Online Appendix:

Mandatory Minimum Reforms, Sentencing, and Racial-Ethnic Disparities
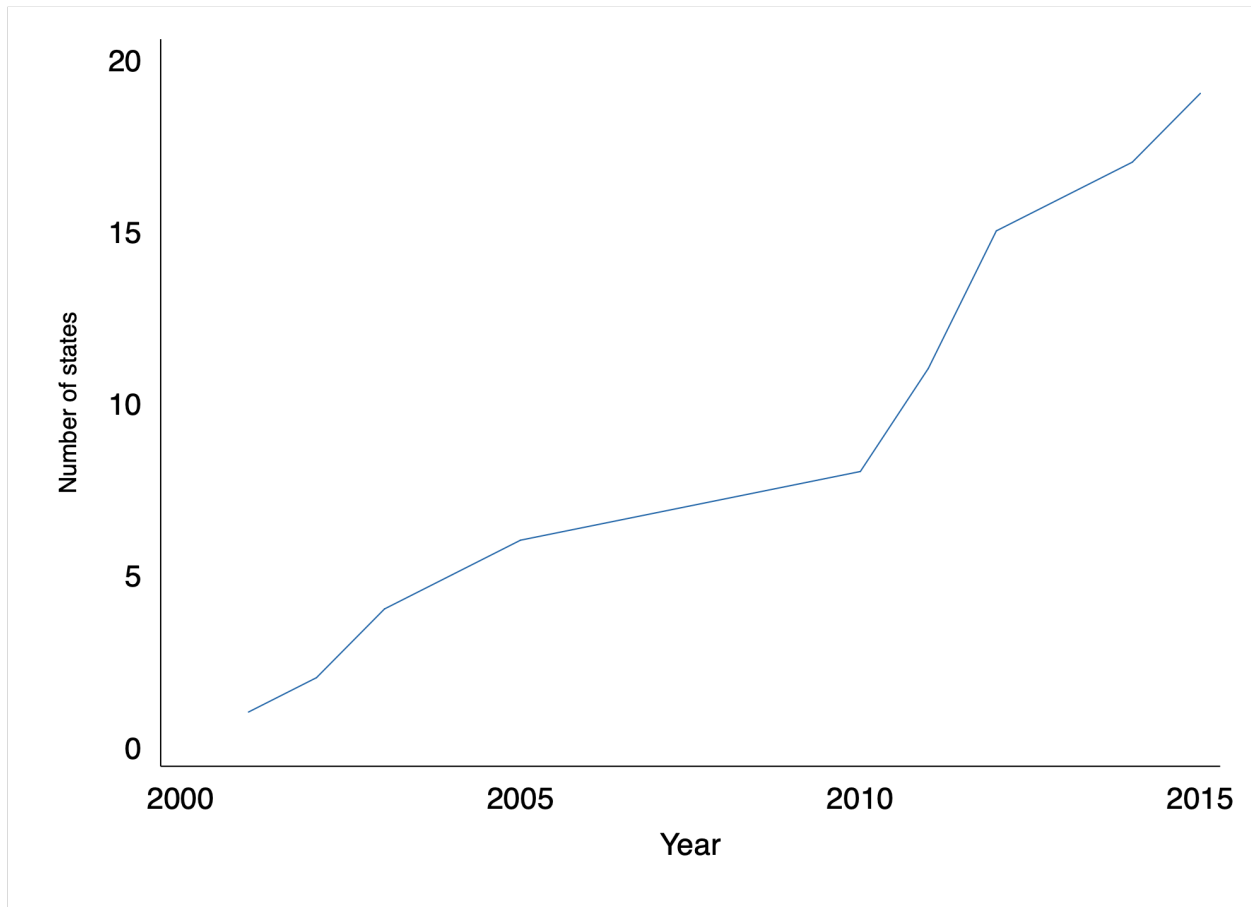
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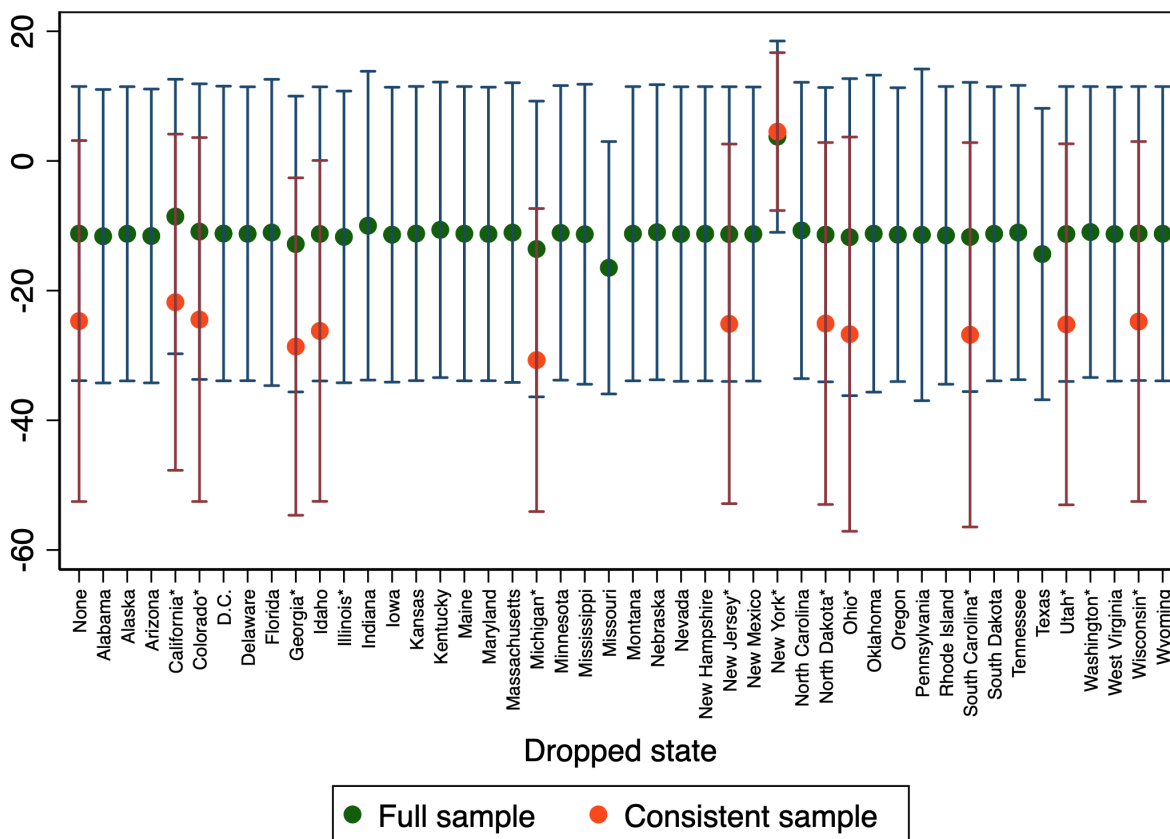[†]Department of Economics, Smith College. Contact Email: mzapryanova@smith.edu.

Figure OA1: Number of States that Reform their Mandatory Minimum Laws

Notes: This graph reports the number of states that reform (repeal or revise) their mandatory minimum laws over time.

Figure OA2: Robustness of Main DD Results: Leave-One-Out Method

Notes: The figure reports the coefficient estimates of the the main DD results from Table 2 along with their 95% confidence intervals resulting from dropping out data from one specific state at a time. We report the robustness of the DD estimates based on both the full sample and the sample restricted to the thirteen states that consistently reported data, as identified by Neal and Rick (2016): California, Colorado, Georgia, Illinois, Michigan, North Dakota, New Jersey, New York, Ohio, South Carolina, Utah, Washington, and Wisconsin. We denote the states that are in the consistent sample with an asterisk.

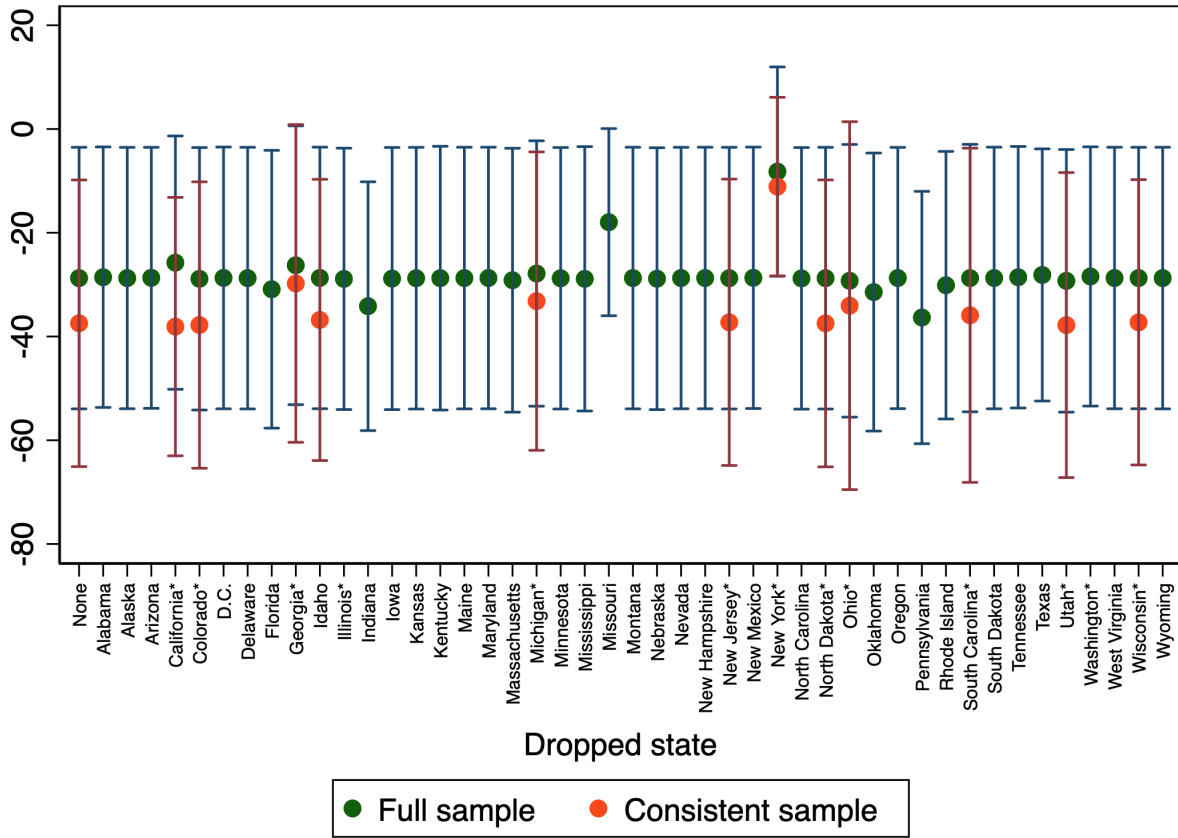Figure OA3: Robustness of Main DDD Results for Black: Leave-One-Out Method
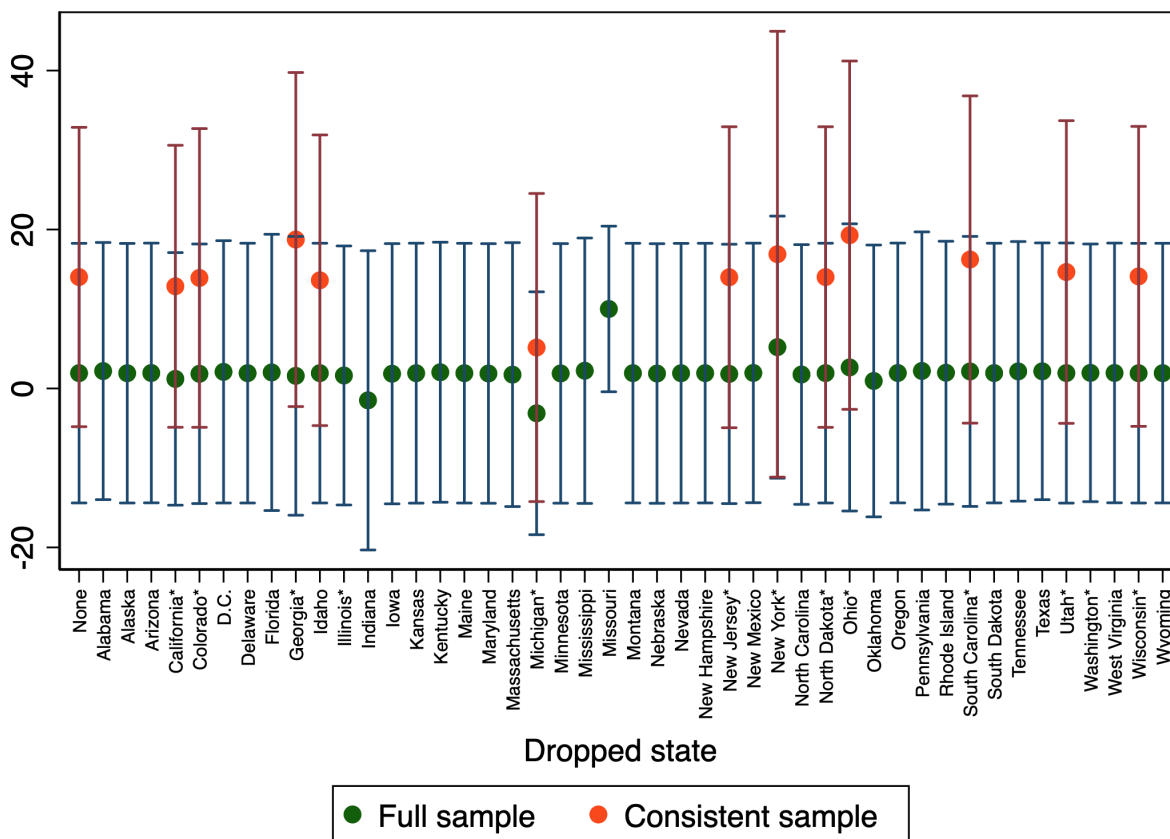
Notes: The figure reports the coefficient estimates of the the main DDD for Black results from Table 3 along with their 95% confidence intervals resulting from dropping out data from one specific state at a time. We report the robustness of the DD estimates based on both the full sample and the sample restricted to the thirteen states that consistently reported data, as identified by Neal and Rick (2016): California, Colorado, Georgia, Illinois, Michigan, North Dakota, New Jersey, New York, Ohio, South Carolina, Utah, Washington, and Wisconsin. We denote the states that are in the consistent sample with an asterisk.

Figure OA4: Robustness of Main DDD Results for Hispanic: Leave-One-Out Method


Notes: The figure reports the coefficient estimates of the the main DDD for Hispanic results from Table 3 along with their 95% confidence intervals resulting from dropping out data from one specific state at a time. We report the robustness of the DD estimates based on both the full sample and the sample restricted to the thirteen states that consistently reported data, as identified by Neal and Rick (2016): California, Colorado, Georgia, Illinois, Michigan, North Dakota, New Jersey, New York, Ohio, South Carolina, Utah, Washington, and Wisconsin. We denote the states that are in the consistent sample with an asterisk.

Figure OA5: Event-Study DD Estimates: Number of Sentences by Crime Category
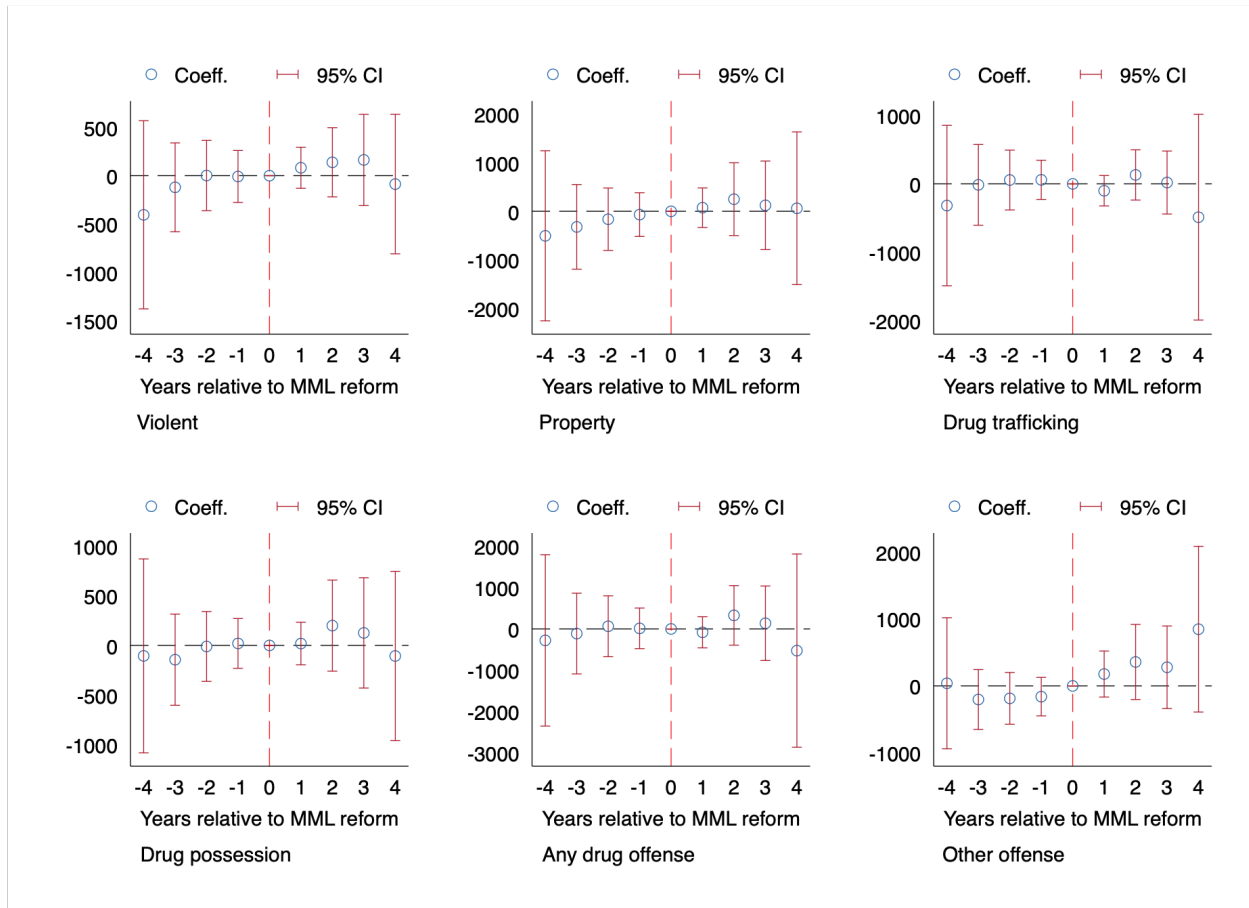
Notes: This figure plots event-study estimates, similar to our main specification in Figure 3, but with dependent variable is number of sentences in the category corresponding to each panel. The omitted dummy is year of implementation, so the coefficient on the year of implementation is set to zero. State and admission year fixed effects are included in all specifications, and standard errors are clustered at the state level. Data are from the National Corrections Reporting Program (1997-2016).

Figure OA6: Event-Study DD Estimates: Fraction of Sentences in Each Crime Category
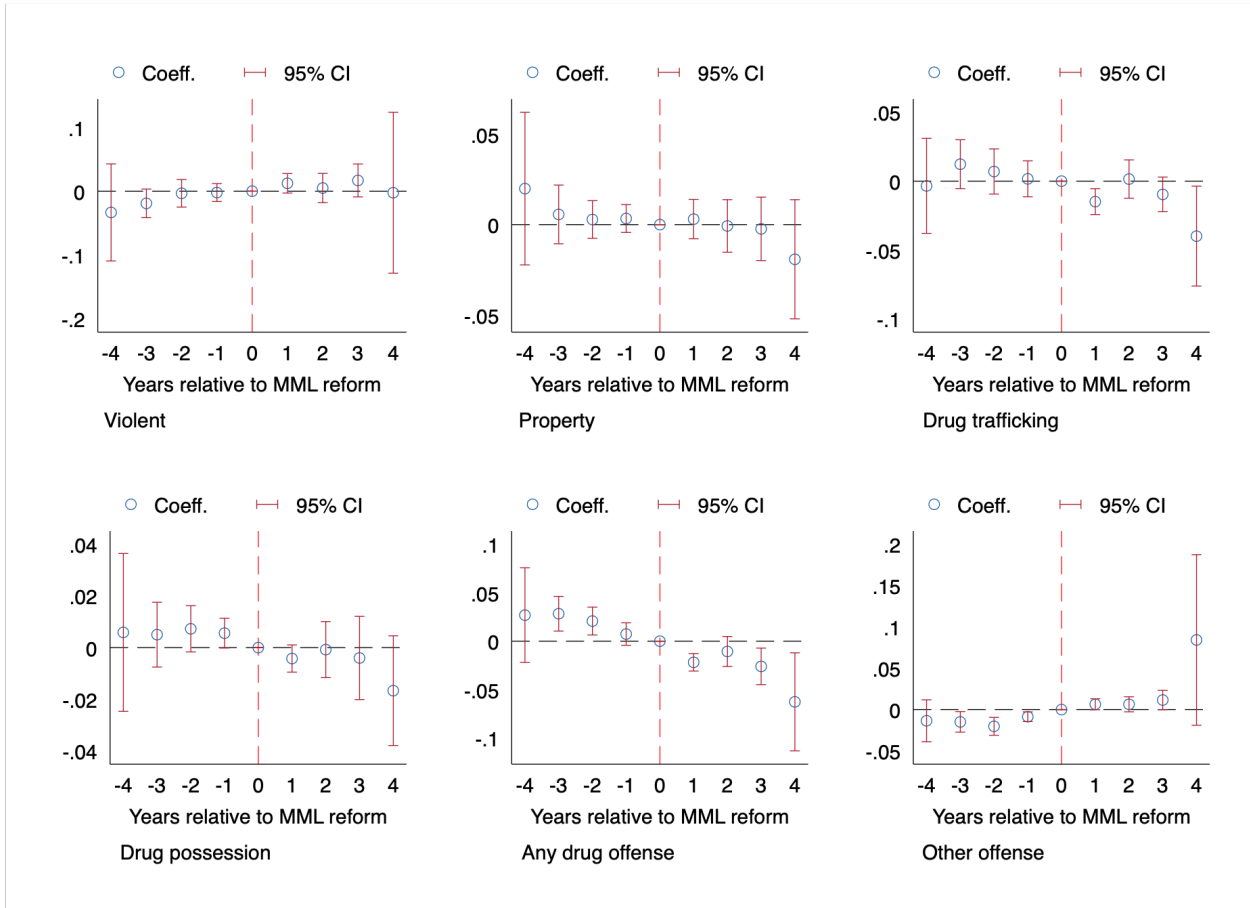
Notes: This figure plots event-study estimates, similar to our main specification in Figure 3, but with dependent variable is number of sentences in the category corresponding to each panel. The omitted dummy is year of implementation, so the coefficient on the year of implementation is set to zero. State and admission year fixed effects are included in all specifications, and standard errors are clustered at the state level. Data are from the National Corrections Reporting Program (1997-2016).

Table OA1: Triple-Difference and Event-Study Estimates: Alternative Specification

	General	Event Study
	(1)	(2)
Hispanic		
MML	-18.91	
	(12.33)	
MML(-4)		-1.092
		(4.117)
MML(-3)		-0.990
		(3.375)
MML(-2)		13.26***
		(4.684)
MML(-1)		4.040**
		(1.803)
MML(1)		-6.527
		(11.11)
MML(2)		-18.65
		(11.52)
MML(3)		-15.80
		(13.74)
MML(4)		-24.62*
		(12.59)
Black		
MML	3.809	
	(9.509)	
MML(-4)		-6.527
		(3.938)
MML(-3)		-1.779
		(1.703)
MML(-2)		-2.762
		(2.428)
MML(-1)		-1.115
		(2.216)
MML(1)		2.949
		(8.632)
MML(2)		0.145
		(8.548)
MML(3)		-3.384
		(9.709)
MML(4)		-4.872
		(11.73)
Mean Sentence	59.23	59.23
R-squared	0.460	0.460
N	2553076	2553076

Notes: The dependent variable is individual sentence length, measured in months. Column (1) reports our DDD estimates–namely, the coefficient estimate on the interaction between MML, a DD indicator that equals to 1 if a state has reformed (repealed or revised) its mandatory minimum sentencing laws for the year-month in which the individual was admitted to prison and an indicator for individual race specified in the row heading. Column (2) shows the corresponding event-study estimates, with the number in brackets on the MML variable indicating years prior or post mandatory minimum reforms. Standard errors clustered at the state level are shown in parentheses (forty-three clusters). In all regressions, we control for individual demographic characteristics (race, ethnicity, gender, age, age squared, highest grade complete, prior felony incarceration) and reason for prison admission. We also include indicators for missing data for each of these control variables. State and admission year fixed effects are included in all specifications.
* p < .10, ** p < .05, *** p < .01
Data source: NCRP 1997-2016.

Table OA2: Robustness: Time Trends Sensitivity Analysis

	(1)	(2)	(3)	(4)
	Panel A: Difference-in-Difference			
	Full Sample			
MML	-11.21	-11.14	-11.21	-11.22
	(11.58)	(11.62)	(11.64)	(11.64)
	Consistent Sample			
MML	-24.69	-24.68	-24.68	-24.67
	(14.20)	(14.22)	(14.22)	(14.22)
	Panel B: Triple-Difference–Black			
	Full Sample			
MML	1.557	1.486	1.409	1.412
	(9.211)	(9.217)	(9.222)	(9.222)
	Consistent Sample			
MML	15.38	15.38	15.37	15.37
	(9.651)	(9.650)	(9.653)	(9.651)
	Panel C: Triple-Difference–Hispanic			
	Full Sample			
MML	-30.70**	-30.76**	-30.80**	-30.80**
	(12.75)	(12.77)	(12.80)	(12.80)
	Consistent Sample			
MML	-33.11**	-33.12**	-33.13*	-33.12*
	(15.20)	(15.20)	(15.20)	(15.21)
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State-specific time trend	No	Yes	Yes	Yes
State-specific time trend sq.	No	No	Yes	Yes
Time trend sq.	No	No	No	Yes

Notes: We report the robustness of our results presented in Table 2 and Table 3 for both the full sample and the sample restricted to the thirteen states that consistently reported data, as identified by Neal and Rick (2016): California, Colorado, Georgia, Illinois, Michigan, North Dakota, New Jersey, New York, Ohio, South Carolina, Utah, Washington, and Wisconsin. The dependent variable is individual sentence length, measured in months. Standard errors clustered at the state level are shown in parentheses (forty-three clusters). In all regressions, we control for individual demographic characteristics (race, ethnicity, gender, age, age squared, highest grade completed, prior felony incarceration) and reason for prison admission. We also include indicators for missing data for each of these control variables. Column (1) includes only state and admission year fixed effects. Columns (2) and (3) add state-specific admission year time trend and its square, respectively. In column (4) we add a linear admission year time trend squared.
* p < .10, ** p < .05, *** p < .01

Table OA3: Robustness: Including State-by-Admission Year Fixed Effects

	DD		DDD-Black		DDD-Hispanic	
	(1)	(2)	(3)	(4)	(5)	(6)
MML	-2.097		8.606		-2.372	
	(3.041)		(5.575)		(3.058)	
MML(-4)		4.916		1.437		2.167
		(7.398)		(4.566)		(3.379)
MML(-3)		2.803		0.367		-1.818
		(5.480)		(2.214)		(2.008)
MML(-2)		2.592		1.164		12.08*
		(3.789)		(1.694)		(6.524)
MML(-1)		1.482		-1.885		1.134
		(2.349)		(1.634)		(1.152)
MML(1)		6.713		1.939		0.793
		(4.967)		(1.908)		(1.532)
MML(2)		5.194		5.165		-4.886**
		(6.898)		(3.490)		(2.392)
MML(3)		-2.764		9.429**		-0.000686
		(6.048)		(3.510)		(1.817)
MML(4)		-14.02*		15.28***		2.256
		(8.337)		(5.231)		(2.096)
Mean Sentence	62.15	62.15	61.23	61.23	53.90	53.90
R-squared	0.474	0.474	0.518	0.518	0.250	0.250
N	2788102	2788102	2204154	2204154	1322084	1322084

Notes: This table tests the robustness of the full sample results presented in Table 2 and Table 3. The dependent variable is time served in prison, measured in months. Standard errors clustered at the state level are shown in parentheses (forty-three clusters). In all regressions, we control for individual demographic characteristics (race, ethnicity, gender, age, age squared, highest grade complete, prior felony incarceration) and reason for prison admission. We also include indicators for missing data for each of these control variables. State-by-admission year fixed effects are included in all specifications. Column (1) reports the coefficient estimate on MML, a DD indicator that equals to 1 if a state has reformed (repealed or revised) its mandatory minimum sentencing laws for the year-month in which the offender was admitted to prison. Columns (3) and (5) report the coefficient estimate on the same MML variable interacted with an indicator for whether the offender is Black or Hispanic, respectively. Columns (2), (4), and (6) present the corresponding event-study estimates.
* $p < .10$, ** $p < .05$, *** $p < .01$
Data source: NCRP 1997-2016.

Table OA4: Robustness: Winsorized Dependent Variable

	DD		DDD-Black		DDD-Hispanic	
	(1)	(2)	(3)	(4)	(5)	(6)
MML	-6.853		0.338		-10.26*	
	(5.463)		(3.894)		(5.229)	
MML(-4)		-2.956		-5.514		-1.405
		(3.438)		(3.358)		(3.313)
MML(-3)		-0.904		-2.441		-0.0786
		(1.692)		(1.760)		(2.407)
MML(-2)		-0.504		-2.276		2.661**
		(1.897)		(1.940)		(1.230)
MML(-1)		1.391		-0.276		2.371**
		(1.042)		(1.220)		(1.136)
MML(1)		-3.362		0.393		-4.230
		(2.151)		(3.835)		(6.062)
MML(2)		-6.234		-2.240		-9.463*
		(3.988)		(3.400)		(5.095)
MML(3)		-6.137		-3.386		-6.755
		(4.519)		(4.923)		(6.780)
MML(4)		-16.48**		-7.132		-14.40**
		(6.473)		(5.907)		(6.342)
Mean sent_zence	51.93	51.93	51.26	51.26	47.80	47.80
R-squared	0.352	0.354	0.349	0.350	0.305	0.305
N	2788102	2788102	2204154	2204154	1322084	1322084

Notes: This table tests the robustness of the full sample results presented in Table 2 and Table 3. The dependent variable is individual sentence length, measured in months, and winsorized to deal with outliers. Standard errors clustered at the state level are shown in parentheses (forty-three clusters). In all regressions, we control for individual demographic characteristics (race, ethnicity, gender, age, age squared, highest grade complete, prior felony incarceration) and reason for prison admission. We also include indicators for missing data for each of these control variables. State and admission year fixed effects are included in all specifications. Column (1) reports the coefficient estimate on MML, a DD indicator that equals to 1 if a state has reformed (repealed or revised) its mandatory minimum sentencing laws for the year-month in which the offender was admitted to prison. Columns (3) and (5) report the coefficient estimate on the same MML variable interacted with an indicator for whether the offender is Black or Hispanic, respectively. Columns (2), (4), and (6) present the corresponding event-study estimates.
* p < .10, ** p < .05, *** p < .01
Data source: NCRP 1997-2016.

Table OA5: Robustness: Logged Dependent Variable

	DD		DDD-Black		DDD-Hispanic	
	(1)	(2)	(3)	(4)	(5)	(6)
MML	-0.170		0.0380		-0.210*	
	(0.125)		(0.0876)		(0.124)	
MML(-4)		-0.0429		-0.114		-0.0352
		(0.0796)		(0.0742)		(0.0662)
MML(-3)		-0.000407		-0.0415		0.0232
		(0.0360)		(0.0413)		(0.0607)
MML(-2)		0.00836		-0.0390		0.0920**
		(0.0455)		(0.0499)		(0.0410)
MML(-1)		0.0362		-0.00244		0.0557
		(0.0267)		(0.0329)		(0.0348)
MML(1)		-0.0793		0.0337		-0.0887
		(0.0493)		(0.0984)		(0.148)
MML(2)		-0.139		-0.0201		-0.206*
		(0.0846)		(0.0803)		(0.122)
MML(3)		-0.146		-0.0420		-0.134
		(0.0989)		(0.103)		(0.160)
MML(4)		-0.359**		-0.110		-0.286*
		(0.145)		(0.124)		(0.154)
Mean logsentence	3.590	3.590	3.567	3.567	3.509	3.509
R-squared	0.368	0.369	0.374	0.374	0.332	0.332
N	2788102	2788102	2204154	2204154	1322084	1322084

Notes: This table tests the robustness of the full sample results presented in Table 2 and Table 3. The dependent variable is individual sentence length, measured in months, and log-transformed. Standard errors clustered at the state level are shown in parentheses (forty-three clusters). In all regressions, we control for individual demographic characteristics (race, ethnicity, gender, age, age squared, highest grade complete, prior felony incarceration) and reason for prison admission. We also include indicators for missing data for each of these control variables. State and admission year fixed effects are included in all specifications. Column (1) reports the coefficient estimate on MML, a DD indicator that equals to 1 if a state has reformed (repealed or revised) its mandatory minimum sentencing laws for the year-month in which the offender was admitted to prison. Columns (3) and (5) report the coefficient estimate on the same MML variable interacted with an indicator for whether the offender is Black or Hispanic, respectively. Columns (2), (4), and (6) present the corresponding event-study estimates.
* $p < .10$, ** $p < .05$, *** $p < .01$
Data source: NCRP 1997-2016.

Table OA6: Robustness: Excluding Prior Felony as Control

	DD		DDD-Black		DDD-Hispanic	
	(1)	(2)	(3)	(4)	(5)	(6)
MML	-11.28		1.646		-30.67**	
	(11.64)		(9.174)		(12.70)	
MML(-4)		-4.050		-7.080*		0.658
		(6.436)		(3.676)		(3.783)
MML(-3)		0.561		-1.436		-0.347
		(2.979)		(1.677)		(3.019)
MML(-2)		1.046		-1.910		14.26***
		(3.420)		(2.298)		(4.706)
MML(-1)		3.360		0.883		10.45***
		(2.453)		(1.491)		(2.979)
MML(1)		-3.441		0.936		-11.19
		(5.553)		(7.685)		(11.86)
MML(2)		-8.732		-2.206		-24.33*
		(7.962)		(7.853)		(12.17)
MML(3)		-12.98		-5.650		-23.94*
		(8.121)		(9.217)		(14.10)
MML(4)		-25.53*		-6.500		-36.06***
		(13.02)		(11.63)		(12.17)
Mean Sentence	62.15	62.15	61.23	61.23	53.90	53.90
R-squared	0.445	0.446	0.487	0.487	0.204	0.204
N	2788102	2788102	2204154	2204154	1322084	1322084

Notes: This table tests the robustness of the full sample results presented in Table 2 and Table 3. The dependent variable is individual sentence length, measured in months. Standard errors clustered at the state level are shown in parentheses (forty-three clusters). In all regressions, we control for individual demographic characteristics (race, ethnicity, gender, age, age squared, highest grade complete) and reason for prison admission. We also include indicators for missing data for each of these control variables. State and admission year fixed effects are included in all specifications. Column (1) reports the coefficient estimate on MML, a DD indicator that equals to 1 if a state has reformed (repealed or revised) its mandatory minimum sentencing laws for the year-month in which the offender was admitted to prison. Columns (3) and (5) report the coefficient estimate on the same MML variable interacted with an indicator for whether the offender is Black or Hispanic, respectively. Columns (2), (4), and (6) present the corresponding event-study estimates.
* p < .10, ** p < .05, *** p < .01
Data source: NCRP 1997-2016.

Table OA7: Robustness: Controlling for Other Sentencing Reforms

	DD	DDD-Black	DDD-Hispanic
	Panel A: Full Sample		
	(1)	(2)	(3)
MML	-7.146	6.876	-28.34**
	(12.37)	(9.243)	(12.35)
Mean Sentence	62.15	61.23	53.90
R-squared	0.446	0.487	0.204
N	2788102	2204154	1322084
	Panel B: Consistent Sample		
	(1)	(2)	(3)
MML	-25.54*	11.76	-30.58*
	(12.06)	(7.861)	(16.49)
Mean Sentence	58.81	58.87	53.28
R-squared	0.300	0.319	0.216
N	1392894	1072415	655580

Notes: Panel A represents full sample estimates. Panel B represents estimates from the sample restricted to the thirteen states that consistently reported data, as identified by Neal and Rick (2016): California, Colorado, Georgia, Illinois, Michigan, North Dakota, New Jersey, New York, Ohio, South Carolina, Utah, Washington, and Wisconsin. The dependent variable is individual sentence length, measured in months. Standard errors clustered at the state level are shown in parentheses (forty-three clusters). In all regressions, we control for individual demographic characteristics (race, ethnicity, gender, age, age squared, highest grade completed, prior felony incarceration) and reason for prison admission. We also include indicators for missing data for each of these control variables. State and admission-year fixed effects are included in all specifications. Column (1) reports the coefficient estimate on MML, a DD indicator that equals 1 if a state has reformed (repealed or revised) its mandatory minimum sentencing laws after the individual was admitted to prison. Columns (2) and (3) report the coefficient estimate on the same MML variable interacted with an indicator for whether the individual is Black or Hispanic, respectively. Data are from the National Corrections Reporting Program (1997-2016).

* $p < .10$, ** $p < .05$, *** $p < .01$

Table OA8: Robustness: Excluding New York or Missouri

| | NY | | MO | |
	General	Event Study	General	Event Study
	(1)	(2)	(3)	(4)
MML	3.747		-16.47	
	(7.528)		(9.930)	
MML(-4)		-7.418		0.656
		(7.535)		(5.295)
MML(-3)		-1.572		2.718
		(3.481)		(2.214)
MML(-2)		-1.964		2.748
		(3.585)		(3.073)
MML(-1)		0.876		4.950**
		(2.299)		(1.909)
MML(1)		1.715		-8.144**
		(4.997)		(3.340)
MML(2)		0.497		-13.73**
		(6.512)		(6.148)
MML(3)		-1.579		-12.08
		(3.673)		(8.496)
MML(4)		-3.149		-23.73*
		(7.429)		(12.73)
Mean Sentence	60.66	60.66	61.02	61.02
R-squared	0.509	0.509	0.465	0.465
N	2611890	2611890	2683515	2683515

Notes: This table reports the full sample estimates with the state in the column header excluded. The odd columns report the coefficient estimate on MML, a DD indicator that equals to 1 if a state has reformed (repealed or revised) its mandatory minimum sentencing laws for the year-month in which the individual was admitted to prison. The even columns present the corresponding event-study estimates, with the number in brackets on the MML variable indicating years prior or post mandatory minimum reforms. Standard errors clustered at the state level are shown in parentheses (forty-three clusters). In all regressions, we control for individual demographic characteristics (race, ethnicity, gender, age, age squared, highest grade complete, prior felony incarceration) and reason for prison admission. We also include indicators for missing data for each of these control variables. State and admission year fixed effects are included in all specifications.
* $p < .10$, ** $p < .05$, *** $p < .01$
Data source: NCRP 1997-2016.

Table OA9: Prison Admissions in New York by Year

year	releases	percent
1997	13,272.0	7.5
1998	12,769.0	7.2
1999	12,782.0	7.3
2000	12,695	7.2
2001	11,196	6.4
2002	11,503	6.5
2003	10,969	6.2
2004	9,843	5.6
2005	9,491	5.4
2006	9,997	5.7
2007	10,194	5.8
2008	9,219	5.2
2009	7,901	4.5
2010	6,899	3.9
2011	6,468	3.7
2012	5,790	3.3
2013	5,329	3
2014	5,105	2.9
2015	4,790	2.7
Total	176,212	100

Notes: We report drug crime prison admission in the state of New York by year.
Data source: NCRP 1997-2016.