

Something, something, something about Foreign Aid

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Abstract

In recent years, numerous studies have sought to explain the strategic and political motivations that direct foreign aid flows (e.g., Alesina and Dollar (2000), Berthélemy (2006) Werker (2012)). To that end, scholars have tested many monadic and dyadic level hypotheses have done so using widely inconsistent measures of ‘strategic interest’. Moreover all the extant literature analyzes aid flows in a dyadic context where the assumption is that the flow of aid between any particular dyad is independent of any other. However, scholars are well aware of potential dependence in foreign aid allocations. Some scholars hypothesize for example that donors exhibit herding (Frot and Santiso 2011) or ”lead donorship behavior (Steinwand 2014) wherein donor countries are dissuaded from giving aid to a country that already has a major donor. This is also empirically problematic as failing to account for interdependencies leads to biased coefficients and standard errors. To explicitly incorporate these interdependencies, we used a mixed hierarchical model with random effects. In doing so we are able to shed new light onto the political and strategic considerations underlying the distribution of foreign aid in the international system.

Introduction

Foreign aid describes the transfer of resources from one government to another. Although the term itself suggests a humanitarian motive, scholars and experts have long debated whether it would be more accurate to ascribe foreign aid a strategic motive instead. With some exceptions (Bermeo 2008), most scholars have found that donors prioritize strategic considerations when dispensing aid (Alesina and Dollar 2000; Berthélemy 2006).

This seeming consensus belies the inconsistency with which scholars conceptualize and measure strategic considerations, which have variously included bilateral trade intensity, UN voting scores, colonial legacies and regional dummies among others. In this paper we seek to rectify fragmentation: First, we create an original measure of bilateral strategic interest that measures the latent distance between countries across the strategic policy space. In doing so, we seek to provide a more coherent measure of strategic interest which incorporates many of the measures that previous papers have used. Such a measure further improves upon existing measures of strategic interest in that it maps strategic interest onto a 'social space' and is thus able to account for third-party relationships (Hoff, Raftery and Handcock 2002).

The existing lack of coherence in evaluating strategic interest extends to model specification. Papers which have empirically evaluated the dominance of strategic over humanitarian motives with some exceptions (Berthélemy 2006), have done so by specifying models which pool all donors together or by running models for each donor country separately. We find this empirical choice puzzling - if foreign aid is indeed given for strategic reasons then surely a donor country should account for the foreign aid given by other countries when making their own allocations. The same should be equally true if foreign aid is given for humanitarian reasons - if a very needy country is already receiving an abundant amount of foreign aid from other countries, a particular donor country may decide to dispense aid to a less needy but overlooked recipient country. Pooled models do not address this issue as they do not distinguish between donor countries while donor by donor regressions cannot address this issue because by construction they do not account

for the allocations of other donor countries.

In our model specification, we also use a hierarchical random effects model with panel data¹ to account for the possibility that foreign aid given by one donor is not given without consideration of allocations by other donors. In doing so, we are able to model both the variation that is common among donor countries as well as that which is specific to a particular donor country, combining the best of what a pooled regression or donor by donor regressions can offer.

With these model and variable specifications, we find that.... [INCLUDE FINDINGS HERE] Moreover, onor by donor regressions have found that there is wide variations of motivations in allocating foreign aid among donors, we find that when we consider the donor countries together that.... [INCLUDE FINDINGS HERE]. In what follows, we first give a brief overview of the literature before introducing our new measure of strategic interest. We then run our analyses of the motivations for foreign aid with our new measure using a hierarchical random effects model. We discuss the implications of our results before concluding.

Lit Review

Scholars have sought to determine the primary motivation for foreign aid at least as far back as the modern foreign aid regime was erected in the post-WWII era. In doing so, they have erected a number of framing devices- i.e. donor interest vs. recipient interest (Lumsdaine 1993), realist vs idealist motivations (Schraeder, Hook and Taylor 1998), donors who give to recipients who practice bad governance or good governance(Dollar and Levin 2006; Neumayer 2005), donors who give to recipients who implement ‘bad polices’ or ‘good policies’ (Alesina and Dollar 2000) etc.

One reason for evaluating the motivations for aid and not aid outcomes is that aid given for strategic reasons may still further development objectives, albeit incidentally, while aid given for humanitarian reasons may also bring unexpected strategic ben-

¹We can go into greater detail and talk about how it is also a zero-inflated model later in the model specification section, what do you think Shahryar?

efits (Maizels and Nissanke 1984). However, evaluating the motivations for aid is not a straightforward process either - any given aid project may work toward providing assistance to a recipient country as well as strategic benefits to a donor country. The question to be answered then is what relative consideration is given to donor interest or humanitarian need when making aid allocation decisions. At the root of these dichotomies is the suspicion that despite rhetoric to the contrary, foreign aid has been dispersed to address donor interest to a much greater extent than it has been for recipient needs.

Scholars sought to provide empirical evidence for answer or another since at least as far back as the late 1970's (McKinlay and Little 1977, 1978, 1979) and onward to the 1980's (Maizels and Nissanke 1984) and 1990's (Lumsdaine 1993; Schraeder, Hook and Taylor 1998), with scholars finding evidence to suggest that foreign aid allocation is driven by strategic concerns much more than humanitarian ones. Alesina and Dollar (2000) were among the first to extend this finding across a large panel of countries, that is to 21 donor countries and 181 recipient countries from 1970-1994. They find that countries that votes relatively more similarly to Japan in the UN are 172% more likely to receive more aid while Egypt and Israel receive upwards of 400% more foreign aid than other countries. Ceteris paribus they argue that inefficient, economically closed non-democratic former colonies are much more likely to receive aid than countries that had not been formerly colonized with similar poverty levels, a finding that Weder and Alesina (2002) echoes when they find that the US is more likely to give corrupt governments more aid. Berthélemy (2006) reaches a similar conclusion, noting that donor countries are generally much more likely to act based off of egotistic motivations than altruistic ones, while Stone (2006) and De Mesquita and Smith (2007) find evidence to suggest that donor countries are more likely to use foreign aid to 'buy influence.'

While scholars have certainly found variation in their results, the overwhelming consensus is that strategic interest largely takes precedence over humanitarian ones in foreign aid allocation. Despite this seeming consensus, we find that Alesina and Dollar (2000)'s remark that 'unfortunately the measurement of what a 'strategic interest' is varies from study to study and is occasionally tautological,' still holds true. That is, strategic

interest has alternately been measured by: trade intensity(Bermeo 2008; Berthélemy and Tichit 2004), UN voting scores (Alesina and Dollar 2000; Weder and Alesina 2002; Dreher and Fuchs Forthcoming), arms transfers (Maizels and Nissanke 1984), colonial legacy (Alesina and Dollar 2000; Bermeo 2008; Berthélemy and Tichit 2004; Berthélemy 2006), alliances (Bermeo 2008; Schraeder, Hook and Taylor 1998), regional dummies(Bermeo 2008; Berthélemy 2006; Maizels and Nissanke 1984), bilateral dummies (Alesina and Dollar 2000; Berthélemy and Tichit 2004; Berthélemy 2006)²or some combination of the above.

Other papers take a negative approach and argue that any shortfall between what would theoretically be expected from poverty-efficient aid allocation and actual aid allocation(Collier and Dollar 2002; Nunnenkamp and Thiele 2006; Thiele, Nunnenkamp and Dreher 2007), or similarly between a theoretical allocation based on good governance and actual aid allocation(Dollar and Levin 2006; Neumayer 2005), is evidence of strategic interest at play.

What's more, what some scholars measure as strategic interest other scholars interpret as a measure of humanitarian interest. As Bermeo (2008) notes for example, there is some controversy in interpreting GDP per capita as a measure of humanitarian aid, as 'the poorer a country is, the more it needs aid, and the easier it might be for donors to use aid to influence decisions in the recipient.' She further notes that colonial legacy, a factor that some scholars see as evidence of strategic interest, may not necessarily be an appropriate measure of strategic interest but instead of 'strategic development.' In this sense, humanitarian and strategic interests are mutually complementary motivations as donor countries seek to further the development of countries that they have a self-interest in seeing develop. We would further add that increased aid among countries with former colonial ties could also be interpreted as a measurement of the greater degree of cultural understanding between these countries, which has long been argued to be a cornerstone of effective aid. In order to properly evaluate the motivations for foreign aid, what is needed is a better and clearer measure of strategic interest, something which we take up in the next section.

²A US-Egypt or US-Israel dummy seems to be the most common instance of a bilateral dummy

Meanwhile, we note that despite the general consensus that donors are more driven by strategic interests than humanitarian ones, researchers also recognize that there may be significant variation in aid allocation *across time*. In their analysis of 22 donor countries and 137 recipient countries from 1980-1999, Berthélemy and Tichit (2004) finds that following the Cold War, foreign aid allocation has been more responsive to a good governance and good economic policy in recipient countries, a result that Bermeo (2008) and Dollar and Levin (2006) echoes. This suggests not only that humanitarian need has become more important in recent years but that the relative balance between strategic and humanitarian considerations are not fixed over time. This claim is disputed by Nunnenkamp and Thiele (2006)'s findings however, whose analysis suggests that foreign aid dispersed from 1981 to 2002 has been *less* targeted to needy countries over time. What these studies hold in common however, is a lack of a *measure* of what they think may be affecting aid allocation across time, only an *interpretation* of what these time effects might mean given their knowledge of the different time periods.

Finally, we similarly note that despite the general consensus that donors are more driven by strategic interests than humanitarian ones, researchers also recognize that there may be significant variation in aid allocation *among different donor countries*. To that end, many papers endeavor to provide an analysis of aid allocation on a cross national level and for individual donor countries (Alesina and Dollar 2000; Berthélemy 2006) while other papers choose to focus on the aid allocation strategies of one donor country at a time Bermeo (2008); Dreher and Fuchs (Forthcoming); McKinlay and Little (1977, 1978); Neumayer (2003); Fleck and Kilby (2010). In none of the papers we have encountered however, have scholars sought to evaluate differences in aid allocation in a multi-level hierarchical model. We seek to account for both variation of foreign aid allocations in time and variation across countries in our model specification, which we detail further in the empirical section of this paper.

Measuring Strategic Relationships

How one *measures* strategic relationships is essential to evaluating the relative importance countries may accord strategic motives when dispensing aid. However, as argued in the literature review, previous papers have been inconsistent in how they have measured strategic interest, which in turn produces incoherence as to what exactly is being measured. It is not simply a matter of using different data to measure the same concept but of using different data to measure different aspects of a concept. That is, while UN voting scores and arms transfers may be acceptable measures of strategic interest, surely nobody is arguing that they are conceptually equivalent in the same way that Polity and Freedom House are.

A large reason for this inconsistency is that while a dyad's strategic bilateral relationship is quite multifaceted, to date, there has not been a readily available measure of strategic relationships which captures its various aspects the same way that scholars have done for other complex concepts.³ The most relevant research to date has been concerned with how to measure foreign policy similarity, starting with Bueno de Mesquita (1975)'s Kendall τ_b measure followed by Signorino and Ritter (1999)'s S Scores, with new work continually being done in this arena (Gartzke and Jo 2006; Häge 2011; D'Orazio 2012)). However, foreign policy similarity arguably only captures the political dimension of strategic relationships, equally relevant is active military cooperation between two countries.

While military cooperation certainly has political dimensions, we would argue that it should be considered a separate aspect of a strategic relationship rather than an subset of political strategic relationship. That is, military security is set apart by its capacity to affect a country's security in a manner that is more immediate, concrete and unilateral than other security concerns across countries more generally, as compared to for example access to natural resources, humanitarian sanctions or environmental policy. While military cooperation can certainly be mediated in the political arena, is qualitatively different - that is it is one thing to jointly condemn the various atrocities of the North Korean

³For example, Polity and Freedom House have provided measures of political institutions while the World Bank's World Governance Indicators (WGI) project provides measures for six dimensions of governance

government, it is quite another thing to take joint military action against it.

A new measure of strategic relationships

Our measure of strategic relationships attempts to introduce greater coherency to the literature by providing a more rigorous measure of these two aspects of a strategic relationship, political and military. We do so by first measuring the latent space of different dyadic variables that measure various aspects of the strategic relationship between countries. We then calculate the latent distance between each dyad for each component. Finally, we combine the latent distances for each variable through a principal components analysis (PCA). As such, our political strategic relationship measure is the first principal component that results from the PCA of the latent distance between dyadic alliances, UN voting and joint membership in an intergovernmental organizations (IGOs). Meanwhile our military strategic relationship measure is the first principal component of the PCA that results from the latent distance between dyadic arms transfers, militarized interstate disputes (MIDs), and wars. Note that MIDs and wars are of course, the opposite of military cooperation; for these latent measures we reverse the scale to account for this. We explain how we construct these measures of strategic interest in greater detail below while we detail the data sources we relied on in the data section.

The main advantage of calculating the latent space of different dyadic variables as opposed to using alternative specifications such as the S Score algorithm⁴ is that we are consequently able to account for third order dependencies within the data. To review, first order dependency refers the propensity for some actors to send or receive more ties than others, second-order dependency refers to reciprocity of exchange between actors while a third-order dependency refers to interactions among three or more actors. Dyadic data are rife with these types of dependencies, and aside from first-order dependency, they pose serious challenges the basic assumption of independence between observations.

In particular, third order dependency includes the concepts of (a) transitivity, (b)

⁴Leeds and Savun (2007) for example creates a measure of a states “threat environment” as the set of all states for which ones is contiguous with or which is a major power and with an S score below the population median.

balance and (c) clusterability. Formally, a triad ijk is said to be transitive if for whenever $y_{ij} = 1$ and $y_{jk} = 1$, we also observe that y_{ik} . This follows the logic of “ a friend of a friend is a friend”. Meanwhile, a triad ijk is said to be balanced if $y_{ij} \times y_{jk} \times y_{ki} > 0$. Conceptually, if the relationship between i and j is ‘positive’, then both will relate to another unit k identically, either both positive or both negative. Finally a triad ijk is said to be clusterable if it is balanced or all the relations are all negative. It is a relaxation of the concept of balance and seeks to capture groups where the measurements are positive within groups and negative between groups.

In other words, third order dependencies suggest that “knowing something about the relationship between i and j as well as between i and k may reveal something about the relationship between i and k , even when we do not directly observe it” (Hoff and Ward 2004). Such a dependency is especially important to capture with regards to strategic relationships as dyadic relationships between two particular countries cannot help but be understood in the context of their relationship with other countries.

Following (Hoff 2005), we run a null generalized bilinear mixed effects model (gbme)⁵ to estimate the latent space for each component of our strategic interest variables. Formally, it is represented as follows:

$$\theta_{i,j} = a_i + b_j + \gamma_{i,j} + z'_i z_j$$

where $\theta_{i,j}$ is the dyadic variable of interest (e.g., alliances), a_i estimates ‘sender’ effects, b_j estimates ‘receiver’ effects and $z'_i z_j$ is the bilinear effect which estimates the latent space and accounts for third order dependencies common in dyadic data. We estimate the model via Gibbs sampling of full conditionals of the parameters. For a more detailed discussion of this model, see Hoff, Raftery and Handcock (2002); Hoff and Ward (2004); Hoff (2005). In Figures 1 and 2 we present a visualization of the resultant latent space we calculated for each component for the year 2005.

⁵Code for running the gbme can be found from Hoff’s website at http://www.stat.washington.edu/hoff/Code/hoff_2005_jasa/

Figure 1: Latent Spaces for components of Political Strategic Interest Measure during 2005

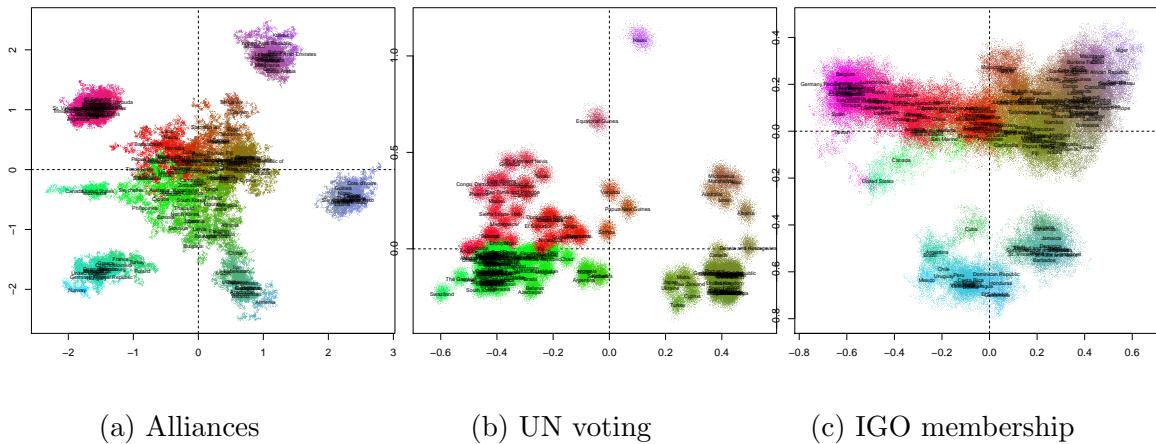
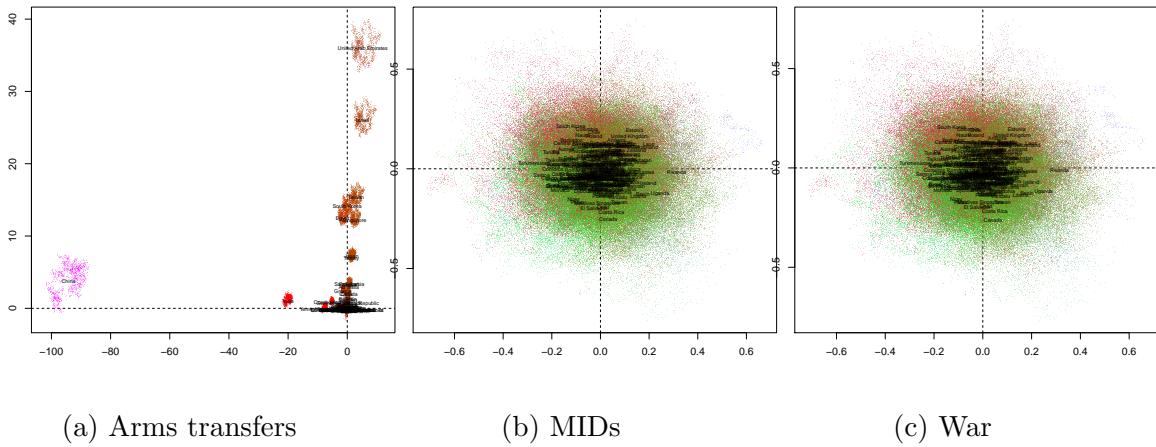


Figure 2: Latent Spaces for components of Military Strategic Interest Measure during 2005



The plots for the components for the political strategic relationship variable suggest that there is distinct clustering among countries. This is also true for latent space of arms transfers, a component of the military strategic relationship variable. However, there is much less clustering for the other two components of the military strategic relationship variable, suggesting that many conflicts involve more than one or two dyads and further that military conflicts can have broad ramifications beyond the dyads involved.

After estimating the latent spaces for these components, we calculate the latent distances between each dyad for each component. We then combine them in a principal components analysis to reduce the dimensionality of our measure while retaining as much variance as possible. That is, alliances, UN voting and joint membership in IGOs all cap-

ture certain aspects of political strategic interest. Instead of choosing only one of them as our measure of strategic interest as other papers have done, we combine them in order to increase our explanatory power. We estimate a PCA for each year separately⁶ and use the first principal component for each year as our measure of strategic interest. On average over all the years, we find that our political strategic interest variable, that is the first component of our PCA of the combination of alliances, UN voting and joint membership in IGOs, explains about 51% of its variance. Meanwhile we find that the our military strategic interest variable, that is the first component of our PCA of the combination of arms transfers, MIDs and war incidence, explains about 66% of its variance.

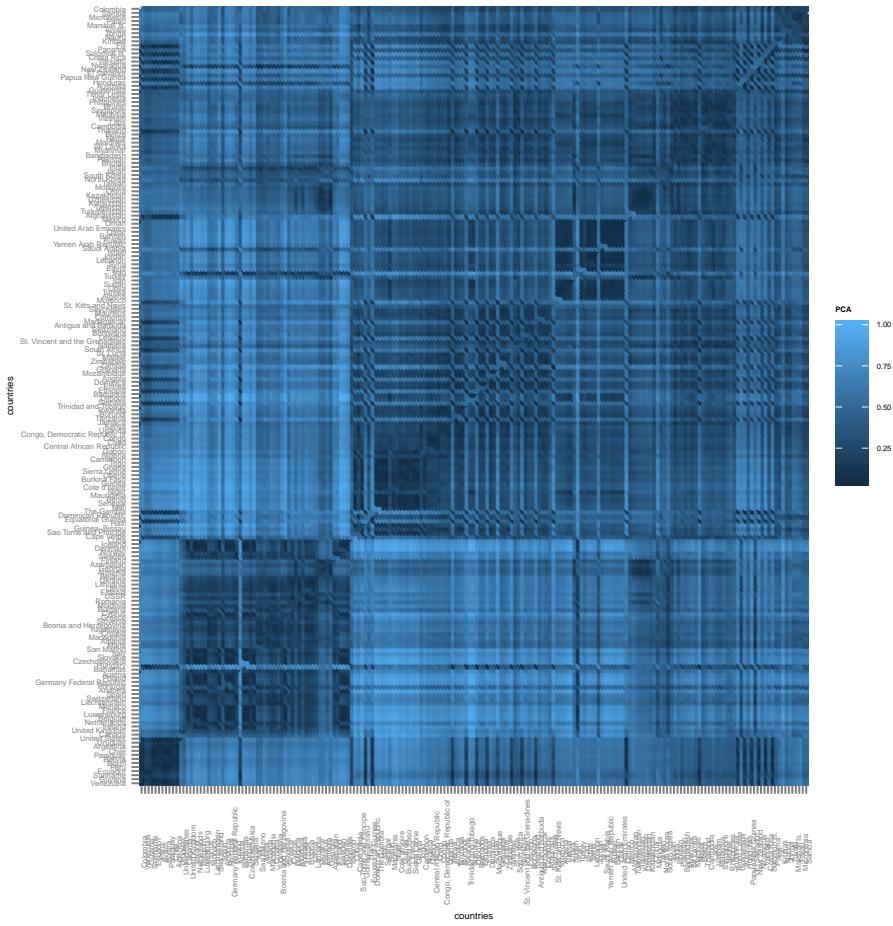
A visualization of the resultant dyadic PCA is shown below in Figures ?? for the political strategic measure and in Figure ?? for the military strategic measure for the year 2005. Along the x and y axes are the countries included in our analysis; any point within the plot represents the dyadic relationship between a country on the x and y axis with darker shading representing a stronger relationship and lighter shading representing a weaker relationship.

These plots suggest that there is much more variation in political strategic relationships than there are military strategic relationships, perhaps because the number of issues spaces in the political arena are much greater. They also suggest that on average, countries have a greater political strategic relationships than military strategic relationships. Since the military strategic relationships data is composed largely of actual military events, this makes sense as on average, conflict between any two countries is much rarer than diplomatic negotiations.

We also conduct a series of post-estimation validation tests for our resulting strategic variables. In particular, we (1) evaluate the relationship between our political strategic interest variable and our military strategic interest variable against S scores and Kendall's τ_b for alliances and (2) investigate how our measures describe well-known dyadic relationships. We perform a simple bivariate OLS with and with year fixed effects to evaluate how

⁶For each year, we conduct a bootstrap PCA of 1000 subsamples each

Figure 3: Dyadic PCA for Political Strategic Interests for year 2005



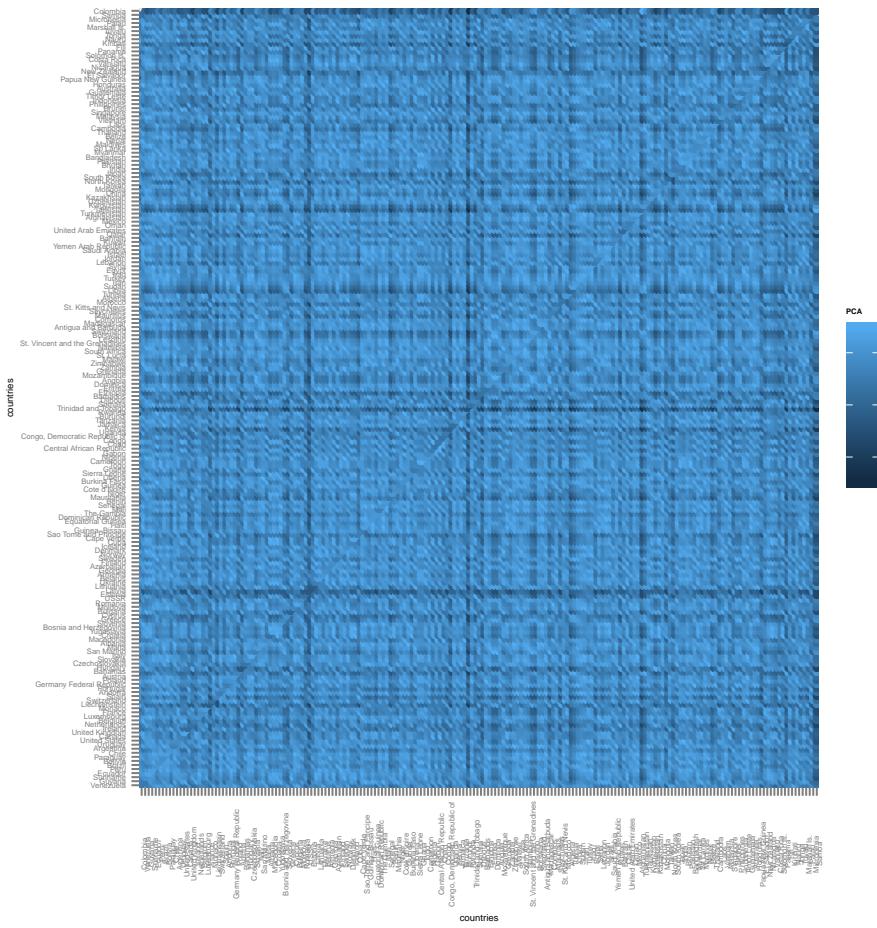
Along the x and y axes are the countries included in our analyses for the year 2005. The color gradient reflects the strength of the strategic relationship between any two dyads, with dark colors reflecting a stronger relationship and light colors reflecting a weaker relationship. Note that because the PCA is of latent distances between any two dyads, dyads that are closer in space and thus stronger strategic relationships will have smaller values.

our measures compare to S scores and Kendall's τ_b .⁷ Note in order to make our strategic measures somewhat interpretable, for the validation we scale our strategic measures to be between 0 and 1 just as S scores and Kendall τ_b is scaled. The results are shown in Table 1 for political strategic interest and Table 2 for military strategic interest.

In brief, we find that our political strategic measure performs well against S scores and Kendall's τ_b for alliances with and without fixed effects. Note that because the PCA is of latent distances between any two dyads, dyads that are closer in space will have

⁷Note for comparison that the bivariate relationship of S scores on Kendall's τ_b is statistically significant with a coefficient of 0.62 while the bivariate relationship of Kendall's τ_b on S Scores is statistically significant with a coefficient of 0.31.

Figure 4: Dyadic PCA for Military Strategic Interests for year 2005



Along the x and y axes are the countries included in our analyses for the year 2005. The color gradient reflects the strength of the strategic relationship between any two dyads, with dark colors reflecting a stronger relationship and light colors reflecting a weaker relationship. Note that because the PCA is of latent distances between any two dyads, dyads that are closer in space and thus stronger strategic relationships will have smaller values.

Table 1: Validation of Political Strategic Interest Variable against S scores and Kendall's τ_b

	Unweighted S Scores	Unweighted S Scores	Weighted S Scores	Weighted S Scores	Tau-B	Tau-B
(Intercept)	0.97*** (0.00)	1.03*** (0.00)	1.01*** (0.00)	1.02*** (0.00)	0.29*** (0.00)	0.25*** (0.00)
Political Strategic Interest	-0.80*** (0.00)	-0.84*** (0.00)	-1.22*** (0.00)	-1.26*** (0.00)	-0.89*** (0.00)	-0.87*** (0.00)
Year FE?	No	Yes	No	Yes	No	Yes
R ²	0.28	0.32	0.32	0.34	0.17	0.17
Adj. R ²	0.28	0.32	0.32	0.34	0.17	0.17
Num. obs.	824426	824426	824426	824426	824148	824148

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2: Validation of Military Strategic Interest Variable against S scores and Kendall's τ_b

	Unweighted S Scores	Unweighted S Scores	Weighted S Scores	Weighted S Scores	Tau-B	Tau-B
(Intercept)	0.75*** (0.00)	0.79*** (0.00)	0.68*** (0.00)	0.66*** (0.00)	0.02*** (0.00)	0.02*** (0.00)
Military Strategic Interest	0.01*** (0.00)	-0.05*** (0.00)	0.03*** (0.00)	-0.10*** (0.01)	0.02*** (0.00)	-0.00 (0.00)
Year FE?	No	Yes	No	Yes	No	Yes
R ²	0.00	0.01	0.00	0.01	0.00	0.00
Adj. R ²	0.00	0.01	0.00	0.01	0.00	-0.00
Num. obs.	824426	824426	824426	824426	824148	824148

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

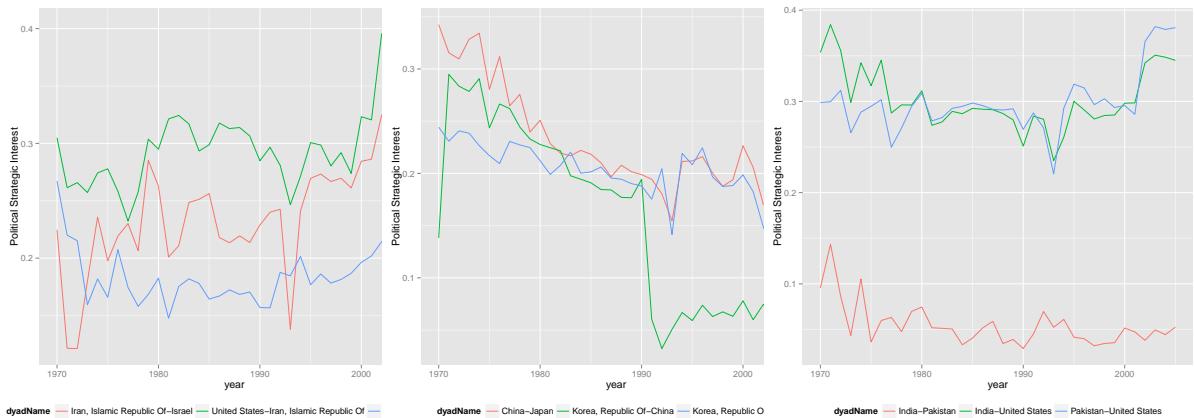
smaller values and therefore represent a stronger strategic relationship. Therefore the negative relationship we find between the political strategic measure and S scores and τ_b are interpreted to mean the greater the foreign policy similarity as measured by the S score or Kendall's τ_b , the smaller the latent distance or the greater the political strategic relationship between a dyad.

Our military strategic measure performs will mixed results with respect to S scores and Kendall's τ_b for alliances . It has a negative and statistically significant relationship between S scores with year fixed effects. It in fact has a positive and statistically significant relationship between S scores and Kendall's τ_b without year fixed effects These mixed results suggest that the military strategic measure is perhaps measuring something qualitatively different than S scores.

Finally we also investigate how our measure performs relative to well known dyadic relationships. In the figures below, we plot the dyadic relationships between countries that are well-known to have friendly or antagonistic relationships. Figure 5 shows for example the dyadic relationship between Iran and Israel, the US and Israel, and the US and Iran. The plot suggests that the US and Israel have consistently had a stronger political strategic relationship throughout time except for the early 1970's when Iran and Israel is shown to have had a stronger political strategic relationship. This is in fact consistent with historical evidence which suggests that Iran and Israel enjoyed close ties before the Iranian revolution. Meanwhile the plot of the dyadic relationships between China and Japan and, North Korea and China and North Korea and Japan suggest more or

less indifferent relations among the three before 1990 after which the political strategic relationship between China and North Korea becomes markedly stronger. This is also consistent with the disappearance of Soviet support for North Korea following the end of the Cold War and the emergence of China as North Korea's new protector. Finally, the plot of the dyadic relationship between India and Pakistan, India and the US and Pakistan and the US suggest in fact that India and Pakistan have a much stronger political strategic relationship than either do with the US. Given the history of antagonism between India and Pakistan, this is a rather surprising result; it also suggests however that a dyad's political relationship and military relationship may be quite different and indeed as two large bordering countries, cooperation between India and Pakistan is important to the security of both.

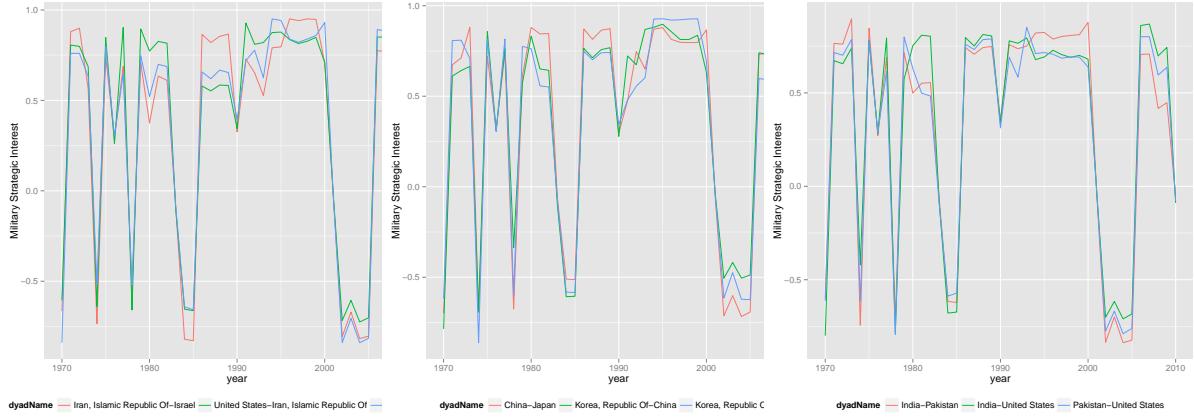
Figure 5: Dyadic relationships over time as measured by the political strategic interest variable



We plot the same dyadic relationships using our military strategic interest variable. Here, variation between different dyadic relationships is much more difficult to tease out, perhaps a function of the fact that military events are much more rare. There are two points of interest about these plots (i) they have large degrees of variation over time, suggesting that while military events may be rare, they also have a large influence on a dyad's military strategic relationship (ii) they dyadic relationships plotted here seem to be very similar over time potentially suggesting that third order dependencies are very strong with regards to military strategic relationships.

Before moving on to the next section, we note that it is possible to do a PCA on all

Figure 6: Dyadic relationships over time as measured by the military strategic interest variable



different of the components of strategic interest — alliances, UN voting, joint IGO membership, arms transfers, mids and wars — combined. If we were to take this approach, we could run our models using the largest components of the resulting PCA. As discussed above, while we argue that political and military strategic interest are qualitatively different, we do acknowledge that both can inform each other and so taking such a course of action would be theoretically logical.

While we considered employing this approach, we decided to make the trade-off for better interpretability of our measure over increased precision of our strategic interest measure as the interpretation of different components of a PCA measure is generally not straightforward as it is. For example, we could end up with a first principal component that is explained by alliances %50 of the time, IGOs %40 of the time, arms transfers % 5 of the time and the rest of the components a combined %5 of the time and a second component that is explained by MIDS %60 of the time, alliances 30% of the time, and the rest of the components a combined %10 of the time. While we may be able to say that strategic interest matters, it would be more difficult to say in what way. In separating out the variables before hand for theoretical reasons, we increase the interpretability of any of our subsequent results while sacrificing some explanatory power. At the same time, whatever results we do find should represent a harder test for the importance of political or military strategic interest because of this trade-off.

Data

Aid flows

Our data from foreign aid flows

While we go into great detail on how we construct our measure of strategic relationships in the previous section, here we document the data sources we used to create our measure.

Political Strategic Relationships

To review, for our measure of political strategic relationships, we conducted a PCA on the latent distances for alliances, UN voting and joint IGO membership. Data for alliances was retrieved from the Correlates of War (COW) Formal Alliance dataset (Gibler 2009). Following (Bueno de Mesquita 1975) and (Signorino and Ritter 1999), we distinguish between different types of alliances with the following weighting scheme: 0 = no alliance, 1 = entente, 2 = neutrality or nonaggression pact, 3 = mutual defense pact.

UN voting data was obtained from the United Nations General Assembly Data set (Strezhnev and Voeten 2012). Here we calculate the proportion of times two states agree out of the total number of votes they both voted on. Agreement means either both vote yes, both vote no, or both abstain. This measure is similar to the ‘voting similarity index’ readily available from the dataset except the voting similarity index does not account for mutual abstentions.

Meanwhile IGO voting data was obtained from the Correlates of War International Governmental Organizations Data Set. (Pevehouse, Nordstrom and Warnke 2010). Dyads were coded as 1 if they belonged to the same IGO as a full member or an associate member and coded as 0 if one or both of them was an observer, had no membership, was not yet a state or was missing data.⁸

⁸Note we had attempted to make distinctions between different types of membership much like for alliances but found that very few states were noted to be Associate Members or Observers of an IGO for the time period that we are conducting our analysis. Thus we chose to use the simpler coding scheme

Military Strategic Relationships

Meanwhile, for our measure of military strategic relationships, we conducted a PCA on the latent distances for arms transfers, MIDs and instances of war. Data for the total sum of arms transfers per year were retrieved from the Stockholm International Peace Research Institute (SIPRI) Arms Transfers Database (Holtom, Bromley, Wezeman and Wezeman 2013). Data for MIDs was retrieved from the Militarized Interstate Dispute (MID) data collection compiled by COW (Palmer, D’Orazio, Kenwick and Lane 2015). Finally, war data was extracted from the COW Inter-State War Data set (Sarkees and Wayman 2010).

Humanitarian Need

For our measure of humanitarian need, we use (1) life expectancy at birth extracted from the (Bank 2013). This measure “indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.”

We also use (2) a count of the number of natural disasters a country has experienced a year from the Emergency Disasters Database (EM-DAT) database (?). For a disaster to be included into the database, at least one of the following criteria must be fulfilled:

- (a) Ten or more people reported killed
- (b) A hundred or more people reported affected
- (c) Declaration of a state of emergency
- (d) Call for international assistance.

These two measures of humanitarian need were chosen to reflect as much as possible the humanitarian need of a particular country. We eschewed using GDP per capita as our measure of humanitarian need in favor of life expectancy, which offers a more holistic measure of the level of health, education and income of a country. Life expectancy in turn was used instead of the UN Human Development Index as it was found that life expectancy is highly correlated with the UN HDI with better coverage(?). Meanwhile natural disasters were included as the incidence of natural disasters are seen as exogenous to a country’s current development (though of course the *impact* of a natural disaster is not).

Covariates

We also include a number of covariates in our model, including measures for political institutions. For our measure of political institutions, we use Polity IV data available from the Center for Systemic Peace (Gurr, Marshall and Jaggers 2010). Polity IV captures differences in regime characteristics on a 21 point scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy). Note we rescale Polity IV to range from 1 to 21 for greater ease of interpretation. We control for macroeconomic indicators by controlling for GDP per capita, available from the World Bank (Bank 2013).

We also control for the incidence of civil war as incidence of civil war in a recipient country certainly informs the ability for a donor country to dispense aid. We do so with data retrieved from the Uppsala Conflict Data Program (UCDP)/International Peace Research Institute (PRIO) Armed Conflict Database. (?). We code as civil war any armed conflict which either (a) “Internal armed conflict occurs between the government of a state and one or more internal opposition group(s) without intervention from other states” or (b) “Internationalized internal armed conflict occurs between the government of a state and one or more internal opposition group(s) with intervention from other states (secondary parties) on one or both sides.”

Finally for our data on former colonies, we used the Colonial History Data Set from the Issue Correlates of War (ICOW) Project (Hensel 2009).

Data and Analysis

Results

Conclusion

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