

APPENDIX

Jana von Stein. 2008. The International Law and Politics of Climate Change: Ratification of the United Nations Framework Convention and the Kyoto Protocol. *The Journal of Conflict Resolution* 52 (2).

Annex 1 Parties (UN Framework Convention on Climate Change)

Australia	Germany	Norway
Austria	Greece	Poland [§]
Belarus [§]	Hungary [§]	Portugal
Belgium	Iceland	Romania [§]
Bulgaria [§]	Ireland	Russian Federation [§]
Canada	Italy	Slovenia ^{§†}
Croatia ^{§†}	Japan	Spain
Czechoslovakia ^{§‡}	Latvia [§]	Sweden
Denmark	Liechtenstein [†]	Switzerland
European Economic Community	Lithuania [§]	Turkey
Estonia [§]	Luxembourg	Ukraine [§]
Finland	Monaco [†]	United Kingdom
France	Netherlands	United States
	New Zealand	

[§] Countries undergoing the process of transition to a market economy.

[†] Joined Annex 1 in 1997.

[‡] Commitment later extended to Czech Republic and Slovak Republic.

**Annex B Parties and Emission Limitation or Reduction Commitment
(Kyoto Protocol and EU Burden-Sharing Agreement)**

Australia	108%	Liechtenstein	92%
Austria	87	Lithuania [§]	92
Belgium	92.5	Luxembourg	72
Bulgaria [§]	92	Monaco	92
Canada	94	Netherlands	94
Croatia [§]	95	New Zealand	100
Czech Republic [§]	92	Norway	101
Denmark	79	Poland [§]	94
Estonia [§]	92	Portugal	127
EEC	92	Romania [§]	94
Finland	100	Russian Federation [§]	100
France	100	Slovakia [§]	92
Germany	79	Slovenia [§]	92
Greece	125	Spain	115
Hungary [§]	94	Sweden	104
Iceland	110	Switzerland	92
Ireland	113	Ukraine [§]	100
Italy	93.5	United Kingdom	87.5
Japan	94	United States	93
Latvia [§]	92		

[§]Countries undergoing the process of transition to a market economy.

Limitation or reduction commitment is expressed as a percentage of 1990 CO₂ emissions, except for the following countries, whose base year appears in parentheses: Bulgaria (1988); Hungary (average of 1985 to 1987); Poland (1988); Romania (1988); Slovenia (1986).

Sources: European Union Council of Environment Ministers. 1998; FCCC 1992, 1997.

Calculation of Variables

Compliance Variables

- I calculate the measure of compliant behavior for the FCCC, *Deviation from 1990 CO₂ Emissions*, using the formula $\frac{CO_{2i,t}}{CO_{2i,1990}} - 1$, where $CO_{2i,t}$ denotes state *i*'s total CO₂ emissions (in metric tons) in year *t*, and $CO_{2i,1990}$ denotes state *i*'s total CO₂ emissions (in metric tons) in 1990. The only difference between this variable and one that measures emissions in year *t* as a percentage of 1990 levels is that the former subtracts 1. I do this so that when I conduct the statistical analyses, a value of 0 is meaningful. It designates a state with emissions identical to 1990 levels. Values less than 0 designate country-years below 100% of 1990 levels; values greater than 0 designate country-years above 100% of 1990 levels.
- For non-Annex 1 parties, the measure of compliant behavior for the Kyoto Protocol, *Deviation from 1990 CO₂ Emissions or Target*, is simply $\frac{CO_{2i,t}}{CO_{2i,1990}} - 1$. For Annex 1 parties, I calculate the measure of compliant behavior using the formula $\frac{CO_{2i,t}}{CO_{2i,target}} - 1$, where $CO_{2i,target}$ denotes a state's target emissions level (in metric tons).

Flexibility Variables

- For each Annex 1 party *i*, *Carbon Sink Credits* equals $\frac{\text{Sink credits}_{i,t} \text{ (in metric tons of CO}_2 \text{ equivalent)}}{CO_{2i,target}}$.
- For each Annex 1 party *i*, the variable *Impact of Activities Implemented Jointly* is $\frac{\text{Greenhouse gas impact from Activities Implemented Jointly}_{i,t} \text{ (in metric tons of CO}_2 \text{ equivalent)}}{CO_{2i,target}}$.

Robustness Checks

I performed the following robustness checks. First, if the correlation coefficient of any two independent variables was greater than .4, I re-estimated each model without the correlated variable. Second, other scholars have found that large or powerful states ratify some agreements more slowly or not at all (Goodliffe and Hawkins 2006). Some have suggested that this argument may extend to Annex 1 party ratification of the Kyoto Protocol.² I tested this argument in two ways (in separate analyses): *Total GDP* (logged) and *Total CO₂ Emissions* (logged). Third, to assess whether the findings were driven by the effect of severe economic contraction, which resulted in lower emissions largely beyond the control of governments, I added to the analyses the variable *Growth Rate*. Finally, to test the proposition that a state's Kyoto Protocol ratification is linked to its FCCC ratification behavior, I included a variable indicating the number of days it took the state to ratify the FCCC in the analyses displayed in Tables 2 and 3. The results are as follows:

- FCCC: the elimination of correlated independent variables has no discernable impact on the results, with one exception: when *Centrality* is not included, *Deviation from 1990 CO₂ Levels* becomes significant at $p < .10$ (suggesting that among non-Annex 1 parties, the latter variable makes states ratify significantly more quickly – the opposite of what one would expect if compliance costs delayed or prevented ratification). In no other specifications does *Deviation from 1990 CO₂ Levels* approach statistical significance. Countries with faster GDP growth ratify more quickly, but this variable does not approach standard levels of statistical significance and the results do not change notably with its inclusion.

- Kyoto Protocol, all parties: The elimination of correlated independent variables has no discernable impact on the results, with one exception. The finding that among perfectly compliant states, Annex 1 parties take longer to ratify, is sensitive to a control for regime type. None of the other results change notably, including the test that, at high levels of noncompliance, Annex 1 parties ratify more slowly than do non-Annex 1 parties ($p = .066$). States with higher GDP growth ratify more quickly, but this result falls short of standard levels of statistical significance. The inclusion of this variable does not alter any of the other findings notably.
- Kyoto Protocol, Annex 1 parties. The elimination of correlated independent variables has no discernable impact on the results, with one exception: although always negative, *Impact of Activities Implemented Jointly* is sensitive to model specification. The variable often falls just short of standard levels of statistical significance, but in some cases it is far from statistical significance whereas in others it is fairly highly statistically significant (for instance, when the control for GDP growth is included). *Total GDP* and *Total CO₂ Emissions* are associated with slower ratification, but these relationships are far from systematic and do not affect the other results. Countries experiencing economic growth ratify less quickly, a finding that is significant at $p = .107$. *GDP Growth Rate's* inclusion has no discernable impact on the results (although, as discussed above, *Impact of Activities Implemented Jointly* is statistically significant).
- Kyoto Protocol, Non-Annex 1 parties. The elimination of correlated independent variables has no discernable impact on the results. Countries with higher GDP growth rates ratify more quickly, but this result falls short of standard levels of statistical significance and the inclusion of this variable does not alter any of the other findings notably.

States that ratified the FCCC quickly generally took longer to ratify the Kyoto Protocol, but this relationship falls short of statistical significance and has no impact on the results.

Notes

¹ Failure to weight by some measure of size (such as Kyoto target, population, or GDP) dramatically alters the meaning of this variable, making it largely a measure of country size or wealth rather than use of flexibility provisions. Because the Activities Implemented Jointly data are measured in metric tons of CO₂ equivalent, it makes most sense to weight them by a country's Kyoto target (in metric tons of CO₂).

² I thank one of the anonymous reviewers for this suggestion.