Measuring Multilateralism: Ideal Point Estimates of State Preferences over Global Treaties

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Abstract

Preferences are crucial to the analysis of many key questions regarding international institutions. This paper analyzes the key predictors of states' preferences over international institutions. It does so by using a spatial-modeling approach that conceptualizes a treaty commitment preference space that includes agreements across multiple policy areas. I analyze the treaty commitment preference space in order to better understand the key dimensions of these preferences. I find that economics, and particularly trade, is the clearest and most consistent predictor of treaty commitment preferences, including with respect to many treaties in non-economic policy areas.

Why do states join some international institutions and not others? These decisions may be explained in part by differences in gains from cooperation, treaty design and the information environment. Yet a significant part of these decisions depends on state preferences, making an understanding of preferences crucial to our understanding of international institutions.

Many key questions regarding international institutions – why states create them, how states design them, and the extent to which they affect state behavior – all depend in part on an understanding of state preferences. States design institutions based on their preferences over possible solutions to international problems, so the design and subsequent effects of institutions are closely connected with the preferences of member states (Downs, Rocke and Barsoom 1996). Uncertainty about other states' preferences often affects design choices and may impede negotiations (Koremenos, Lipson and Snidal 2001). State

preferences can also shape the effects of international institutions. States may not comply with institutions with weak enforcement mechanisms unless they have an underlying preference for doing so. Conversely, observed compliance may result from underlying state preferences rather than mechanisms created by the institution itself (Downs, Rocke and Barsoom 1996).

International relations theory suggests that state preferences should vary systematically based on state characteristics and should, in turn, affect which institutions states join. Despite the attention paid to questions about international institutions and the recognition that preferences are crucial in answering those questions, few studies have systematically analyzed the factors that shape states' preferences with respect to international institutions. Several scholars have analyzed the demand for international cooperation, focusing on economic agreements (Milner 1997; Bagwell and Staiger 1997*a*,*b*; Downs, Rocke and Barsoom 1998). Others have studied the determinants of membership patterns in individual institutions or sets of institutions within a policy area, including human rights treaties (Vreeland 2008), environmental treaties (von Stein 2008), international courts (Simmons and Danner 2010), alliances (Morrow 1991), and economic agreements (Mansfield and Milner 2012). Yet the substantive areas addressed by multinational treaties are much broader, and states vary significantly in the extent to which they join such treaties.

This paper therefore addresses the following research question: which characteristics of states are the most important predictors of their treaty commitment preferences? I analyze states' decisions to join universal treaties across a broad range of substantive areas. I estimate states' treaty commitment preferences by using a spatial-modeling approach often used to estimate legislative ideal points. Several competing theories suggest that differing state characteristics should be most important in shaping treaty commitment preferences, and I empirically test these against each other. This analysis indicates that economics – specifically, trade – is the key factor underlying states' treaty commitment

preferences, a result that is particularly significant because most of the treaties I analyze do not explicit address economic relations. Which types of universal treaties states join depends in large part on their interest in being integrated into the global economy. This finding is consistent both during and after the Cold War. While other factors, including cultural ties and domestic regime types, appear to also play minor roles, trade levels significantly overshadow them.

The results of this paper have several important implications. First, if states' preferences with respect to universal treaties are shaped primarily by their economic interests, then it may be the case that these interests also affect the joining of other institutions, including regional organizations, bilateral treaties and informal institutions. Second, to the extent that uncertainty about preferences can be an impediment to international cooperation, the results presented in this paper indicate that this problem may be most severe when states cannot reliably determine each others' economic preferences. Third, and perhaps most importantly, understanding the extent to which economics drives the joining of treaties not explicitly related to economic policy can significantly improve our understanding of the design, ratification and effectiveness of such agreements. Finally, this study builds on a broader literature that attempts the difficult task of estimating state preferences based on revealed choices (Bueno de Mesquita 1975; Altfeld and Bueno de Mesquita 1979; Gartzke 1998; Signorino and Ritter 1999; Voeten 2000) by providing complementary and potentially useful estimates of revealed state preferences over universal treaties. The measures produced by this paper can be used in future studies to analyze the relationships between treaty commitment preferences and important outcomes such as treaty compliance and the design and evolution of international institutions.

1. Treaty Commitment Preferences

Following Frieden (1999, 42), I define a state's preferences as "the way it orders the possible outcomes of an interaction." State preferences are key determinants of

international cooperation. For example, states tend to create institutions with restricted membership so that they can cooperate with others that have similar interests, which may increase the probability of compliance (Downs, Rocke and Barsoom 1996; Koremenos, Lipson and Snidal 2001). Likewise, states may attempt to minimize distributional and enforcement problems by working with specific partners. Yet to argue that states with compatible preferences tend to work together raises as many questions as it answers. Which types of states tend to have similar preferences? Which characteristics of states are more important in shaping preferences over international cooperation?

A detailed analysis of states' preferences over international institutions, therefore, is critical to improving our understanding of international cooperation. States are complex actors, and their characteristics vary along many dimensions. Several strands of international relations theory imply that state preferences affect their strategies for international cooperation, but these literatures offer competing explanations of which state characteristics are most important in determining these preferences. A particular set of states may be quite similar to each other in terms of language and religion, for example, but have significantly different economic interests and regime types. Should we expect such cultural similarities to be the primary determinant of these states' preferences over international cooperation or do the differences between them matter more? The goal of this paper is to conduct an empirical test of which of these characteristics is most important in shaping states preferences and, in turn, their commitments to international institutions.

Economic Factors. The growth of global economic activity over the last several decades has been facilitated and institutionalized in part through the creation of multilateral agreements. Some treaties explicitly address economic policies, such as those related to trade liberalization and investment cooperation, yet many other treaties facilitate economic activity less directly. A large number of agreements, many of them universal, facilitate international exchange indirectly by coordinating activities and expectations with respect to issues such as container shipping, the transport of hazardous materials and road

signage. International relations scholarship provides several reasons to suspect that economic interests underlie states' interests in international cooperation and, as a result, their treaty joining decisions. Krasner (1995), for example, argues that international institutional joining may be based on economic grounds, and specifically that smaller economies may seek to join institutions to protect their interests from larger, more powerful economies. Functionalists often argue that governments cooperate with each other because of increasing material demands from domestic actors (Shanks, Jacobson and Kaplan 1996). Rich states tend to join more intergovernmental organizations (IGOs) (Shanks, Jacobson and Kaplan 1996; Beckfield 2003), and pairs of states that trade heavily with each other are more likely to join the same IGOs (Boehmer and Nordstrom 2008). Analyzing voting behavior in the United Nations General Assembly (UNGA), Kim and Russett (1996) find that, after the Cold War, voting preferences were generally defined based on states' level of economic development. The extent to which a state is engaged in international trade is an indicator of broader integration into global cooperation and reflects the extent of its dependence on global rules and regulations. States often use treaties to tie economic and non-economic policies, such as human rights (Hafner-Burton 2005), which further indicates that economic interests may affect the joining of non-economic treaties.

Domestic Politics. Domestic political factors have wide-ranging effects on states' treaty commitment preferences. As Moravcsik (1997, 518) argues, "States ... represent some subset of domestic society, on the basis of whose interests state officials define state preferences and act purposively in world politics." The processes of aggregation of multiple domestic preferences into unified national decisions by governments differ when governments must appeal to voting constituents. Democracies may therefore have different treaty commitment preferences from autocracies. International cooperation is less likely when domestic state authority to ratify treaties is allocated to multiple branches of government, as it is within many democracies (Mansfield and Milner 2012). Democratic dyads are more likely to join the same IGOs (Boehmer and Nordstrom 2008), which

indicates that regime type affects states' choices of international institutions. Because democracy is a key determinant of treaty compliance (Simmons 2000), the intertwined relationship between treaty joining and compliance suggests democracy may also be a determinant of joining. Regime type is thought to affect a wide range of other international outcomes, including the ability of states to win wars (Reiter and Stam 2002) and the extent to which states make reliable allies (Lipson 2005). Finally, democratic peace theory suggests that regime type affects states preferences in ways that shape conflictual and cooperative behavior.

Domestic veto players affect which treaties states join and may therefore be important in shaping states' treaty commitment preferences. Veto players are actors and institutions whose consent is needed to alter policy, including legislatures, courts and sub-national governmental units (Tsebelis 1995). Veto players make commitments to international institutions more credible across a range of policy areas (Milner 1997; Milner and Rosendorff 1997; Martin 2000; Mansfield and Milner 2012). In governments with more veto players, there are fewer changes to tariff rates and non-tariff barriers (O'Reilly 2005), monetary policy is more rigid (Hallerberg 2002), independent central banks have a greater impact on inflation rates (Keefer and Stasavage 2003), and fewer changes are made to capital controls (Kastner and Rector 2003). Similarly, states with more veto players are less likely to conclude preferential trade agreements (PTAs) (Mansfield, Milner and Pevehouse 2007) and ratify European Union environmental directives (Perkins and Neumayer 2007). Finally, states with more veto players are more likely to make reservations when ratifying human rights agreements (Neumayer 2007).

Power and the Cold War. States' treaty commitment preferences may also depend on their relative capabilities. Powerful states may prefer to sign different treaties from weaker states and may prefer to cooperate with other sets of partners than weaker states. Some powerful states may place an especially large premium on national sovereignty, leading them to refrain from joining treaties. Most notably, the United States often

declines to join treaties on these grounds, notably including the Convention on the Elimination of all Forms of Discrimination against Women. More broadly, if states make decisions based on the distribution of capabilities, as theorists of international cooperation often expect, then we would expect them to choose treaties and treaty partners based on this factor. Iida (1988) argues that weak states may band together into blocs to counter more powerful states, and these blocs may extend to treaty commitment choices. Likewise, Waltz (1993) predicted that European states would balance against the United States in the post-Cold-War period. During the Cold War, the importance of power politics may have also had important effects on preference for international cooperation. Voeten (2000) finds that the Cold War was a key factor in determining UNGA voting preferences. If the underlying factors that shaped these votes were similar to the factors shaping treaty-making, it may be the case that alliance/bloc membership during the Cold War was a key dimension of treaty commitment preferences, with members of the U.S. and Soviet blocs joining starkly different institutions.

Civilization and Region. Another key factor that may affect treaty commitment preferences, espoused most prominently by Huntington (1997), is the state's "civilization." Huntington argues that both international conflict and cooperation are shaped by cultural factors, independently of concerns over power and economics. In his view, the world consists of eight civilizations with varying degrees of similarity and difference from one another. If Huntington is correct, civilization may be a key factor in shaping treaty commitment preferences. Some recent evidence indicates that international institution membership may be affected by such factors. Beckfield (2003) finds that Western states tend to join more IGOs, and Greenhill (2010, Ch. 6) shows that many joint memberships in IGOs can be explained by shared linguistic and colonial ties. Underlying these results is the additional possibility that states in different geographic regions may have distinct treaty commitment preferences. Conflictual behavior varies considerably by region (Bennett and Stam 1999; Lemke 2002), which suggests that cooperative behavior may

likewise vary. Accordingly, several studies of UNGA voting have found that geography was among the key determinants of state preferences (Kim and Russett 1996; Voeten 2000).

2. Methodology

I order to analyze which of these factors affect states' treaty commitment preferences, we first need a measure of those preferences. Yet measuring state preferences is notoriously difficult. Preferences cannot be directly observed. In much of the international relations literature, preferences are therefore assumed. States are often conceived to be wealth-maximizing or security-maximizing – or as having a preference for maximizing the utility of sub-national actors in control of the state. Others take the approach of inducing state preferences from observed outcomes. The revealed preference approach has important limitations. Preferences affect the choices states make, but these choices are also affected by other aspects of the strategic environment. Nonetheless, because we cannot measure preferences directly, as Frieden (1999, 60) argues, "In many instances, it may be the best research strategy available."

Despite the limitations of revealed preference measures, this approach has made important contributions to the field. In a ground-breaking paper, Altfeld and Bueno de Mesquita (1979) argued that states' alliance portfolios can be used to estimate the revealed similarity of states' foreign policy interests. Although they propose a different measurement technique, Signorino and Ritter (1999) concur with the approach of using these choices to estimate revealed preferences. A related literature estimates revealed preferences by using states' voting records in the UNGA (Alker and Russett 1965; Kim and Russett 1996; Voeten 2000). Using these data, Gartzke (1998) proposed an alternative measure of dyadic interest similarity, known as the Affinity score, which has been widely used in the literature (Broz and Hawes 2006; Bearce and Bondanella 2007; Haftel 2007; Savun and Tirone 2011). As the measures of alliance portfolios and UNGA voting have shown, there is significant value in estimating revealed preferences despite their limitations. This paper takes a similar approach to estimating treaty commitment preferences.

A simple approach to estimating these preferences may be to count treaty commitments. Problems with such an approach include the fact that it ignores the extent to which many treaties are similar (and thus have similar members) and assumes that all treaties are equally informative about underlying preferences. At best, such an approach could crudely estimate states' propensity to ratify treaties in general, but would not be able to address preferences toward certain treaties versus others. By analogy, such a procedure would amount to attempting to estimate legislator preferences based on a count of bills they vote for, a procedure long recognized in the legislative studies literature as being misleading. Certain types of legislators tend to vote for certain types of bills, while others vote for other types of bills. Likewise, different types of states tend to ratify different types of treaties, making a count of treaty ratifications relatively uninformative.

In order to estimate states' treaty commitment preferences, we therefore need a method that can take into account the diversity of treaties and the complexity of joining decisions. The literature on UNGA voting has long recognized that methods designed to reduce the dimensionality of choice behavior are appropriate for estimating state preferences (Alker and Russett 1965; Voeten 2000). In order to estimate state preferences with respect to treaties, I rely on the spatial model of political choice. The basic notion behind implementations of the spatial model is that, by observing the choices political actors make, we can estimate their preferences relative to each other and relative to the options with which they are faced. In this model, the options of committing and not committing to a treaty are represented by points in an n-dimensional policy space. Each state decides whether or not to commit to a treaty by weighing the distance between these points and its ideal point in this space. Simmons (2009) has recently suggested that this logic applies to treaty commitment decisions: "To use the language of spatial models, the nearer a treaty is to a government's ideal point, the more likely that government is to commit" (p. 65, emphasis omitted).

Thinking of treaty commitment decisions in this way allows for the use of methods

traditionally applied to analyze other dichotomous choices, most importantly those used to study legislative roll-call voting. Specifically, I use the W-NOMINATE multi-dimensional scaling method to estimate states' treaty commitment preferences (Poole and Rosenthal 1997). W-NOMINATE is a random utility model of Euclidean spatial voting (Enelow and Hinich 1984) that assumes each actor assigns a utility to each of two options. This utility is determined both by the distance between the actor and the options as well as a stochastic error term. W-NOMINATE estimates can be derived in n-dimensions, and the analyst must choose the optimal number of dimensions (as discussed in the Supplementary Information). The resulting coordinates are quantifications of latent dimensions and therefore have no objective scale. In simpler terms, the coordinates of actors are only meaningful in terms of their relationship to other actors' locations. W-NOMINATE is an iterative optimization algorithm. The results of the algorithm define the locations of states and treaties in the n-dimensional space such as to minimize the distances between states and the treaties they have ratified while maximizing the distances between states and treaties they have not ratified. W-NOMINATE will place states that have signed many of the same treaties closer together, while states with few treaties in common will be far apart.

Poole and Rosenthal (1997) created W-NOMINATE as a tool for estimating legislator preferences and used it to analyze roll-call voting in the U.S. Congress. Other scholars have used W-NOMINATE estimation to study such areas as the repeal of the Corn Laws (Schonhardt-Bailey 2003), the Confederate legislature (Jenkins 1999), the European Parliament (Hix 2001; Noury 2001), and various national legislatures (Londregan 2000; Morgenstern 2003). In addition, many scholars have used the distances between points in the W-NOMINATE space for various purposes, including analyzing party cohesion (Desposato 2008), testing ideological compatibility differentials on party membership (Desposato 2006), measuring party polarization (Howell and Lewis 2002), and measuring the benefits associated with the differences between voting options (Rothenberg and Sanders 2000). W-NOMINATE has also been applied in the international context,

particularly to analyze voting by states in the United Nations General Assembly (Voeten 2000; Reed et al. 2008).

While this methodology has many advantages, a key limitation is that it can only be used for universal treaties, which are open to all states. This is because, in order to be able to use the spatial modeling approach to analyze treaty decisions, we must be able to infer that any non-joining behavior is the choice of the states in question (i.e., the state was eligible to join the treaty but chose not to). I collected treaty ratification data from the United Nations Treaty Collection (UNTC), an online database that provides information regarding all treaties deposited with the U.N. Secretary-General. I analyzed the set of treaties included in the UNTC to determine which are de jure open to all states and which are limited to a specific set of states. The latter are excluded from the analysis, leaving 280 universal treaties.

The data set includes a broad range of substantive areas, including immunity, human rights, transportation, the environment, communications and arms control.[1] The UNTC includes conventions, treaties, protocols to treaties and treaty amendments, each of which I include in my data set as a separate treaty-commitment choice. I do this because each item reflects a separate decision made by states, regardless of whether the item amends a previous choice. For simplicity, I will refer to each such item as a "treaty" in this paper. For each treaty, I have thus created a matrix consisting of all of the states in the international system and an indication of whether or not each ratified the treaty. If a state has ratified a treaty as of a given year, I code that state as a "1" with respect to that treaty; otherwise the state is coded as a "0". Using these data, I create a matrix for each year between 1950 and 2008 that indicates, for each treaty then in force, which states then

[1] The treaties included in the data set are coded by the UNTC as addressing the following subject matters: privileges and immunities (36), human rights (24), refugees (4), narcotics (13), traffic in persons (8), obscene publications (5), health (11), international trade and development (14), transport and communications (45), navigation (10), economic statistics (2), education and culture (9), the status of women (3), freedom of information (1), penal matters (18), commodities (19), maintenance obligations (1), law of the sea (10), commercial arbitration (1), law of treaties (3), outer space (2), telecommunications (2), disarmament (9), the environment (31), fiscal matters (2), and miscellaneous (1). A complete list of these agreements is available from the author upon request.

in existence had ratified the treaty as of the end of the year.

While much of the literature focuses on treaty commitment with respect to a given treaty or set of similar treaties, I focus on treaty commitment preferences across substantive policy areas. This approach has three advantages. First, it avoids the need to make potentially arbitrary decisions over which treaties belong in the same policy area. While the UNTC has a system of categorizing treaties, in many cases individual treaties can be interpreted as covering issues that cross multiple areas. Second, at the theoretical level, there are many reasons to suspect that broader concerns drive treaty commitments across various policy areas, as discussed above. This methodology can create a measure that allows us to test the extent to which that is the case. Finally, if treaty commitment decisions are driven by many different latent dimensions of state preferences, then the results of the W-NOMINATE models will demonstrate this. That is, if every policy area is affected by a different latent dimension, then a W-NOMINATE model that only estimates two latent dimensions will fit the data poorly. On the other hand, if a two-dimensional data fits the data well, this would be a strong indication that, although there are many substantive areas of treaty-making, states have preferences with respect to treaty commitment cut across these policy areas.

Restricting the sample of treaties to universal treaties comes with some cost. Importantly, the universal treaty data set does not include many of the key international agreements governing economic relations. Agreements such as Bilateral Investment Treaties (BITs) and Preferential Trade Agreements (PTAs) are not universal. Also excluded are global agreements such as the General Agreement on Tariffs and Trade (GATT) and the World Trade Organizations (WTO), which restrict membership to states that meet strict accession requirements. On the other hand, analyzing revealed preferences with respect to universal treaties alleviates some (but certainly not all) of the limitations of inductive measures of preferences. Because these treaties are open to all states, there is more consistency in the strategic environment with respect to universal treaties than with respect

to treaties with restricted membership. While individual states may face differing strategic environments (most importantly differing levels of information) and those differences may explain some of their joining decisions, differences in universal treaty joining are more likely to be reflective of underlying preferences than differences in restricted membership treaty joining. Overall, however, it should be noted that the inferences made in this paper are limited to state preferences with respect to universal treaty commitments.

3. Results

Interpreting ideal point estimation results can be complex. There are two related aspects to doing so. The first is interpreting the meanings of the dimensions. The meanings of the ideal point dimensions are not specified in advance; instead, the results indicate where each state lies along the latent dimensions in the data, and it is up to the analyst to determine what these dimensions mean. If a variable is a key determinant of states' treaty commitment preferences, then it should be strongly associated with the first latent dimension in the W-NOMINATE results. Section 1 of this paper provided several factors that may influence treaty commitments. This section attempts to test those against each other using the W-NOMINATE results.

Interpreting ideal points may be relatively straightforward when using data on the U.S. Congress because we may have strong theoretical priors that Democrats and Republicans have significantly different ideologies. This is likely to be more difficult with respect to the international system, however, because competing theories suggest multiple aspects of international relations that may drive treaty commitment preferences. The second aspect of this process is interpreting any particularly interesting cleavages in the space that cross multiple dimensions. The coordinates themselves do not directly reveal the answers to these questions, although there are several techniques that can be used to answer them.

In order to test competing explanations of treaty commitment preferences against each other, I rely below on several regression models. Nonetheless, regression models have

two significant limitations in this context. Categorical factors such as culture and region may result in clustering in the W-NOMINATE space that may not be captured by a regression model. Second, the effect of the Cold War on treaty commitment preferences is best examined by analyzing the relative locations of the U.S. and Soviet blocs in the treaty commitment preference space. I therefore supplement the regression models with several additional analyses.

Measures of fit regarding the W-NOMINATE model are reported in the Supplementary Information. The measures of fit are comparable to those of existing work using this methodology. The results also indicate that a single latent dimension explains the bulk of treaty commitment decisions. This is particularly important because treaties covering many different policy areas are included in the data. If it were the case that states had sharply differing and unrelated preferences with respect to treaty commitments in different policy areas, then multiple latent dimensions would exist in the data, resulting in a poor model fit.

Because W-NOMINATE is a spatial model, and the coordinates it produces are only meaningful relative to each other, it is useful to begin by analyzing the results visually.[2] Consider the analogy to the U.S. Congress: simple visual inspection reveals that the key cleavage in the preference space is between Democrats and Republicans. While it is unlikely that the treaty preference space will be so intuitively defined, it may be possible to visualize patterns. The notion that culture determines states' preferences does not offer specific predictions regarding where different regions or civilizations should be in relation to each other in the treaty space, but rather that a state's location will be significantly determined by its culture. This suggests that states should be clustered by region or civilization, and this clustering may be apparent visually. Likewise, clustering among the key rivals during the Cold War would support the notion that this conflict was crucial in

[2] Because the second dimension of the model explains little of the variance in treaty commitment decisions, I focus this analysis on interpreting the first dimension of the model. A brief analysis of the second dimension is included in the Supplementary Information.

shaping treaty commitment preferences.

A second way to interpret the W-NOMINATE results is to analyze the movement of states within the space over time. If states known to have transitioned in important ways over this period move significantly along a given dimension, this might suggest that the particular form of transition is correlated with the dimension. For example, if states were to move along the first dimension in the years after transitioning to democracy, this would support the notion that the first dimension is defined by regime type.

A third method for analyzing the W-NOMINATE dimensions is by plotting a known characteristic of the states as a normal vector in the preference space (Poole 2005). Extending a vector from the origin through the coordinates of the normal vector yields a line that indicates that, as states move along that line through the two-dimensional space, they tend to have larger values of the characteristic in question. Likewise, upon reflecting that line over the origin, states that are further from the origin tend to have lower values of that characteristic. If a normal vector is close to parallel to one of the axes, this indicates that the underlying characteristic is correlated to the W-NOMINATE estimates for that dimension.

As the discussion above suggests, some of these methods may be more useful with respect to certain variables. For continuous variables with reliable existing measures, such as income and population, the normal vector and regression analysis may be especially useful. For categorical variables, however, it may be more useful to visually determine whether there is any clustering of states in accordance with the categories. This is likely to be the case for analyzing the effects of region and civilization.

3.1 Visualizing the Treaty Preference Space

For each year, W-NOMINATE produces a set of coordinates indicating the locations of each state and treaty. Figure 1 shows the locations of states in a two-dimensional treaty preference space in 1980, 1990, 2000 and 2008. Because the first dimension explains much more of the variance than the second dimension, it is important to note that small

differences along the second dimension may not be especially meaningful. The plots depict each state by region, which allows us to look for regional clustering. The plots also specify the locations of the five permanent members of the UN Security Council. Because region is a categorical variable, effects of this variable on the locations of states within the preference space may be most effectively analyzed visually.

Several aspects of these results are worth noting. First, there is some regional clustering, especially among the European states, which tend to be in the northeast of the space in 1980 and 1990 and move toward the east more recently. The W-NOMINATE algorithm attempts to place states that ratify more treaties in common relatively close together and, by contrast, to separate from each other states that have not ratified many treaties in common. The European regional clustering therefore suggests that these states have ratified many of the same treaties. Other regions are less tightly clustered, except for a group of Asian states toward the western area of the space in 2000 and the southwest in 2008. Nonetheless, the regional clustering appears to be less stark than that found by Voeten (2000) for the UNGA. Most regions overlap significantly with each other. A significant cleavage existed in the space during 1980 and 1990 running at approximately the $x = y$ line, but this cleavage does not appear to have divided states along regional lines. The cleavage appears to be weaker in 2000 and to have dissipated as of 2008. Finally, during the Cold War the Western great powers do appear to be separated from the U.S.S.R. and China along the second dimension. Because the first dimensions explains most treaty commitment decisions, this suggests that Cold War rivals had different treaty commitment preferences, but that these differences were not the key determinants of their decisions.

Because civilization is a categorical variable, its effects on the location of states in the treaty preference space can also be analyzed visually. Figure 2 shows the locations of states in the treaty commitment preference space coded by civilization. The civilizations are coded according to the categories and map provided by Huntington (1997, p.xx). There appears to be weak civilization-based clustering. There are two clusters of Latin American

states, for example, one on each side of the $x = y$ cleavage in 1980, 1990 and 2000. Western states also cluster in two groups on either side of this cleavage. As of 2008, states from most civilizations are spread fairly widely across the space. Overall, these results provide little support for the notion that treaty commitment preferences are based on civilization.

An additional possibility that can be analyzed graphically is the possible cleavage between members of NATO and the Warsaw Pact during the Cold War. Figure 2 shows the locations of the members of these alliances in 1980. NATO members are mostly clustered together, as are most Warsaw Pact members. Yet the two clusters are not particularly far apart in the space, especially along the first dimension. The results for other years during the Cold War are fairly similar. If the Cold War were a primary determinant of treaty commitment preferences, we might expect to see the members of the two alliances in opposite sides of the space (i.e., Democrats and Republicans in the U.S. Congress). The results therefore suggest the Cold War was not a major factor in determining treaty commitment preferences.

3.2 Movement in W-NOMINATE Space Over Time

I continue the analysis by examining the movement of key states in the preference space. Figure 3 shows the movement of the five permanent members of the U.N. Security Council along the first dimension since 1960. The preferences of most of the great powers are relatively stable over time. China, however, moves rapidly along the first dimension in the late 1970s. This period in China's history witnessed the takeover by Deng Xiaoping and the beginning of the reforms intended to modernize China and integrate it into the global economy. During this era, China ratified many treaties intended to facilitate trade and other economic cooperation. Its movement along the first dimension toward the more developed economies during this era suggests the first dimension may reflect the extent of a state's interest in international economic cooperation and interdependence within the global economy. It is also remarkable how closely correlated the movements of the United States and China have been along the first dimension since 1980. This means that the

United States and China have had similar preferences along the first dimension since 1980, which further suggests the dimension is more likely to be one of economic interests than factors such as regime type, region and civilization, along which the two powers clearly differ. Finally, the fact that the U.S. and U.S.S.R. are consistently on the same side of the first dimension weighs against the Cold War being a key determinant of treaty commitment preferences. Indeed, the lack of significant movement by the great powers after the end of the Cold War suggests this change in the structure of international relations did not have a significant impact on treaty commitment preferences.

Other states have also moved significantly in the treaty preference space. Figure 3 shows the movement over time of the four states that have moved the furthest along the first dimension: Uruguay, Paraguay, Mali and South Korea. These cases may be especially informative as to the substantive meaning of the coordinates. All of these moved in the same direction, although at different times. Analyzing these periods in these states' histories may help to explain the first dimension. South Korea's major movement occurred in the late 1970s, during the Fourth Republic and the lead-up to the assassination of President Park Chung-hee. This was a period of significant domestic oppression, but also of increased South Korean interest in multilateral economic cooperation, leading up to the normalization of relations between China and the United States. Uruguay's treaty preference shift also occurred in the late 1970s, in the middle of a period of civil-military dictatorship. The president during this period, Aparicio Méndez, instituted domestic economic reforms and began opening up Uruguay's economy to cooperation with other states. Mali's significant movement along the first dimension occurred in 1967, the year in which Mali reformed many domestic economic policies and rejoined the Franc currency zone. In 1967, Mali ratified many treaties intended to facilitate economic cooperation. Paraguay's movement along the first dimension has been more gradual. During the period of this movement, Paraguay experienced a transition to democracy as well as significant increases in trade and income, so the Paraguay case is less informative as it its preference

shift may have been due to multiple factors. Nonetheless, the cases of Uruguay, South Korea and Mali indicate that as states seek to open up economic relations with the world their treaty commitment preferences tend to change such that they move in a single direction along the first dimension.

3.3 Analysis of Normal Vectors

In this section, I interpret the treaty preference space by using normal vector analysis. Normal vectors in the preference space that are close to parallel to the dimensional axes may reveal the meanings of those dimensions. The first step is to estimate the following OLS model:

$$Y = \beta_1 X_1 + \beta_2 X_2 + \varepsilon \tag{1}$$

where Y is a vector of country-year data (e.g., trade, GDP), X_1 is the vector of first-dimension W-NOMINATE coordinates and X_2 is the vector of second-dimension W-NOMINATE coordinates. The coordinates (x, y) of the normal vector are obtained using the following equations:

$$x = \frac{\beta_1}{\sqrt{\beta_1^2 + \beta_2^2}} \qquad\qquad y = \frac{\beta_2}{\sqrt{\beta_1^2 + \beta_2^2}} \tag{2}$$

I calculate the coordinates of the normal vectors for several variables. For regime type, I use the data from the Polity IV project (Marshall and Jaggers 2002). As a measure of state power, I use the Correlates of War capabilities index (CINC). For trade and GDP per capita, I use the data provided by Gleditsch (2002). I take the natural logarithm of these three measures. Finally, I use the measures of Affinity toward the U.S. and U.S.S.R. developed by Gartzke (2006) as indicators of preference similarity to the U.S. and U.S.S.R.

Figure 4 shows the normal vectors for these variables in 1980, 1990 and 2000. In both 1980 and 1990, none of the normal vectors appears close to parallel to either dimension, although trade is closer to parallel to the first dimension than the other

variables. The closeness of the vectors to each other nonetheless demonstrates that rich, powerful, democratic and trade-dependent states tend to have different treaty commitment preferences from poor, weak, autocratic and relatively autarkic states. The vectors are close to each other because the underlying variables are themselves highly correlated. All of these variables may be important in shaping states' treaty commitments, therefore, although because of their correlation with each other we cannot determine their independent effects using this method.

As of 2000, however, several of the vectors move away from the $x = y$ line and flatten out, most notably the normal vector for trade. The flattening out of several of the vectors in 2000 suggests that these factors, and especially trade, are now closer to the meaning of the first dimension, indicating that they are better predictors of states' treaty commitment preferences. In particular, the movement of the trade vector toward the first dimension during this period suggests that increasing globalization and economic interdependence during the period 1980-2000 resulted in economic activities becoming increasingly important in shaping states' treaty commitment preferences.

To further test the effects of the Cold War, Figure 5 shows the normal vectors for the U.S. and U.S.S.R Affinity scores in 1960, 1970 and 1980. The vectors point in opposite directions because states that tended to have high Affinity scores for the U.S. tended to have low Affinity scores for the U.S.S.R., and vice versa. In 1960, the vectors are close to parallel to the second dimension, with states closer to the U.S. toward the north of the space and those favoring the U.S.S.R. toward the south. This suggests the Cold War may have been the second dimension of treaty commitment preferences during this era. As the Cold War went on, however, the normal vectors move toward the $x = y$ line, which suggests that, as of 1980, Cold War dynamics were less important in determining treaty commitment preferences.

3.4 Regression Analysis

The final method I use to analyze the treaty commitment preference space includes

a series of regression models. First, I compare the extent to which competing factors explain treaty commitment preferences by estimating OLS models using the state coordinates along the first dimension as the dependent variable. In each of these models, only one explanatory variable is included, and each model is run separately for each year from 1960 to 2000. The data used are those describe above. As a measure of domestic veto players, I follow existing studies of the relationship between veto players and treaties (Mansfield, Milner and Pevehouse 2007; Perkins and Neumayer 2007; Neumayer 2007) by using the *PolCon iii* measure developed by Henisz (2002). Based on a spatial model of interaction between political actors, the measure takes into account three factors: (1) the extent to which there are effective legislative veto points; (2) the extent to which these veto points are controlled by different parties from the executive's; and (3) the extent to which the majority controlling each veto point is cohesive. The measure therefore contains information not only about institutional veto points but also about the extent to which those are controlled by opposition groups, which is crucial to testing my hypotheses. The measure is continuous, with possible values ranging from 0 to 1. The largest values are given to country-years that feature effective, cohesive legislatures with divergent preferences from those of the executive.

The extent to which these variables fit the data can be analyzed by comparing the R^2 statistics of these bivariate models. Figure 6 shows the R^2 statistics of these models using the first dimension as the dependent variable. The models that include trade alone have a significantly better fit than the others, and this becomes increasingly true starting in the early 1970s. This indicates that, as globalization has increased and economic cooperation has become more important, states' interests in international trade increasingly explain their treaty commitment preferences. Interestingly, capabilities are by far the weakest predictors of treaty preferences along this dimension. Several other factors, including regime type and income, fit the data fairly well, but because these variables are correlated with each other (and with trade), it is difficult to discern their independent

impact from this analysis.

To examine the independent relationships between these variables and treaty commitment preferences, I estimate several additional OLS models. These models also use the state coordinates along the first dimension as dependent variables, but include all of the variables analyzed in the models above. As above, I use the natural logarithms of capabilities, per capita GDP and trade. For each dimension, I estimate models for 1960, 1970, 1980, 1990 and 2000 separately because I am interested in analyzing the meanings of the W-NOMINATE dimensions at different times. The results of these models are shown in Table 1.

Trade is the only consistent predictor of states' treaty commitment preferences. This is the clearest evidence that the first dimension is closely related to states' economic interests. The result is especially striking because treaties explicitly focused on issues such as reductions to barriers to trade or the opening of financial markets are generally not universal so are not included in the UNTC data. Nonetheless, the UNTC does include several universal treaties that facilitate economic cooperation, as discussed above. Another factor that predicts treaty commitment preferences along the first dimension is the Sinic civilization, although this is not the case as of 1980. Interestingly, the decreased predictive power of this variable coincides with China's opening of economic relations, further suggesting that treaty commitment preferences are explained well by economic interests. The democracy variable becomes significant as of 2000, which means that in the current era regime type may also play a key role in shaping treaty commitment preferences. Competing variables such as capabilities, regime type and veto players are not consistently significant in these models, further indicating that these are not key drivers of treaty commitment preferences.

3.5 Robustness Tests

To test the robustness of the results reported above, I have conducted several additional analyses.

Although treaty ratifications and roll-call voting decisions are analytically similar in some ways, they also differ in ways that could be problematic when using methods designed for analyzing roll-call voting in the treaty context. A key way these decisions differ from each other is that roll-call voting decisions must be made relatively quickly, but treaty ratification decisions can be made over long periods of time. This introduces the following problem: if a legislator does not vote for a bill, that decision is generally informative about his or her preferences. A state, however, may not ratify a treaty for reasons that are significantly less informative. New states, in particular, often have many higher priorities than universal treaty ratification and thus often do not ratify such treaties immediately upon independence. Non-ratifications in such circumstances may not be informative of a new state's preferences. To address this issue, I re-estimate the W-NOMINATE models with the following modification to the treaty data set: when a new state joins the international system, it does not enter the data set for 2 years, thus allowing the state time to make informative ratification decisions. Table 5 in the Supplementary Information reports the results of regression models based on this modified treaty data set. The results of all of this analysis are substantially similar to those reported above.

The main data set includes some treaties related to economic cooperation as well as many other treaties. To ensure that the results are not driven by the small number of economic cooperation treaties included in the data set, I conduct the analysis again with these treaties removed. Specifically, I remove all of the treaties coded by the UNTC as addressing international trade and development, economic statistics, commodities, commercial arbitration or fiscal matters. Table 6 in the Supplementary Information reports the results of regression models based on this modified treaty data set. Strikingly, trade remains the strongest predictor of states' treaty commitment preferences even with respect to treaties that do not address economic cooperation. These models fit the data less well than the main results reported above; in other words, adding the economic cooperation treaties improves the fit of the models, which further suggests that economic concerns are

crucial.

Finally, there is an important debate in the legislative studies literature regarding the most appropriate algorithm for estimating actors' preferences. In particular, Clinton, Jackman and Rivers (2004) propose a Bayesian estimation model that assumes quadratic utility functions rather than the Gaussian utility functions assumed by W-NOMINATE. Table 7 in the Supplementary Information reports the results of regression models based on treaty commitment preferences estimated using the Clinton, Jackman and Rivers (2004) methodology. The results of all of this analysis are substantially similar to those reported above.

4. Conclusions

The empirical tests conducted in this paper indicate that the key predictor of universal treaty commitment preferences is the extent of states' interest in international economic cooperation. Table 2 summarizes the results of my analysis. While no single method can fully interpret the W-NOMINATE results, across the various analyses performed above, economics – particularly trade – is by far the best and most consistent predictor of states' revealed treaty commitment preferences. This finding would perhaps be less noteworthy if it were based on a data set consisting of PTAs, BITs and other instruments explicitly related to economics. Yet that is far from the case; PTAs, BITs, regional economic cooperation agreements and wider agreements such as the WTO are not universal, and therefore not included in the data. Nonetheless, trade levels are strong predictors of states' decisions to join universal treaties in other policy areas.

These results have important implications for our understanding of international cooperation. We have already learned from studies of the rational design of international institutions that uncertainty about preferences can hinder cooperation through such institutions (Koremenos, Lipson and Snidal 2001). The findings in this paper indicate that states with similar trade interests tend to ratify similar agreements. In turn, this may indicate that uncertainty about preferences may be lower among states with similar

economic interests. Although this should be viewed as a tentative conclusion and merits further investigation, it supports an important strand of scholarship that argues that interdependence promotes peace by reducing uncertainty (Gartzke, Li and Boehmer 2001; Gartzke 2007). An additional implication of this paper is that economic interests appear to be key predictors of ratifications of treaties in other domains, including human rights, the environment and arms control. Although we have long understood that these issues have important economic consequences and are often linked to economic cooperation in specific instances, the results in this paper provide more comprehensive evidence regarding the close relationship between states' economic interests and their treaty commitments in these areas.

An additional implication of this paper is the relative unimportance of factors like capabilities and the balance of power in explaining international cooperation. Cold War alignment appears to vary along the second dimension, yet members of both NATO and the Warsaw Pact tend to be on the positive end of this dimension. This means that, even during the Cold War, members of these two rival alliances nonetheless had similar treaty commitment preferences and cooperated with each other on a broad range of issues. The broader meaning of this second dimension, especially during the Cold War era, appears to have been primarily a distinction between states with a Judeo-Christian background and others. It is striking how little national capabilities appear to affect treaty commitment preferences. I have found no evidence that indicates that more powerful states systematically prefer to ratify different treaties than weaker states. Indeed, there is little in the data to suggest that states either use universal treaties to balance against powerful states or to bandwagon with individual major powers.

The measures of treaty commitment preferences in this paper provide a useful complement to existing measures based on alliance portfolios and UNGA voting. Each of these measures has limitations, both because they measure revealed preferences and because each measure takes into account only certain dimensions of state policymaking. As

with the extant measures, the W-NOMINATE measures could be used to test important hypotheses regarding international institutions. For example, scholars of institutional design may be interested in testing hypotheses about the effects of state preferences - or in controlling for these while testing the effects of other factors. In addition, socialization theorists are often interested in understanding the extent to which membership in international institutions leads to changes in state interests over time (Checkel 2005; Hooghe 2005; Johnston 2005). Statistical tests of these theories can be challenging (cf. Bearce and Bondanella 2007), in part because of the difficulty of measuring preferences, and the W-NOMINATE measures may prove useful for this purpose. Finally, scholars often use the alliance and UNGA measures as controls for interest similarity when testing hypotheses about other factors that affect dyadic relations, and the W-NOMINATE could be in lieu or alongside these measures depending on the dimension(s) of interest similarity that is relevant to the question at hand.

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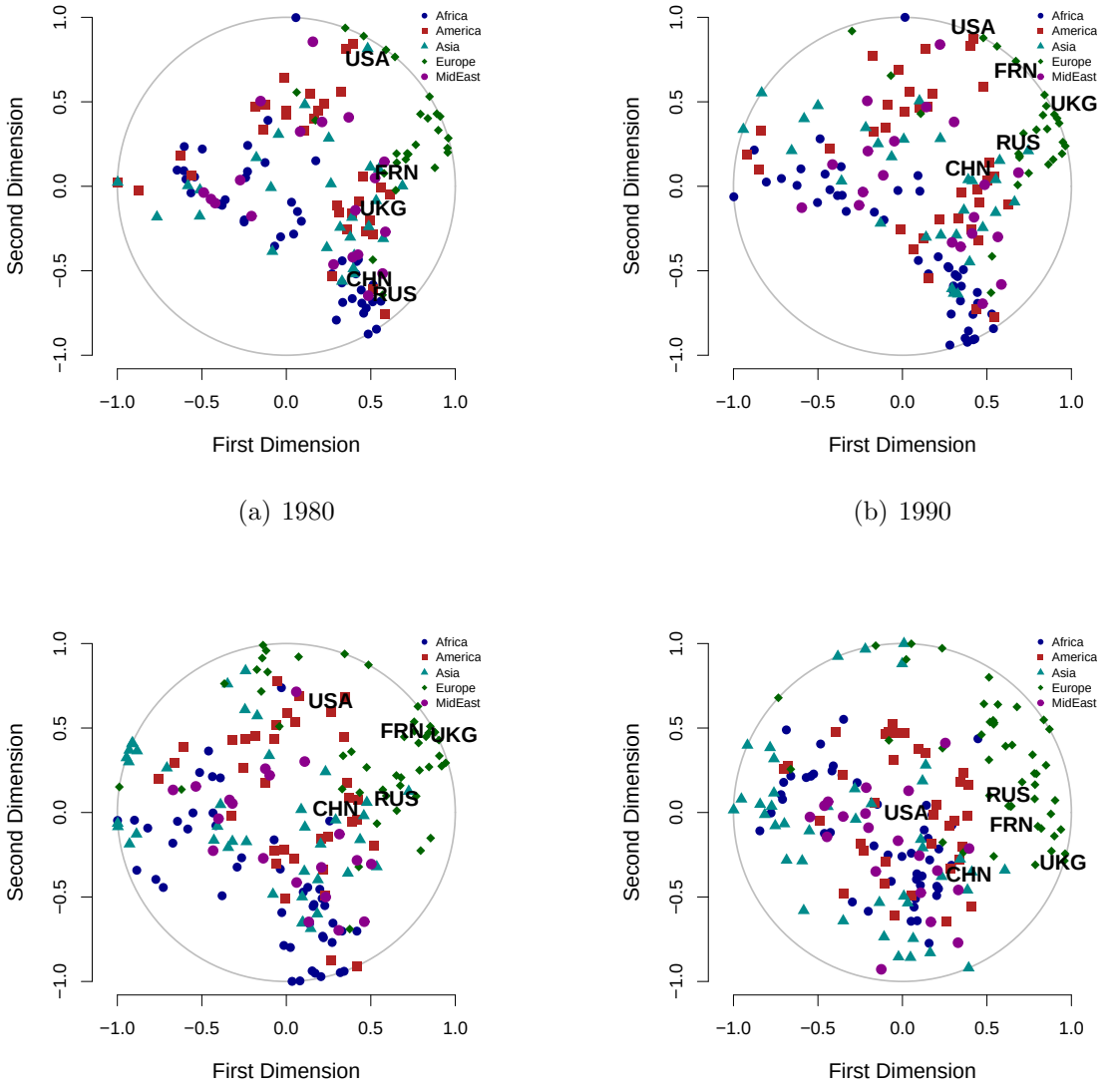


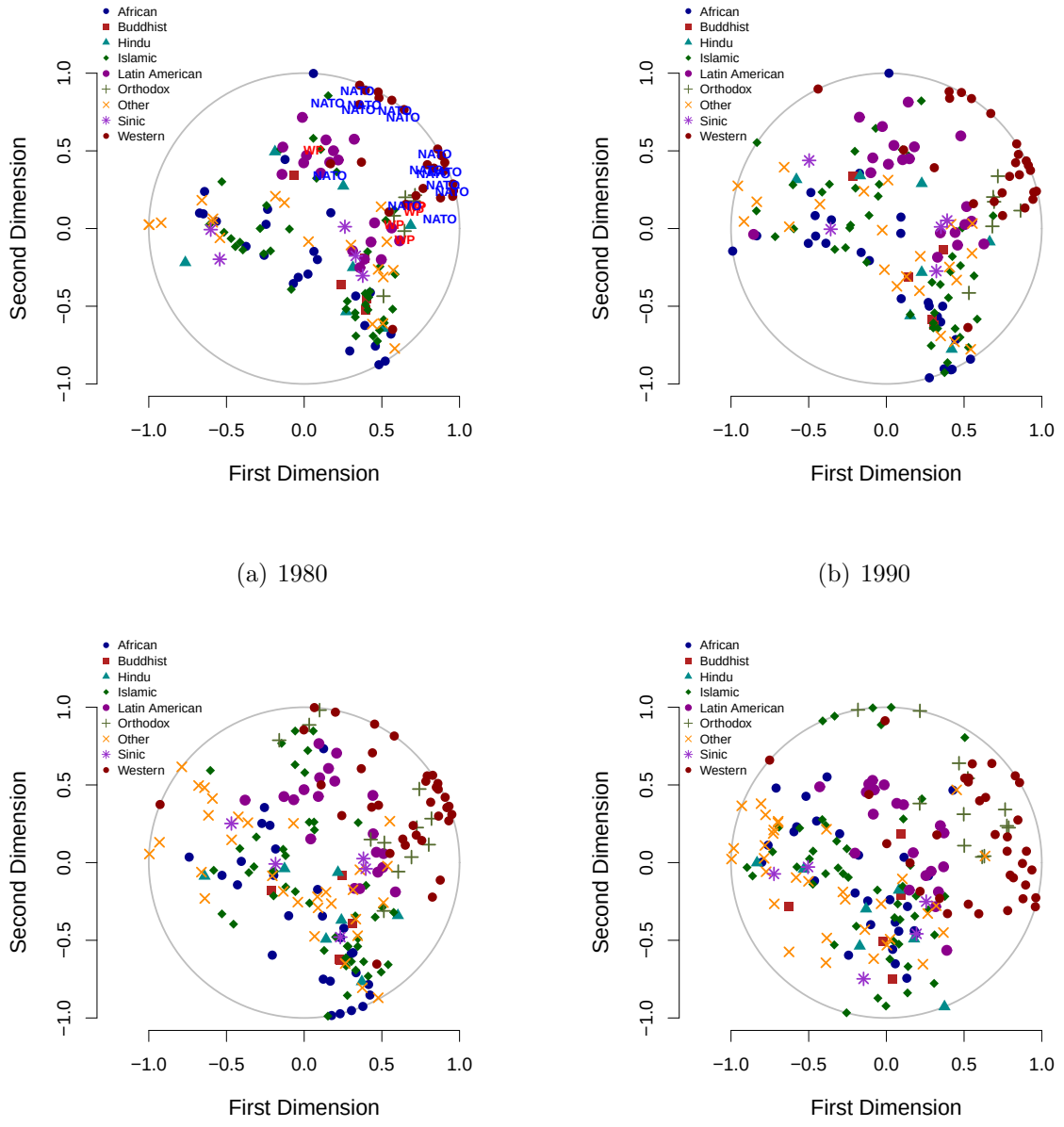
(a) 1980

(b) 1990

(c) 2000

(d) 2008

Figure 1: W-NOMINATE coordinates by region. The locations of the five permanent members of the U.N. Security Council are noted.



(a) 1980

(b) 1990

(c) 2000

(d) 2008

Figure 2: W-NOMINATE coordinates by civilization. Locations of NATO and Warsaw Pact members in 1980 are highlighted.

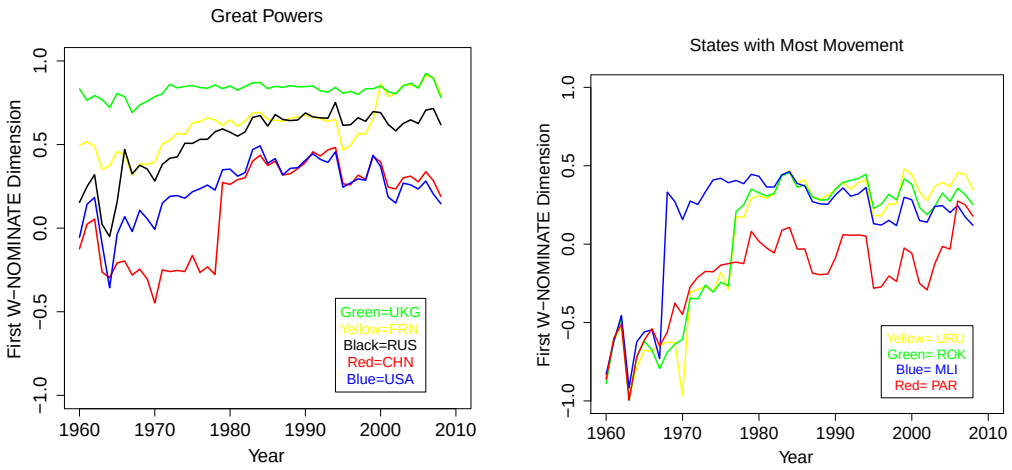


Figure 3: Movement of the great powers along the first W-NOMINATE dimension and positions of states with the most movement, 1960-2008.

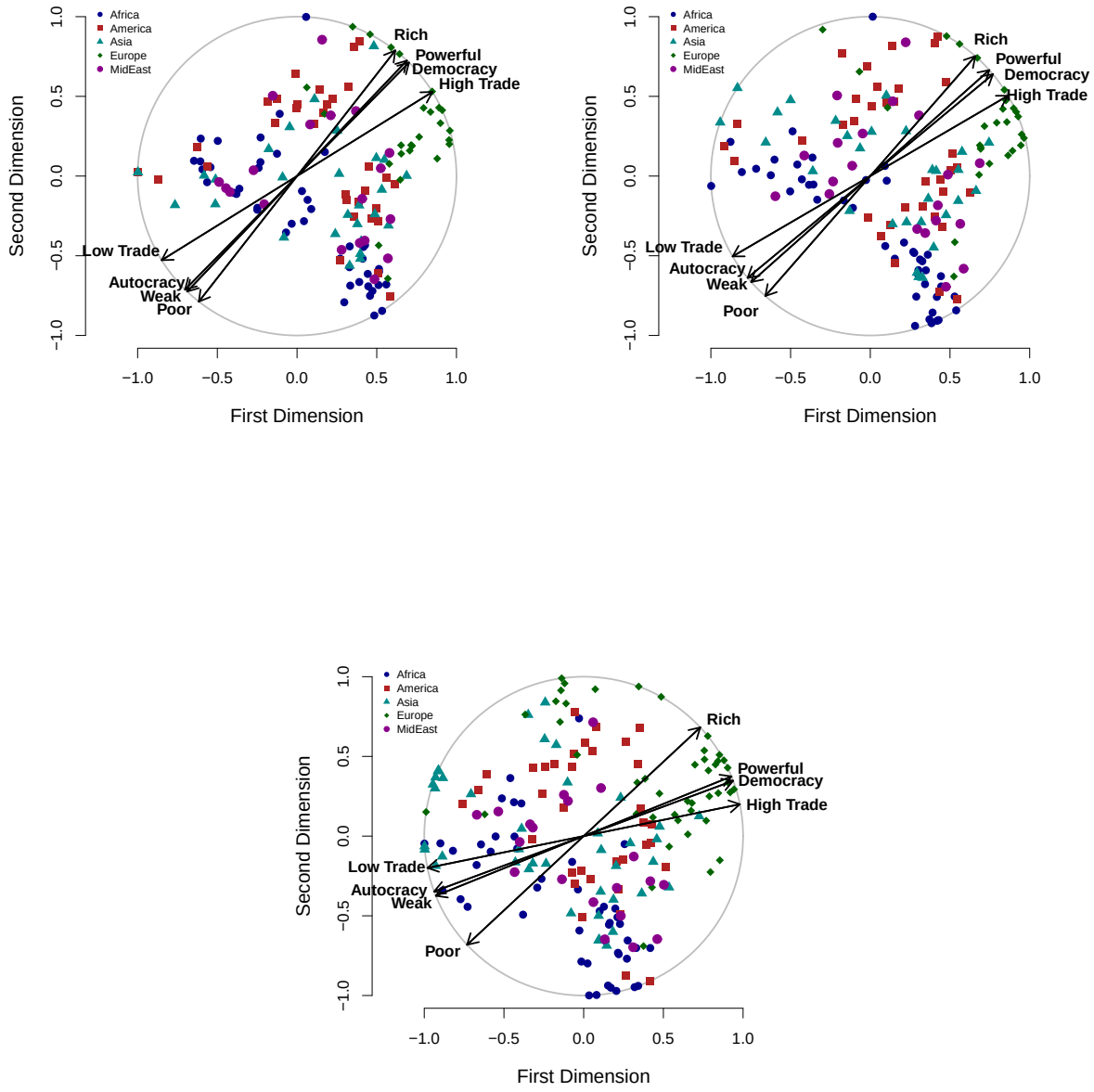


Figure 4: Normal vectors for income, regime type, trade and power in 1980, 1990, and 2000.

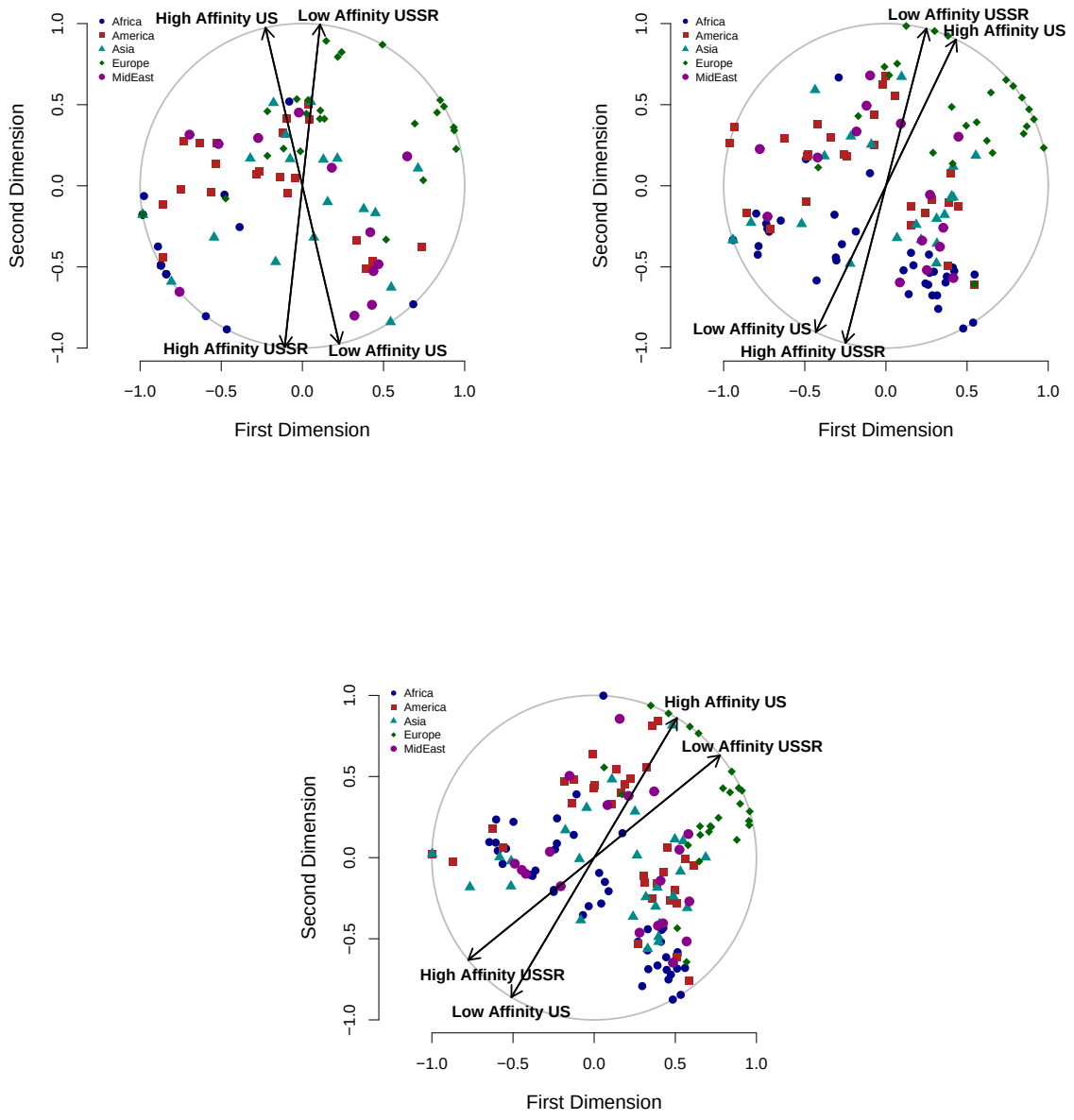


Figure 5: Normal vectors for U.S. Affinity and U.S.S.R. Affinity in 1960, 1970, and 1980.

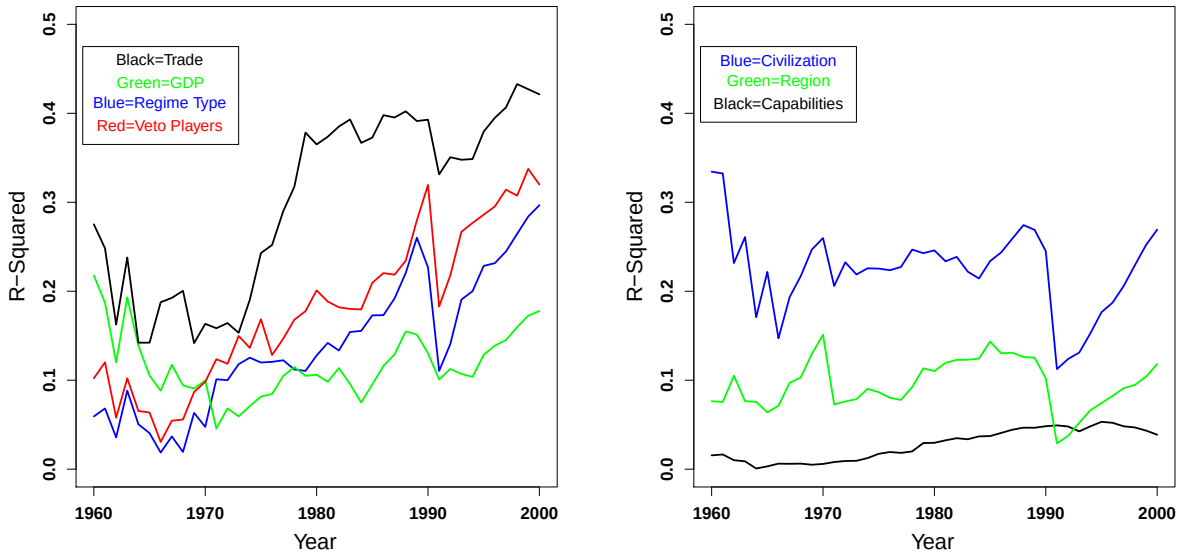


Figure 6: Fits of competing bivariate OLS models of W-NOMINATE first dimension.

Table 1: OLS Models of First-Dimension W-NOMINATE Coordinates

Variable	**1960**	**1970**	**1980**	**1990**	**2000**
Democracy	-0.027*	-0.000	-0.003	0.006	0.004
	(0.014)	(0.014)	(0.009)	(0.008)	(0.006)
Veto Players	0.508	0.036	0.246	0.223	0.216*
	(0.391)	(0.379)	(0.240)	(0.200)	(0.113)
Capabilities	-1.366	-1.009	-2.355	-1.661	-0.929
	(2.355)	(2.287)	(2.075)	(2.130)	(1.461)
GDP Per Capita (logged)	0.107	0.024	-0.124**	-0.101*	-0.026
	(0.116)	(0.078)	(0.050)	(0.056)	(0.037)
Total Trade (logged)	0.084*	0.070*	0.118***	0.110***	0.096***
	(0.046)	(0.037)	(0.026)	(0.028)	(0.020)
Asia	-0.012	0.137	-0.230	-0.133	-0.082
	(0.326)	(0.212)	(0.156)	(0.156)	(0.125)
Europe	0.241	0.496*	0.163	0.190	0.251*
	(0.327)	(0.252)	(0.184)	(0.187)	(0.142)
MidEast	0.144	0.066	-0.184	-0.131	-0.099
	(0.370)	(0.265)	(0.190)	(0.195)	(0.148)
Africa	-0.455	0.174	-0.125	-0.147	0.004
	(0.363)	(0.253)	(0.183)	(0.184)	(0.150)
Western	-0.334	-0.247	-0.120	-0.135	-0.121
	(0.310)	(0.240)	(0.166)	(0.167)	(0.125)
Islamic	-0.373*	-0.193	-0.120	-0.058	-0.052
	(0.209)	(0.180)	(0.127)	(0.130)	(0.098)
African	-0.148	-0.306	-0.187	-0.046	-0.111
	(0.303)	(0.207)	(0.151)	(0.155)	(0.127)
Latin	-0.596*	-0.310	-0.205	-0.211	-0.127
	(0.348)	(0.215)	(0.159)	(0.160)	(0.130)
Orthodox	-0.753**	-0.403	0.012	0.006	-0.147
	(0.358)	(0.316)	(0.234)	(0.231)	(0.146)
Sinic	-0.837***	-0.759***	-0.267	-0.246	-0.242
	(0.264)	(0.229)	(0.192)	(0.196)	(0.162)
Constant	-1.040	-0.538	0.374	0.202	-0.452
	(0.746)	(0.524)	(0.358)	(0.406)	(0.289)
N	86	115	126	125	144
R^2	0.516	0.351	0.447	0.488	0.584

Standard errors in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
The baseline region is America.
The baseline civilization includes the states coded by Huntington as "other".

Table 2: Summary of Findings

Method	**Economics**	**Regime Type**	**Power**	**Cold War**	**Civilization**	**Region**
Visual Inspection	—	—	—	Minor clustering by alignment	Clustering among Western and Latin states	Clustering among European states
State Movement	States move along the first dimension when opening up economic relations	No evidence in favor	No evidence in favor	No evidence in favor	—	—
Normal Vectors	Trade is the closest normal vector to the first dimension in 2000	Regime type is closer to the first dimension by 2000	No evidence in favor	No evidence in favor	—	—
Regression	Trade levels predict placement along the first dimension	No evidence in favor	No evidence in favor	—	No evidence in favor	No evidence in favor

Supplementary Information

A. W-NOMINATE Model Fit

This section discusses the fit of the W-NOMINATE model to the treaty commitment data. The first issue to address is the correct number of dimensions to include in the model. The crux of this question is as follows: While the underlying data can be analyzed in n-dimensions, how many of these dimensions are sufficiently substantively meaningful? Poole (2005) suggests that a preliminary determination can be made by plotting the normalized eigenvalues of the double-centered agreement score matrix produced by W-NOMINATE. Because the eigenvalues measure the fit of the underlying data, they are likely to flatten out when the dimensions are no longer meaningful. Figure 9 shows plots of eigenvalues against their dimensions for 1980, 1990, 2000 and 2008. The eigenvalues begin to flatten out after the third (or fourth in 2008) dimension, which suggests that there two meaningful dimensions are in the data. I continue the analysis using two-dimensional models.

The algorithm converges on estimated state and treaty locations when the probability of the observed treaty ratifications is maximized. The extent to which the W-NOMINATE model fits the data is therefore based on how well it predicts actual treaty ratification behavior. The model will not correctly predict all treaty ratifications, resulting in both false positives (i.e., cases where a country is predicted to ratify a treaty but does not do so) and false negatives (i.e., cases where a country is predicted not to ratify a treaty but nonetheless does so). Table 3 lists, for 2008, the ten countries with the most predicted ratifications, false positives, predicted non-ratifications and false-negatives. European states dominate the list of states with the most correctly predicted treaty ratifications. Note that these are not simply states that ratify many treaties, but also ones that *predictably* ratify such treaties. This is intuitively not surprising, especially as these countries are often at the forefront of setting the agenda for international lawmaking.

States that predictably ratify few treaties include small island states, extremely poor states such as Somalia and Equatorial Guinea, and relatively new states such as East Timor. These states may have little incentive to participate in the institutions created by many of these treaties. Interestingly, a few states appear to have both many false positives and false negatives, including the United States, Switzerland and Cuba. This suggests that the model is relatively weak at predicting the treaty ratification behavior of these states, i.e., that these states tend to be the most idiosyncratic in terms of treaty ratification.

Three standardized measures of fit have been developed to compare results using multidimensional scaling methods (Poole and Rosenthal 1997; Poole 2005). The first is the percentage of choices included in the underlying data that are correctly classified by the model. This measure gives an overall sense of how well treaty ratifications fit each of the dimensions and provides an indication of the extent to which the second dimension is significant relative to the first. One limitation of this measure, however, is that it does not take into account the underlying distribution of 1s and 0s in the data, which is likely to be uneven. This problem is addressed by a second measure, the aggregate proportional reduction in error (APRE), which provides the percentage reduction in classification errors provided by W-NOMINATE relative to a model that assumes all states ratify the same treaties as the majority of states. The APRE is calculated by dividing (1) the sum of all minority choices subtracted by classification errors; by (2) the sum of minority choices. A highly effective method of determining the effect of adding dimensions to the model involves subtracting the APRE for a one-dimensional model from the APRE for a two-dimensional model, which controls for the size of the majority and provides a measure of the net benefit of adding the second dimension. Finally, the geometric mean probability (GMP) reflects how well each state's actual choices reflect those predicted by the model. The GMP is calculated by taking the exponential of the average log-likelihood of observed decisions.

Table 4 provides the measures of fit for several years of the treaty data. For comparison, Table 4 also provides comparable measures provided by Poole and Rosenthal

(1997) for the U.S. House of Representatives, Hix, Noury and Rolan (2006) for the European Parliament, and Voeten (2000) for the UNGA. The first dimension appears to explain about 82% of the variance in the treaty data, whereas the second dimension explains only an additional 2%. Most importantly, this suggests the first dimension is meaningful and predicts treaty commitment to a significant extent. This also suggests that the second dimension is not especially significant and minor differences in states' locations along that dimension may not be particularly meaningful. The measures of fit are comparable to those of the other data, especially the Congressional data. It is notable that the APRE2-APRE1 statistic is significantly larger for the treaty data than for the U.S. House and UNGA, which means that adding the second dimension to the model does more to improve fit with respect to the treaty commitment data. Nonetheless, the decline in this statistic over time suggests the second dimension has become less important.

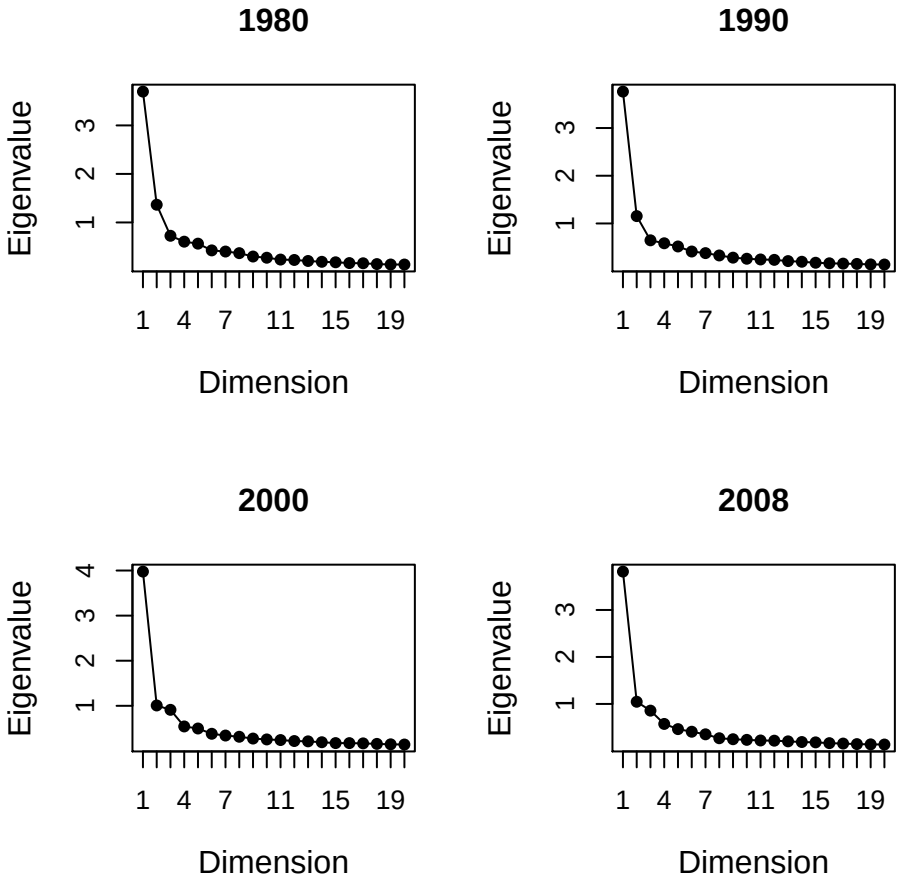


Figure 7: Scree plots of W-NOMINATE models in 1980, 1990, 2000, and 2008.

Table 3: Top 10 States by W-NOMINATE Classification Results in 2008

Most Ratifications Correctly Predicted	**Most False Positives**	**Most Non-Ratifications Correctly Predicted**	**Most False Negatives**
Netherlands	Montenegro	Tuvalu	Liberia
Norway	United States	Palau	Mexico
Denmark	Luxembourg	Bhutan	United States
Sweden	Switzerland	Micronesia	Cuba
Finland	Liberia	East Timor	Sri Lanka
Germany	Russia	Marshall Islands	Switzerland
Belgium	Cuba	Brunei	Montenegro
Austria	Bosnia	Somalia	Panama
United Kingdom	Austria	Eritrea	Canada
Slovakia	Czech Republic	Equatorial Guinea	Uzbekistan

Table 4: Measures of Fit for Universal Treaty Data and Other Data

Data	**Classification % 1 dim**	**Classification % 2 dim**	**APRE1**	**APRE2**	**APRE2-APRE1**	**GMP1**	**GMP2**
Treaties 1960	86.7	89.7	26.5	42.5	16.0	0.70	0.78
Treaties 1970	81.8	84.4	26.9	37.5	10.6	0.66	0.71
Treaties 1980	82.5	84.6	27.4	36.1	8.7	0.68	0.71
Treaties 1990	82.6	84.2	27.3	34.2	6.9	0.67	0.70
Treaties 2000	83.2	84.7	24.6	31.5	6.9	0.67	0.70
Treaties 2008	82.5	84.3	21.8	29.7	7.9	0.67	0.70
U.S. House 1960	82.7	84.4	47.9	53.1	5.2	0.68	0.70
Eur. Parl. 1979-1984	86.0	91.5	46.9	67.6	20.7	—	—
UNGA 1991-1996	91.8	93.0	62.1	67.7	5.6	—	0.83

B. Robustness Tests

Table 5: OLS Models of First-Dimension W-NOMINATE Coordinates
Lags for New States

Variable	**1960**	**1970**	**1980**	**1990**	**2000**
Democracy	-0.023	-0.000	-0.003	0.006	0.005
	(0.017)	(0.014)	(0.010)	(0.008)	(0.008)
Veto Players	0.423	0.029	0.259	0.245	0.275*
	(0.444)	(0.380)	(0.285)	(0.207)	(0.141)
Capabilities	-0.730	-0.964	-2.681	-1.684	-1.126
	(2.674)	(2.296)	(2.468)	(2.208)	(1.816)
GDP Per Capita (logged)	0.145	0.028	-0.159***	-0.106*	-0.031
	(0.134)	(0.078)	(0.059)	(0.058)	(0.046)
Total Trade (logged)	0.048	0.069*	0.140***	0.114***	0.118***
	(0.058)	(0.037)	(0.031)	(0.029)	(0.025)
Asia	0.034	0.138	-0.256	-0.143	-0.098
	(0.357)	(0.213)	(0.185)	(0.162)	(0.155)
Europe	0.207	0.500*	0.147	0.201	0.323*
	(0.358)	(0.253)	(0.219)	(0.194)	(0.176)
MidEast	0.074	0.062	-0.215	-0.142	-0.113
	(0.411)	(0.266)	(0.225)	(0.202)	(0.184)
Africa	-0.228	0.170	-0.154	-0.162	0.014
	(0.434)	(0.254)	(0.218)	(0.190)	(0.186)
Western	-0.303	-0.252	-0.138	-0.140	-0.157
	(0.343)	(0.241)	(0.197)	(0.173)	(0.155)
Islamic	-0.307	-0.189	-0.144	-0.057	-0.081
	(0.243)	(0.180)	(0.151)	(0.134)	(0.122)
African	-0.006	-0.304	-0.229	-0.043	-0.132
	(0.459)	(0.208)	(0.180)	(0.160)	(0.158)
Latin	-0.665*	-0.316	-0.213	-0.224	-0.164
	(0.381)	(0.215)	(0.190)	(0.166)	(0.162)
Orthodox	-0.531	-0.411	0.023	-0.000	-0.201
	(0.421)	(0.317)	(0.278)	(0.240)	(0.182)
Sinic	-0.823**	-0.760***	-0.357	-0.248	-0.297
	(0.325)	(0.230)	(0.229)	(0.203)	(0.202)
Constant	-0.961	-0.554	0.490	0.176	-0.798**
	(0.871)	(0.526)	(0.426)	(0.421)	(0.359)
N	75	115	126	125	144
R^2	0.373	0.350	0.417	0.495	0.581

Standard errors in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
The baseline region is America.
The baseline civilization includes the states coded by Huntington as "other".

Table 6: OLS Models of First-Dimension W-NOMINATE Coordinates
Economic Cooperation Treaties Excluded

Variable	**1960**	**1970**	**1980**	**1990**	**2000**
Democracy	-0.024**	-0.001	-0.003	0.007	0.006
	(0.012)	(0.013)	(0.009)	(0.008)	(0.008)
Veto Players	0.437	0.034	0.232	0.208	0.254*
	(0.330)	(0.365)	(0.243)	(0.198)	(0.136)
Capabilities	-0.928	-1.019	-2.578	-1.913	-1.369
	(1.986)	(2.202)	(2.109)	(2.107)	(1.762)
GDP Per Capita (logged)	0.066	0.026	-0.124**	-0.102*	-0.031
	(0.098)	(0.075)	(0.051)	(0.055)	(0.045)
Total Trade (logged)	0.079**	0.064*	0.122***	0.108***	0.111***
	(0.039)	(0.036)	(0.026)	(0.028)	(0.025)
Asia	-0.021	0.118	-0.247	-0.143	-0.102
	(0.275)	(0.204)	(0.158)	(0.154)	(0.151)
Europe	0.163	0.460	0.163*	0.205	0.327*
	(0.276)	(0.242)	(0.187)	(0.185)	(0.171)
MidEast	0.126	0.052	-0.201	-0.131	-0.114
	(0.312)	(0.255)	(0.193)	(0.193)	(0.178)
Africa	-0.385	0.147	-0.142	-0.157	0.001
	(0.306)	(0.244)	(0.186)	(0.182)	(0.181)
Western	-0.231	-0.253	-0.135	-0.150	-0.159
	(0.261)	(0.232)	(0.168)	(0.165)	(0.150)
Islamic	-0.260	-0.176	-0.116	-0.065	-0.068
	(0.176)	(0.173)	(0.129)	(0.128)	(0.118)
African	-0.060	-0.300	-0.182	-0.057	-0.119
	(0.255)	(0.199)	(0.153)	(0.153)	(0.153)
Latin	-0.374	-0.295	-0.211	-0.218	-0.164
	(0.294)	(0.207)	(0.162)	(0.159)	(0.157)
Orthodox	-0.615**	-0.403	-0.007	-0.042	-0.208
	(0.302)	(0.304)	(0.238)	(0.229)	(0.176)
Sinic	-0.728***	-0.737***	-0.250	-0.235	-0.273
	(0.223)	(0.221)	(0.195)	(0.194)	(0.196)
Constant	-0.542	-0.445	0.361	0.248	-0.728**
	(0.629)	(0.505)	(0.364)	(0.402)	(0.349)
N	86	115	126	125	144
R^2	0.491	0.335	0.441	0.485	0.575

Standard errors in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
The baseline region is America.
The baseline civilization includes the states coded by Huntington as "other".

Table 7: OLS Models of First-Dimension W-NOMINATE Coordinates
Bayesian Estimation Models

Variable	**1960**	**1970**	**1980**	**1990**	**2000**
Democracy	-0.026**	0.000	-0.009	0.007*	0.003
	(0.013)	(0.018)	(0.015)	(0.004)	(0.007)
Veto Players	0.490	0.024	0.332	-0.016	0.207
	(0.354)	(0.515)	(0.403)	(0.098)	(0.130)
Capabilities	-1.243	2.183	-3.414	0.788	-1.840
	(2.131)	(3.111)	(3.493)	(1.042)	(1.677)
Per Capita GDP (logged)	0.063	-0.152	-0.154*	-0.039	-0.062
	(0.105)	(0.106)	(0.084)	(0.027)	(0.042)
Total Trade (logged)	0.091**	0.022	0.156***	0.055***	0.108***
	(0.042)	(0.050)	(0.043)	(0.014)	(0.023)
Asia	0.062	-0.266	-0.292	0.026	-0.129
	(0.295)	(0.288)	(0.262)	(0.076)	(0.143)
Europe	0.241	-0.233	0.126	0.332***	0.095
	(0.296)	(0.342)	(0.311)	(0.091)	(0.163)
MidEast	0.209	-0.012	-0.231	0.055	0.000
	(0.335)	(0.360)	(0.319)	(0.095)	(0.170)
Africa	-0.446	-0.376	-0.175	-0.071	0.139
	(0.328)	(0.344)	(0.308)	(0.090)	(0.172)
Western	-0.229	0.614	-0.412*	0.273***	-0.324**
	(0.280)	(0.327)	(0.279)	(0.082)	(0.143)
Islamic	-0.413**	0.063	-0.138	0.008	-0.212*
	(0.189)	(0.244)	(0.214)	(0.063)	(0.113)
African	-0.164	0.107	-0.250	-0.003	-0.278*
	(0.274)	(0.282)	(0.254)	(0.076)	(0.146)
Latin	-0.539*	0.398	-0.330	0.223***	-0.300**
	(0.315)	(0.292)	(0.268)	(0.078)	(0.149)
Orthodox	-0.614*	0.509	-0.093	0.050	-0.364**
	(0.324)	(0.430)	(0.394)	(0.113)	(0.168)
Sinic	-0.909***	0.572	-0.435	-0.041	-0.300
	(0.239)	(0.312)	(0.324)	(0.096)	(0.186)
Constant	-0.929	0.824	0.068	-0.307	-0.299
	(0.675)	(0.713)	(0.602)	(0.199)	(0.332)
N	86	115	126	125	144
R^2	0.587	0.209	0.221	0.820	0.339

Standard errors in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
The baseline region is America.
The baseline civilization includes the states coded by Huntington as "other".

C. Analysis of Second Dimension

This section analyzes the second dimension of the treaty commitment preference space. Figure 8 shows the positions of the five permanent U.N. Security Council members over time. The great powers moved significantly more along the second dimension during this period than along the first dimension. First, China moved far along this dimension in the late 1970s. Interestingly, this moved China away from the United States (and the other Western powers), in contrast with its movement along the first dimension toward those powers. In the 2000s, all of the great powers moved in the same direction along the second dimension, which may mean that the meaning of the second dimension changed during this time.

With respect to the second dimension, the most significant movement was by China, Iran, Australia and Bahrain, as shown in Figure 8. Iran moved significantly along the second dimension in the mid 1970s and again in the early 2000s. The first change coincides with the Shah's abolition of opposition parties. Among other things, this made it easier for the Shah to obtain legislative approval of treaties he had previously signed, and thus Iran ratified many treaties immediately after the creation of one-party rule. In the second period, Iran was ruled by the reformer Mohammad Khatami, who initiated many economic and political reforms, including opening up Iran to international cooperation. Australia is an interesting case, as its most significant movement occurred in 1988 under a newly elected government. The prior election had been called early and featured an unusual double dissolution, such that all seats in the legislature were up for election. The Labor Party consolidated power during the election, which likely means it was able to pass the ratifications of many treaties it did not have the votes to pass earlier. Bahrain is perhaps the oddest case because it moves significantly in one direction, then immediately back in the other direction. This occurred during the 1980s, a particularly tumultuous period that included an attempted Islamist coup and ongoing political uncertainty caused by the Iran-Iraq war. It may be the case that, as a result, Bahrain's treaty ratification behavior

was relatively erratic during this period.

Figure 6 shows the fits of competing OLS models of the second-dimension coordinates. In the 1960s, the second dimension is highly correlated with trade, although this correlation declines in the early 1970s, which is also the era in which the fit of trade with the first dimension improves. Civilization has the best fit with the second dimension. This can be difficult to interpret because it is a categorical variable, but based on the plots in Figure 2, it seems that Western, Orthodox and Latin American states tend to be on one end of this dimension, whereas African, Sinic, Islamic and Buddhist states are mostly on the other end. This suggests that the meaning of the second dimension, especially during the 1960s and 1970s, may be related to cultural issues. As with the first dimension, capabilities are a poor predictor of treaty commitment preferences.

Table 8 shows the results of OLS models of the second-dimension coordinates with all variables included. The two variables most consistently significant are the Western and Latin-American civilizations. This is consistent with the visual finding that these states tend to cluster on one end of the preference space along the second dimension. Interestingly, Voeten (2000) finds that membership in these civilizations is significantly correlated with the first dimension of UNGA voting in the 1990s, whereas with respect to treaty preferences these variables are only significant for the second dimension. This indicates that the determinants of UNGA voting preferences differ substantially from those of treaty commitment preferences.

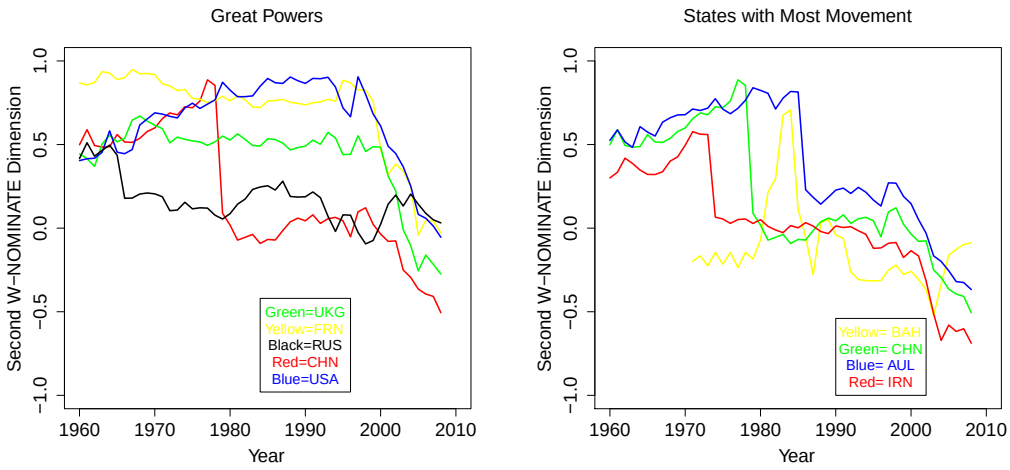


Figure 8: Movement of the great powers along the second W-NOMINATE dimension and positions of states with the most movement, 1960-2008.

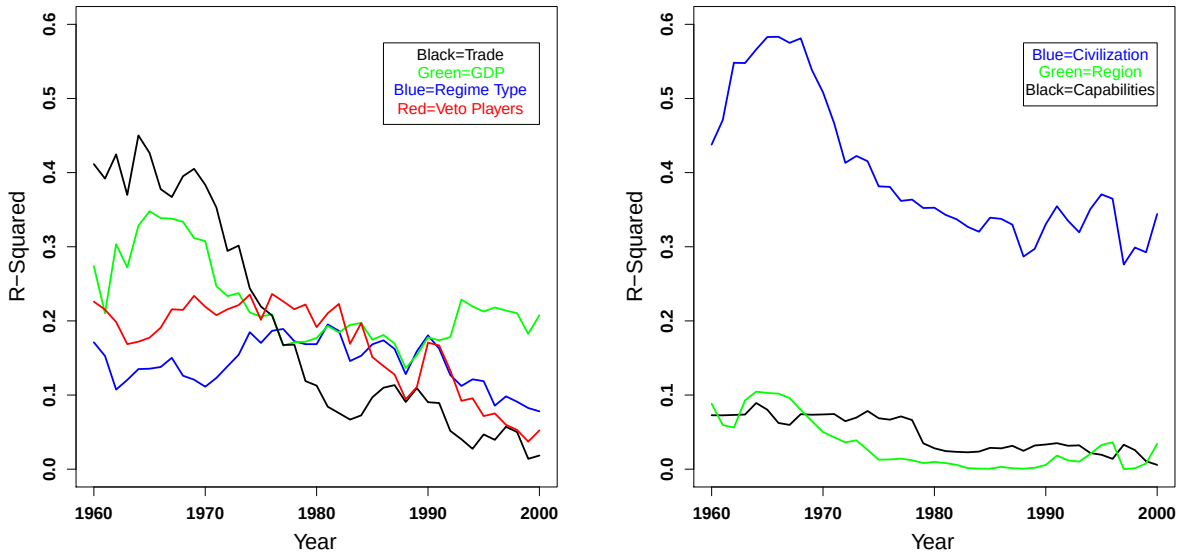


Figure 9: Fits of competing bivariate OLS models of W-NOMINATE second dimension.

Table 8: OLS Models of Second-Dimension W-NOMINATE Coordinates

Variable	**1960**	**1970**	**1980**	**1990**	**2000**
Democracy	0.011	-0.007	0.009	0.010	0.009
	(0.010)	(0.009)	(0.010)	(0.009)	(0.009)
Veto Players	-0.214	0.176	-0.066	-0.292	-0.249
	(0.271)	(0.260)	(0.270)	(0.241)	(0.161)
Capabilities	0.716	3.402**	4.353**	4.234	3.396
	(1.628)	(1.568)	(2.342)	(2.567)	(2.083)
Per Capita GDP (logged)	-0.136**	-0.069	-0.015	-0.004	0.099**
	(0.080)	(0.054)	(0.056)	(0.067)	(0.053)
Total Trade (logged)	0.114***	0.029	-0.030	-0.010	-0.067***
	(0.032)	(0.025)	(0.029)	(0.034)	(0.029)
Asia	0.019	0.160	0.209	0.216	0.253
	(0.225)	(0.145)	(0.176)	(0.188)	(0.178)
Europe	0.256	0.312**	0.198	0.281	0.238
	(0.226)	(0.172)	(0.208)	(0.225)	(0.202)
MidEast	-0.064	0.269	0.247	0.247	-0.071
	(0.256)	(0.182)	(0.214)	(0.235)	(0.211)
Africa	-0.161	-0.075	-0.062	-0.039	-0.388**
	(0.251)	(0.173)	(0.207)	(0.221)	(0.214)
Western	0.474***	0.570***	0.735***	0.656***	0.788***
	(0.214)	(0.165)	(0.187)	(0.201)	(0.178)
Islamic	0.114	-0.022	0.155	0.112	0.487***
	(0.145)	(0.123)	(0.144)	(0.156)	(0.140)
African	0.068	-0.020	0.192	0.098	0.520***
	(0.209)	(0.142)	(0.170)	(0.186)	(0.181)
Latin	0.321	0.462***	0.658***	0.724***	0.827***
	(0.241)	(0.147)	(0.180)	(0.193)	(0.185)
Orthodox	0.335	0.226	0.215	0.159	0.623***
	(0.248)	(0.217)	(0.264)	(0.279)	(0.208)
Sinic	0.025	-0.048	0.021	0.182	0.267
	(0.183)	(0.157)	(0.217)	(0.236)	(0.231)
Constant	-0.066	-0.081	-0.040	-0.229	-0.718
	(0.516)	(0.359)	(0.404)	(0.490)	(0.412)
N	86	115	126	125	144
R^2	0.617	0.638	0.451	0.432	0.528

Standard errors in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
The baseline region is America.
The baseline civilization includes the states coded by Huntington as "other".