Supplemental Online Appendix to "Legislative Behavior Absent Reelection Incentives: Findings from a Natural Experiment in the Arkansas Senate"

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Intended for Online Publication Only

March 27, 2017

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Contents

Overview

This supplemental appendix to the paper "Legislative Behavior Absent Reelection Incentives: Findings from a Natural Experiment in the Arkansas Senate" is intended for online publication only. Section A2 presents balance tests separately for each cohort, and Section A3 presents results for the main outcomes separately for each cohort. In the tables reported below, 'Tr' refers to reelection-ineligible senators and 'Co' refers to reelection-eligible senators.

Additional Balance Tests for Arkansas Experimental Design

In this section, we present the same information in Table 1 in the main body of the paper, disaggregated by cohort. Table A1 presents the results from balance tests for the group of senators who drew lots in October 1993. Table A2 presents the results from balance tests for the group of senators who drew lots in December 2002. Finally, Table A3 presents the same covariate balance tests in Table 1 in the main paper, but now uses t-tests of the null hypothesis that means in both groups are equal instead of randomization-inference tests of the sharp null hypothesis, and it also uses t-tests to perform tests of equivalence.

Table A1: Randomization-Based Covariate Balance Between Reelection-Ineligible and Reelection-Eligible Arkansas Senators, 81st (1997-1998) Legislative Session

	Means			**Test of no effect**	**Max δ failing to reject $H_0^\delta : \lvert\tau\rvert > \delta$**	
	Tr	Co	Difference	p-value	$\delta^\star$	$\delta^\star$/`sd`
Vote Share	97.29	90.78	6.51	0.27	15.06	1
Married	0.94	0.83	0.11	0.6	0.29	0.91
Male	0.94	1	-0.06	0.48	0.14	0.84
Democrat	0.94	0.83	0.11	0.59	0.3	0.93
Black	0.12	0.06	0.06	0.6	0.25	0.86
Attorney	0.47	0.5	-0.03	1	0.33	0.65
Age	50.71	50	0.71	0.85	7.06	0.64
Hotelling omnibus				0.8739		
Max abs. val. t-tstat				0.6794		
Sample Size	17	18				

Note: 'Tr' refers to treatment group of reelection-ineligible senators (assigned 4-year lot in 1992), and 'Co' refers to control group of reelection-eligible senators (assigned 2-year lot in 1992). The test of no effect reports randomization-based p-values corresponding to the sharp null hypothesis that the treatment of removing reelection incentives has no effect for any unit using the difference-in-means test statistic. Tests of the hypothesis H_0^δ reported in the last two columns are also randomization-based, assuming a constant treatment effect model as explained in the text and employing $W_{\texttt{DM}}$; `sd` is the pooled standard deviation across treated and control observations.

Table A2: Randomization-Based Covariate Balance Between Reelection-Ineligible and Reelection-Eligible Arkansas Senators, 86th (2007-2008) Legislative Session

	Means			**Test of no effect**	**Max δ failing to reject $H_0^\delta : \lvert\tau\rvert > \delta$**	
	Tr	Co	Difference	p-value	$\delta^\star$	$\delta^\star$/`sd`
Vote Share	80.17	81.69	-1.52	0.85	15.5	0.7
Married	0.8	0.93	-0.13	0.6	0.33	0.95
Male	0.93	0.57	0.36	0.04	0.62	1.55
Democrat	0.87	0.64	0.22	0.22	0.5	1.17
Black	0.13	0.07	0.06	1	0.29	0.91
Attorney	0	0.14	-0.14	0.22	0.29	1.13
Age	50.6	56.36	-5.76	0.17	12.69	1.17
Hotelling omnibus				0.0113		
Max abs. val. t-tstat				0.1196		
Sample Size	15	14				

Note: 'Tr' refers to treatment group of reelection-ineligible senators (assigned 4-year lot in 2002), and 'Co' refers to control group of reelection-eligible senators (assigned 2-year lot in 2002). The test of no effect reports randomization-based p-values corresponding to the sharp null hypothesis that the treatment of removing reelection incentives has no effect for any unit using the difference-in-means test statistic. Tests of the hypothesis H_0^δ reported in the last two columns are also randomization-based, assuming a constant treatment effect model as explained in the text and employing $W_{\texttt{DM}}$; `sd` is the pooled standard deviation across treated and control observations.

Table A3: T-tests of Covariate Balance Between Reelection-Ineligible and Reelection-Eligible Arkansas Senators, pooling 81st (1997-1998) and 86th (2007-2008) Legislative Sessions

	Means			**Test of no effect**	**Max δ failing to reject $H_0^\delta : \lvert\tau\rvert > \delta$**	
	Tr	Co	Difference	p-value	$\delta^\star$	$\delta^\star$/`sd`
Vote Share	89.27	86.8	2.46	0.61	10.59	0.54
Married	0.88	0.88	0	1	0.14	0.42
Male	0.94	0.81	0.12	0.14	0.26	0.8
Democrat	0.91	0.75	0.16	0.1	0.31	0.83
Black	0.12	0.06	0.06	0.4	0.19	0.63
Attorney	0.25	0.34	-0.09	0.42	0.29	0.62
Age	50.66	52.78	-2.12	0.44	6.71	0.61
Hotelling omnibus				0.347351515446167		

Note: 'Tr' refers to treatment group of reelection-ineligible senators (assigned 4-year lot in 1992 or 2002), and 'Co' refers to control group of reelection-eligible senators (assigned 2-year lot in 1992 or 2002). The test of no effect reports p-values corresponding to a t-test that the treatment-control difference-in-means is zero. Tests of the hypothesis H_0^δ reported in the last two columns are also based on t-tests; `sd` is the pooled standard deviation across treated and control observations.

Table A4: T-tests of Covariate Balance Between Reelection-Ineligible and Reelection-Eligible Arkansas Senators, pooling 81st (1997-1998) and 86th (2007-2008) Legislative Sessions—Only survivors

	Means			**Test of no effect**	**Max δ failing to reject $H_0^\delta : \lvert\tau\rvert > \delta$**	
	Tr	Co	Difference	p-value	$\delta^\star$	$\delta^\star$/`sd`
Vote Share	90.79	83.66	7.13	0.21	16.6	0.85
Married	0.85	0.91	-0.07	0.48	0.22	0.67
Male	0.96	0.78	0.18	0.07	0.34	1.06
Democrat	0.96	0.78	0.18	0.07	0.34	1.06
Black	0.15	0.04	0.11	0.2	0.25	0.83
Attorney	0.27	0.39	-0.12	0.38	0.35	0.74
Age	50.81	50.74	0.07	0.98	5.43	0.48
Hotelling omnibus				0.118183436025808		
Sample Size	26	23				

Note: 'Tr' refers to treatment group of reelection-ineligible senators (assigned 4-year lot in 1992 or 2002), and 'Co' refers to control group of reelection-eligible senators (assigned 2-year lot in 1992 or 2002). The test of no effect reports p-values corresponding to a t-test that the treatment-control difference-in-means is zero. Tests of the hypothesis H_0^δ reported in the last two columns are also based on t-tests; `sd` is the pooled standard deviation across treated and control observations.

Additional Treatment Effect Results for Arkansas Experimental Design

Additional Results for Main Sample

In Table A5, we present tests of the sharp null hypothesis and 95% confidence intervals based on the constant treatment effect model, using additional test statistics to those employed in Table 3 in the main paper. The test statistics are the difference in the inter-quartile range (IQR) between treated and control outcomes, and the covariate-adjusted Kolmogorov-Smirnov (KS) statistic. For completeness, we also present results based on the unadjusted KS statistic, which was also employed in Table 3 in the main paper to test the sharp null.

We use the IQR statistic to explore whether the treatment had the effect of affecting the variability of the outcomes. This test statistic is defined as $W_{\texttt{IQR}} = (g_{0.75,1}(Y_i) - g_{0.25,1}(Y_i)) - (g_{0.75,0}(Y_i) - g_{0.25,0}(Y_i))$, where $g_{\delta,1}(Y_i)$ and $g_{\delta,0}(Y_i)$ denote, respectively, the δ empirical quantiles of the observed outcomes in the treatment and control groups.

The covariate adjusted KS statistic is the maximum absolute difference in the empirical distribution functions of the treated and control least-squares residuals, $W_{\texttt{AKS}} = \sup_y |\hat{F}_1^e(y) - \hat{F}_0^e(y)|$, where, as defined in the main paper, $\hat{e}_i$ is the residual obtained from a least-squares fit of the observed outcome on K predetermined covariates, $\hat{e}_i = Y_i - \mathbf{x}_i'\hat{\boldsymbol{\beta}}$, with $\mathbf{x}_i$ a $K \times 1$ vector of covariates, $i = 1, 2, \ldots, n$, $\hat{\boldsymbol{\beta}}$ a $K \times 1$ vector of least-squares coefficients from a fit of $\mathbf{Y}$ on the matrix of covariates, $\mathbf{X} = [\mathbf{x}_1', \mathbf{x}_2', \ldots, \mathbf{x}_n']'$, and $\hat{F}_1^e$ and $\hat{F}_0^e$ are the empirical cumulative distribution functions of the residuals $\hat{e}_i$ in the treatment and control groups, respectively,

Table A5: Test of Sharp Null Hypothesis and Confidence Intervals Based on Different Test Statistics for Outcome Variables in Arkansas Senate, pooling 81st (1997-1998) and 86th (2007-2008) Legislative Sessions

	P-value from Test of Sharp Null			**95% CI for Constant Effect**	
	$W_{\texttt{IQR}}$	$W_{\texttt{KS}}$	$W_{\texttt{CKS}}$	$W_{\texttt{KS}}$	$W_{\texttt{CKS}}$
Abstentions	0.05	0.47	0.73	[-0.59,0.65]	[-0.57,0.59]
Resolutions	0.82	0.31	0.46	[-0.75,1]	[-1,1]
Bills introduced	0.12	0.34	0.57	[-1,10.99]	[-4.97,11]
Bills passed	0.42	0.78	0.80	[-4,6.99]	[-4,7.11]
Bills Cosponsored	0.17	0.55	0.57	[-19.08,9]	[-16.93,10.17]

Note: P-values correspond to randomization-based test of the sharp null hypothesis that the treatment has no effect for any unit employing different test statistics defined in the text. The treatment is the removal of reelection incentives, and the tests are based on a comparison of reelection-ineligible senators (assigned 4-year lot in 1992 or 2002) and reelection-eligible senators (assigned 2-year lot in 1992 or 2002). Confidence intervals are calculated by inverting randomization-based hypothesis tests in a constant treatment effect model, employing different test statistics.

Results Separately by Session

We now present, in Tables A6 and A7, the effects of term limits separately for the 1992 and the 2002 cohorts, respectively. The outcomes for the 1992 cohort occur during the 1997 legislative session, and the outcomes of the 2002 cohort occur during the 2007 legislative session. In the main body of the paper we pool observations to address potential concerns about sample size; here we show that conducting separate analyses for the 1997 and 2007 sessions returns comparable results.

Table A6: Test of Sharp Null Hypothesis and Confidence Intervals Based on Different Test Statistics for Outcome Variables in Arkansas Senate, 81st (1997-1998) Legislative Session

	P-value from Test of Sharp Null				**95% CI for Constant Effect**		
	$W_{\texttt{DM}}$	$W_{\texttt{CDM}}$	$W_{\texttt{DR}}$	$W_{\texttt{KS}}$	$W_{\texttt{DM}}$	$W_{\texttt{CDM}}$	$W_{\texttt{DR}}$
Abstentions	0.91	0.45	0.82	0.72	[-1.26,1.38]	[-1.03,2.17]	[-0.6,1.65]
Resolutions	0.09	0.06	0.09	0.07	[-0.16,2.51]	[-0.12,3.24]	[0,2.99]
Bills introduced	0.35	0.48	0.54	0.25	[-4.35,12.55]	[-6.84,14.54]	[-5.99,11.99]
Bills passed	0.28	0.32	0.46	0.22	[-2.79,10.61]	[-4.17,12.91]	[-3.99,9]

Note: P-values correspond to randomization-based test of the sharp null hypothesis that the treatment has no effect for any unit employing different test statistics defined in the text. The treatment is the removal of reelection incentives, and the tests are based on a comparison of reelection-ineligible senators (assigned 4-year lot in 1992) and reelection-eligible senators (assigned 2-year lot in 1992). Confidence intervals are calculated by inverting randomization-based hypothesis tests in a constant treatment effect model, employing different test statistics.

Table A7: Test of Sharp Null Hypothesis and Confidence Intervals Based on Different Test Statistics for Outcome Variables in Arkansas Senate, 86th (2007-2008) Legislative Session

	P-value from Test of Sharp Null				**95% CI for Constant Effect**		
	$W_{\texttt{DM}}$	$W_{\texttt{CDM}}$	$W_{\texttt{DR}}$	$W_{\texttt{KS}}$	$W_{\texttt{DM}}$	$W_{\texttt{CDM}}$	$W_{\texttt{DR}}$
Abstentions	0.39	0.42	0.79	0.86	[-0.64,6.65]	[-0.94,6.66]	[-0.38,0.7]
Resolutions	0.78	0.72	0.79	0.75	[-1.33,2]	[-1.32,1.9]	[-1.77,1.99]
Bills introduced	0.94	0.89	0.54	0.55	[-8.74,9.49]	[-8.4,9.33]	[-7.99,10]
Bills passed	0.98	0.99	0.99	1.00	[-5.5,5.31]	[-5.2,5.03]	[-5.99,5.99]
Bills Cosponsored	0.41	0.41	0.44	0.55	[-14.26,6.16]	[-14.16,6.11]	[-15.99,5.99]

Note: P-values correspond to randomization-based test of the sharp null hypothesis that the treatment has no effect for any unit employing different test statistics defined in the text. The treatment is the removal of reelection incentives, and the tests are based on a comparison of reelection-ineligible senators (assigned 4-year lot in 2002) and reelection-eligible senators (assigned 2-year lot in 2002). Confidence intervals are calculated by inverting randomization-based hypothesis tests in a constant treatment effect model, employing different test statistics.