Duque, Marina G. "Recognizing International Status: A Relational Approach."
International Studies Quarterly

Online Appendix

Overall Network Structure

Table A1 shows basic statistics for the network of embassies (1970-2010):

- Network density—the proportion of existing ties to potential ties—remains stable between 1970 and 2010, when the number of states increases from 134 to 190. On average, states send only 21% of the potential embassies that could be sent abroad.

- The proportion of symmetric dyads is stable over time. On average, 90% of the dyads are symmetric—either null (no embassies exchanged) or mutual (embassies sent by both states in the dyad). Asymmetric dyads (cases of unrequited recognition) are relatively rare.

- The global clustering coefficient—the proportion of closed triads to both open and closed triads—is stable. On average, for any three nodes i, j, and k, if the ties (i,j) and (i,k) exist, a (j,k) tie also exists 54% of the time.

Table A1. Network Statistics

	1970	1975	1980	1985	1990	1995	2000	2005	2010
Nodes	134	148	157	162	164	183	187	188	190
Isolates	1	9	2	1	1	0	0	1	0
Ties	3,655	4,567	5,314	5,597	5,871	6,165	6,620	7,380	8,272
Density	0.20	0.21	0.22	0.21	0.22	0.18	0.19	0.21	0.23
Proportion of Symmetric Dyads	0.88	0.89	0.91	0.91	0.9	0.91	0.91	0.91	0.92
Global Clustering Coefficient	0.52	0.55	0.56	0.54	0.56	0.52	0.52	0.54	0.55

The stability of the basic network statistics over time, however, does not imply that the network itself is static. Table A2 shows the number and proportion of embassies opened and closed each period relative to the previous period. On average, 12% of the embassies that exist in a given period are closed in the following period; relative to the previous period, 23% more new embassies are opened each period. In other words, there is variation over time in the network to be explained.

Table A2. Embassies Opened and Closed Relative to the Previous Period (1975-2010)

		1975	1980	1985	1990	1995	2000	2005	2010
Opened	Count	1,435	1,317	890	781	1,564	1,042	1,324	1,463
	Percent	39	29	17	14	27	17	20	20
Closed	Count	523	570	607	507	1,270	587	564	571
	Percent	14	12	11	9	22	10	9	8

Table A3 shows the number of new embassies received by country between 1995-2000 and 2000-2005 respectively. By 2000, 166 countries receive new embassies; by 2005, 170 countries receive new embassies. New embassies are distributed throughout the network rather than concentrated in a few countries.

Table A3. New Embassies Received by Country (1995-2005)

1995-2000						2000-2005					
SAF	37	ALG	6	SLU	2	MAL	33	CDI	9	SOM	4
GMY	34	IRN	6	PAN	2	CUB	25	BFO	9	MYA	4
UKR	28	LEB	6	SUR	2	CAN	24	ETH	9	HAI	3
AUS	25	KUW	6	URU	2	ISR	22	MZM	9	TRI	3
ITA	25	TAJ	6	LIT	2	POL	21	KZK	9	GUA	3
BEL	24	UZB	6	FIN	2	CRO	21	PAK	9	SAL	3
FRN	24	THI	6	BEN	2	YUG	21	BNG	9	COS	3
CAN	23	DRV	6	SIE	2	USA	20	JAM	8	PER	3
BOS	23	AUL	6	GAB	2	AUL	20	NIC	8	BOL	3
CHN	22	PER	5	ANG	2	SAF	19	BUL	8	PAR	3
UKG	19	POL	5	NAM	2	TKM	19	ARM	8	LIT	3
YUG	19	CZR	5	BOT	2	CHN	19	ANG	8	STP	3
USA	17	CYP	5	MAG	2	MEX	17	BAH	8	MAA	3
ETH	17	BFO	5	TUN	2	JOR	17	TAW	8	GHA	3
NTH	16	NIG	5	KYR	2	AFG	17	PHI	8	TAZ	3
ROK	16	ERI	5	MYA	2	UKG	16	FRN	7	NAM	3
EGY	15	ZIM	5	SRI	2	BEL	16	SWZ	7	TUN	3
JPN	15	BAH	5	NEP	2	ITA	16	GRC	7	SRI	3
MOR	13	OMA	5	CUB	1	RUS	16	EST	7	SVG	2
LIB	13	TAW	5	DOM	1	IRN	16	NIR	7	AAB	2
TUR	13	PAK	5	JAM	1	INS	16	GUI	7	GRG	2
MAL	13	CAM	5	SVG	1	SLV	15	ALG	7	ICE	2
BRA	12	HAI	4	SKN	1	SEN	15	TAJ	7	GNB	2
SPN	12	VEN	4	SAL	1	UZB	15	PRK	7	BEN	2
POR	12	LUX	4	COS	1	JPN	15	DOM	6	TOG	2
BLR	11	ALB	4	GUY	1	IND	15	COL	6	DJI	2
BRU	11	MLD	4	ECU	1	THI	15	IRE	6	ZAM	2
IND	10	EST	4	ICE	1	AUS	14	NTH	6	ZIM	2
MEX	9	NIR	4	STP	1	AZE	14	ALB	6	MAG	2
CHL	9	RWA	4	GAM	1	MOR	14	BOS	6	COM	2
RUS	9	MZM	4	MLI	1	EGY	14	BLR	6	TUR	2
NOR	9	SUD	4	SEN	1	DRV	14	ERI	6	YEM	2
DEN	9	SAU	4	GUI	1	BRA	13	SAU	6	CAM	2
ISR	9	TKM	4	LBR	1	POR	13	KUW	6	BRU	2
MAC	8	TON	4	TOG	1	HUN	13	UAE	6	PNG	2
CRO	8	BAR	3	CAO	1	CYP	13	KYR	6	NEW	2
GRC	8	GUA	3	CON	1	LIB	13	MON	6	FIJ	2
ROM	8	HON	3	UGA	1	SIN	13	GRN	5	PAL	2
GHA	8	NIC	3	BUI	1	GMY	12	SPN	5	BHM	1
KEN	8	PAR	3	SOM	1	DEN	12	ROM	5	BAR	1
KZK	8	SWZ	3	MAW	1	UGA	12	LAT	5	DMA	1
PHI	8	AZE	3	SWA	1	VEN	11	NOR	5	SLU	1
INS	8	MAA	3	COM	1	CHL	11	CAO	5	SKN	1
NEW	8	CDI	3	MAS	1	ARG	11	GAB	5	HON	1
SWD	7	DRC	3	SEY	1	MAC	11	CHA	5	MLD	1
ZAM	7	TAZ	3	AFG	1	NIG	11	CON	5	CAP	1
JOR	7	LES	3	MAD	1	IRQ	11	BOT	5	GAM	1
UAE	7	SYR	3	LAO	1	LEB	11	SYR	5	SIE	1
TRI	6	YEM	3	VAN	1	ETM	11	LAO	5	RWA	1
ARG	6	QAT	3	NAU	1	URU	10	BLZ	4	MAW	1
IRE	6	MON	3	MSI	1	SWD	10	PAN	4	MAS	1
HUN	6	PRK	3	PAL	1	SUD	10	UKR	4	SEY	1
SLO	6	BNG	3			QAT	10	FIN	4	OMA	1
BUL	6	SIN	3			ROK	10	LBR	4	NEP	1
LAT	6	PNG	3			CZR	9	CEN	4	VAN	1
ARM	6	KIR	3			SLO	9	DRC	4	NAU	1
GRG	6	FIJ	3			MLI	9	KEN	4		

Network Centrality

Table A4 shows the in- and out-degree distributions, both of which are right skewed: there are few states that send or receive many embassies, while a large number of states send or receive fewer embassies.

Table A4. Degree Distribution

	1970	1975	1980	1985	1990	1995	2000	2005	2010
In-Degree									
Minimum	0	0	0	0	0	1	0	0	0
Median	21	27	27	30	30	24	24	28	32
Mean	27	33	34	35	36	34	35	39	43
Maximum	103	119	115	127	127	151	156	166	184
Out-Degree									
Minimum	0	0	0	0	0	1	0	0	0
Median	20	24	24	24	25	24	24	28	33
Mean	27	33	34	35	36	34	35	39	43
Maximum	108	120	127	131	134	148	151	157	160

The skewed in- and out-degree distributions shown in Table A4 suggest a power-law distribution—whereby $P(X = x)$ is proportional to x^α, where x is a positive number and the scaling parameter α is greater than 1 (Clauset, Shalizi, and Newman, 2009). To check if the in- and out-degree distributions follow a power law, I conduct Kolmogorov-Smirnov tests using the 2005 network (Table A5). The high p-values in the last column indicate that the observed quantities are consistent with a power-law distribution only for values above 60 (for in-degree) and 67 (for out-degree). In other words, the in- and out-degree distributions do not follow a power law.

Table A5. Power Law Tests (2005)

Data	Alpha	Cut-off	Log-likelihood	KS	p
In-Degree	3.81	60	-207.17	.08	.90
Out-Degree	4.41	67	-174.89	.07	.99

Table A6 compares the distributions of normalized centrality measures for the 2005 network. Although the spread of the distributions varies, all distributions are right skewed: there are few states with high centrality scores, while a large number of states have low centrality.

Table A6. Distributions of Normalized Centrality Measures (2005)

Centrality Measure	Minimum	Median	Mean	Maximum
Degree	0	.15	.21	.89
Closeness	0	.36	.36	.48
Betweenness	0	0	0	.11
Eigenvector	0	.30	.36	1

As shown in Table A7, all measures of centrality are positively correlated; the more important a node is along one of these dimensions, the more important it is along the others. Pair-wise correlations reach their peak between degree and eigenvector centrality (0.97).
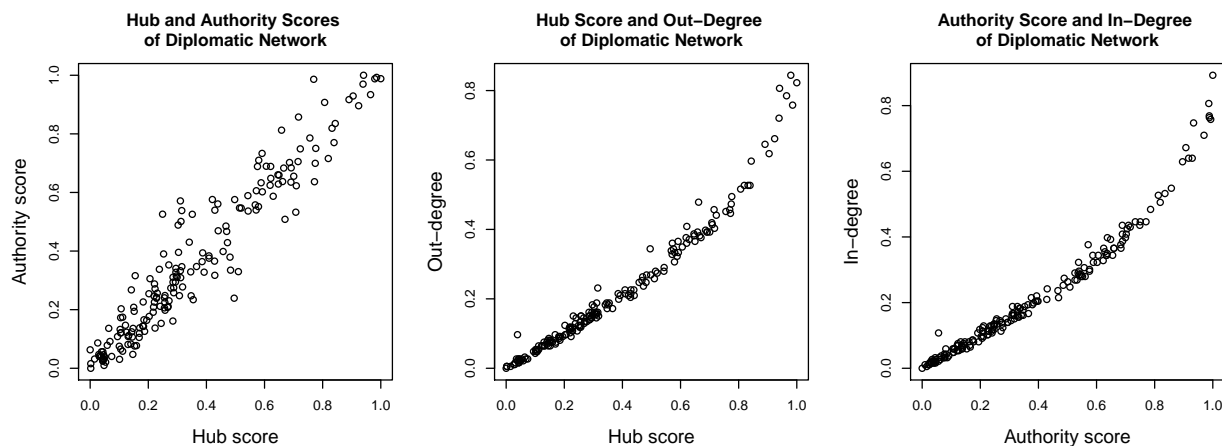
Table A7. Correlations Between Normalized Centrality Measures (2005)

	Degree	Closeness	Betweenness	Eigenvector
Degree	-			
Closeness	.80	-		
Betweenness	.72	.58	-	
Eigenvector	.97	.79	.59	-

Figure A1. Degree and Eigenvector Centrality Rankings (2005)

To assess whether eigenvector centrality provides additional information about the structure of the diplomatic network that is not provided by degree centrality (Renshon, 2016), Figure A1 compares the ranking of states according to each type of centrality. As the figure shows, the correlation between the two rankings is very high (0.95)—that is, states' positions in the rankings of eigenvector and degree centrality are very similar. The only case in which the two measures differ somewhat is Taiwan, who tends to receive embassies from states with low eigenvector centrality rather than states with high eigenvector centrality. This indicates that degree centrality and eigenvector centrality provide similar information about network structure.

The centrality measures discussed above are based on inward ties (i.e., the embassies hosted by a state). However, outward ties may also contain information about the importance of nodes (Fowler and Jeon, 2008:20). Some states may send embassies only to the most important states while others cast the net wider, sending embassies to less popular states. Distinguishing between these two types of senders may be useful to identify important states in the network. As shown in Figure A2, however, considering outward ties does not provide new information regarding node importance. Hub and authority scores are highly correlated (0.96)—which indicates that states that are good hubs (send many outgoing ties to authorities) also tend to be good authorities (receive many incoming ties from hubs). Moreover, hub scores are highly correlated with out-degree (0.97), while authority scores are highly correlated with in-degree (0.97).

Figure A2. Hub and Authority Scores (2005)

Data Sources

Table A8 shows the sources of the exogenous variables used in the analysis, as well as their version and time coverage.

Table A8. Data Sources

Measure	Source	Version	Time Coverage
Democracy	Gleditsch and Ward (1997)	4.0	1970-2005
Human Rights	Gibney et al. (2015)	-	1980-2005
Economic Freedom	Heritage Foundation and The Wall Street Journal*	-	1995-2005
GDP/capita	Gleditsch (2002)	6.0	1970-2005
GDP	Gleditsch (2002)	6.0	1970-2005
Population	Singer, Bremer, and Stuckey (1972); Singer (1988)	4.0	1970-2005
Military Spending	Singer, Bremer, and Stuckey (1972); Singer (1988)	4.0	1970-2005
CINC Score	Singer, Bremer, and Stuckey (1972); Singer (1988)	4.0	1970-2005
Nuclear Weapons	Singh and Way (2004)	-	1970-2000
Alliance	Leeds et al. (2002)	3.0	1970-2003
Trade	Barbieri, Keshk, and Pollins (2009)	3.0	1970-2005
Contiguity	Stinnett et al. (2002)	3.1	1970-2005
Region	UN Statistics Division[†]	-	1970-2005
IGO Headquarters	The World Treaty Index[‡]	-	1970-1999

[*] Available at http://www.heritage.org/index/download (accessed February 20, 2015).

[†] Available at http://unstats.un.org/unsd/methods/m49/m49regin.htm (accessed February 20, 2015).

[‡] Available at http://www.worldtreatyindex.com/ (accessed February 20, 2015).

Summary Statistics

Table A9 shows the distributions in 2000 of the state-level variables included in the main specification, and Table A10 shows pairwise correlations for the same year. The only variable that has mostly negative correlations is *Nuclear Weapons*, whose correlations reach their minimum with *Human Rights* (-.23).

5

Table A9. State-Level Variable Distributions for Model 1 (2000)

	GDP/ capita*	Military Spending*	Nuclear Weapons	Demo- cracy	Human Rights	Econ Freedom	IGO HQ
Min.	5.98	8.01	0	-10	1	8.90	0
Median	8.49	13.24	0	6	4	59.55	0
Mean	8.55	13.09	0.06	3.59	3.69	58.73	0.26
Max.	11.12	17.77	1	10	5	87.80	1

* log-transformed.

Table A10. Correlation Matrix for State-Level Variables in Model 1 (2000)

	GDP/ capita	Military Spending	Nuclear Weapons	Demo- cracy	Human Rights	Econ Freedom	IGO HQ
GDP/capita	-	0.54	0.05	0.35	0.57	0.56	0.13
Mil Spending	0.54	-	0.37	0.05	-0.00	0.18	0.31
Nuc Weapons	0.05	0.37	-	-0.03	-0.23	-0.13	0.06
Democracy	0.35	0.05	-0.03	-	0.50	0.54	0.27
Human Rights	0.57	-0.00	-0.23	0.50	-	0.60	0.06
Econ Freedom	0.56	0.18	-0.13	0.54	0.60	-	0.17
IGO HQ	0.13	0.31	0.06	0.27	0.06	0.17	-

Model Terms

To estimate the TERGM of diplomatic ties, I use the xergm package in R (Leifeld and Cranmer, Forthcoming). Table A11 describes the model terms used in the main specification.

Table A11. TERG Model Specification (Model 1)

Model Term	Hypothesis/Function	Effect Type
istar(2)	Popularity	Node-based network dependency
ostar(2)	Sociality	Node-based network dependency
mutual	Reciprocity	Dyadic network dependency
triangle	Transitivity	Triadic or higher-order dependency
absdiff(Democracy)	Homophily	Dyadic covariate effect
absdiff(Human Rights)	Homophily	Dyadic covariate effect
absdiff(Economic Freedom)	Homophily	Dyadic covariate effect
absdiff(GDP/capita)	Homophily	Dyadic covariate effect
absdiff(Military Spending)	Homophily	Dyadic covariate effect
absdiff(Nuclear Weapons)	Homophily	Dyadic covariate effect
nodeicov(Democracy)	Alternative explanation	Node covariate effect (receiver)
nodeicov(Human Rights)	Alternative explanation	Node covariate effect (receiver)
nodeicov(Economic Freedom)	Alternative explanation	Node covariate effect (receiver)
nodeicov(GDP/capita)	Alternative explanation	Node covariate effect (receiver)
nodeicov(Military Spending)	Alternative explanation	Node covariate effect (receiver)
nodeicov(Nuclear Weapons)	Alternative explanation	Node covariate effect (receiver)
edgecov(Alliance)	Control	Dyadic covariate effect
edgecov(Trade)	Control	Dyadic covariate effect
edgecov(Contiguity)	Control	Dyadic covariate effect
nodematch(Region)	Control	Dyadic covariate effect
nodeicov(IGO Headquarters)	Control	Node covariate effect (receiver)
nodeocov(GDP/capita)	Control	Node covariate effect (sender)
edgecov(Lagged Network Ties)	Control	Tie stability
edges	Constant	–

Goodness of Fit

To assess model fit, I conduct goodness of fit tests. As shown in Figure A3, Model 1 accurately recovers the structure of the diplomatic network; in other words, the model fits the data very well.
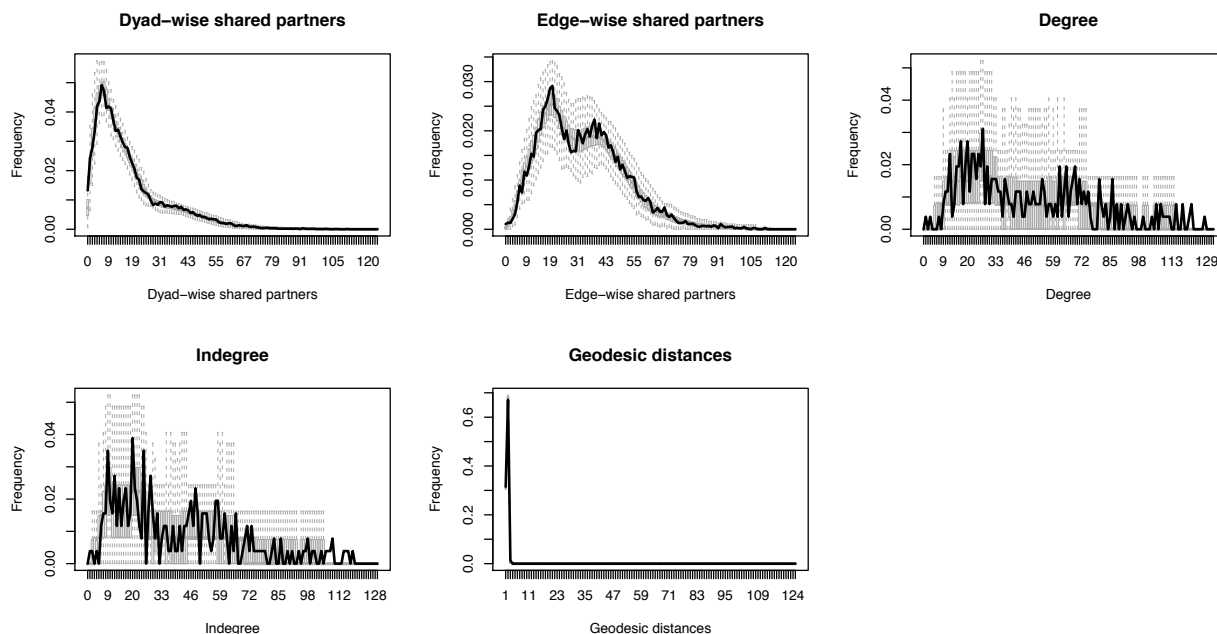
Figure A3. Goodness-of-Fit of the TERGM of Diplomatic Ties for 1995-2005 (Model 1).
Note: Boxplots represent the distribution of statistics from 1,000 simulated networks generated from the estimated model. Solid lines represent predicted probabilities. Lines close to the simulated median indicate good model fit.

Degeneracy Checks

To assess possible degeneracy in the model, I compare the distributions from 1,000 simulated networks generated from the model to the observed distributions for all model statistics at $t = 2$ (year 2000) and $t = 3$ (year 2005). As shown in Table A12, the high p-values for the degeneracy checks indicate that, for all model terms and for both periods, the sample statistics cannot be statistically distinguished from the observed statistics. In other words, the model is not degenerate.

Robustness Checks

Table A12. Degeneracy Checks for the TERGM of Diplomatic Ties for 1995-2005 (Model 1)

	$t = 2$						$t = 3$					
	Observed	Simulated	Estimate	s.e.	z	p	Observed	Simulated	Estimate	s.e.	z	p
Popularity	133583.00	148412.18	14829.18	27089.58	0.55	0.58	164467.00	148412.18	-18054.82	27089.58	-0.67	0.51
Sociality	136244.00	149261.06	13017.06	24172.69	0.54	0.59	165934.00	149261.06	-16672.94	24172.69	-0.69	0.49
Reciprocity	1966.00	2107.56	141.56	267.62	0.53	0.60	2287.00	2107.56	-179.44	267.62	-0.67	0.50
Transitivity	202320.00	223329.84	21009.84	39483.86	0.53	0.59	251062.00	223329.84	-27732.16	39483.86	-0.70	0.48
Democracy$_{|i-j|}$	31945.00	32872.42	927.41	3253.02	0.29	0.78	34664.00	32872.42	-1791.59	3253.02	-0.55	0.58
Human Rights$_{|i-j|}$	6743.00	6674.53	-68.47	343.86	-0.20	0.84	6778.00	6674.53	-103.47	343.86	-0.30	0.76
Economic Freedom$_{|i-j|}$	58731.20	60601.42	1870.22	5305.65	0.35	0.72	64229.50	60601.42	-3628.08	5305.65	-0.68	0.49
GDP/capita$_{|i-j|}$	6306.80	6842.83	536.02	965.91	0.55	0.58	7555.39	6842.83	-712.56	965.91	-0.74	0.46
Military Spending$_{|i-j|}$	12162.09	12829.02	666.93	1474.09	0.45	0.65	13736.01	12829.02	-906.99	1474.09	-0.62	0.54
Nuclear Weapons$_{|i-j|}$	1133.00	1179.01	46.01	110.97	0.41	0.68	1248.00	1179.01	-68.99	110.97	-0.62	0.53
Democracy$_j$	19847.00	21936.68	2089.68	4116.79	0.51	0.61	24419.00	21936.68	-2482.32	4116.79	-0.60	0.55
Human Rights$_j$	17071.00	18805.14	1734.14	2800.57	0.62	0.54	20983.00	18805.14	-2177.86	2800.57	-0.78	0.44
Economic Freedom$_j$	286255.00	307397.91	21142.91	37981.87	0.56	0.58	335699.80	307397.91	-28301.89	37981.87	-0.75	0.46
GDP/Capita$_j$	42847.24	45714.27	2867.03	5283.01	0.54	0.59	49702.12	45714.27	-3987.84	5283.01	-0.75	0.45
Military Expenditure$_j$	69861.50	74078.51	4217.00	7989.10	0.53	0.60	80118.42	74078.51	-6039.91	7989.10	-0.76	0.45
Nuclear Weapons$_j$	583.00	609.39	26.39	73.08	0.36	0.72	650.00	609.39	-40.61	73.08	-0.56	0.58
Alliance	1443.00	1553.53	110.53	205.13	0.54	0.59	1678.00	1553.53	-124.47	205.13	-0.61	0.54
Trade	7610.53	7391.64	-218.89	925.77	-0.24	0.81	7401.20	7391.64	-9.57	925.77	-0.01	0.99
Contiguity	351.00	376.45	25.45	44.87	0.57	0.57	407.00	376.45	-30.55	44.87	-0.68	0.50
Same Region	596.00	639.34	43.34	86.44	0.50	0.62	688.00	639.34	-48.66	86.44	-0.56	0.57
IGO Headquarters	1822.00	2010.24	188.25	286.73	0.66	0.51	2193.00	2010.24	-182.75	286.73	-0.64	0.52
GDP/capita$_i$	43005.92	45825.48	2819.56	5235.73	0.54	0.59	49770.45	45825.48	-3944.97	5235.73	-0.75	0.45
Tie Stability	4183.00	4384.92	201.92	359.35	0.56	0.57	4667.00	4384.92	-282.08	359.35	-0.78	0.43
Edges	4823.00	5119.63	296.63	568.11	0.52	0.60	5546.00	5119.63	-426.37	568.11	-0.75	0.45

Notes: Results from 2 "basis" networks (with 1,000 simulations each) and 2 observed "target" networks.

p-values based on a two-sample *t*-tests. Small *p*-values indicate a significant difference between simulations and observed networks.

Table A13. Temporal Exponential Random Graph Models of Diplomatic Ties for 1995-2005 (Robustness Checks)

	Model 2 State Attributes; No Endogenous Effects	Model 3[†] State and Dyad Attributes; No Endogenous Effects	Model 1 Main Specification; With Endogenous Effects
Endogenous Effects			
Popularity			0.031 (0.028; 0.039)*
Sociality			0.028 (0.026; 0.032)*
Reciprocity			1.756 (1.661; 1.827)*
Transitivity			0.005 (0.002; 0.006)*
Homophily			
Democracy$_{|i-j|}$		−0.006 (−0.021; 0.013)	−0.014 (−0.024; −0.002)*
Human Rights$_{|i-j|}$		−0.075 (−0.110; −0.030)*	−0.056 (−0.100; −0.017)*
Economic Freedom$_{|i-j|}$		−0.011 (−0.016; −0.005)*	−0.004 (−0.006; −0.001)*
GDP/capita$_{|i-j|}$		0.042 (0.006; 0.065)*	−0.053 (−0.090; −0.017)*
Military Spending$_{|i-j|}$		−0.069 (−0.100; −0.032)*	−0.013 (−0.030; −0.013)*
Nuclear Weapons$_{|i-j|}$		1.249 (1.247; 1.291)*	−0.002 (−0.025; 0.037)
State Attributes			
Democracy$_j$	−0.004 (−0.008; 0.004)	−0.006 (−0.013; 0.006)	−0.030 (−0.044; −0.013)*
Human Rights$_j$	0.086 (0.057; 0.125)*	0.077 (0.062; 0.114)*	0.051 (0.051; 0.057)*
Economic Freedom$_j$	−0.004 (−0.011; 0.002)	−0.007 (−0.013; −0.001)*	0.008 (0.008; 0.011)*
GDP/capita$_j$	−0.094 (−0.168; −0.053)*	−0.070 (−0.169; −0.015)*	−0.093 (−0.149; −0.065)*
Military Spending$_j$	0.350 (0.332; 0.383)*	0.366 (0.340; 0.409)*	0.034 (0.027; 0.034)*
Nuclear Weapons$_j$	0.098 (0.014; 0.156)*	−0.969 (−1.136; −0.852)*	−0.332 (−0.419; −0.270)*
Control Variables			
Alliance	1.114 (0.945; 1.334)*	1.134 (0.912; 1.451)*	1.041 (0.890; 1.263)*
Trade	0.005 (−0.003; 0.012)	0.007 (−0.003; 0.014)	0.007 (0.006; 0.007)*
Contiguity	1.160 (0.896; 1.439)*	1.085 (0.798; 1.355)*	0.693 (0.479; 0.886)*
Same Region	0.688 (0.554; 0.807)*	0.638 (0.523; 0.731)*	0.884 (0.814; 0.949)*
IGO Headquarters	0.222 (0.189; 0.261)*	0.269 (0.246; 0.309)*	0.054 (0.028; 0.082)*
GDP/capita$_i$	0.274 (0.267; 0.284)*	0.271 (0.267; 0.277)*	−0.021 (−0.026; −0.013)*
Tie Stability	4.870 (4.802; 4.987)*	4.765 (4.708; 4.880)*	3.610 (3.451; 3.806)*
Edges	−9.204 (−9.511; −8.865)*	−9.056 (−9.455; −8.673)*	−5.677 (−5.687; −5.677)*

* o outside 95% confidence interval based on 1,000 bootstrap replications.

† A TERGM without endogenous effects is equivalent to a logit model (Cranmer and Desmarais, 2011:79).

Notes: N$_{1995}$ = 123, N$_{2005}$ = 134. Following network notation, i denotes the sending state and j denotes the receiving state.

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Table A14. Temporal Exponential Random Graph Models of Diplomatic Ties (Robustness Checks)

	Model 4 (Democracy)	Model 5 (Human Rights)	Model 6 (Economic Freedom)	Model 1 (Main Specification)
Endogenous Effects				
Popularity	0.030 (0.025; 0.034)*	0.023 (0.018; 0.028)*	0.029 (0.026; 0.035)*	0.031 (0.028; 0.039)*
Sociality	0.027 (0.024; 0.032)*	0.025 (0.023; 0.029)*	0.027 (0.026; 0.029)*	0.028 (0.026; 0.032)*
Reciprocity	1.888 (1.679; 2.078)*	1.674 (1.555; 1.796)*	1.739 (1.674; 1.792)*	1.756 (1.661; 1.827)*
Transitivity	0.005 (0.002; 0.007)*	0.006 (0.003; 0.008)*	0.004 (0.003; 0.005)*	0.005 (0.002; 0.006)*
Homophily				
Democracy$_{|i-j|}$	−0.017 (−0.024; −0.013)*			−0.014 (−0.024; −0.002)*
Human Rights$_{|i-j|}$		−0.044 (−0.061; −0.016)*		−0.056 (−0.100; −0.017)*
Economic Freedom$_{|i-j|}$			−0.003 (−0.004; −0.003)*	−0.004 (−0.006; −0.001)*
GDP/capita$_{|i-j|}$	−0.052 (−0.087; −0.005)*	−0.048 (−0.072; −0.022)*	−0.095 (−0.113; −0.073)*	−0.053 (−0.090; −0.017)*
Military Spending$_{|i-j|}$	−0.003 (−0.022; 0.009)	−0.009 (−0.019; −0.001)*	−0.008 (−0.018; −0.008)*	−0.013 (−0.030; −0.013)*
Nuclear Weapons$_{|i-j|}$	0.114 (−0.023; 0.239)	0.178 (0.102; 0.241)*	−0.091 (−0.170; −0.024)*	−0.002 (−0.025; 0.037)
State Attributes				
Democracy$_{j}$	−0.027 (−0.036; −0.015)*			−0.030 (−0.044; −0.013)*
Human Rights$_{j}$		0.007 (−0.048; 0.051)		0.051 (0.051; 0.057)*
Economic Freedom$_{j}$			0.006 (0.001; 0.010)*	0.008 (0.008; 0.011)*
GDP/capita$_{j}$	0.063 (0.015; 0.082)*	−0.039 (−0.098; 0.029)	−0.130 (−0.167; −0.097)*	−0.093 (−0.149; −0.065)*
Military Spending$_{j}$	−0.059 (−0.087; 0.012)	0.034 (0.009; 0.059)*	0.054 (0.041; 0.063)*	0.034 (0.027; 0.034)*
Nuclear Weapons$_{j}$	−0.200 (−0.406; −0.043)*	−0.348 (−0.632; −0.079)*	−0.475 (−0.612; −0.336)*	−0.332 (−0.419; −0.270)*
Control Variables				
Alliance	0.613 (0.425; 0.828)*	0.758 (0.538; 0.957)*	1.000 (0.876; 1.168)*	1.041 (0.890; 1.263)*
Trade	0.005 (−0.009; 0.021)	0.013 (0.003; 0.022)*	0.007 (0.006; 0.007)*	0.007 (0.006; 0.007)*
Contiguity	0.837 (0.684; 1.005)*	0.834 (0.598; 1.097)*	0.684 (0.461; 0.916)*	0.693 (0.479; 0.886)*
Same Region	0.759 (0.601; 0.898)*	0.826 (0.653; 0.983)*	0.886 (0.824; 0.947)*	0.884 (0.814; 0.949)*
IGO Headquarters	0.087 (0.012; 0.163)*	0.028 (−0.031; 0.134)	−0.045 (−0.045; −0.035)*	0.054 (0.028; 0.082)*
GDP/capita$_{i}$	−0.019 (−0.033; 0.002)	−0.010 (−0.043; 0.031)	−0.028 (−0.031; −0.025)*	−0.021 (−0.026; −0.013)*
Tie Stability	3.253 (2.901; 3.547)*	3.550 (3.423; 3.707)*	3.632 (3.469; 3.817)*	3.610 (3.451; 3.806)*
Edges	−5.010 (−5.720; −4.608)*	−5.475 (−6.149; −5.085)*	−5.391 (−5.420; −5.365)*	−5.677 (−5.687; −5.677)*
Period	1970-2005	1980-2005	1995-2005	1995-2005
N	$N_{1970} = 122, N_{2005} = 144$	$N_{1980} = 132, N_{2005} = 159$	$N_{1995} = 131, N_{2005} = 140$	$N_{1995} = 123, N_{2005} = 134$

* o outside 95% confidence interval based on 1,000 bootstrap replications.

Note: Following network notation, *i* denotes the sending state and *j* denotes the receiving state.

Table A15. Temporal Exponential Random Graph Models of Diplomatic Ties for 1995–2005 (Robustness Checks)

	Model 8 (GDP and Population)	Model 9 (CINC Score)	Model 1 (Main Specification)
Endogenous Effects			
Popularity	0.032 (0.028; 0.039)*	0.032 (0.030; 0.037)*	0.031 (0.028; 0.039)*
Sociality	0.027 (0.027; 0.028)*	0.025 (0.023; 0.029)*	0.028 (0.026; 0.032)*
Reciprocity	1.757 (1.656; 1.837)*	1.744 (1.639; 1.818)*	1.756 (1.661; 1.827)*
Transitivity	0.004 (0.001; 0.006)*	0.007 (0.004; 0.008)*	0.005 (0.002; 0.006)*
Homophily			
Democracy$_{|i-j|}$	−0.014 (−0.024; −0.001)*	−0.014 (−0.024; −0.001)*	−0.014 (−0.024; −0.002)*
Human Rights$_{|i-j|}$	−0.074 (−0.105; −0.046)*	−0.057 (−0.103; −0.017)*	−0.056 (−0.100; −0.017)*
Economic Freedom$_{|i-j|}$	−0.005 (−0.008; −0.002)*	−0.003 (−0.005; −0.000)*	−0.004 (−0.006; −0.001)*
GDP/capita$_{|i-j|}$		−0.049 (−0.092; −0.013)*	−0.053 (−0.090; −0.017)*
GDP$_{|i-j|}$	−0.050 (−0.066; −0.028)*		
Population$_{|i-j|}$	0.035 (0.012; 0.061)*		
Military Spending$_{|i-j|}$	0.000 (−0.016; 0.000)		
CINC Score$_{|i-j|}$		1.206 (0.969; 1.414)*	−0.013 (−0.030; −0.013)*
Nuclear Weapons$_{|i-j|}$	−0.011 (−0.013; 0.006)	−0.067 (−0.105; −0.022)*	−0.002 (−0.025; 0.037)
State Attributes			
Democracy$_j$	−0.029 (−0.043; −0.013)*	−0.032 (−0.046; −0.015)*	−0.030 (−0.044; −0.013)*
Human Rights$_j$	0.045 (0.045; 0.053)*	0.032 (0.019; 0.050)*	0.051 (0.051; 0.057)*
Economic Freedom$_j$	0.008 (0.008; 0.010)*	0.009 (0.009; 0.011)*	0.008 (0.008; 0.011)*
GDP/capita$_j$		−0.074 (−0.132; −0.049)*	−0.093 (−0.149; −0.065)*
GDP$_j$	−0.084 (−0.099; −0.073)*		
Population$_j$	0.089 (0.063; 0.139)*		
Military Spending$_j$	0.034 (0.008; 0.038)*		0.034 (0.027; 0.034)*
CINC Score$_j$		−1.143 (−2.075; −0.250)*	
Nuclear Weapons$_j$	−0.352 (−0.435; −0.288)*	−0.264 (−0.411; −0.165)*	−0.332 (−0.419; −0.270)*
Control Variables			
Alliance	1.051 (0.884; 1.288)*	1.040 (0.900; 1.250)*	1.041 (0.890; 1.263)*
Trade	0.006 (0.005; 0.006)*	0.007 (0.006; 0.007)*	0.007 (0.006; 0.007)*
Contiguity	0.718 (0.509; 0.906)*	0.704 (0.494; 0.901)*	0.693 (0.479; 0.886)*
Same Region	0.901 (0.852; 0.945)*	0.882 (0.823; 0.942)*	0.884 (0.814; 0.949)*
IGO Headquarters$_j$	0.049 (0.020; 0.085)*	0.055 (0.036; 0.086)*	0.054 (0.028; 0.082)*
GDP/capita$_i$		−0.016 (−0.020; −0.008)*	−0.021 (−0.026; −0.013)*
GDP$_i$	0.024 (−0.040; 0.094)		
Tie Stability	3.612 (3.451; 3.818)*	3.603 (3.440; 3.804)*	3.610 (3.451; 3.806)*
Edges	−6.756 (−7.837; −5.966)*	−5.349 (−5.548; −5.229)*	−5.677 (−5.687; −5.677)*

* o outside 95% confidence interval based on 1,000 bootstrap replications.

Notes: $N_{1995} = 123$, $N_{2005} = 134$. Following network notation, i denotes the sending state and j denotes the receiving state.

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