Do Arms Control Treaties Work? Assessing the Effectiveness of the Nuclear Nonproliferation Treaty

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Erratum

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Because of a data merging error, the Nonproliferation Treaty (NPT) ratification status of four countries – Libya, North Korea, South Korea, and Zaire/Democratic Republic of Congo – was mis-coded for some years in the data set we used to produce the results reported in the article "Do Arms Control Treaties Work? Assessing the Effectiveness of the Nuclear Nonproliferation Treaty."*

We have corrected these errors and used the updated data to generate new matched data sets. We then re-estimated all of the models reported in our article using the new matched data sets. Tables 1 and 2 display the results of corrected models previously reported in the main text of the article. Tables 3 through 8 show the results of corrected models previously reported in the Supplementary Information (SI) file. The evidence continues to support the conclusion we reached in our study. In all of the corrected models, NPT membership is associated with a smaller likelihood of nuclear proliferation.

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Table 1: Logit Models of Nuclear Proliferation

DV:	(1) Pursuit	(2) Program
NPT Ratification	-1.767***	-1.906***
	(0.469)	(0.436)
US/USSR Rivalry	1.480**	1.748***
	(0.474)	(0.517)
Nuclear Cooperation Agreements	0.040	0.030
	(0.031)	(0.020)
Treaty Commitment Preferences	3.132***	4.027***
	(0.862)	(0.794)
MIDs	0.531***	0.501***
	(0.159)	(0.146)
GDP per Capita (logged)	-0.184	0.131
	(0.275)	(0.232)
Superpower Alliance	-0.457	-0.647
	(0.634)	(0.644)
Polity	0.000	0.007
	(0.029)	(0.029)
Cold War	-3.636*	-2.182**
	(1.465)	(0.838)
Enduring Rivalry	1.162**	1.262**
	(0.419)	(0.412)
Leader Rebel Experience	1.714***	1.339***
	(0.447)	(0.402)
Personalist Regime	0.252	0.570
	(0.421)	(0.429)
Year	0.160***	0.168***
	(0.036)	(0.036)
Time	-0.336	-0.309
	(0.172)	(0.161)
Time^2	0.042**	0.049**
	(0.014)	(0.015)
Time^3	-0.003	-0.004
	(0.002)	(0.002)
Constant	-326.395***	-346.542***
	(69.683)	(71.476)
Observations	1,562	1,682

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Logit Models of Nuclear Proliferation

DV:	(1) Pursuit S&W	(2) Pursuit J&G	(3) Program S&W	(4) Program J&G
NPT Ratification	-1.457**	-1.147*	-1.755***	-1.541**
	(0.475)	(0.523)	(0.466)	(0.500)
US/USSR Rivalry	0.948	0.453	1.354*	0.443
	(0.519)	(0.488)	(0.551)	(0.575)
Nuclear Cooperation Agreements	0.047	0.043	0.032	0.037
	(0.025)	(0.032)	(0.018)	(0.024)
Treaty Commitment Preferences	1.843**	3.089***	2.870***	3.889***
	(0.665)	(0.930)	(0.630)	(1.070)
MIDs	0.890***	0.274	0.887***	0.499*
	(0.249)	(0.209)	(0.229)	(0.234)
GDP per Capita (logged)	0.038	-0.174	0.164	-0.128
	(0.241)	(0.243)	(0.217)	(0.210)
Superpower Alliance	-0.167	0.476	-0.174	0.680
	(0.528)	(0.558)	(0.563)	(0.572)
Polity	0.036	-0.004	0.016	-0.006
	(0.029)	(0.036)	(0.029)	(0.035)
Cold War	-2.752	-3.283	-0.918	-2.524*
	(1.610)	(2.019)	(0.707)	(1.170)
Enduring Rivalry	0.995*	3.559***	1.174**	4.066***
	(0.390)	(0.790)	(0.406)	(0.762)
Leader Rebel Experience	1.200**	1.633***	0.774*	1.443**
	(0.409)	(0.494)	(0.355)	(0.468)
Personalist Regime	0.055	-0.546	0.239	-0.591
	(0.451)	(0.434)	(0.478)	(0.541)
Year	0.098***	0.198***	0.116***	0.212***
	(0.029)	(0.044)	(0.030)	(0.052)
Time	0.437*	0.058	0.476*	0.000
	(0.211)	(0.196)	(0.208)	(0.207)
Time^2	0.036	-0.007	0.042	-0.027
	(0.027)	(0.024)	(0.035)	(0.051)
Time^3	-0.016**	-0.013**	-0.017***	-0.015*
	(0.005)	(0.005)	(0.005)	(0.007)
Constant	-203.784***	-400.911***	-240.731***	-431.769***
	(57.388)	(88.528)	(58.990)	(103.130)
Observations	1,550	1,558	1,682	1,674

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Logit Models of Nuclear Proliferation with Polity Interaction Term

	(1)	(2)
DV:	Pursuit	Program
NPT Ratification	-3.420*	-3.815***
	(1.598)	(1.145)
Polity	0.010	0.017
	(0.031)	(0.032)
NPT Ratification * Polity	-0.269	-0.339*
	(0.200)	(0.137)
US/USSR Rivalry	1.345**	1.511**
	(0.470)	(0.530)
Nuclear Cooperation Agreements	0.061*	0.060**
	(0.028)	(0.022)
Treaty Commitment Preferences	2.844***	3.554***
	(0.825)	(0.778)
MIDs	0.543***	0.536***
	(0.163)	(0.153)
GDP per Capita (logged)	-0.091	0.268
	(0.275)	(0.247)
Superpower Alliance	-0.671	-0.944
	(0.617)	(0.675)
Cold War	-3.084*	-1.753*
	(1.551)	(0.828)
Enduring Rivalry	1.111*	1.226**
	(0.438)	(0.427)
Leader Rebel Experience	1.725***	1.366**
	(0.452)	(0.433)
Personalist Regime	0.282	0.596
	(0.419)	(0.423)
Year	0.151***	0.160***
	(0.036)	(0.036)
Time	-0.301	-0.270
	(0.169)	(0.164)
Time^2	0.041**	0.047**
	(0.014)	(0.016)
Time^3	-0.003	-0.004
	(0.002)	(0.002)
Constant	-309.272***	-331.316***
	(69.590)	(71.613)
Observations	1,562	1,682

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Average Treatment Effects of NPT Ratification - Genetic Matching Result

	(1)	(2)
DV:	Pursuit	Program
NPT Ratification	-0.058***	-0.128***
	(0.007)	(0.008)
n	1732	1874

Note: Estimates are average treatment effects rather than regression coefficients.
Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Logit Models of Nuclear Proliferation - Effects of Signature and/or Ratification

DV:	(1) Pursuit	(2) Program
NPT Signature and/or Ratification	-2.507***	-3.126***
	(0.440)	(0.414)
US/USSR Rivalry	1.229**	0.835
	(0.477)	(0.489)
Nuclear Cooperation Agreements	0.061*	0.055*
	(0.025)	(0.022)
Treaty Commitment Preferences	3.145*	4.526**
	(1.369)	(1.483)
MIDs	0.554***	0.588***
	(0.162)	(0.147)
GDP per Capita (logged)	-0.025	0.333
	(0.267)	(0.217)
Superpower Alliance	-0.683	-1.118
	(0.604)	(0.632)
Polity	0.021	0.008
	(0.036)	(0.030)
Cold War	-3.182*	-2.361**
	(1.241)	(0.770)
Enduring Rivalry	0.993*	1.704***
	(0.399)	(0.398)
Leader Rebel Experience	1.897***	1.641***
	(0.463)	(0.425)
Personalist Regime	0.772*	0.551
	(0.391)	(0.398)
Year	0.152***	0.189***
	(0.032)	(0.037)
Time	-0.183	-0.234
	(0.167)	(0.168)
Time^2	0.041**	0.053***
	(0.014)	(0.014)
Time^3	-0.004	-0.004
	(0.002)	(0.002)
Constant	-312.222***	-390.551***
	(63.907)	(73.343)
Observations	1,134	1,278

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Logit Models of Nuclear Proliferation: NCAs Excluded

DV:	(1) Pursuit	(2) Program
NPT Ratification	-1.610***	-1.856***
	(0.430)	(0.451)
US/USSR Rivalry	1.457**	1.380**
	(0.509)	(0.519)
Treaty Commitment Preferences	4.162***	4.325***
	(0.727)	(0.679)
MIDs	0.603***	0.560***
	(0.176)	(0.162)
GDP per Capita (logged)	-0.181	0.043
	(0.311)	(0.223)
Superpower Alliance	0.185	-0.098
	(0.603)	(0.551)
Polity	0.015	0.003
	(0.029)	(0.028)
Cold War	-4.344*	-2.719***
	(1.758)	(0.815)
Enduring Rivalry	1.098**	1.493***
	(0.420)	(0.412)
Leader Rebel Experience	1.551***	1.277**
	(0.456)	(0.398)
Personalist Regime	0.448	0.258
	(0.445)	(0.484)
Year	0.180***	0.190***
	(0.037)	(0.036)
Time	-0.426**	-0.448**
	(0.157)	(0.153)
Time^2	0.041**	0.048***
	(0.013)	(0.015)
Time^3	-0.002	-0.002
	(0.002)	(0.002)
Constant	-367.113***	-388.562***
	(72.404)	(70.222)
Observations	1,564	1,692

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Logit Model of Nuclear Program Onset

DV:	(1) Program Onset
NPT Ratification	-3.594***
	(0.912)
US/USSR Rivalry	1.301
	(0.915)
Nuclear Cooperation Agreements	0.054*
	(0.025)
Treaty Commitment Preferences	-0.644
	(1.965)
MIDs	0.815***
	(0.209)
GDP Per Capita (logged)	-0.403
	(0.886)
Super Power Alliance	-0.514
	(1.635)
Polity	0.113
	(0.063)
Enduring Rivalry	0.869
	(1.116)
Leader Rebel Experience	1.540
	(1.088)
Personalist Regime	-0.924
	(1.102)
Time	-0.172
	(0.115)
Time^2	-0.009
	(0.015)
Time^3	0.001
	(0.001)
Constant	-3.331
	(7.330)
Observations	1,462

Standard errors in parentheses
The Cold War variable is excluded because the
matched sample contains zero program onsets during the Cold War.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8: Logit Models of NPT Ratification

	(1) NPT Ratification	(2) NPT Ratification
Treaty Commitment Preferences	2.215***	2.790***
	(0.151)	(0.119)
Nuclear Cooperation Agreements	-0.034***	——
	(0.004)	
MIDs	-0.100	——
	(0.066)	
GDP Per Capita (logged)	-0.059	——
	(0.055)	
Superpower Alliance	0.475***	——
	(0.124)	
Polity	0.046***	——
	(0.008)	
US/USSR Rivalry	0.511**	——
	(0.184)	
Cold War	0.704***	——
	(0.189)	
Enduring Rivalry	-0.468***	——
	(0.113)	
Leader Rebel Experience	-0.037	——
	(0.101)	
Personalist Regime	0.526***	——
	(0.111)	
Year	0.060***	——
	(0.008)	
Constant	-118.259***	-0.656***
	(15.901)	(0.087)
Observations	3,931	3,931
AIC	0.818	0.903
BIC	-29236.562	-28971.690
PCP	80.36	80.26

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$