Dual Party Politics and USAID – a GIS Investigation

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Abstract

This study analyzed the relationship between dual party politics (Democrat and Republican) and USAID appropriated by the U.S. Federal Government from 1946 to 2008. Pearson's Correlation was the primary statistical relationship explored in this study. The dual party membership of both legislative branches (the House and Senate) and the Executive branch (President) were taken into account separately when compared to the amount of USAID given to each country or region. To give these results context, the strength of the relationship between dual party politics to USAID was compared to the relationship between Conflict Sites and USAID with the hypothesis that the relationship to Conflict Sites would be greater.

Introduction

Foreign aid is the "transfer abroad of public resources on concessional terms" (Dusen, 2005). U.S. foreign aid is difficult to define, because "the United States has no single foreign aid budget and over 50 official United States entities (agencies and departments) are responsible for delivering official aid" (Riddell, 2007).

Current U.S. foreign aid is the result of a series of events following World War II (Hart, 2009). These events included the Breton Woods Conference, the establishment of the United Nations, and the Marshall Plan. With these events, the U.S. started an aggressive foreign policy that shunned protectionism and isolationism, once the historical status quo. These pursuits were partly motivated by a desire to see markets improve across the world and to proliferate the power of the dollar.

Another motive was to deter or contain communism (Lancaster, 2007). Foreign aid played such a large role in containing communism it continued from the end of World War II through the Cold War. During the Cold War the U.S. saw the expansion of military assistance to other countries. After the Cold War, foreign aid was further expanded by antiterrorism programs that appeared at the turn of the millennium.

The primary agency allocating foreign aid is the U.S. Agency for International Development, also known as USAID (USAID, USAID: From the American People, n.d.). From here-on all foreign aid money and support will be referred to as USAID. From World War II to the present, U.S. "foreign aid has been justified on the grounds that one of its effects is to prevent" and address conflict (Lancaster, 2000). This focus was not limited to military assistance. USAID officials stated, "Many of the most important causes of violence, extremism and instability – such as stagnant or deteriorating economies, weak or illegitimate political institutions, or competition over natural resources – are

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the central concerns of aid" (USAID, 2007). USAID saw a connection between development and conflict, listing democracy, economic growth, natural resources and social development – all issues addressed by different programs and funds within USAID – as issues affecting conflict resolution and mitigation.

USAID assistance encompassed over 100 different programs and worked "with more than 3,500 American companies and over 300 U.S.-based private voluntary organizations" (USAID, 2010a). The above mentioned additional programs' financial records have been kept by USAID in what is called the U.S. Overseas Loans and Grants, Obligations and Loan Authorizations, also known as the Greenbook (USAID, 2009a). The monies detailed by the Greenbook and the decision on how they were spent have been shared by the Executive branch and Legislative branches of the government.

Many agencies have been involved with USAID on the funding side and the implementation side (USAID, 2010b). More importantly the Legislative and Executive branches have chosen their budgets and requirements for funding, nominated and appointed directors and secretaries, and created long term plans and goals; such as, declaring war and peace.

There has been very little scholarly research done on U.S. dual-party political partisanship and USAID. "Traditionally understood as above parties, beyond the water's edge, foreign policy has been portrayed either as consensual or as idiosyncratic, more associated with leaders and circumstances than with partisan orientations" (Noël, 2000). In a press conference with Chinese President Hu Jintao, President Obama stated, "Partisanship ends at the water's edge," in regards to Democrat and Republican rivalries and foreign policy (ABC, 2011).

According to Dr. Alain Noël and Dr. Jean-Philippe Thérien, professors from the Université de Montréal, the lack of research on the parties-aid relationship "is surprising given the centrality of political parties in the government of liberal democracies, their importance in the study of public policy and their acknowledged role in some key foreign policy changes" (Noël, 2000).

The purpose of this was to investigate the degree of correlation between the fluctuation of power between the Democrat and Republican Parties in the Legislative and Executive branches of government had with the amount of USAID received by countries. To provide context for the results of this study, the correlation between U.S. political shifts and USAID was compared to the correlation between Conflict Sites and USAID. It was assumed in this study, due to the stated mission of USAID, that there would be a stronger correlation between Conflict Sites and USAID.

Methods

Data

The Greenbook detailed U.S. Federal Expenditures such as USAID, loans, and grants. These numbers were based on the Federal Government's fiscal year: October 1st to September 30th from 1976 to 2008 and July 1st to June 30th from 1946 to 1976 (USAID, 2010c).

The data were further divided by the country that received the money and the federally sponsored program the money came from. The receiving country and the federally sponsored programs shared a "many-to-many relationship" inside the database. This table had to be summarized by an SQL sum statement to show the total amount of money each

country received each fiscal year independent from the United States Government and independent of funding source or program.

The amount of USAID given to regions was not an aggregate of the sum of the money given to the countries within the regions. The money given to regions "includes U.S. Government loan and grant assistance not assigned to a specific country within the…region; including assistance to regional organizations and programs" (USAID, 2008). This was important to note when comparing USAID given to regions and USAID given to countries within that region. This results in two different independent variables for a single geographic location.

The Greenbook uses a different configuration for the amount of USAID given to the region of Canada, which was the name we gave to the North American region. Greenbook data has a separate account for the region of Canada, which "includes Canada and all global funding that could not be assigned to a specific benefiting country or region" (USAID, 2009b). For the purpose of this study, the region of Canada includes only the foreign assistance specifically given to the country of Canada eliminating the unknown amount in this separate account slated for the region of Canada. This was done in an effort to ensure proper comparison between regions.

The year 1976 has two fiscal years due to the transition from one fiscal year to the other (USAID, 2010c). These two years were summed up as one seamless fiscal year in this process; in fact it became something different entirely. This was necessary to acquire the correct sums but the process also affected later calculations of Pearson's Correlation.

Additional correlating tables were created in order to calculate a correlation between the political landscape of the Executive Branch and the amount of money received by each country. In the table that represented Presidents, the number one was given to represent Republicans and the number zero to represent Democrats. Both the House and the Senate were given the number of Senators and Representatives representing each party (United States Senate, 2010; Office of the Clerk of the U.S. House of Representatives, 2010). In hindsight a percentage of the control would have been more appropriate. A percentage would have been more accurate because it would have reacted properly with either changes in the number of legislators in either the House or the Senate and changes caused by registered Independents. This was important as the Legislative branch control has been based off the proportion of seats a party holds in comparison to the other parties. For this paper's purpose the number of legislators was sufficient due to the rarity of third party members from 1946 to 2008.

Conflict Site data from 1946 to 2004 was collected from the Peace Research Institute of Oslo's (PRIO) Armed Conflict Dataset (PRIO, 2007). The Conflict Site dataset was used because it provided coordinates for the conflict zones and the year the conflict occurred. It was noted that this dataset did not list all countries involved in each conflict. This study lists the country where the conflicts occurred. Conflict Site data from 2004 to 2008 was not available.

Data Manipulation

The first step in data manipulation was to ensure Constant Dollar Data for each year in the Greenbook. This was important to ensure accurate values when doing correlation calculations. The office of USAID provides numbers on constant

dollar data. According to USAID, inflation changes the purchasing power of the dollar (Grants, n.d.). Comparing assistance given at different times is complicated by the changing value of the dollar over time. In order to address this issue, USAID included queries, which allowed users to obtain data adjusted for inflation. The U.S. Overseas Loans and Grants data officially uses the "GDP Chain Price Index" deflator created by the Bureau of Economic Analysis.

Instead using the BEA's Deflator the constant dollar, data were calculated based off of Oregon State University's Inflation Conversion Factors which doubled as a deflator (Sahr, 2009). The conversion was completed by a Python script that interfaced with a MySQL Database to update each entry in the Greenbook based off of the fiscal year of the entry and the matching Inflation Conversion Factors, thus converting the year to 2008 equivalent dollars. More recent conversions were available; however, the 2008 conversion was chosen to avoid any recent errors. Completing this task with Python scripting in lieu of excel or manually executing the task guaranteed a more robust, traceable, and repeatable way of forming the product.

Following the conversion of the money into constant dollars, the data were summarized by the total dollar amount each country and region received during the Republican Presidencies and the amount received during Democrat Presidencies. The same conversion was used to calculate a Pearson Correlation for each country compared to both the Executive and Legislative branches of government party members (Republican Presidents, Democrat Presidents, House Republicans, House Democrats, Republican Senators, and Democrat Senators). The amount of money received from 1946 to 2008 and the number of elected officials for the same time period were considered parameters of the population of available data in the Greenbook.

The year and number of conflicts per country and region were geocoded based off of their x and y coordinates using ArcMap. These coordinates were joined to the country/region dataset using a spatial join. These results were then summarized to provide the total number of conflicts per country/region. Using the data from the spatial join, the tables were manipulated by a Pivot Table in Excel in order to calculate the number of conflicts per region.

As with Dual Party data, the Conflict Site data were used as a dependent variable (y) and the total constant dollar amount each country and region received was used as the independent variable (x) to find the Pearson's Correlation Coefficient for each country and region.

The correlation coefficients for each country and each dependent variable (Democrats, Republicans, and Conflict Sites) needed to be compared. In order to do so, the correlation coefficients had to be converted into additive Coefficients of Determination, aggregated for each party irrespective of government branch. Once this was done the average Coefficient of Determination was found for Democrats-aid, Republicans-aid, and Conflict-aid. This provided a means by which the large data-sets could be compared. Pearson's Correlation and the Coefficient of Determination were further explained below.

Pearson's Correlation

The correlation coefficient is sometimes called the simple correlation coefficient (Zar, 2010). It is also known as the

Pearson product-moment correlation coefficient in reference to one of its pioneers: Karl Pearson (Figure 1).

Figure 1. Pearson's Correlation Equation.

The correlation coefficient does not measure the change of one variable compared to another. It measures the "strength of association between the two variables" (Zar, 2010).

According to Mario F. Triola's "Elementary Statistics," in order to formulate the correlation coefficient for a *sample*, the data must come from a random sample, the scatter-plot must visually appear to make a straight-line pattern, and the outliers must be removed (Triola, 2006). Like many other sources the discussion of correlation mentioned little, if anything, of correlation tests of a population. It was assumed that the above criteria from Mario F. Triola's "Elementary Statistics", only applies to inferential statistics (making inferences about samples).

According to the text "Statistics for Research," a text used for statistical data management using SPSS software, "Many would ask: are measures of relationships such as correlation, descriptive or inferential statistics? The answer is simple. If the researcher is using population data, measures of relationships are descriptive statistics since the researcher is measuring the strength or degree of relationships among variables in the population" (Subong, 2005). Additionally, Zar's "Biostatistical Analysis" acknowledged that the criteria given by Triola "do not need to be satisfied in order to compute a correlation coefficient" (Zar, 2010). When Pearson's correlation coefficient (r) represents a population, it is designated with the Greek symbol rho (ρ).

Pearson's correlation coefficient only measures the strength of correlation between two variables. With "descriptive statistics you simply measure the degree or strength of relationship. But in inferential statistics, the researcher determines the significance of the degree of relationships" (Subong, 2005). In this study only the strength of relationship between certain variables of the total population was tested. This was the best fit based on the above criteria.

Coefficient of Determination

Correlation coefficients are not additive. In order to compare the average of correlations between parties-aid and conflict-aid the correlation coefficients had to be converted into values that could be added. These values are known as the coefficients of determination. The coefficient of determination was found by squaring the correlation coefficient (Figure 2).

Figure 2. Coefficient of Determination.

The Coefficient of Determination measures the "proportion of total variation in the dependent variable (y) that is explained or accounted for by … the independent variable (x)" (Nufrio, 2006). The Coefficient of Determination was a better measurement of the "strength" of a bivariate relationship than correlation alone. The example below using Greenbook dollars received by Vietnam was noted in this study (Table 1).

Looking at the above table (Table 1) it was noted that it would have been incorrect to compare the two correlation values (r) and say the correlation between

Senate Democrats and dollars received by Vietnam was twice as strong as the correlation between those dollars and House Democrats. The Coefficient of Determination (R^2) this study was able to correctly compare such values. Going back to the Vietnam example (Table 1), it was noted that when R^2 values were compared, the strength of the relationship between Senate Democrats and aid given to Vietnam was actually over four times stronger than the relationship between House Democrats and aid. This example illustrated the importance of using the Coefficient of Determination.

Table 1. Bivariate relationships between Greenbook dollars received by Vietnam and two dependent variables (Senate Democrats and House Democrats).

	Senate Democrats	House Democrats
ρ	0.50463	0.242083
$R^2=\rho^2$	0.2546514369	0.058604178889

Additionally, the Coefficient of Determination has been often listed as a percentage (Lucy, 2005). "Sometimes the coefficient of determination when cited as a percentage is known as the 'percentage level of variation,' and is considered a more realistic measure of the strength of a linear relationship than the correlation coefficient." As this study noted, the Coefficient of Determination between Senate Democrats and aid given to Vietnam was 0.255 or 25% of the variation in USAID given to Vietnam could be attributed to the number of Democrats in the Senate.

Cartogram

The results of the correlations to the regions and the total amount of USAID were displayed using the "Diffusion Cartogram;" a type of cartogram developed by Mark Newman and Michael Gastner at the University of Michigan (Newman, 2004). The instructions attached to the script were created by ESRI and explain that, "Density Equalizing Cartograms change the shape of map polygons so that their size is based upon another attribute such as population size. The size and shape of the polygons are changed, sometimes dramatically, but their original neighbors remain neighbors, and no new neighbors or new gaps are added" (Catherine, 2007).

This type of cartogram was chosen because the relationship or proximity and borders of a country were more recognizable than a country's shape. The cartogram preserves these more efficiently than it preserves the shape of the country while still making the inference of density.

There were limits to Mark Newman's and Michael Gastner's Diffusion Cartogram program. Negative values were not recognized. Correlation values fall between +1 and -1, with 0 representing no relationship. For this reason cartograms were only used for sum value maps. Cartograms were not used for correlation.

Another drawback of the Diffusion Cartogram program was that correlation was directly related to the area of the country, and yet the countries' borders could not be removed from their neighbors. Using cartograms for correlation would have resulted in some countries appearing small despite their greater area.

Russia was an excellent example of this phenomenon (Figure 3). The sum of USAID given to Russia and Conflict Sites in Russia was $17 billion - a relatively large sum in comparison to other countries, such as Oman which received only $400 million (light green in the Middle East in Figure 3). However it was

noted that Russia appears long and thin across the top-right of the cartogram (Figure 3). The area of Russia was quite large, but as it could not be moved from its neighbors (with decidedly smaller correlations) Russia appears at first glance to have a very small representation in the cartogram. To overcome this aesthetic problem and to represent the disparity of USAID distributed to different countries and regions, color was used.

Color

A color gradient was used to show the differences between countries with negative and positive correlations. Color helped to further clarify bivariate relationships where cartograms were unable.

In all cartograms, Quantities: Graduated Color scheme was used with Natural Breaks. The Graduated Color scheme used darker colors to represent larger quantities with lighter colors representing lower quantities. As Antarctica never received USAID, or had any Conflict Sites, it represents 0 in every map and cartogram.

Antarctica is usually represented in Light Cream or White on correlation maps. The color scheme used for correlation maps was two diverging ramps that diverged from zero, with the more positive correlations appearing in a Blue, Red, or Green. The negative correlations appeared in Blue or Red. Political maps switched from Blue or Red as the primary positive correlation color depending on the political party. For example in Figure 8, Democrat Senators to USAID positive correlations were represented by Blue; whereas, in Figure 10, Republican Senators to USAID positive correlations were represented by Red. The darker the color, the higher the correlation whether that correlation was negative or positive.

Results

Constant Dollars

The cartograms below did not show a bivariate relationship (Figure 3 and Figure 4). The first cartogram illustrated the sum of constant Greenbook dollars each country received between 1946 and 2008 (Figure 3). The greatest amount of USAID given to any one country was given to India, which received a total of $73.9 billion dollars between 1946 and 2008.

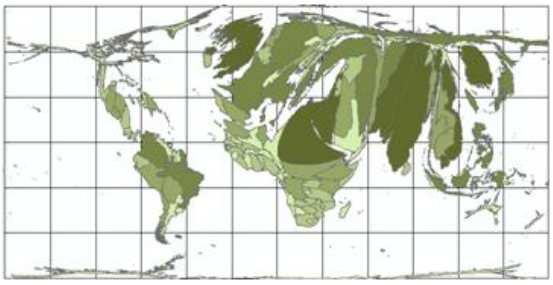

Figure 3. Sum of constant Greenbook dollars received by country 1946-2008. Light Green = $0 to Dark Green =$73.9 Billion.

It was noted that the greatest amount of USAID given to regions (non-specified country funds or regional initiatives), was given to the regions of Asia, which received $15.5 billion and Sub-Saharan Africa, which received $11.6 (Figure 4).

When compared, it was easy to see how USAID given to regions was not an aggregate of countries within that region. For instance, the geographic region of Asia includes the country of India, but the funds given to Asia were far less ($15.5 billion) than the amount allocated to India alone ($73.9 billion). This was why it was important to have separate cartograms for countries and separate cartograms for regions throughout this study. Illustrating USAID with separate cartograms was necessary as funds given to regions do not serve the same political and foreign policy aims as funds given to sovereign countries.

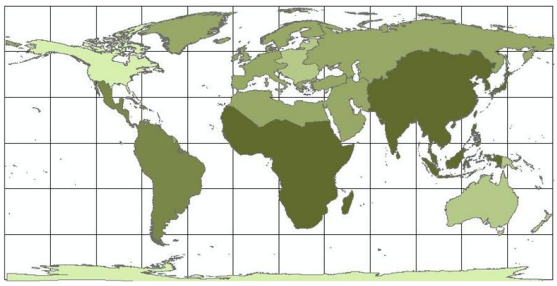

Figure 4. Sum of constant Greenbook dollars received by region 1946-2008. Light Green = $0 to Dark Green =$15.5 Billion.

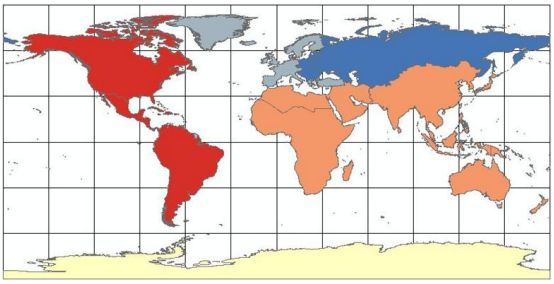

Figure 5. Pearson Correlation of Presidents and USAID received by region. For Democrats Dark Red = -2.17 to Dark Blue = +0.258. For Republicans Dark Red = +2.17 to Dark Blue = -0.258.

Presidencies

The results for presidencies were unique because they did not have any Independent parties involved. This made the results of Democrats versus Republicans the complete opposite of each other. It was sufficient to display the results as only one map showing both parties.

In each of the President maps (Figures 5 and 6) the red color ramp represented positive correlations for Republican Presidents and negative correlations for Democrat Presidents. The blue color ramp represented positive correlations for Democrat Presidents and negative correlations for Republican Presidents.

Democrat Presidencies' Correlation to USAID

Europe, Eastern Europe, and Eurasia (all located in the northern region) were all positive correlations with Democrat Presidents (Figure 5). The largest positive correlation between Democrat Presidents and USAID given to a region was the region of Eastern Europe with a correlation coefficient of $\rho = 0.258$ (Table 2). When the Coefficient of Determination was calculated $R^2 = 0.0665$ or 6.65% of the variation in USAID given to regional programs in Eastern Europe could be attributed to Democrat Presidents.

Out of 188 countries, Lebanon, Oman, Honduras, Equatorial Guinea, Niger, Guatemala, El Salvador, Greece, Djibouti, and Seychelles had the ten greatest correlations of Democrat presidencies to USAID. Greece was the only positive correlation from the top ten correlations (Figure 6).

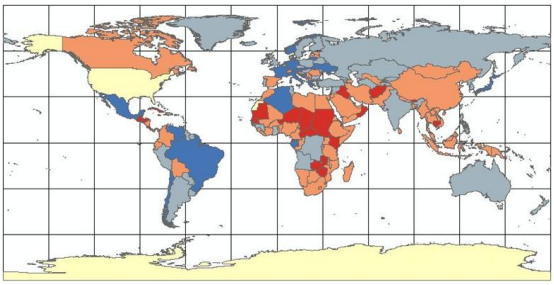

Figure 6. Pearson Correlation of Presidents and USAID received by country. For Democrats Dark Red = -0.417 to Dark Blue = 0.356. For Republicans Dark Red = +0.417 to Dark Blue = -0.356.

In all there were 115 negative correlations compared to 73 positive correlations for Democrat Presidents and USAID received by country (Figure 6). There were 12 known countries that did not receive USAID including the United States of America. These countries had a correlation of 0 and since they were universal to both Republicans and Democrats they did not affect the conclusions.

The average Coefficient of Determination for Democrat Presidents to USAID given to individual countries was R^2=0.038, meaning 3.8% of the variation in USAID given to sovereign countries could be attributed to Democrat Presidents.

Table 2. Regional Pearson Correlation results for Democrat Presidents.

Region	ρ
Eastern Europe	0.257908
Eurasia	0.248504
Western Europe	0.105687
Antarctica	0
Middle East and North Africa	-0.033197
Asia	-0.117458
Sub-Saharan Africa	-0.118893
Oceania	-0.122062
Canada	-0.202805
Latin America and Caribbean	-0.216989

Republican Presidencies' Correlation to USAID

Latin America and the Caribbean, Canada, Oceania, Sub-Saharan Africa, Asia, the Middle East and North Africa all had positive correlations with Republican Presidents (Figure 5). European regional interests as a whole, including Western Europe, Eurasia, and Eastern Europe had a negative correlation with Republican Presidents in power (Table 3).

Lebanon, Oman, Honduras, Equatorial Guinea, Niger, Guatemala, El Salvador, Greece, Djibouti, and Seychelles had the ten greatest correlations out of 188 countries. Greece was the only negative correlation from the top ten correlations (Figure 6).

In all there were 115 positive correlations compared to 73 negative (Figure 6). There were 12 known countries that did not receive USAID including the United States of America. These countries had a correlation of 0 and since they were universal to both Republican and Democrat Presidents they did not affect the conclusion.

Table 3. Regional Pearson Correlation results for Republican Presidents.

Region	ρ
Latin America and Caribbean	0.216989
Canada	0.202805
Oceania	0.122062
Sub-Saharan Africa	0.118893
Asia	0.117458
Middle East and North Africa	0.033197
Antarctica	0
Western Europe	-0.105687
Eurasia	-0.248504
Eastern Europe	-0.257908

The average Coefficient of Determination for Republican Presidents to USAID given to individual countries was R^2=.038, meaning 3.8% of the variation in USAID given to sovereign countries could be attributed to the number of Republican Presidents in power. It was a magnitude of 0% greater than Democrat Presidents to USAID given to countries. Because the correlations of Democrat Presidents and Republican Presidents to USAID mirrored each other, there was no difference in the magnitude of the Coefficient of Determination.

Senate

USAID's correlation to the Senate contained small subtle differences in the results between the Republican and Democrat leaders because of Independent members in the Senate.

Democrat Senators Correlation to USAID

Latin America and the Caribbean, Oceania, and the Middle East and North

Africa were all positive correlations for the Democrat Senators and USAID given to Regions (Figure 7 and Table 4).

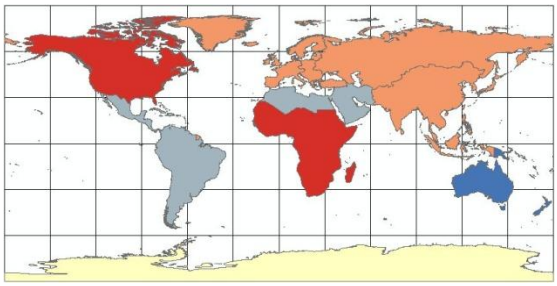

Figure 7. Pearson Correlation of Democrat Senators and USAID received by region. Dark Red = -0.357 to Dark Blue = +0.241.

India, Tunisia, Chile, Brazil, Trinidad and Tobago, Pakistan, Paraguay, Morocco, Laos, Uruguay, Turkey, and Vietnam were positive correlations (shown in dark blue in Figure 8). In all there were 131 negative correlations compared to 57 positive.

Table 4. Regional Pearson Correlation results for Democrat Senators.

Region	ρ
Oceania	0.444638
Latin America and Caribbean	0.241471
Middle East and North Africa	0.179725
Antarctica	0
Eastern Europe	-0.0364
Western Europe	-0.09156
Asia	-0.14727
Eurasia	-0.21315
Canada	-0.33107
Sub-Saharan Africa	-0.35671

The average Coefficient of Determination for Senate Democrats to USAID given to individual countries was R^2=.074. When the Coefficient of Determination (R^2=0.074) was used as a percent of the variation, 7.4% of the variation in USAID given to sovereign countries could be attributed to the number of Senate Democrats in power.

Republican Senators Correlation to USAID

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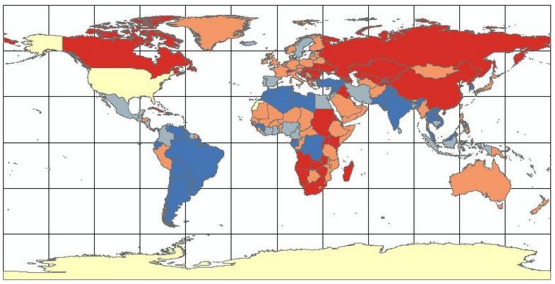

Figure 8. Pearson Correlation of Democrat Senators and USAID received by country. Dark Red = -0.422 to Dark Blue = +0.725.

Republican Senators Correlation to USAID

Eastern Europe, Western Europe, Asia, Eurasia, Canada, and Sub-Saharan Africa were all positive correlations for Republican Senators, with Regional aid given to Sub-Saharan Africa as the largest positive correlation to Senate Republicans (Figure 9 and Table 5).

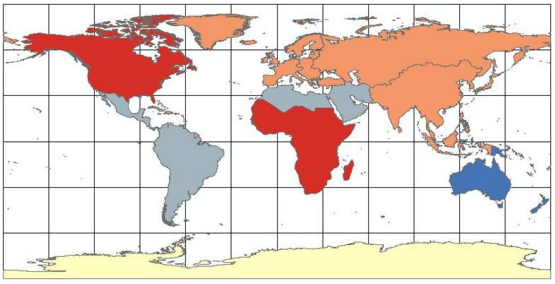

Figure 9. Pearson Correlation of Republican Senators and USAID received by region. Dark Blue = -0.452 to Dark Red = +0.49.

India, Tunisia, Chile, Brazil, Trinidad and Tobago, Pakistan, Paraguay, Laos, Uruguay, Turkey, and Vietnam all were positive correlations (Figure 10). There were no negative correlation values in the top-ten. There were 65 negative correlations compared to 123 positive (Figure 10).

Table 5. Regional Pearson Correlation results for Republican Senators.

Region	ρ
Sub-Saharan Africa	0.489576
Canada	0.254631
Eurasia	0.194936
Asia	0.07156
Western Europe	0.021832
Eastern Europe	0.005643
Antarctica	0
Latin America and Caribbean	-0.124356
Middle East and North Africa	-0.140847
Oceania	-0.451551

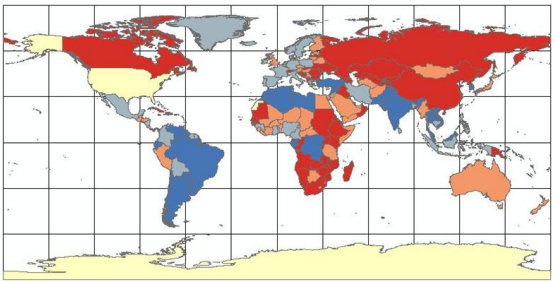

Figure 10. Pearson Correlation of Republican Senators and USAID received by country. Dark Blue = -0.697 to Dark Red = +0.519.

The average Coefficient of Determination for Senate Republicans to USAID given to individual countries was R^2=.089. When used as a percent of the variation, R^2 showed 8.9% of the variation in USAID given to sovereign countries could be attributed to the number of Senate Democrats in power. The magnitude of Senate Republicans to USAID given to countries was 1.5% greater than the Coefficient of Determination for Senate Democrats.

House of Representatives

With the House, like the senate, there were small differences between the correlation coefficients of Democrat and Republican parties due to the effect of independent House party members.

Democrat Representative's Correlation to USAID

Oceania, Latin America and the Caribbean were positive correlations for the House Democrats to USAID received by regions (Figure 11 and Table 6). The region that had the highest correlation with House Democrats was Oceania at $\rho = 0.445$.

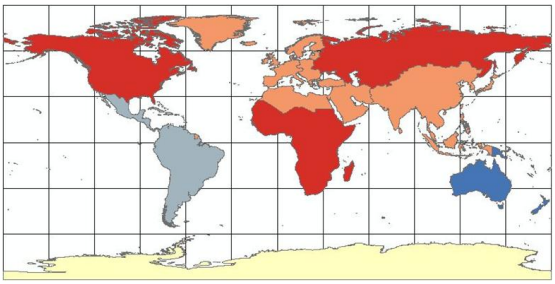

Figure 11. Pearson Correlation of House Democrats and USAID received by region. Dark Red= -0.357 to Dark Blue = +0.445.

Table 6. Regional Pearson Correlation results for House Democrats.

Region	ρ
Oceania	0.444638
Latin America and Caribbean	0.241471
Antarctica	0
Western Europe	-0.09156
Middle East and North Africa	0.179725
Eastern Europe	-0.0364
Asia	-0.14727
Sub-Saharan Africa	-0.35671
Eurasia	-0.21315
Canada	-0.33107

Only two countries were found to be two standard deviations from the mean of the correlation of Democrat

Congressmen to USAID. Sri Lanka (ρ = 0.556) and Togo (ρ = 0.524) stood two standard deviations away from the mean of the parameter (Figure 14).

Bulgaria, Sri Lanka, Macedonia, Angola, Azerbaijan, Togo, Tajikistan, Uzbekistan, Croatia, and Kiribati had the ten greatest correlations of Democrat Representatives to USAID out of 188 countries. Sri Lanka and Togo were the only positive correlations from the top ten. In all there were 105 negative correlations compared to 83 positive (Figure 12).

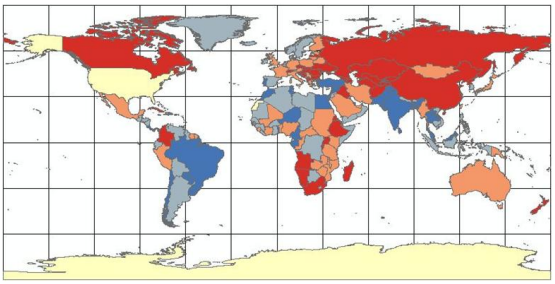

Figure 12. Pearson Correlation of House Democrats and USAID received by country. Dark Red= -0.607 to Dark Blue = +0.556.

The average Coefficient of Determination for House Democrats to USAID given to individual countries was R^2= 0.076, meaning 7.6% of the variation in USAID given to sovereign countries could be attributed to the number of House Democrats in power.

Republican Representatives Correlation to USAID

Eurasia, sub-Saharan Africa, Asia, Eastern Europe, Middle East and North Africa, and Western Europe were positive correlations for House Republicans to regions (Figure 13 and Table 7).

The largest correlation was between USAID given to Canada and Republican Representatives in power. Considering how this study manipulated the dollars given to Canada, it was appropriate to consider USAID given to Eurasia as the highest correlation at ρ = 0.355.

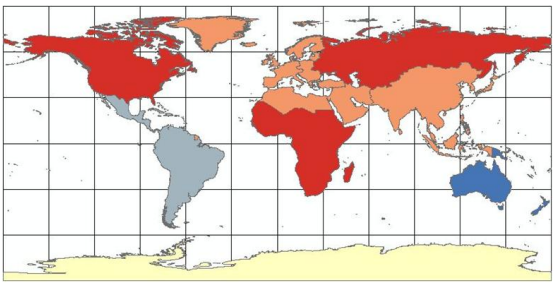

Figure 13. Pearson Correlation of House Republicans and USAID received by region. Dark Blue = -0.374 to Dark Red = +0.375.

Table 7. Regional Pearson Correlation results for House Republicans.

Region	ρ
Canada	0.375279
Eurasia	0.354822
Sub-Saharan Africa	0.320536
Asia	0.173024
Eastern Europe	0.136794
Middle East and North Africa	0.082091
Western Europe	0.059924
Antarctica	0
Latin America and Caribbean	-0.0891
Oceania	-0.37426

Bulgaria, Sri Lanka, Macedonia, Angola, Azerbaijan, Togo, Tajikistan, Uzbekistan, Kiribati, and Croatia had the ten greatest correlations of House Republicans to USAID out of 188 countries (Figure 14). Sri Lanka and Togo were the only positive correlations from the top ten. In all there were 82 negative correlations compared to 106 positive.

The average Coefficient of Determination for House Republicans to USAID given to individual countries was R^2= 0.076. When the Coefficient of Determination (R^2=0.076) was used as a percent of the variation, 7.6% of the variation in USAID given to sovereign

countries could be attributed to the number of House Republicans in power.

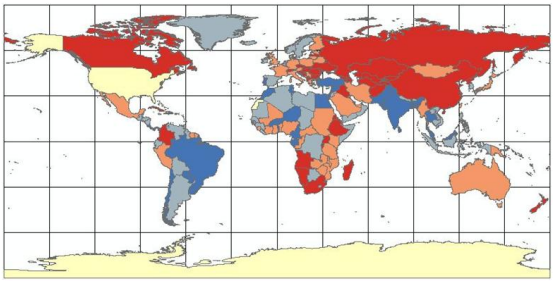

Figure 14. Pearson Correlation of House Republicans and USAID received by country. Dark Blue = -0.556 to Dark Red = +0.603.

Conflict Sites

The following map illustrated the total number of Conflict Sites found in each country from 1946 to 2004 as gathered from PRIO's Armed Conflict data-set (Figure 15).

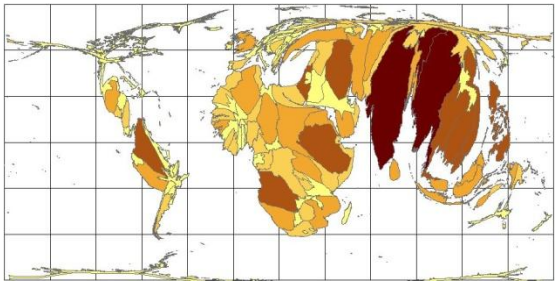

Figure 15. Sum of Conflict Sites in each country 1946-2004. Cream = 0 to Dark Brown = 188.

The country with the largest number of Conflict Sites was Burma with 188 distinct Conflict Sites. The second highest number of Conflict Sites per country was found in India, with 187 conflicts. India will be discussed at the end of this study in the Discussion section under the heading: Conflicts-Aid versus Party-Aid.

It was noted that when the data were observed by region, Asia had the largest sum of Conflict Sites from 1946 to 2004 with a total of 845 Conflict Sites (Figure 16 and Table 8). Canada had the smallest number of Conflict Sites during the same time period with two Conflict Sites.

When Conflict Sites were correlated with Greenbook USAID given to regional programs and initiatives, the results showed the highest correlation existed between the region of Eastern Europe and USAID ($\rho = 0.75$) (Figure 17 and Table 9).

Table 8. Sum (Σ) of Conflict Sites per region.

Region	Σ
Canada	2
Eurasia	44
Sub-Saharan Africa	539
Asia	845
Eastern Europe	27
Middle East and North Africa	295
Western Europe	71
Antarctica	0
Latin America and Caribbean	156
Oceania	7

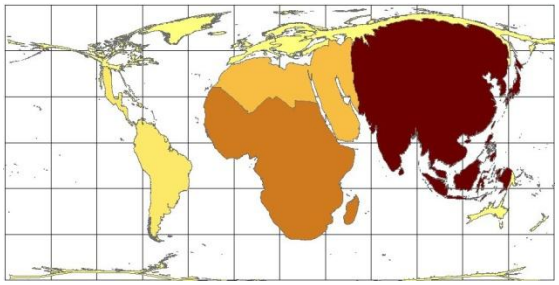

Figure 16. Sum of Conflict Sites in each region 1946-2004. Cream = 0 to Dark Brown = 845.

Conflict Sites and USAID

When Conflict Sites per country – rather than per region – were taken as the dependent variable, it was noted that El Salvador had the largest correlation with USAID with $\rho = 0.748$ (Figure 18). The Coefficient of Determination was $R^2=0.561$, meaning 56% of the variation in dollars received by El Salvador could be attributed to Conflict Sites.

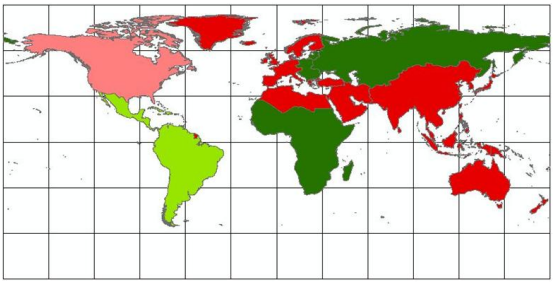

Figure 17. Correlation of Conflict Sites and USAID per region 1946-2004. Dark Red = -0.192 to Dark Green = +0.752.

Table 9. Regional Pearson Correlation results for Conflict Sites.

Region	ρ
Canada	-0.05821
Eurasia	0.446034
Sub-Saharan Africa	0.687436
Asia	-0.14225
Eastern Europe	0.751845
Middle East and North Africa	-0.12057
Western Europe	-0.19204
Antarctica	0
Latin America and Caribbean	0.191729
Oceania	-0.12372

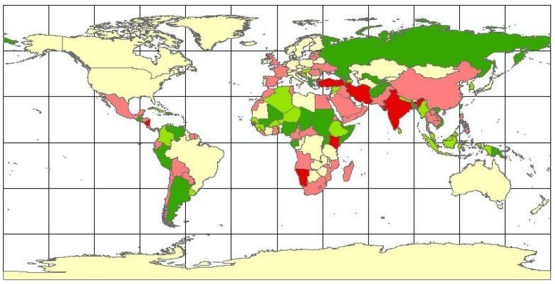

Figure 18. Correlation of Conflict Sites and USAID received by country. Dark Red = -0.494 to Dark Green = +0.752.

Discussion

Parties-Aid Relationships

The highest correlation for regions was Republican Senators to Sub-Saharan Africa at a correlation of $\rho = 0.489$ (Figure 9). It was noted the Coefficient of Determination for Republican Senators to Sub-Saharan Africa was $R^2 = 0.24$ ($\rho^2 = (0.49)^2$). Consequently, 24% of the variation in dollars received by regional programs benefitting Sub-Saharan Africa could be attributed to the number of Republican Senators.

The highest correlation for a single country was Democrat Senators to India at $\rho = 0.725$ (Figure 8). The Coefficient of Determination for Democrat Senators to India was $\rho^2 = 0.526$ ($\rho^2 = (0.725)^2$). Thus 52.5% of the variation in dollars received by India could be attributed to the number of Senate Democrats in office each year.

With the proportion of common variation being as great as 24% and 53% as with the aforementioned cases of the region of Sub-Saharan Africa and the country of India, it was important to note anything that might call the validity of the bivariate relationships into question.

Volatility was something that called correlation in to question. Correlation was described in an article published by the Federal Reserve Bank of New York as co-movement or covariance over volatility (Adrian, 2007). Covariance measures how two variables move together. "While [correlation] is frequently used it has a notable drawback: the correlation may change because its numerator (covariance) or denominator (volatility) changes" (Adrian, 2007). To ensure that correlation was being compared fairly the volatility must be examined.

While inspecting the data for this study, it was found that there were a large number of USAID accounts that either were not opened until years after 1946 or closed fairly quickly after being opened. The Presidency, House, and Senate all have different terms of service. All create discrepancies by increasing volatility. In order to find the cases with a high correlation due to a low volatility and high

correlation due to high covariance or co-movement, covariance was calculated separately.

A recent study conducted by Princeton University suggests, "changes in domestic political ideology through regularly occurring elections could introduce changes in aid levels, which in turn create volatility in aid…volatility in aid is an increasingly cited cause of aid ineffectiveness" (Tingley, 2010). This study suggests volatility could be a direct result of the relationship between partisan politics and USAID.

Conflicts-Aid Relationships

As previously noted, the highest correlation between USAID and Conflict Sites was with the region of Eastern Europe ($\rho = 0.752$) (Figure 17 and Table 9). The Coefficient of Determination for Eastern Europe and USAID was $R^2 = 0.565$, or over 56% of the variation in USAID received could be attributed to the number of conflicts in Eastern Europe. Without further investigation, this seemed to fall in line with one of the founding goals of USAID – containing communism.

According to professor of Economics, Dr. Geoffrey Gilbert, "The earliest USAID programs were conceived as part of the Cold War effort to contain communism. That objective had largely disappeared by 1990…other concerns have replaced it" (2004). After reviewing the constant dollar data from the Greenbook, it appears that Dr. Gilbert's comments were at the least incomplete when considering Eastern Europe (Figure 19).

From the Greenbook data, it was noted that shortly after World War II almost no money was given to regional programs or initiatives in Eastern Europe (Figure 19). It was not until 1990, after the beginning of the fall of communism in 1989, that we begin to see money given to Eastern Europe. This was not surprising as it would have been difficult to provide USAID to regional programs that did not exist before the fall of Soviet Russia. When this data were compared with the number of Conflict Sites in Eastern Europe at the same time (Figure 20), considerable correlation was found between USAID and Conflict Sites in the map (Figure 17). This appeared to be in line with USAID's mission to mitigate and address conflict.

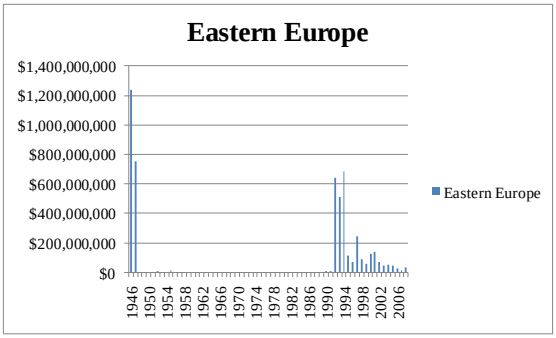

Figure 19. USAID in constant dollars given to Eastern Europe from 1946-2008.

From the above data and the map (Figure 17), one could assume USAID was used to rebuild Eastern Europe during the fall of communism and promote democracy in Eastern Europe after 1990. According Dr. Kevin F. F. Quigley, president of the National Peace Corps Association, "From 1990 to 2003, democracy assistance / governance represented 14.8 percent of the total U.S. assistance in Eastern Europe provided by USAID. Democracy assistance rose more than 600 percent, from…1990 to…2003" (2007). Correlation does not prove causality; however, Dr. Quigley's data illustrated an example where correlation maps and graphs could quickly paint a very compelling picture of actual historical events with causal implications.

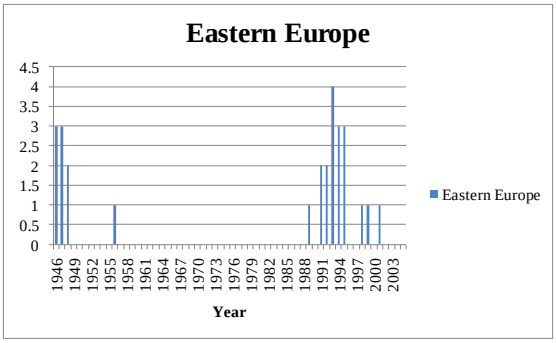

Figure 20. Number of Conflict Sites (y axis) from 1946 to 2004 (x axis).

Conflicts-Aid versus Party-Aid

In the case of Conflict Sites in Eastern Europe and USAID, bivariate relationships of considerable strength can at times illustrate historical events, and lead to further studies that may shed light on causality. With the example of Conflict Sites in Eastern Europe, 56% of the variation in USAID received could be attributed to the number of Conflict Sites in Eastern Europe. When nearly 53% of the variation in dollars received by India could be attributed to the number of Senate Democrats in office each year, one was left to question why further study has not been made of Domestic Politics and its affect on USAID and U.S. foreign policy.

A question that this study could answer, was what bivariate relationship, parties-aid or conflict-aid has the greatest magnitude, or mathematically speaking, the greatest Coefficient of Determination. To simplify this comparison, the Coefficient of Determination was calculated for all regional correlation coefficients, added and then averaged giving Democrats, Republicans, and Conflict Sites each a Coefficient of Determination ($\Sigma \rho^2$ / #regions = average R^2) (Table 10).

The average Coefficient of Determination for Democrats and Republicans was almost identical. The number of Democrats in branches of power accounted for 5.39% of the variation in dollars received by region. The number of Republicans in branches of power accounted for 5.31% of the variation in dollars received by region. The relationship between Conflict Sites and USAID had the greatest magnitude with 15%. This suggested USAID received by regional programs showed little difference between the Democrats and Republicans as dependent variables; thus the relationship between Dual Party politics and regional USAID was not very strong compared to Conflict Sites – a known regional issue and concern of USAID.

Table 10. Average R^2 for Democrats, Republicans, and Conflict Sites (dependent variables) to USAID received by region (independent variable).

Democrats	R^2 =0.053962
Republicans	R^2 =0.053163
Conflict Sites	R^2 =0.151543

The data were noted to be different when Democrats, Republicans and Conflict Sites were compared as dependent variables when the independent variable was not money received by regional funds, but money received by individual countries (Figure 20). The number of Democrats in branches of power accounted for 13.7% of the variation in dollars received by country. The number of Republicans in branches of power accounted for 15.1% of the variation in dollars received by country. The average Coefficient of Determination for Conflict Sites to aid received by all countries was 4.2%, far smaller than the average Coefficient of Determination when the independent variable was aid benefitting regions at 15% (Figure 17 and Figure 18).

What caused this disparity? One possible answer: there were not Conflict

Sites in every country in the world, resulting in a large number of zeros. In contrast, Democrats and Republicans were represented every year aid was given to the countries of the world (Table 11). The lack of conflicts in certain countries affected the correlation and therefore the Coefficient of Determination for Conflict Sites.

Table 11. Average R^2 for Democrats, Republicans, and Conflict Sites (dependent variables) to USAID received by country (independent variable).

Democrats	R^2 =0.137478
Republicans	R^2 =0.151792
Conflict Sites	R^2 =0.042328

Although Conflict Sites had a smaller Coefficient of Determination when the independent variable was USAID benefitting sovereign countries, conflicts tend to be regional issues. Measuring for Conflict Sites per region makes sense, as conflicts are rarely isolated incidences in regards to USAID allocation. There may only be one location where the conflict takes place, but there could be multiple countries and governments involved in a conflict. Generally speaking, these countries and governments tend to be in the same region and would therefore overcome the previously mentioned problem of zeroes or lack of representation.

This study noted some countries that had high positive correlations with partisan political shifts. When the correlation and Coefficient of Determination was computed for the dependent variables (parties represented in each branch and Conflict Sites) and the USAID received by India, it was noted that 52.5% of the variation in dollars received by India could be attributed to the number of Senate Democrats in office each year (Table 12). India was chosen as an example, because it was a country where Conflict Sites could be found and where the largest correlation between a political party and USAID given to a single country was noted.

Table 12. Bivariate relationships between USAID given to India and dependent variables.

	ρ	$\rho^2 = R^2$
R. President	-0.22057	0.04865
R. Senate	-0.69788	0.48703
R. House	-0.4045	0.163624
D. President	0.220567	0.04865
D. Senate	0.724571	0.525004
D. House	0.412844	0.170441
Conflict Sites	-0.30543	0.09329

The nature of the relationship between Republicans and aid given to India was negative across all branches, whereas the relationship between Democrats and aid given to India was positive across all branches. The correlation between aid given to India and Conflict Sites was not only negative, but small. Further study would have to be done to find if there was a causal relationship between USAID benefitting India and domestic partisanship.

A recent study by the Politics Department of Princeton University suggests this disparity could be a result of different ideological views between Republicans and Democrats: "Individuals who are more conservative are also less likely to support foreign aid. The literature on legislative voting on foreign aid in the US finds a similar pattern…Notably as governments become more conservative, the share of GDP committed to foreign aid effort declines" (Tingley, 2010). Further study would have to be done to verify Princeton's claim, but correlation data

suggests that such a study would be worthwhile.

Questions Created

At the conclusion of this project many questions arose. This section was intended for anyone who wishes to challenge these findings or conduct further investigation.

Firstly, if legislator voting history on foreign policy were compared to aid rather than the number of Republican or Democrat Representatives, would the bivariate relationships be different? This question implied that Congressmen may not stand on party platforms with every vote. A study conducted by The Ohio University, suggested "there is considerable stability in congressional roll-call voting over time with the change that does occur tending to be gradual rather than dramatic" (Weisberg, 1978).

Secondly, would it have been better to compare USAID to the percentage or difference between the percentage of seats held by Republicans or Democrats in the respective branches, rather than the total number? Political Science Professor, Dr. Randall B. Ripley, of the University of Ohio suggested in the study of partisanship there were multiple indicators of a party's strength such as: "percentages of the population identifying themselves with each of the parties, percentages of the two-party vote for the House of Representatives candidates of each of the parties, and percent of the two-party vote for the president candidates of each of the parties" (1975). Dr. Ripley goes on to say that the "size of the majority party's margin in Congress (in number of seats" could also be used.

Thirdly, what relationships would arise from studying the correlation between specific USAID projects and receiving countries? There already exist multiple studies on the relationships between certain projects and particular countries/regions.

Fourthly, what would the data look like if the countries within certain regions were combined as aggregates of USAID rather than using the regional funds outlined by the Greenbook?

Lastly, although correlation does not indicate causality between variables, were there studies that could be conducted that would show partisan politics directly affecting USAID? Prior to this study, one scholarly report reviewed whether the Federal agency, USAID, had sought partisan political interests. Published in the Southern Economic Journal, this study used "data on domestic USAID contract spending and votes in the 104th Congress House of Representatives … to test whether the geographic distribution of USAID contract spending within the United States was consistent with a systematic attempt to build support for USAID in Congress" (Kilby, 2001). Further studies of this kind would be of great interest.

Conclusion

The purpose of this paper was to investigate how strong of a correlation or relationship the number of Democrat or Republican Party members in the Legislative and Executive branches of government had with the amount of USAID received by countries and the USAID benefitting regions. This study found that in the case of some countries and regions the magnitude of the party-aid relationship warranted further study.

This paper did not infer or try to define causality. To provide context for the resulting relationships between partisan politics and USAID, those relationships were compared to the

strength of the relationship between the number of Conflict Sites occurring in each country and USAID. USAID has claimed that addressing and mitigating conflicts were major concerns of USAID. This study hypothesized that due to this claim the strength of relationship between Conflict Sites and USAID would be greater than the parties-aid relationship. That hypothesis was surprisingly incorrect when the independent variable was USAID received by country. In this case, a stronger relationship was found between dual party politics and USAID received by countries.

The hypothesis was correct when the independent variable was USAID received by regional funds and programs. The magnitude of the relationship between USAID benefitting region-specific funds and dual party politics was small in comparison. This suggested Conflict Sites may be a regional issue and there may be very little partisanship related to USAID benefitting regional funds.

This conclusion and the correlation data found suggested while President Obama's statement: "Partisanship ends at the water's edge," could be something politicians aspire to, it may not always be true (ABC, 2011).

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