

## **Foreign Aid and Conflict in Sub-Saharan Africa**

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## ABSTRACT

Past research has discovered differing relationships between foreign aid and conflict. Some have concluded that aid moderates conflict while others determined foreign aid, at the very least, contributed to conflict experienced within countries. This research also attempts to determine foreign aid's effect on conflict, but departs from past studies in an important way. Conflict is separated into three categories: ethnic conflict, genocides/politocides and civil wars. By focusing on Sub-Saharan Africa and utilizing rare event logistical regression techniques, this research determined that foreign aid has a moderating effect on all types of conflict. What remains unknown is why this relationship exists. Is foreign aid being utilized to create effective governmental and economic institutions, or is development aid being diverted to military aid in times of conflict?

Between 1946 and 2002 there were 47 civil wars with at least 1.37 million battle-related deaths in Sub-Saharan Africa (Lacina and Gleditsch 2005). If you consider the civilian casualties from those conflicts, that number of conflict-related deaths increases significantly. Because of these statistics, Sub-Saharan conflict is of vital importance, not just for scholarly reasons but to attempt to provide relief to the people suffering from the devastation of war.

Recent assertions claim foreign aid<sup>1</sup> may instigate conflict<sup>2</sup> within a country. William Easterly described how foreign aid, intended to construct a nationwide irrigation system, led to ethnic violence in Sri Lanka (2001, 274). More recently, Dambisa Moyo explicitly stated “aid foments conflict” (2009, 59). Aid certainly can do many things; however, donor countries are not providing aid (especially development aid) to create or prolong conflicts within recipient nations.

There are limited studies researching the effect aid has on conflict. Unfortunately, of those studies that do explore the topic, the results are mixed. There are studies that claim aid increases conflict, although most, if not all, quantitative research has found little evidence to support this theory.

This study follows in the form of previous quantitative studies with minor adjustments in the measurement of conflict. Similar to previous analyses, this study utilizes a dichotomous dependent variable for conflict but departs from previous research by separating conflict into three distinct categories: ethnic conflict, genocides/politicides, or civil war. This is done with the use of conflict data from the Political Instability Task Force (PITF).

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<sup>1</sup> There are primarily two types of foreign aid that can be provided to a country: development or military assistance. Because military assistance is provided to increase the military strength of a country and increase the likelihood of a successful outcome in conflict, it is excluded from this paper. So, the use of the word “aid” in this paper implies development assistance, unless otherwise specified.

<sup>2</sup> Unless otherwise specified, within this paper the use of the term “conflict” implies conflict contained within the borders of the country.

Interestingly, this study finds that for all three types of conflict, as foreign aid increases the incidence of conflict decreases. These findings contradict Easterly's and Moyo's claim that foreign aid creates or increases conflict within many nations. However, this study's findings should be considered with past research that looked at more contextual variables that determined foreign aid can be used for detrimental means and may create or escalate tensions in a country.

The study proceeds as follows. First is a review of relevant literature, including both the ethnic conflict literature as well as the interplay of foreign aid and conflict. After the literature review, there are two cases included where foreign aid (or the withholding of foreign aid) created (or moderated) ethnic tensions. The data and methods section then follows to describe the sources of data as well as the statistical procedure utilized. An analysis of the data and discussion of the full statistical results are included. The study concludes by summarizing results by analyzing how the results relate to previous studies and possible future research questions.

## **Literature Review**

Past research on the relationship between foreign aid and conflict examined the topic both quantitatively and qualitatively. Interestingly, the qualitative studies provided theories why foreign aid may increase conflict. In most cases, they utilized single country case studies to support their hypotheses. Generally, the quantitative studies found an inverse relationship between foreign aid and conflict, or more specifically, aid moderated conflict.

### *Foreign Aid and Conflict Theories*

There are several theories attempting to explain the relationship between foreign aid and conflict. One theory, described as the rebel-financing theory, is that aid could be seen as a prize for rebels. According to the theory, rebel groups could be thought of as a business; like any other business, rebel groups need financial resources to fund their operations (Collier and Hoeffler

2000). The theory originated from findings that countries dependent on primary commodity exports had higher incidences of internal conflict. This was thought to be because the rebels' eagerness to profit from natural resources or agricultural exports prompted violence. Logically, foreign aid could be included as a sort of spoils of victory and rebels may be further emboldened to start a conflict if they believe that, in addition to taking power of the country, they will also take control of money obtained from foreign aid. In the rebel-financing theory, greed, not grievance, starts conflict (Collier and Hoeffler 2000).

However, after reanalyzing their data, Collier and Hoeffler dismissed the rebel-financing argument. They stated that unlike natural-resources, aid cannot be captured during a conflict because aid is generally decreased during periods of war (2002, 437). Their research sought to determine what affect, if any, a country's policy environment had on conflict (while also including foreign aid receipts). They concluded that neither foreign aid nor the policy environment had a direct effect on the risk of conflict; however, they determined the indirect effects on economic growth and the diversity of income sources (that occur in an increasing aid and policy environment) reduced the risk of conflict (Collier and Hoeffler 2002, 447).

Fearon (2005) found similar findings to Collier and Hoeffler (2000) that would indicate support for the rebel-financing theory. Surprisingly though, the research did not concur with the theory. Instead, it concluded that countries that are dependent upon primary exports have weakened and/or less developed state institutions. Their research results determined it was the weak/less developed institutions that were conducive to conflict.

Another theory of the possible relationship between foreign aid and conflict is that aid could increase the economic growth of a country and subsequently increase the standard of living experienced by the citizens. Various studies have analyzed this relationship believing that as a

country becomes more prosperous, the likelihood of rebellion diminishes (Collier and Hoeffler 2002, de Ree and Nillesen 2009).

In their work, de Ree and Nillesen (2009) noted a strong relationship between economic development and conflict. Factors found to elevate the risk of conflict included low per capita income, poorly performing institutions or dependence on primary commodity exports. Because development assistance attempts to jumpstart economic development, they hypothesized aid may be related to conflict through its effects on economic conditions. To test their hypothesis, they chose Sub-Saharan African countries to analyze. What their results indicated however was that contrary to their hypothesis, foreign aid directly affects the probability of conflict continuation negatively and significantly in Sub-Saharan Africa but had no significant relationship to the onset of conflict. They believed their findings indicated that foreign aid was being diverted into military expenditure in times of conflict to help quell rebellion (de Ree and Nillesen 2009, 312).

In an attempt to test both the rebel-financing theory and the theory that aid creates economic growth which decreases the likelihood of conflict, Nielsen et al., hypothesized that “aid shocks” (rapid changes in aid flows) would impact the likelihood of conflict (2011, 221). They analyzed both positive and negative aid shocks. Consistent with the theory that increases in foreign aid help usher in economic growth, which decreases the likelihood of conflict, their findings indicated that negative aid shocks, or significant decreases in foreign aid from the previous year, increased the likelihood of occurrence of conflict. Positive aid shocks did not appear to cause conflict, which would appear to refute the rebel financing theory.

A third theory describing the relationship between foreign aid and conflict is that foreign aid may change the structure of income within a country to become more diversified, and as a result, conflict would decrease. This theory states that as per capita income increases, the

economy of the nation tends to diversify away from sole dependence on primary commodity exports (Collier and Hoeffler 2002, 439). Conversely, the theory states countries dependent upon primary commodity exports would experience conflict more frequently. Several studies have exhibited this relationship between dependence on primary commodity exports and conflict (Chaudhry 1989; Karl 1997; Fearon & Laitin 2003; Fearon 2005).

### *Foreign Aid and Ethnic Conflict*

Some researchers have focused on more specific types of conflict, namely ethnic conflict, when analyzing its relationship with foreign aid. To begin, it is important to understand how foreign aid and ethnic politics interact to understand how foreign aid could lead to ethnic tension and then conflict. Herring and Esman (2001) describe the three ways in which foreign aid, especially development assistance, impacts ethnic politics. First, it must be understood that aid projects have distributive consequences. Also, aid is allocated and administered in a political context. Finally, the rising use of conditionalities to obtain assistance increases the likelihood of interfering with ethnic politics.

While these three items do not always indicate foreign aid will produce ethnic tension and conflict, the way foreign aid is administered within a nation can significantly impact the likelihood of conflict. If projects are selected that only benefit one ethnic/identity group, if aid projects are selected without consulting minority ethnic parties (assuming the party system is divided over ethnic lines), or if aid is provided only if the recipient nation complies with an increasing number of conditions that may run counter to the best interests of all ethnic groups, then the likelihood of conflict increases significantly. However, if a nation understands the importance of allocating aid based on discussions with all groups affected and goes about distributing aid in such a way as to not exclude any groups, the likelihood of conflict decreases.

In a case study on the history of ethnic violence in Rwanda, Uvin (1996) believed foreign aid was at least partly responsible for the violence experienced. The basis of his argument is that in Africa, countries appear to be experiencing intercommunal violence more frequently. “Almost always these acts of extreme violence seem to follow ethnic patterns, even in places where historically there has been no animosity between the groups concerned. All of these countries were large recipients of foreign aid” (Uvin 1996, 3). However, Uvin stopped short of stating foreign aid was the sole determinant of the ethnic conflict experienced. He believed foreign aid negatively interacted with the processes of nation-building, social differentiation, political exclusion and cultural change.

Uvin (1996) continued to state that much of the development aid provided to countries has been provided utilizing a “top-down” approach, often neglecting societal ills for the benefit of economic development. “Much development aid helps to lay the groundwork for further inequality and mal-development, as well as structural, and eventually, acute, violence” (Uvin 1996, 34).

Perhaps it is the donors who are increasing conflict by ineffectual or harmful aid decisions. Alesina and Dollar found that political and strategic considerations of the donor country were at least as important, and perhaps more important, than the recipient country’s policy or political institutions when determining aid allocations (2000, 40). Because donor countries provide aid based on their own interests, aid flows might increase conflict due to the ignorance of national ethnic grievances.

Elbadawi and Sambanis (2000) hypothesized ethnic conflict in Sub-Saharan Africa to be due primarily to the numerous ethnic groups living in close proximity to one another. However, upon testing, it appeared the high levels of civil wars in Africa were not due to ethnic or

linguistic fragmentation, but were due from high levels of poverty, failed political institutions and economic dependence on natural resources. Furthermore, in the case of Africa, compared to other regions, ethnic diversity was a deterrent rather than a cause of civil war (Elbadawi and Sambanis 2000).

Finally, Gallagher-Cunningham and Weidmann (2010) saw ethnic conflict in Sub-Saharan Africa as context dependent. They believed it was based more on the configuration of ethnicity within local level political boundaries where politicians and ethnic groups interact. What they found supported their hypothesis. Overall, the ethnic conflict they studied was caused by ethnic minorities and was due to disagreements over the distribution of power or of goods and a sense of insecurity due to limitations placed on the free exercise of cultural distinction by the ruling group.

Overall, there appears to be no general consensus as to foreign aid's consequences on conflict. Many studies observed foreign aid having a moderating effect on conflict, while other studies found that foreign aid at least played a role in creating or intensifying conflict. The major weakness in all the quantitative studies listed above is the inclusion of all types of conflict into a single measure. Ethnic conflict was not separated from civil war; genocides were not distinguished from ethnic or civil conflict. The use of this type of measure for conflict does not allow researchers to determine what variables create a specified type of conflict and what other factors could stop it from continuing.

### **Foreign Aid Moderating and Creating Ethnic Tensions**

Below are two examples of foreign aid's interaction with ethnic tensions and conflict. The first illustrates how donor countries, after considering ethnic politics, declined providing development aid for a project in Kenya with a peaceful conclusion. The second demonstrates the dark side of foreign aid as donor countries did not consider ethnic divisions in Sri Lanka prior to

providing aid, resulting in a violent ethnic war that has continued for many years. The cases below are not intended to be full case studies, however, are intended to show both the benefits and detriments of foreign aid on ethnic politics.

### *Foreign Aid Moderating Conflict*

Sometimes the ruling government of a nation is not concerned with inequalities associated with aid distribution. Cohen (2001) provided an example in Kenya where aid donors analyzed the merits of an aid project and determined not to provide aid as it would most likely add to the ethnic tension in the region.

As background, there are an estimated 40 different ethnic groups in Kenya. The largest groups are the Kikuyu, Luo and Luyha, which together account for approximately 50% of the country's total population. The Kamba and Kalenjin are each approximately 10% of the total population with the remainder of Kenya's inhabitants (approximately 30%) comprising the remaining 35 ethnic groups (Cohen 2001).

In the early 1990's, the Kalenjins controlled the government, led by President Moi. They requested aid for an international airport in Eldoret citing a need to relieve congestion from the international airport in Nairobi. However, Eldoret was near the president's hometown and was the center of the ruling coalition's support base. The airport in Nairobi was located within Kikuyu territory. Opponents of the airport argued that if the airport was built, it would serve to strengthen the autonomy of the Kalenjin and would also waste scarce government resources (the projected cost of the original Eldoret airport was \$96 million) (Cohen 2001).

After considering the aid request and examining the ethnic politics within the country, international aid agencies declined to provide funding, citing ethnic hostilities that could escalate between the Kalenjin and Kikuyu ethnic groups if the project proceeded (Cohen 2001, 96). Even

without the foreign assistance, President Moi decided to continue with his plans to construct the airport and awarded the construction contract to a Canadian firm. He soon after applied for assistance from the Canadian International Development Agency (CIDA) but they quickly rejected the request even though a Canadian firm was contracted to do the work. They too cited concerns over the ethnic tensions created by the project (Cohen 2001).

In the end, the airport was constructed however the project was substantially scaled back. Because funding for the airport came from domestic sources, many opposition party leaders from the Kikuyu and Luo ethnic groups voiced dissent over the use of funds. However, beyond the opposition voiced by other ethnic group leaders, there was no violence that resulted from the completion of the project.

While foreign aid was not provided in the case of Kenya's Eldoret airport, it is clear that ethnic politics were considered prior to awarding assistance. Had foreign aid been provided for the airport project, hostilities between ethnic groups might have grown and resulted in a bloody conflict.

### *Foreign Aid Creating Conflict*

The conflict that has gripped Sri Lanka since the early 1980's has a troubling and somewhat puzzling history. Prior to 1983, Sri Lanka had no prolonged ethnic conflict and appeared to be on the path to economic and political development. Then, in the summer of 1983, riots in the country claimed 2,000 lives and destroyed 18,000 homes and 5,000 businesses; total damage from the riots was estimated to be \$300 million dollars (Herring 2001). Many believe the drastic change toward conflict had roots in foreign aid.

Sri Lanka is primarily populated by two ethnic groups: the Tamils (who are the minority group) and the Sinhala (the majority ethnic group and group in political power). The two groups

have clashed in the past over government policies, but it was never to a level which would be considered a civil war. More often, the clashes were considered to be ethnic competition, with the Tamils and the Sinhala disagreeing over the direction of the country (Herring 2001, 142).

In the late 1970's, for various reasons, Sri Lanka began to move away from social democratic principles the government had previously enacted and began to follow a plan of economic liberalization. This was done in an attempt to enable Sri Lanka's economy to be more open to international markets and hence promote economic growth (Herring 2001, 144). In the conversion to a more liberal market economy, Sri Lanka sought out development assistance from the international community.

One of the larger, if not the largest, project undertaken by Sri Lanka was the Accelerated Mahaweli Project. Its purpose was to provide power generation and irrigation for crops in the dry zones of the nation. Because the dry zones were sparsely populated, a colonization program settled new residents into the dry zones to begin farming. However, the Tamils soon began to believe the colonization would be done along ethnic lines and they became discontented.

The weariness of the Tamils, related to the Mahaweli Project, was not unfounded. The Tamil believed the colonization was done to change the ethnic composition of areas where they were a majority. In 1946, the Sinhalese living in the dry zones that were to be affected by the project was only approximately 20% of the total population of the area. In 1976, that percentage increased to over 83% (Herring 2001).

Additionally, early in the project's design and construction, a North Central feeder canal that was to be constructed to water Tamil areas was canceled. The government stated it was deserted on technical grounds; however, no new projects were proposed to help the Tamils living in those areas to make up for the loss of the canal. Furthermore, foreign aid utilization in the city

of Jaffna (a Tamil populated area) was zero between 1977 and 1982 (Easterly 2001, 274). It appeared foreign aid was being utilized to benefit one ethnic group at the detriment of ethnic minorities.

The Mahaweli project was significant due to the ethnic history of the country. From approximately the sixth century BC to the thirteenth century AD, Sinhalese Buddhist kings had built an intricate irrigation system to aid in growing rice in the dry areas of Sri Lanka but this system was destroyed by medieval Tamil invaders. The Mahaweli project promised reemergence of the hydraulic civilization once destroyed by the Tamils.

While there may have been other factors that led to the civil war that broke out between the Sinhalese and Tamil groups in 1983, the Mahaweli project, at the very least, exacerbated the growing tensions between the groups. Since 1983, Sri Lanka has been plagued by intermittent violence and terrorist attacks aimed at either Sinhalese or Tamil strongholds.

Again, the examples above from Kenya and Sri Lanka should not be seen as full case studies, however, are indicative that foreign aid can impact tensions and conflict within a country. While these are only two specific cases, this research attempts to determine what general impact foreign aid has on conflict within a certain geographical area.

## **Theory and Methods**

Because of Sub-Saharan Africa's high frequency of conflict, as well as the large amounts of foreign aid that have gone to many of its countries, the region appears to be an excellent test case to determine what, if any, effect foreign aid has on conflict (see Appendix A for the countries included in the analysis). Additionally, no matter what time period is selected, the beginning and ending years are almost always arbitrary. This study utilizes the time period from

1980 to 2009. This appears to be a sufficient amount of time to study the effects of foreign aid on conflict, as well as benefit from the inclusion of recent data.

Although several previous quantitative studies concluded that foreign aid either moderated or had no effect on conflict, this research employs the rebel-financing theory. This theory states foreign aid can be considered a “prize” to rebel groups and may increase the incidence of conflict as rebel groups search for capital to fund their operations (and attempt to take over power in a country). It is hypothesized that as foreign aid provided to a country increases so too will conflict. However, because it is also assumed that there are other determinants of conflict within a nation, several other factors are included in the analysis.

#### *Dependent Variable*

Nearly all past studies analyzing the relationship between foreign aid and conflict have utilized a dichotomous measure of conflict (Collier & Hoeffler 2000; Elbadawi & Sambanis 2000; Fearon & Laitin 2003; Fearon 2005; de Ree & Nillesen 2009; Nielsen et al 2011; Savun & Tirone 2011). This measure came from the PRIO dataset and included any situation with at least 25 battle-related deaths as a conflict.

The Political Instability Task Force (PITF) provides information measuring state failure and political violence for various conflict-related events. The information and definitions used in this research on ethnic wars, genocides/politocides and revolutionary (civil) wars were obtained from the PITF. To be considered an ethnic war, it must be an “episode of violent conflict between governments and national, ethnic, religious or other communal minorities (ethnic challengers) in which the challengers seek major changes in their status.” Genocides and politicides are “events that involve the promotion execution, and/or implied consent by governing elites or their agents that result in the deaths of a substantial portion of a communal

group or a politicized non-communal group.” Revolutionary (civil) wars are defined as “episodes of violent conflict between governments and politically organized groups (political challengers) that seek to overthrow the central government, to replace its leaders, or to seize power in one region.”

Also, to be considered a civil or ethnic war certain event thresholds must be met: a mobilization threshold in which each party to the action must mobilize at least 1,000 or more people; and a conflict intensity threshold whereby there must be at least 1,000 conflict-related deaths over the course of the conflict as well as one year where the conflict-related death toll exceeds 100 fatalities. The scaled ranking for genocides/politicides is dependent on the annual number of deaths experienced.

The PITF conflict measures are reported as a scaled score between 0 (no conflict) to 4 (highest level of conflict). But, for ease of comparability to previous research, the PITF data has been recoded for this study. Anytime PITF reports a conflict, the event is marked as a 1 (i.e. conflict occurred). When PITF reports no conflict in a country during the year, the event is marked as 0. The use of the dichotomous dependent variable for conflict is consistent with the previous conflict literature.

The benefits of using PITF’s political violence data are obvious. Past studies did not differentiate between ethnic conflict, genocides/politicides and civil wars. Additionally, previous studies have generally utilized five year averages for conflict. Fearon concluded the use of five year averages, when looking at conflict, can significantly affect findings when compared to the use of country years (2005, 498). Because the variables utilized in this research are either reported on an annual basis or are time invariant, the use of country years appears reasonable, if not more appropriate.

### *Peace Years*

The number of uninterrupted peace years is included for several reasons. First, Beck, Katz and Tucker (1998) noted the inclusion of this type of variable will help correct any temporal independence violations inherent in time-series, cross-section data. It is also included as previous research has shown that as the number of years of peace experienced by a country increase, the likelihood of conflict decreases (Collier and Hoeffler 2002; Collier and Hoeffler 2002; de Ree and Nillesen 2009).

The variable is calculated by taking the first year after a conflict ends and numbering it 0. The following year would be 1, the year after 2, etc. until the next outbreak of war. At that point the numbering is restarted once peace is restored.

### *Foreign Aid*

Foreign aid amounts included in the analysis are lagged one year. It is assumed that current year foreign aid received in one year will impact conflict in the proceeding year. This is due to the uncertainty and non-regular receipt of aid payments. All amounts of foreign aid are normalized by the population of the country to determine the per capita foreign aid received. This is done for ease of comparability, so that countries with large populations that receive large amounts of aid are more easily compared to smaller countries who may not receive as much in total aid. The foreign aid amounts are taken from the World Bank's World Databank and is held constant in 2007 United States dollars.

### *Ethnic and Religious Fractionalization*

To determine if the ethnic or religious composition of a nation impacts the level of conflict experienced, measures of ethnic and religious fractionalization are included. Both measures were taken from Fearon and Laitin (2003). Ethnic fractionalization is based primarily

on information found in the *Atlas Narodov Mira* (1964). The variable indicates the likelihood that two random individuals within the country will be from different ethnolinguistic groups.

The measure of religious fractionalization is similar to ethnic fractionalization. It too indicates the likelihood that two random individuals will be from separate religious backgrounds. This measure was based on information from the CIA Factbook and other sources not provided by Fearon and Laitin (2003).

#### *Polity IV Score*

To control for the level of freedom or repressiveness of a government, Polity IV scores are used. Each year, a country is provided a “score” from the Polity IV Project that range from 10 (completely democratic) to -10 (completely autocratic). These scores are as reputable as other measures of democracy, like Freedom House scores, and appear to be appropriate for use in this research.

Additionally, previous studies have found there may be an inverted U-shape relationship between conflict and regime repressiveness (Muller 1985; Weede 1987). These studies found that extremely free or repressive regimes will prevent political violence, while regimes in transition have difficulty preventing conflict from starting or suppressing it quickly when political violence occurs. Because of this potential inverted U-shaped relationship, an additional variable is included-the squared Polity IV scores.

#### *Mountainous Terrain*

Past research has suggested that a mountainous terrain within a country is conducive to internal strife as it provides a hard to access location as protection against the government (Fearon and Laitin 2003). Included in the statistical model is a measure of the mountainous terrain within a nation. It is borrowed from Fearon and Laitin (2003). The measure determines

the difference of the highest and lowest point in a nation and computes a “mountainous score.” Unfortunately, the measure does not include other hard to reach areas that may favor rebels (like swamps or jungles), but this appears to be the best measure available.

#### *Oil Producing Economy*

As elaborated on in the literature review, a dependence on primary commodity exports has been associated with higher levels of conflict. Because of these findings, a measure of economic dependence on oil has been included in the model. The variable is measured as a proportion of annual oil revenues divided by total gross domestic product. Unfortunately, this measure does not account for other primary commodities, such as diamonds. The information can be obtained from the World Bank’s World Databank and both amounts (value of primary commodity exports and GDP) are reported in current local currency units.

#### *Income Equality*

Some studies have found inequality, especially income inequality, to be a determinant of conflict (Nagel 1974; Muller 1985). There are various methods of measuring income inequality, such as the gini coefficient, the percentage of people living under the poverty line, per capita GDP, etc. Because it is most widely available for all countries over the time period covered, this study utilizes per capita GDP. The information can be obtained from the World Bank’s World Databank. GDP per capita is held constant at 2000 United States dollars.

#### *Statistical Model*

Like past conflict related research, this study utilizes a dichotomous dependent variable. Because the outbreak of conflict is considered a rare occurrence, the use of rare-event logistical regression technique is employed. The use of other logistic regression techniques has been

shown to significantly underestimate the probability of rare events; utilizing rare events logistical regression helps to lessen this underestimation (King and Zeng 2001).

Also, as noted by Beck, Katz and Tucker (1998), time-series, cross-sectional data with a binary dependent variable often violate the independence assumption of ordinary logit statistical models. To remedy this, the data set includes a dummy variable to mark the number of years since the start of the most recent onset of conflict within a nation (the variable is titled “peace years,” see above for a more complete description). While it is a simple technique, this method has been shown to adequately remedy temporal dependence often found in time-series, cross-sectional data.

### **Results and Discussion of Regression Analysis**

Of the 30 years and 49 countries included in the analysis, there are a total of 1,036 country years (the difference is due to missing information). For the time period covered, there were 279 country years of conflict experienced in 23 countries. The countries with the longest continuous conflict were Sudan and Uganda, who both suffered conflict for 27 of the total 30 years included in the study.

As for the breakdown by the type of conflict, there were a total of 224 country years of ethnic conflict experienced in 17 separate countries. Civil conflicts accounted for 113 country years in 14 countries. Genocides and/or politicides occurred in 6 countries for a total of 61 country years. The early 1990’s appeared to be the worst time for conflict in Sub-Saharan Africa, with 1992 being the worst. That year saw 16 countries (or approximately 1/3 of the total countries included in the analysis) experiencing conflict.

Based on Table 1, there appears to be an inverse relationship between conflict and foreign aid. This holds true for all forms of conflict (ethnic conflict, genocides/politicides, and

civil wars). The results are only statistically significant in the ethnic conflict model; however, each of the models shows the same relationship. These findings appear to contradict the rebel-financing theory and would also appear to dispute the claims made by Easterly (2001) and Moyo (2009).

Although it is undeterminable from the models, it would be of interest what causes foreign aid to have a moderating effect on conflict. Optimists would hope it is because recipient countries utilize the money to create better governmental and economic institutions to benefit all citizens and make war and insurrection unattractive to the majority of people. However, the findings could indicate that the countries receiving more development aid are better able to take foreign aid cash flows and transfer it for military purposes to suppress insurrection. Further study of this question may be appropriate.

While the model indicates an inverse relationship between foreign aid and conflict, it may be inappropriate to conclude that aid always acts to moderate ethnic conflict. There are obviously situations where, if not cognizant of the conditions in recipient countries, foreign aid can exacerbate existing tensions as noted by Uvin (1996), Easterly (2001), Herring (2001) and Herring and Esman (2001). The danger of statistical modeling is to ignore the unique aspects of the subject under study and any researcher should be hesitant to claim results from statistical analysis as empirical truths.

Not surprisingly, the longer a country has experienced peace, the less likely conflict will erupt. The relationship is significant in all the models and is consistent with prior conflict-related research.

**Table 1: The Determinants of Conflict in Sub-Saharan Africa**

Independent Variables	Rare Events Logit Estimates <sup>a</sup>		
	Ethnic Conflict	Genocide/Politicide	Civil Conflict
Constant	0.4262 (0.8135)	-4.0285 ** (1.9928)	-1.1067 (1.0764)
Foreign Aid (t-1)	-0.0090 ** (0.0038)	-0.0214 (0.0159)	-0.0101 (0.0064)
Peace Years	-0.4400 *** (0.1210)	-0.3898 * (0.2051)	-0.3031 *** (0.0864)
Ethnic Fractionalization	1.0944 (0.7321)	0.0513 (1.1315)	1.5390 ** (0.7195)
Religious Fractionalization	0.4599 (0.8877)	6.0712 * (3.5680)	1.5450 (1.0772)
Polity IV Score	0.0102 (0.0280)	-0.0176 (0.0737)	-0.0563 (0.0392)
Polity IV Squared	-0.0258 *** (0.0053)	-0.0241 ** (0.0119)	-0.0175 ** (0.0075)
Mountainous Terrain	0.0119 (0.0074)	0.0147 (0.0102)	0.0026 (0.0073)
Oil Exports/GDP	0.1213 (0.7383)	1.1244 (1.1291)	3.5130 ** (1.1290)
Per Capita GDP	-0.0001 (0.0003)	0.0011 ** (0.0005)	-0.0025 ** (0.0008)
Observations	1,036	1,036	1,036

a - The top entries are the coefficients. Standard errors are in parentheses.  
\*\*\* p < .01; \*\* p < .05; \* p < .10

Interestingly, the level of democracy or autocracy (as measured by Polity IV scores) is not significant in any of the models. But the Polity IV squared measure is inversely related to all types of conflict and is significant in the three models. It appears conflict in Sub-Saharan Africa follows the theory of Muller (1985) and Weede (1987) - conflict would be prevalent in regimes that are in transition from one type to another, but would be less likely in countries that are either very democratic or autocratic.

Ethnic and religious fractionalization appears to be positively correlated to all types of conflict. This relationship between conflict and ethnic fractionalization may call into question the conclusions of Elbadawi and Sambanis (2000) that in Africa ethnic diversity is a deterrent to conflict. Perhaps surprising to some, ethnic fractionalization is not significant when looking at ethnic conflict. It is significant however when examining civil conflict in Africa. Religious fractionalization is only significant in one of the models – the genocide/politicide model. The fact that these variables are not significant in many of the models is not surprising, as very few previous studies have found either ethnic or religious fractionalization to be significant determinants of conflict.

Mountainous terrain is not significant in any model but is positively related to the incidence of all types of conflict. This relationship provides further support to Fearon and Laitin's (2003) work that mountainous terrain increases conflict.

The increasing dependence of a nation on oil production appears to increase the incidence of all types of conflict in Sub-Saharan Africa, although it was only significant in the civil conflict model. This finding supports the work of Elbadawi and Sambanis (2000) and Collier and Hoeffler (2000). Past research (as well as this study) would benefit from expanding the measure of primary commodity dependence from oil production exclusively and adding dependence on other natural resources. But, for now, oil production as a percentage of gross domestic product is the best current measure for primary commodity dependence.

Finally, it is interesting to note that per capita GDP (a proxy measure for income inequality) has both a positive and inverse relationship with conflict, depending on the type of violence. Rising levels of per capita GDP are associated with higher incidences of genocides/politicides. This relationship is significant in the model. Per capita GDP seems to have

a moderating effect on both ethnic and civil conflict. This relationship is only significant to civil conflict, but the relationship would be predicted by Elbadawi and Sambanis (2000) as they found decreasing levels of income inequality were associated with lower levels of conflict.

Here again, the choice of measurement of income inequality may be lacking. This study chose per capita GDP due to the availability of information and because it was utilized in past research (Nielsen et al. 2011). Perhaps as the Gini coefficient of income inequality becomes more widely available for all countries and more often reported, future research may benefit from a more direct measure of income inequality.

## **Conclusion**

Conflict is not unique to Sub-Saharan Africa; however, the relatively recent number of outbreaks of war and duration of violence certainly are. Additionally, foreign aid has poured into Sub-Saharan Africa with more than \$1 trillion in development assistance over the past several decades (Moyo 2009, XIX). Because of these facts, some researchers have begun to question whether development aid is helping countries develop economically or if the aid may be increasing the incidence and intensity of wars.

This research, focusing on Sub-Saharan Africa, sought to determine what affect foreign aid had on conflict. It follows several previous studies but differs by separating conflict into three types: ethnic conflict, genocides/politicides, and civil war.

Through the use of rare event logistic regression techniques, this study found an inverse relationship between foreign aid and conflict. This was true of all three types of conflict, however, was only statistically significant for ethnic conflict. What remains unknown is why this relationship exists. Do countries receiving more foreign aid invest the money into better governmental and economic institutions that are more receptive to the people and create

diversified economies, making it easier for citizens to earn a living and raise a family? Or, do the findings indicate that countries receiving more development aid divert that cash flow for military purposes to suppress insurrection?

Perhaps those two questions are the key to eradicating conflict within Africa. If foreign assistance is being utilized to create better political and economic institutions and conflict naturally begins to disappear as citizens start to experience prosperity, then aid should continue to flow to these nations. If, however, foreign aid is acting as a band-aid to cover up the inadequacies of government or the needs of the people, then we, as a global community, need to find another solution other than continually increasing foreign aid to this area.

## Appendix A: Sub-Saharan African Nations

Angola	Madagascar
Benin	Malawi
Botswana	Mali
Burkina Faso	Mauritania
Burundi	Mauritius
Cameroon	Mozambique
Cape Verde	Namibia
Central African Republic	Niger
Chad	Nigeria
Comoros	North Africa
Democratic Republic of Congo	Rwanda
Republic of Congo	Sao Tome and Principe
Cote d'Ivoire	Senegal
Djibouti	Seychelles
Equatorial Guinea	Sierra Leone
Eritrea	Somalia
Ethiopia	South Africa
Gabon	Sudan
The Gambia	Swaziland
Ghana	Tanzania
Guinea	Togo
Guinea-Bissau	Uganda
Kenya	Zambia
Lesotho	Zimbabwe
Liberia	

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