

Supplementary Files for
Accounting for Extra-Dyadic Sources of International Outcomes

Table 1: Uncertainty and Defense Pacts

	<i>Model 1</i>	<i>Model 2</i>
<i>System Uncertainty</i>		-1.93*** (0.10)
<i>Alliance Reputation</i>	0.56*** (0.19)	0.73*** (0.18)
<i>Alliance History</i>	1.00* (0.61)	1.15* (0.62)
<i>Portfolio Similarity</i>	0.79*** (0.06)	0.82*** (0.06)
<i>Interaction Score (IIS)</i>	0.45*** (0.10)	0.40*** (0.09)
<i>Joint Enemy</i>	0.80*** (0.01)	0.82*** (0.02)
<i>Distance</i>	-0.0081*** (0.00)	-0.0083*** (0.00)
<i>Major Power Status</i>	0.045** (0.02)	0.13*** (0.02)
<i>Polity Difference</i>	-0.014*** (0.00)	-0.014*** (0.00)
<i>Joint Democracy</i>	-0.050*** (0.02)	-0.095*** (0.02)
<i>Constant</i>	-3.00*** (0.06)	-2.55*** (0.06)
Observations	1045707	1045707
Pseudo R^2	0.16	0.16

Standard errors corrected for clustering by dyad are presented in parentheses.

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

Table 2: Multinomial Logit Analyses of Alliance Formation

	<i>Null</i>	<i>System</i>	<i>Region</i>
Non-Defense Pact Alliances			
<i>Uncertainty</i>		-4.99*** (0.40)	-0.88*** (0.33)
Alliance Reputation	2.19*** (0.68)	3.06*** (0.67)	2.23*** (0.68)
Alliance History	-2.89* (1.57)	-2.68 (1.63)	-2.88* (1.58)
.....			
Constant	-5.57*** (0.12)	-4.23*** (0.16)	-5.23*** (0.17)
Defense Pacts			
<i>Uncertainty</i>		-4.61*** (0.28)	-12.4*** (0.44)
Alliance Reputation	2.78*** (0.46)	3.30*** (0.45)	3.20*** (0.48)
Alliance History	1.76* (1.02)	2.09** (1.06)	2.68** (1.14)
.....			
Constant	-7.03*** (0.19)	-5.90*** (0.19)	-2.23*** (0.24)
Observations	1045707	1045707	1045707
Pseudo R^2	0.1481	0.1542	0.1672
chi2	13046.8	14012.5	13055.0
ll	-40480.8	-40191.3	-39572.4

Standard errors in parentheses. Base category: No Alliance

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

Table 3: Uncertainty, Alliance Formation, k -adic Sample

	<i>Model 1</i>	<i>Model 2</i>
<i>System Uncertainty</i>		-4.10*** (0.87)
<i>Total CINC of k-ad</i>	8.70*** (1.24)	10.8*** (1.29)
<i>Total CINC of k-ad²</i>	-14.6*** (2.77)	-17.6*** (2.80)
<i>Number of Previous Alliance Failures</i>	-1.35*** (0.20)	-1.46*** (0.21)
<i>Time Since Previous Defense Pact</i>	-0.13*** (0.04)	-0.11*** (0.04)
<i>Constant</i>	-4.08*** (0.17)	-3.16*** (0.25)
Observations	24,611	24,611
Pseudo R^2	0.04	0.05
Log-Likelihood	-1396	-1384

Standard errors are presented in parentheses. Cubic splines are not presented to save space. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Uncertainty and Nuclear Proliferation, Region Fixed Effects

	Singh and Way		Jo and Gartzke	
	<i>System</i>	<i>Region</i>	<i>System</i>	<i>Region</i>
<i>Uncertainty</i>	-49.2*** (14.62)	-25.8*** (7.21)	-53.9*** (15.59)	-28.3*** (7.23)
<i>Personalist Regime</i>	2.67*** (0.64)	3.24*** (0.77)	2.90*** (0.66)	3.16*** (0.72)
<i>Land</i>	0.99*** (0.22)	0.98*** (0.25)	1.07*** (0.24)	0.85*** (0.23)
<i>Region Fixed Effects (Reference Category: Europe and Africa)</i>				
<i>Middle East</i>	5.01*** (1.67)	11.9*** (2.76)	2.80* (1.45)	8.61*** (2.03)
<i>Asia</i>	5.75*** (1.65)	7.21*** (2.05)	3.56*** (1.37)	3.57*** (1.35)
<i>America</i>	2.14 (1.89)	0.11 (2.52)	0.69 (1.83)	-1.42 (1.80)
<i>Constant</i>	-2.31 (3.83)	-5.53 (4.12)	0.92 (3.88)	1.48 (3.60)
$\ln(\sigma_v^2)$				
<i>Constant</i>	2.82*** (0.35)	3.26*** (0.48)	2.73*** (0.35)	2.50*** (0.43)
Observations	5338	5324	5335	5321

Standard errors in parentheses

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

Table 5: Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
<i>Alliance Formation Application</i>					
Systemic Uncertainty	1,315,954	0.24	0.07	0.19	0.51
Dynamic Regional Uncertainty	1,315,954	0.40	0.07	0.19	0.68
Alliance Formation	1,572,896	0.01	0.08	0.00	1.00
Alliance Reputation	1,460,047	0.00	0.01	-0.32	0.61
Alliance History	1,419,971	0.00	0.00	-0.33	0.68
Portfolio Similarity	1,313,740	0.76	0.19	-0.22	1.00
Interaction Score	1,288,912	0.00	0.05	-0.94	0.42
Joint Enemy	1,582,576	0.10	0.31	0.00	1.00
Distance	1,457,406	64.26	23.74	0.00	111.33
Major Power Status	1,459,726	0.10	0.30	0.00	1.00
Polity Difference	1,173,488	7.75	6.31	0.00	20.00
Joint Democracy	1,460,046	0.12	0.32	0.00	1.00
<i>Nuclear Proliferation Application</i>					
Systemic Uncertainty	7,421	0.21	0.01	0.19	0.24
Fixed Regional Uncertainty	7,384	0.39	0.09	0.28	0.63
Nuclear Weapon Pursue (SW)	7,109	0.03	0.18	0.00	1.00
Nuclear Weapon Pursue (JG)	7,102	0.04	0.19	0.00	1.00
Personalist Regime	5,659	0.20	0.40	0.00	1.00
Land	7,422	3.13	2.40	0.00	20.00

Table 6: Alliance Results with DOE-Score based Uncertainty Measures

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Uncertainty</i>	-0.67*** (0.03)	-0.53*** (0.03)	-0.64*** (0.03)	-0.64*** (0.03)	-0.48*** (0.03)	-0.48*** (0.03)
<i>Alliance Reputation</i>	1.71*** (0.20)	1.68*** (0.20)	1.70*** (0.20)	1.70*** (0.20)	1.67*** (0.20)	1.67*** (0.20)
<i>Alliance History</i>	0.65 (0.63)	0.66 (0.62)	0.65 (0.63)	0.65 (0.63)	0.66 (0.62)	0.66 (0.62)
<i>Portfolio Similarity</i>	0.61*** (0.04)	0.61*** (0.04)	0.61*** (0.04)	0.61*** (0.04)	0.61*** (0.04)	0.61*** (0.04)
<i>Interaction Score (IIS)</i>	0.16** (0.06)	0.17*** (0.06)	0.16** (0.06)	0.16** (0.06)	0.17*** (0.06)	0.17*** (0.06)
<i>Joint Enemy</i>	0.57*** (0.01)	0.57*** (0.01)	0.57*** (0.01)	0.57*** (0.01)	0.57*** (0.01)	0.57*** (0.01)
<i>Distance</i>	-0.012*** (0.00)	-0.012*** (0.00)	-0.012*** (0.00)	-0.012*** (0.00)	-0.012*** (0.00)	-0.012*** (0.00)
<i>Major Power Status</i>	0.20*** (0.02)	0.18*** (0.02)	0.20*** (0.02)	0.20*** (0.02)	0.17*** (0.02)	0.17*** (0.02)
<i>Polity Difference</i>	-0.0028*** (0.00)	-0.0023*** (0.00)	-0.0028*** (0.00)	-0.0028*** (0.00)	-0.0022*** (0.00)	-0.0022*** (0.00)
<i>Joint Democracy</i>	0.15*** (0.01)	0.17*** (0.01)	0.15*** (0.01)	0.15*** (0.01)	0.17*** (0.01)	0.17*** (0.01)
<i>Constant</i>	-2.21*** (0.04)	-2.25*** (0.04)	-2.22*** (0.04)	-2.22*** (0.04)	-2.28*** (0.04)	-2.28*** (0.04)
Observations	1045707	1045707	1045707	1045707	1045707	1045707
pseudo R2	0.1467	0.1438	0.1463	0.1462	0.1431	0.1430
PRL CVL	0.9495	0.9493	0.9494	0.9494	0.9492	0.9492

Standard errors corrected for clustering by dyad are presented in parentheses.

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

Table 7: Singh and Way Results with DOE-Score based Uncertainty Measures

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Uncertainty</i>	-21.7*** (5.62)	-28.0*** (6.68)	-18.6*** (5.02)	-18.6*** (5.02)	-26.5*** (6.01)	-25.9*** (5.90)
<i>Personalist Regime</i>	3.11*** (0.72)	3.01*** (0.68)	3.10*** (0.70)	3.10*** (0.70)	3.11*** (0.73)	3.10*** (0.72)
<i>Land</i>	0.73*** (0.25)	0.71*** (0.20)	0.73*** (0.23)	0.73*** (0.23)	0.73*** (0.22)	0.71*** (0.22)
<i>Constant</i>	-3.00 (2.65)	1.00 (2.91)	-4.45* (2.39)	-4.45* (2.39)	-1.72 (2.80)	-0.90 (2.74)
$\ln(\sigma_v^2)$	3.31*** (0.30)	3.27*** (0.23)	3.38*** (0.27)	3.38*** (0.27)	3.73*** (0.22)	3.53*** (0.23)
Observations	5338	5338	5338	5338	5338	5338
PRL CVL	0.6238	0.6182	0.6064	0.6114	0.6234	0.6120

Standard errors corrected for clustering by dyad are presented in parentheses.

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

Table 8: Gartzke and Jo Results with DOE-Score based Uncertainty Measures

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Uncertainty</i>	-16.1*** (4.93)	-20.0*** (5.72)	-14.0*** (4.46)	-14.0*** (4.45)	-16.2*** (4.85)	-16.0*** (4.81)
<i>Personalist Regime</i>	3.31*** (0.69)	3.28*** (0.69)	3.32*** (0.69)	3.32*** (0.69)	3.29*** (0.69)	3.29*** (0.69)
<i>Land</i>	0.85*** (0.23)	0.85*** (0.23)	0.86*** (0.23)	0.86*** (0.23)	0.86*** (0.23)	0.86*** (0.23)
<i>Constant</i>	-3.63 (2.38)	-1.42 (2.83)	-4.37* (2.30)	-4.36* (2.30)	-2.85 (2.58)	-2.89 (2.57)
$\ln(\sigma_v^2)$	3.02*** (0.26)	3.08*** (0.25)	3.01*** (0.27)	3.00*** (0.27)	3.07*** (0.26)	3.05*** (0.26)
Observations	5337	5337	5337	5337	5337	5337
PRL CVL	0.6934	0.6962	0.6922	0.6922	0.7110	0.7113

Standard errors corrected for clustering by dyad are presented in parentheses.

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

Table 9: Uncertainty and Alliance Formation | Hierarchical Model

	Model A1	Model A2	Model A3	Model A4	Model A5	Model A6	Model A7	Model A8
	Null	System	System	Region	Region	Null	System	System
System Uncertainty		-9.09*** (1.59)	-9.22*** (1.73)	-3.54*** (0.36)	-10.1*** (0.93)		-7.70*** (1.48)	-8.36*** (1.66)
Alliance Reputation	-7.50*** (0.83)	-7.48*** (0.82)	-7.48*** (0.82)	-7.32*** (0.83)	-7.48*** (0.84)	-7.74*** (1.35)	-7.71*** (1.34)	-7.69*** (1.34)
Alliance History	-3.60** (1.45)	-3.61** (1.45)	-3.61** (1.45)	-3.40** (1.43)	-3.74*** (1.44)	-2.14 (1.41)	-2.16 (1.41)	-2.15 (1.41)
Portfolio Similarity	2.16*** (0.09)	2.15*** (0.09)	2.15*** (0.09)	2.27*** (0.09)	2.36*** (0.09)	1.95*** (0.14)	1.94*** (0.14)	1.94*** (0.14)
Interaction Score	0.50*** (0.14)	0.50*** (0.14)	0.50*** (0.14)	0.45*** (0.14)	0.47*** (0.14)	-0.13 (0.13)	-0.12 (0.13)	-0.12 (0.13)
Joint Enemy	0.63*** (0.03)	0.63*** (0.03)	0.63*** (0.03)	0.60*** (0.03)	0.60*** (0.03)	0.61*** (0.04)	0.61*** (0.04)	0.61*** (0.04)
Distance	-0.036*** (0.00)	-0.036*** (0.00)	-0.036*** (0.00)	-0.036*** (0.00)	-0.036*** (0.00)	-0.025*** (0.00)	-0.025*** (0.00)	-0.025*** (0.00)
Major Power Status	0.81*** (0.03)	0.82*** (0.03)	0.82*** (0.03)	0.24*** (0.07)	-0.14* (0.07)	0.54*** (0.05)	0.56*** (0.05)	0.56*** (0.05)
Polity Difference	-0.014*** (0.00)	-0.014*** (0.00)	-0.014*** (0.00)	-0.013*** (0.00)	-0.013*** (0.00)	-0.0031 (0.00)	-0.0035 (0.00)	-0.0035 (0.00)
Joint Democracy	0.47*** (0.04)	0.46*** (0.04)	0.46*** (0.04)	0.49*** (0.04)	0.49*** (0.04)	0.35*** (0.06)	0.34*** (0.06)	0.34*** (0.06)
Constant	-7.01*** (0.19)	-4.06*** (0.52)	-4.03*** (0.55)	-5.46*** (0.24)	-3.62*** (0.37)	-6.69*** (0.21)	-4.20*** (0.50)	-4.04*** (0.51)
Random Parameters								
$\sigma(\text{Intercept}_{\text{YEAR}})$	1.94 (0.14)	1.79 (0.13)	1.75 (0.23)	1.83 (0.14)	3.03 (0.28)	1.75 (0.14)	1.65 (0.13)	1.37 (0.29)
$\sigma(\text{Slope}_{\text{UNCERTAINTY}})$	- -	- -	1.22 (3.21)	- -	7.00 (0.70)	- -	- -	3.07 (1.50)
Observations	1.045.707	1.045.707	1.045.707	1.045.707	1.045.707	162.456	162.456	162.456
Sample	Full	Full	Full	Full	Full	PR	PR	PR
ll	-29558.3	-29541.5	-29542.4	-29509.7	-29201.8	-11126.2	-11112.1	-11111.5

Standard errors corrected for clustering by dyad are presented in parentheses.

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

Table 10: Uncertainty and Nuclear Proliferation, Singh and Way | Hierarchical Model

	Model SW1	Model SW1	Model SW3	Model SW4	Model SW5
Year Level Predictors					
System Uncertainty		-66.5*** (17.19)	-65.7*** (17.53)		
Region Level Predictors					
Region Uncertainty				-13.2*** (4.81)	-19.5*** (5.85)
Personalist Regime	1.85*** (0.36)	2.02*** (0.36)	2.03*** (0.37)	1.52*** (0.38)	1.53*** (0.38)
Land	0.25*** (0.06)	0.26*** (0.06)	0.26*** (0.06)	0.30*** (0.06)	0.28*** (0.06)
Constant	0.028 (0.33)	14.0*** (3.61)	13.8*** (3.68)	3.91* (2.28)	6.14*** (1.96)
Random Parameters					
σ (Intercept _{YEAR})	0.99 (0.18)	0.77 (0.16)	0.00 (1.64)	- -	- -
σ (Intercept _{REGION})	- -	- -	- -	2.47 (1.05)	0.00 (1.16)
σ (Intercept _{SYS.UNC.})	- -	- -	3.62 (0.78)	- -	- -
σ (Intercept _{REG.UNC.})	- -	- -	- -	- -	6.35 (2.60)
Observations	5338	5338	5338	5324	5324
ll	-232.8	-225.9	-225.8	-217.0	-213.3

Standard errors corrected for clustering by dyad are presented in parentheses.

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

Table 11: Uncertainty and Nuclear Proliferation, Gartzke and Jo | Hierarchical Model

	Model GJ1	Model GJ2	Model GJ3	Model GJ4	Model GJ5
Year Level Predictors					
System Uncertainty		-61.1*** (14.95)	-60.2*** (15.22)		
Region Level Predictors					
Region Uncertainty				-25.3*** (4.65)	-30.1*** (6.16)
Personalist Regime	2.15*** (0.38)	2.35*** (0.39)	2.35*** (0.39)	2.23*** (0.39)	2.24*** (0.40)
Land	0.30*** (0.06)	0.32*** (0.06)	0.32*** (0.06)	0.29*** (0.06)	0.27*** (0.06)
Constant	-0.31 (0.32)	12.4*** (3.15)	12.2*** (3.20)	8.75*** (2.47)	10.2*** (1.86)
Random Parameters					
$\sigma(\text{Intercept}_{\text{YEAR}})$	0.87 (0.17)	0.65 0.16	0.00 (1.72)	- -	- -
$\sigma(\text{Intercept}_{\text{REGION}})$	- -	- -	- -	3.49 (1.39)	0.00 (1.31)
$\sigma(\text{Intercept}_{\text{SYS.UNC.}})$	- -	- -	3.10 (0.74)	- -	- -
$\sigma(\text{Intercept}_{\text{REG.UNC.}})$	- -	- -	- -	- -	8.08 (3.20)
Observations	5337	5335	5335	5321	5321
ll	-251.1	-243.3	-243.2	-236.5	-231.7

Standard errors corrected for clustering by dyad are presented in parentheses.

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