>	0.0006 (0.0012)	-0.009 (0.018)
Mean of DV	0.041	0.644
N	2,952	3,844,805
Data Source	SEER	Census

Notes for column (1): Standard errors are corrected for clustering at the state level are in parentheses. Annual age and gender specific population shares between 1980 and 2000 are generated from age and gender specific population estimates from National Cancer Institute's Surveillance, Epidemiology and End Results Program (SEER).

Notes for column (2): Standard errors are corrected for clustering at the state are in parentheses. Data is obtained from public use 1980, 1990, and 2000 censuses of population.

Appendix Table 2. Data Extract Showing Source of Identifying Variation in Reduced Form and IV Models

<i>Year of Arrest</i>	<i>State</i>	<i>Age Cohort</i>	<i>Birth Cohort</i>	<i>Part I Female Arrests</i>	<i>Female Pop (000s)</i>	<i>Female Arrest Rate</i>	<i>Affected</i>	<i>Male Sports₁₉₇₁</i>	<i>Affected* Male Sports₁₉₇₁</i>	<i>Female Sports_{i(14)}</i>
1983	AL	30-34	1949-53	863	150	5.75	0	0.2	0	0
1984	AL	30-34	1950-54	924	152	6.06	1/20	0.2	0.01	0
1985	AL	30-34	1951-55	761	156	4.88	3/20	0.2	0.03	0
1986	AL	30-34	1952-56	848	159	5.33	6/20	0.2	0.06	0
1991	AL	30-34	1957-61	968	171	5.67	1	0.2	0.2	0.07
...
1996	AL	30-34	1962-66	1240	162	7.66	1	0.2	0.2	0.12
1997	AL	30-34	1963-67	1161	158	7.36	1	0.2	0.2	0.13
1998	AL	30-34	1964-68	997	155	6.43	1	0.2	0.2	0.12
1999	AL	30-34	1965-69	945	153	6.17	1	0.2	0.2	0.1
2000	AL	30-34	1966-70	639	153	4.18	1	0.2	0.2	0.11
...
1983	CA	30-34	1949-53	6902	1128	6.12	0	0.38	0	0.03
1984	CA	30-34	1950-54	7536	1164	6.47	1/20	0.38	0.02	0.03
1985	CA	30-34	1951-55	8664	1209	7.17	3/20	0.38	0.06	0.03
1986	CA	30-34	1952-56	9587	1252	7.66	6/20	0.38	0.11	0.03
1991	CA	30-34	1957-61	11711	1406	8.33	1	0.38	0.38	0.11
...
1996	CA	30-34	1962-66	11191	1382	8.1	1	0.38	0.38	0.18
1997	CA	30-34	1963-67	11301	1363	8.29	1	0.38	0.38	0.24
1998	CA	30-34	1964-68	9871	1340	7.36	1	0.38	0.38	0.19
1999	CA	30-34	1965-69	8505	1318	6.45	1	0.38	0.38	0.2
2000	CA	30-34	1966-70	8191	1306	6.27	1	0.38	0.38	0.18

Appendix Table 3. Estimated Correlation Between Male Sports Participation in 1971 and Female Total Arrest Rate in 1970

	<i>Female Arrest Rate in 1970</i>
<i>Male Sports Participation in 1971</i>	0.348 (1.676)
Mean of DV	1.99
N	47

Notes: Arrest rates are arrests per 1000 of the relevant age group population. Arrest counts from UCR (Uniform Crime Reports) divided by age and gender specific population estimates from National Cancer Institute's Surveillance, Epidemiology and End Results Program.

Appendix Table 4. Estimated Effect of Title IX on Labor Market Outcomes

	<i>Years of Education</i>	<i>Labor Force Participation</i>	<i>Log of Weekly Earnings</i>
	(1)	(2)	(3)
<i>Post Title IX_i * MSPORT_s¹⁹⁷¹</i>	0.112* (0.062)	0.022* (0.013)	0.059*** (0.020)
N	3,213	3,213	3,213

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Notes: Standard errors are corrected for clustering at the state level and are in parentheses and regressions are weighted by state population. All models include the full set of controls in column (3) of Table 3.

Appendix Table 5. Estimates of Relationship Between Title IX and Total Part I and Part II Female Arrests per 1,000 Population Ages 25-to-39, Uniform Crime Reports, 1980-2000

	(1)	(2)	(3)	(4)
Total Part I and Part II Offenses				
1-3 Cohorts After Title IX (β_1)	-0.027 (0.064)	-0.052 (0.052)	-0.008 (0.054)	-0.008 (0.053)
4+ Cohorts After Title IX (β_2)	-1.081 (1.185)	-1.313** (0.562)	-1.136* (0.586)	-1.103* (0.586)
($\beta_1 + \beta_2$) [p-value]	-1.11[p=0.34]	-1.36**[p=0.02]	-1.14*[p=0.05]	-1.11*[p=0.06]
Mean	28.34	28.34	28.34	28.34
N	3,043	3,043	3,043	3,043
State linear time trend?	No	Yes	Yes	Yes
Census division-by-year fixed effects?	No	No	Yes	Yes
Birth cohort linear time trend?	No	No	No	Yes
Age specific linear time trend?	No	No	No	Yes

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Notes: Standard errors are corrected for clustering at the state level are in parentheses and regressions are weighted by state population. All models include the full set of controls in column (3) of Table 3.

Appendix Table 6. Heterogeneity in Effects of Title IX, by 1970 State Characteristics

	Share of Females with Some College		Poverty Rate		Household Income	
	<i>Below Median</i>	<i>Above Median</i>	<i>Below Median</i>	<i>Above Median</i>	<i>Below Median</i>	<i>Above Median</i>
	(1)	(2)	(3)	(4)	(5)	(6)
Violent Offenses						
1-3 Cohorts After Title IX (β_1)	0.016 (0.013)	-0.013* (0.007)	-0.011 (0.009)	0.002 (0.012)	0.004 (0.009)	-0.012 (0.010)
4+ Cohorts After Title IX (β_2)	-0.276* (0.155)	-0.635*** (0.164)	-0.463*** (0.125)	-0.410** (0.163)	-0.260** (0.118)	-0.706*** (0.222)
($\beta_1 + \beta_2$) [p-value]	-0.259[p=0.11]	-0.648***[p=0.00]	-0.475***[p=0.00]	-0.408**[p=0.02]	-0.256**[p=0.04]	-0.719***[p=0.00]
N	1,521	1,476	1,502	1,495	1,485	1,512
Property Offenses						
1-3 Cohorts After Title IX (β_1)	-0.038 (0.027)	-0.059** (0.021)	-0.090*** (0.025)	-0.010 (0.028)	-0.014 (0.013)	-0.082*** (0.028)
4+ Cohorts After Title IX (β_2)	-0.551 (0.776)	-0.846** (0.362)	-0.660** (0.308)	0.240 (0.554)	-0.433 (0.527)	-0.588 (0.390)
($\beta_1 + \beta_2$) [p-value]	-0.588[p=0.45]	-0.905**[p=0.02]	-0.750**[p=0.02]	0.229[p=0.68]	-0.448[p=0.40]	-0.670[p=0.10]
N	1,546	1,492	1,520	1,518	1,510	1,528
Total Part I Offenses						
1-3 Cohorts After Title IX (β_1)	-0.021 (0.031)	-0.070*** (0.023)	-0.097*** (0.027)	-0.009 (0.037)	-0.010 (0.020)	-0.090*** (0.029)
4+ Cohorts After Title IX (β_2)	-0.835 (0.899)	-1.476*** (0.309)	-1.097*** (0.289)	-0.199 (0.658)	-0.703 (0.586)	-1.288*** (0.360)
($\beta_1 + \beta_2$) [p-value]	-0.856[p=0.35]	-1.545***[p=0.00]	-1.194***[p=0.00]	-0.208[p=0.75]	-0.713[p=0.23]	-1.378***[p=0.00]
N	1,545	1,494	1,520	1,519	1,513	1,526

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Notes: Standard errors are corrected for clustering at the state level and regressions are weighted by state population. All models include the full set of controls in column (3) of Table 3.

Appendix Table 7. First-Stage Estimate of the Effect of Title IX on Female Sports Participation Rate

<i>Post Title IX_i * MS_{SPORT_s}¹⁹⁷¹</i>	0.371***	0.336***	0.336***
	(0.059)	(0.066)	(0.066)
N	3,150	3,150	3,150
F-stat	38.96	27.64	27.35
State fixed effects?	Yes	Yes	Yes
Birth cohort fixed effects?	Yes	Yes	Yes
Age cohort fixed effects?	Yes	Yes	Yes
Year of crime fixed effects?	Yes	Yes	Yes
Demographic and Crime Controls?	No	Yes	Yes
State-specific time-varying controls?	No	Yes	Yes
State linear time trend	No	No	Yes
Age cohort linear time trend	No	No	Yes
Birth cohort linear time trend	No	No	Yes

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Notes: Standard errors are corrected for clustering at the state level are in parentheses. Education, earnings and labor force participation rates are obtained from monthly Current Population Survey (CPS) Basic Monthly Data between 1980 and 2000. Controls include state, age, birth cohort, and year fixed effects, unemployment rate and log earnings for males 24-54.

**Appendix Table 8. Sensitivity of 2SLS Estimates to the Use of tF Standard Errors
(Lee et al. 2000)**

	(1)	(2)	(3)
Violent Offenses	-3.171***	-3.283***	-3.283***
[N = 2,997]	(0.791)	(0.827)	(0.831)
tF Standard Error	[0.902]	[1.009]	[1.023]
Property Offenses	-2.545	-1.738	-1.753
[N = 3,038]	(1.945)	(2.204)	(2.215)
tF Standard Error	[2.217]	[2.689]	[2.724]
Total Part I Offenses	-5.685**	-4.986**	-5.001*
[N = 3,039]	(2.168)	(2.481)	(2.495)
tF Standard Error	[2.472]	[3.027]	[3.069]
Drug Offenses	-8.130**	-6.075***	-6.089***
[N = 3,019]	(3.548)	(1.735)	(1.750)
tF Standard Error	[4.045]	[2.116]	[2.152]
<i>First Stage F-Stat</i>	<i>38.96</i>	<i>27.63</i>	<i>27.35</i>
State, Birth Cohort, Age, Year FE?	Yes	Yes	Yes
Demographic and Crime Controls?	No	Yes	Yes
State-specific time-varying controls?	No	Yes	Yes
State linear time trend?	No	No	Yes
Age cohort linear time trend?	No	No	Yes
Birth cohort linear time trend?	No	No	Yes

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Notes: Standard errors are corrected for clustering at the state level and regressions are weighted by state population. Brackets include tF standard errors calculated using the method described in Lee et al (2020). All models include the full set of controls in column (3) of Table 3. The instrumental variable is the interaction between the male sports participation rate in 1971 and an indicator turning on for birth cohorts affected by Title IX.

Appendix Table 9. Estimates of Relationship Between Pre-Title IX Male Sports Participation Rate and Female Arrests per 1,000 Population for those Ages 15-to-24, Uniform Crime Reports, 1974-2000

Violent Offenses	
1-3 Cohorts After Title IX (β_1)	-0.001 (0.018)
4+ Cohorts After Title IX (β_2)	-0.022 (0.083)
($\beta_1 + \beta_2$) [p-value]	-0.024[p=0.81]
DV Mean	1.07
N	1,715
Property Offenses	
1-3 Cohorts After Title IX (β_1)	-0.408*** (0.110)
4+ Cohorts After Title IX (β_2)	-1.669*** (0.507)
($\beta_1 + \beta_2$) [p-value]	-2.076***[p=0.00]
DV Mean	9.64
N	1,710
Total Part I Offenses	
1-3 Cohorts After Title IX (β_1)	-0.412*** (0.121)
4+ Cohorts After Title IX (β_2)	-1.704*** (0.559)
($\beta_1 + \beta_2$) [p-value]	-2.115***[p=0.00]
DV Mean	10.71
N	1,711

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Notes: Standard errors are corrected for clustering at the state level are in parentheses and regressions are weighted. The specification includes controls for state fixed effects, year of arrest fixed effects, age fixed effects, and birth year fixed effects.