Quantifying the Impact of Foreign Aid Programs

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Introduction

The Visualising Peace Virtually Integrated Project (VIP) examines the different ways peace is visualized: who contributes to peace, what constitutes peace, where peace exists, and many other questions about peace and the peacebuilding process. The diverse projects associated with the Visualising Peace VIP all critically evaluate the concept of peace in history and the current world, drawing attention to the multifaceted and complex dynamics of global, interpersonal, and inner peace. This paper intends to contribute to the existing literature in the VIP in order to add another dimension of the ways peace is visualized. Much of the literature in the VIP engages with peace qualitatively, investigating peace through personal, experiential lenses. This project aims to approach peace quantitatively in order to both examine peace from a new perspective and highlight the complexity of defining and measuring peace. This paper will first evaluate the existing academic literature on foreign aid programs and their varied impacts on recipient nations, locating opportunities to introduce new projects, then analyze and visualize data collected on the relationship between US foreign aid and a number of domestic variables for recipient nations, providing commentary and historical context in order to situate the economic, human, and sociopolitical trends within the wider national circumstances.

Literature Review

The complex nature of wide-reaching foreign aid distribution systems, especially programs like that of the United States, has required many researchers in the field to significantly limit the scope of their analyses into the effects of this aid. Scholars have approached this challenge from a variety of different angles, with some like Moreira (2005) focusing solely on the economic impact of foreign aid through economic growth indices (26). Other scholars choose to restrict the scope of investigation, with Findley (2018) only examining the effects of foreign aid on civil wars as exhibited through scholarly theory (361). Still others engage with the impacts of aid on specific levels of recipient countries; for example, Bräutigam and Knack (2004) specifically focus on foreign aid's effect on the good governance practices (256). These variations, while providing in-depth analyses of specific issues within the broader paradigm of foreign aid distribution, fail to consider the inherent interdependence of these factors. While they do acknowledge the multitude of elements that influence the effects of foreign aid, many of these scholars often isolate the impacts of aid and ignore the relationship between their respective fields of study.

Moreira's study on the economic impact of foreign aid uses real GDP per capita as a measure of national economic well-being, running multiple regression models in order to examine the relationship between economic growth and a series of independent variables including foreign aid (Moreira 2005, 33). This study incorporates other influential factors on economic growth including domestic savings, private savings, and population growth, as well as addresses both the micro and macroeconomic impacts of foreign aid in response to a number of gaps in previous studies (Moreira 2005, 36). This discussion effectively considers a number of interplaying factors in relation to economic growth; however, it does not acknowledge the direct and indirect sociopolitical influences. The study does not include any social or political independent variables, discounting the direct causal relationships between the two dimensions. Further, it does not consider how sociopolitical events and dynamics affect the study's selected variables, possibly ignoring some "root causes" of which the measured economic variables are mere manifestations. As a result, in attempting to compare the impact of foreign aid on economic growth in comparison to other influential factors, the study excludes underlying political and social elements that may be important to more fully understanding the relationship examined.

Findley's paper, on the other hand, attempts to limit the scope of the relationship between aid and its effects on recipient countries by explaining the effects of aid on the occurrence of civil war in recipients (Findley 2018, 360). The paper engages with various theoretical approaches to the relationship between aid, war, and peace, separating the concept of civil war into onset, dynamics, and recurrence. In doing so, it evaluates the direct, conditional, and indirect effects of foreign aid on all stages of war, including the postwar "peace" process (Findley 2018, 364). This paper highlights a variety of factors that touch on both economic and political aspects of aid distribution, including aid looting, reach of government and opposition to the "hearts" of people, and opportunity costs (Findley 2018, 367). However, the study operates on a theoretical level, only suggesting themes and approaches for future research based on their theoretical strength. As a result, the paper does not provide any guidance on how to measure its variables, a shortcoming that it acknowledges (Findley 2018, 377). Therefore, though it interacts with many facets of foreign aid paradigms, it fails to propose applicable methods of ensuring the complexity will be adequately addressed.

Bräutigam and Knack's study attempts to reconcile the conflicting gaps in Findley and Moreira's literature by associating a typically unmeasured phenomenon, namely, weak governance institutions, in measurable, economic terms of aid as a percent of GDP (Bräutigam and Knack 2004, 257). In doing so, the study equates the governance of a country to its economic sphere by drawing connections between the economic vitality and governmental proceedings of a country (Bräutigam and Knack 2004, 258). The study examines the relationship between economic decline, political violence and governance conventionally, but then controls for income and political violence in order to isolate the effect that aid, measured through Gross National Product (GNP), has on governance (Bräutigam and Knack 2004, 260). The study, despite its strength, still focuses on the more removed aspects of government. It contributes important information about the high-level effects of aid but does not look beyond the practices of a government into the effects that these practices have on its citizens. As a result, it only captures part of the narrative of foreign aid paradigms, failing to acknowledge the more "human" effects of aid.

This project seeks to begin the process of filling these gaps in existing literature. It examines a variety of national indicators across economic, human, and sociopolitical, targeting each facet individually and in conjunction with each other. Importantly, however, this project does not serve as a comprehensive study that fills every gap in the existing literature. Rather, it aims to better understand the multifaceted effects of aid in a quantifiable manner and in a way that presents opportunities for further research. Because of the broad scope of the project and its inherent limitations, this project will not present decisive conclusions on whether and how foreign aid programs influence peace and the peacebuilding process, only analyzing the statistical results and offering entry points to further enquiry.

Terminology and Methodology

This project uses a series of case studies to examine the dynamic relationship between US foreign aid and a series of measures regarding the economic, human, and sociopolitical statuses of recipient nations. The cases were chosen based on two factors: income levels associated with each country's GNI per capita, and consistency of aid allocation ("The World by Income and Region"). Illustrated in Table 1, these distinctions created a two-tiered system that allows for comparison across income levels, as well as illuminates the potential effect of inconsistent aid distribution between countries of a single income level.

Case Studies Separated by Income Level and Aid Gaps

	Low income	**Lower-mid income**	**Upper-mid income**	**High income**
Gap in aid (gap years)	Syria (1981-1993)	Nigeria (1976-1986)	Albania (1947-1991)	Canada (1961-1999)
No gap in aid	Burkina Faso	Honduras	Belize	Greece

(Table 1)

Additionally, this paper measures the effects of US aid on inflation, migration, and political rights and civil liberties. By studying inflation data sourced from the International Monetary Fund (IMF), the project can visualize the active change in the cost of living in a recipient country ("Inflation Rate"). This measure, unlike one like real GDP, conceptualizes the economic state of a country in terms of change, rather than static measures. This measure contextualizes each datapoint in reference to the country's own history, rather than in comparison to other countries, and allows for a more uniform comparison across countries. Consistent data regarding migration proved difficult to obtain. The United Nations (UN) releases data on the international migrant stock every five years, providing numbers of migrants from each country beginning in 1990 ("International Migrant Stock"). This dataset limited the scope of this paper to 1990, as no single agency has provided consolidated information consistent with the UN's data; therefore, in order to use one constant source of migration data, this paper employs only the official UN information, choosing to analyze data beginning in 1990. Finally, this project uses Freedom House ratings of political rights and civil liberties, in which numerical scores between one and 40 are converted into ratings between 1 and 7, where a higher rating indicates less freedom (Country and Territory Ratings and Statuses, 1973-2024"). This measure uses a series of questions regarding the rights and liberties in political and civil society, assigning a score to each answer and compiling these scores into "ratings." Much like Bräutigam and Knack's study, this paper uses a compilation of a variety of factors into simpler indices in order to more easily visualize the political and civil environments under examination.

When analyzing the regression models in order to examine the relationship between US foreign aid allocation and migration, inflation, political rights, and civil liberties, the expected regression coefficients vary based on measure. The regression coefficient represents how the changes in aid correspond to changes in the other specified variables. When positive, the coefficient indicates a direct relationship between more aid and the given variable as both increase together; a negative coefficient indicates an indirect relationship where one increases as the other decreases. Further, the "p value" of a regression model illustrates the statistical certainty of the relationship between the two variables represented in the regression coefficient. The p value measures the likelihood that the regression coefficient could be produced if the null hypothesis, which states that no relationship between the two variables exists, is true (Dahiru 2008, 22). P values range from 0 to 1, with lower p values signifying more certainty, meaning that the relationship between the two variables is less likely to be coincidental and more likely to indicate relational correlation. A p value less than .001 indicates a high degree of certainty, meaning the relationship between the variables likely signifies correlation, but not causation as the measure only tests against the null hypothesis. Conversely, a p value above .5 indicates that the relationship between the two variables is likely to be coincidental. Regression coefficients with p values lower than .05 are deemed "statistically significant," a term this paper will use often, because they indicate some degree of certainty regarding correlation between variables.

Finally, this paper conceptualizes US foreign aid in terms of both obligations and disbursements. Obligations refer to the amount of money pledged by the US government to another country. Obligations declare how much money the US intends to distribute to any given country (DBM 2012, 1). Disbursement figures, on the other hand, represent the amount actually paid by the government to these countries (OUSD(C) 2021, G-14). Disbursements, then, liquify obligations and serve as the practice of distributing aid, whereas obligations only demonstrate the promises of aid. This distinction will be referenced throughout the discussion of results, and the bivariate linear regression models will use obligation data because of its extensive availability. While the US government has published obligations reports since fiscal year (FY) 1947, it has only published disbursement data since FY 2001. Therefore, this paper will use the available obligations data as a generally accurate representation of US foreign aid policy, but will note major discrepancies between obligated and disbursed allocations. All aid amounts have been adjusted to constant US dollars.

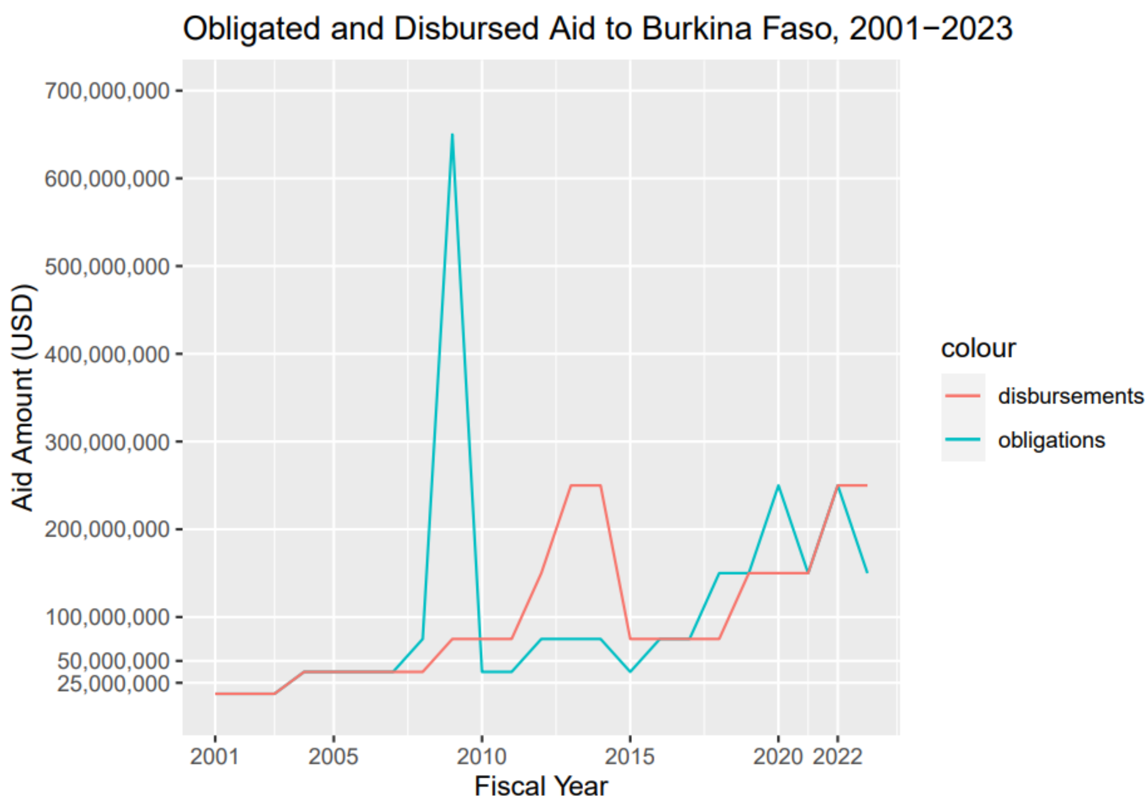
Results and Discussion

When discussing the results of the data visualization graphs as well as the bivariate regression models, this project will interact with the products both regarding the data collected and the wider contexts they operate in. By orienting the trends in aid distribution within their surrounding domestic and international environments and the notable events they coincide with, this paper can provide a more nuanced understanding of the political influences on aid programs. This broader context will then inform the examination of the more specific interactions between aid and the measures of economic, human, and sociopolitical implications in recipient countries in the form of inflation, migration, and political and civil freedoms. The dual approach this project uses attempts to unify the isolated dimensions typically reviewed in empirical research on foreign aid and provide a groundwork for further research. In order to engage with each case thoroughly, this project will examine the results of each country individually, then discuss the cross-country results later in this section.

Burkina Faso

Burkina Faso, located in Western Africa, is labeled by the World Bank as a low income country based on GNI per capita. The country has received constant US foreign aid since 1961 following its independence from France in August 1960 (Englebert 2004, 113). Generally, the country has received a steady amount of aid from the US. In FY 2009, however, obligated aid rose to over $650 million from just under $60 million the year before. This abrupt increase roughly corresponded with a period of heightened instability in the country’s inflation rate, which fluctuated from -.2% to 10.7% and back to .9% between 2008 and 2010, most likely as an effect of the global financial crisis and the 2009 floods that displaced 150,000 people (OCHA 2009;

Calvo 2010, 1). Despite the dramatic increase in obligated aid, though, this amount did not precipitate in disbursed aid. Though the US historically matched disbursements to obligations in Burkina Faso, it only disbursed roughly $67 million in aid in 2009, a break from preceding years' trends (Figure 1). In the following years, though, disbursed aid surpassed obligations, a trend opposite to the anomalous lack of distributed aid in 2009.



(Figure 1)

Though both migration and foreign aid trended upward between 1990 and 2023 and produced a regression coefficient of .001, the relationship between the two variables was not significant as the model's p value indicated a low degree of certainty, meaning that the relationship may be coincidental rather than correlative. In reference to inflation and political rights, the regression coefficient was either too small to detect or zero, which indicates no directional relationship. The lack of any relationship between an increase in US foreign aid and these variables is likely, therefore, because of the near-zero regression coefficient along with the large p value. Though US aid obligations to Burkina Faso increased over the period 1990-2023, inflation rates fluctuated around the same range, experiencing shocks due to the devaluation of the CFA franc in 1994, the 2008 global recession, and the 2020 global pandemic, but not trending upward as obligations did ("Background Information"). Similarly, the Freedom House political rights rating also did not improve as obligations increased, indicating the potentially non-existent relationship between the variables. In contrast, though the regression coefficient between US foreign aid and civil liberties was zero in the summary, it produced a p value of .01 (Figure 2). P values are only associated with non-zero regression coefficients, though; thus, the regression model must simply not reach enough significant digits to include the regression coefficient. US foreign aid, then, directly correlates with civil liberties to a statistically significant extent, meaning that as foreign aid increases, civil liberties worsened as the rating increased on the scale from one to seven.

`Table: effect of foreign aid on civil liberties`

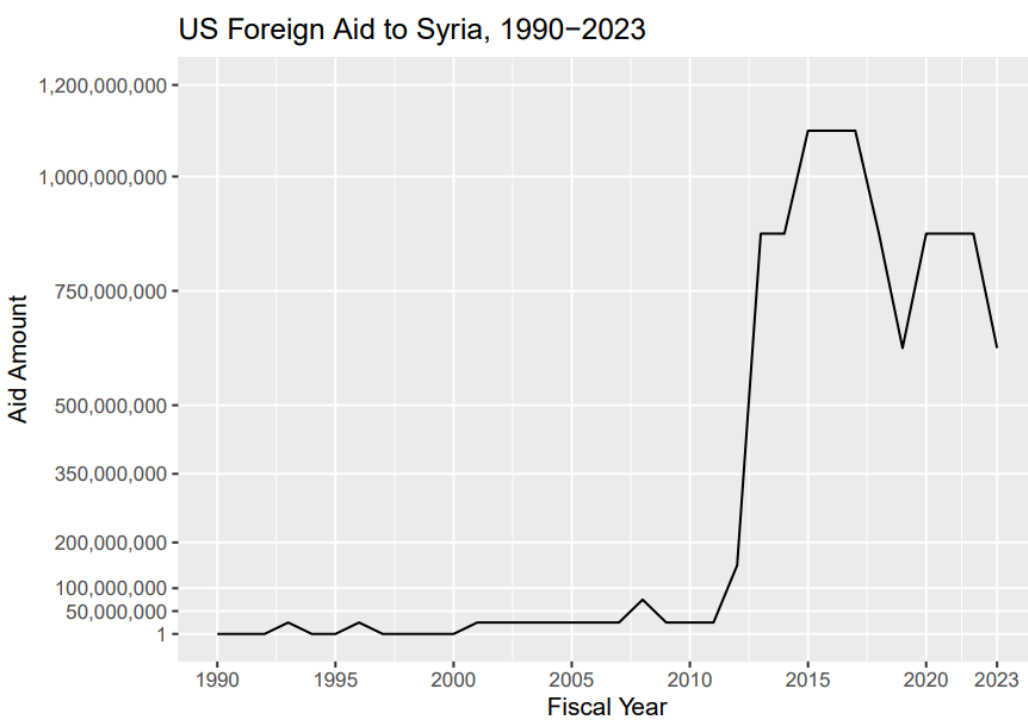
	(1)
US foreign aid	0.000**
	(0.000)
:————	———:
Num.Obs.	51
R2	0.052
R2 Adj.	0.033
AIC	177.3
BIC	183.1
RMSE	0.92

Note: ^^ + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

(Figure 2)

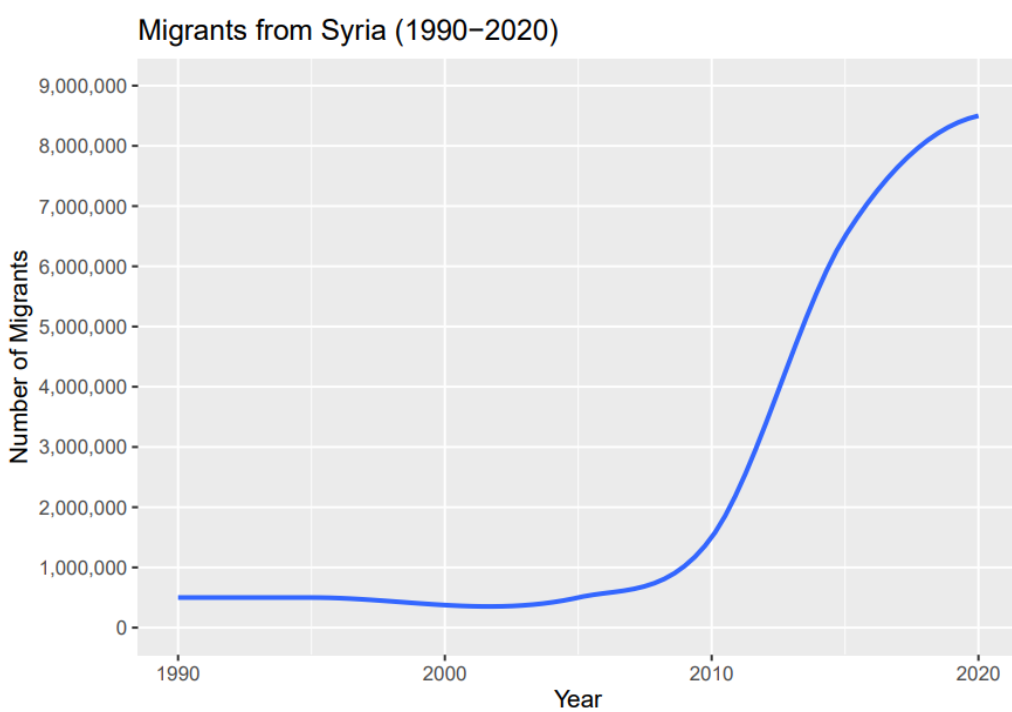
Syria

Syria, also considered a low income country by the World Bank, has received inconsistent flows of US foreign aid. Between 1981 and 2000, the US government authorized no aid obligations to Syria (with the exception of 1993 and 1996) as the Soviet-backed country supported Iran during the Iran-Iraq War (1980-1988) following Iran's 1979 revolution, and actively engaged with terrorist organizations including Hezbollah during and after the Lebanese Civil War (1975-1990) (Ali 2019, 4; Wastnidge 2017, 149). Throughout the early 2000s, aid obligations remained low, reflecting US-Syria relations (Figure 3). In March 2011, the ongoing Syrian Civil War began, sparking the "worst humanitarian disaster since the end of the Cold War" and prompting the US to increase aid obligations to the country from just under $34 million in FY 2011 to over $155 million in 2012 (Berti 2015, 41; Figure 3).



(Figure 3)

The dramatic increase in US foreign aid obligated in response to the outbreak of the war reflects the human consequences of the war, correlating with Syrian migration data. In the regression model between aid obligations and Syrian migrant numbers, a positive .006 correlation with a .05 p value indicates that the relationship between the two variables is significant to a low extent, meaning it is more unlikely than likely that the relationship was a product of coincidence. The positive correlation signals that as US foreign aid increased, so too did the number of migrants exiting Syria. Importantly, it is impossible to conclude if US aid mitigated the potential migrant flow caused by the civil war because of the incidental nature of the data collected. Still, the visualization of migrant populations bears striking resemblance to that of US foreign aid, drawing attention to the severity of the civil war and the efforts of the international community to provide assistance (Figure 4).



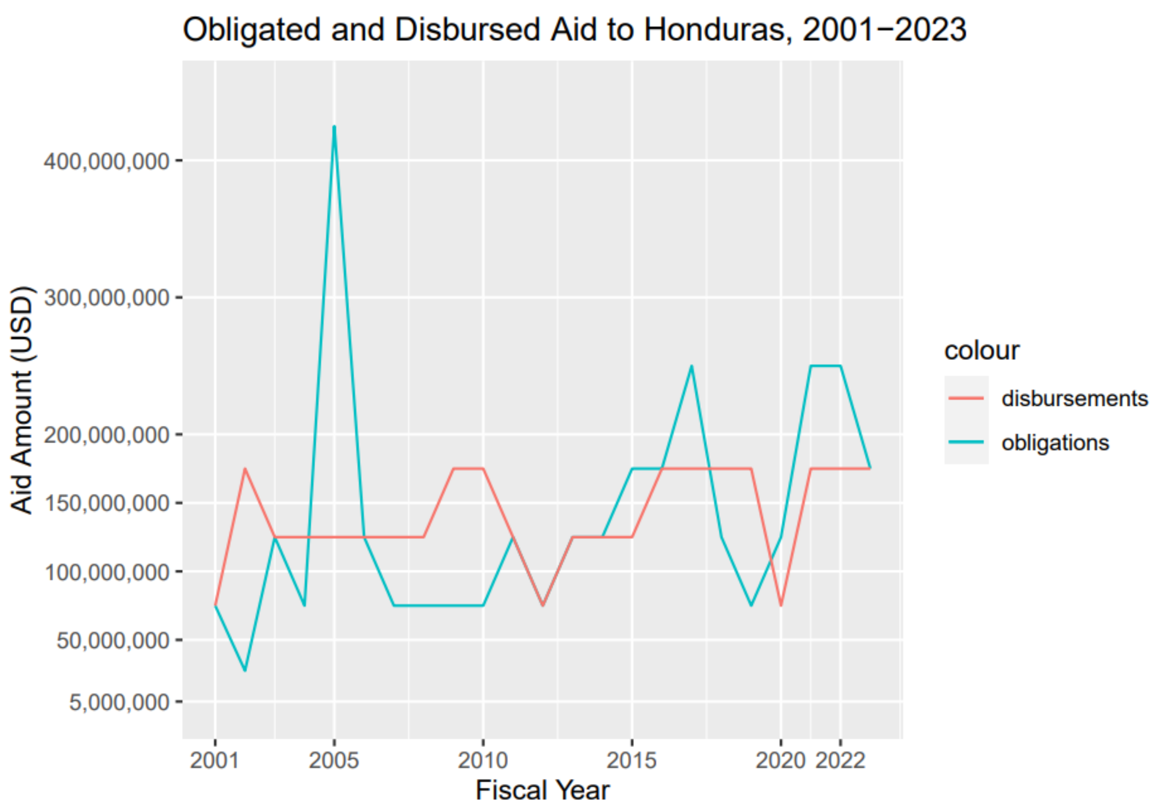
(Figure 4)

Syria stopped reporting inflation data in 2011 when the war began, limiting the amount of data available for the regression model and graph. However, various researchers have used different methods to visualize the economic consequences of the civil war, all pointing to the immediately disastrous effects the conflict has had on the country's economy. One study uses satellite data from a number of Syrian cities at night between 1992 and 2013 to both illustrate and estimate the magnitude of economic suffering (Giovannetti and Perra 2020, 8). Though concrete inflation data cannot be examined in relation to US foreign aid, its absence testifies to the political and civil environments in Syria, which only worsened with the outbreak of war. Inflation, political rights, and civil liberties all significantly correlate with US aid obligations to a limited magnitude, as the regression coefficients for each model did not capture the significant digits that represent their relationships, indicating that any relationship is very slight. Still, these results demonstrate the unwavering direness of the economic and sociopolitical situations in Syria even amidst the dramatic influx of US aid.

Honduras

The case of US aid to Honduras, a lower-middle income country, highlights the idiosyncratic nature of foreign aid programs. Though Honduras has received constant aid from the US since the Marshall Plan began in 1946, the country's economic, human, and sociopolitical trends appear contradictory and do not correlate in any way with the overall trend in US assistance. Since 1990, migration from Honduras has increased at a rate faster than the global average, trending in an expected way with the decreasing political rights and civil liberties enjoyed by citizens of the country. Over the same period, however, inflation has steadily decreased, slowly approaching the economically healthy 2% inflation rate. These contradicting trends highlight the complexity of measuring "peace" in a nation and the inability of simple statistical measures to convey a comprehensive understanding of national well-being, as Honduras's ongoing struggle with organized crime is not captured by these measures.

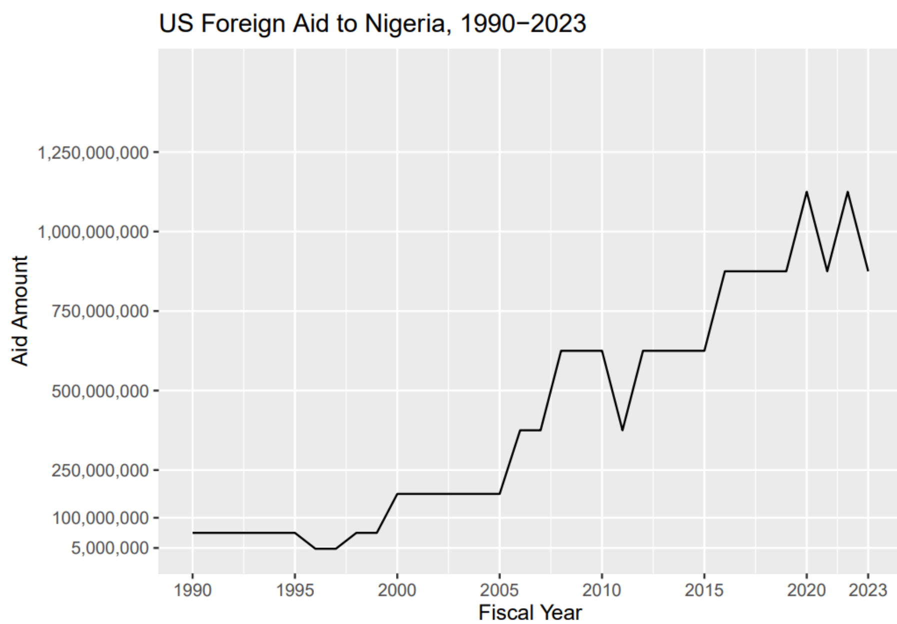
The 2005 spike in aid obligation to Honduras further contributes to the complexity of the US's foreign aid program in the country. In 2005, the US obligated nearly $420 million in aid to Honduras, an increase from the $95 million obligated in 2004 and $100 million obligated in 2006. However, the US disbursed between $100 million and $120 million in all three years, highlighting the discrepancy between obligated and disbursed aid. This disparity contributes to a larger trend of unmatched obligated and disbursed US foreign aid to Honduras (Figure 5).



(Figure 5)

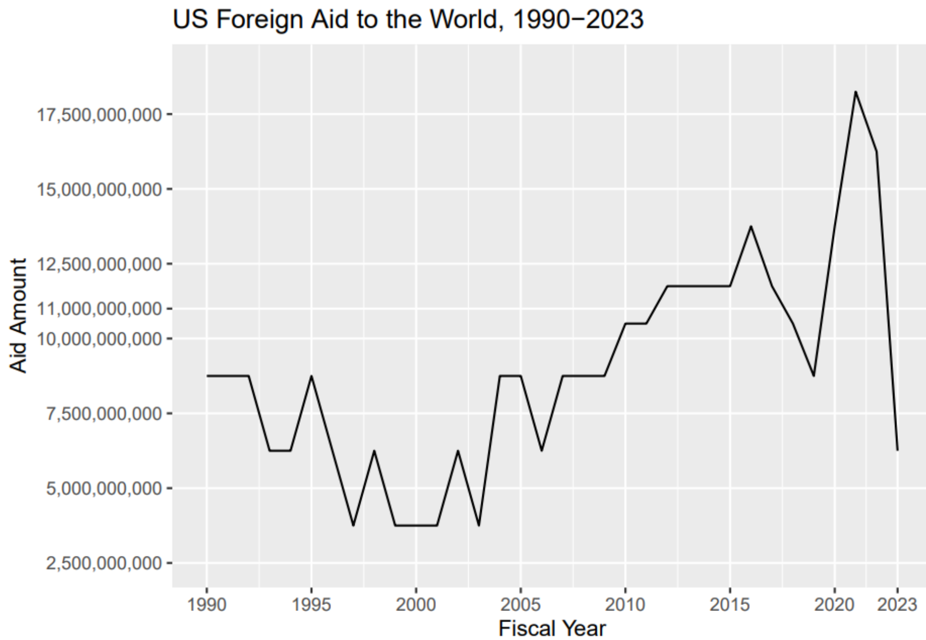
Nigeria

Nigeria, also a lower-middle income country, has received US foreign aid since 1952 with the exception of the 10-year period between 1976 and 1986. This gap precedes the term under examination, but can provide insight into the effects of a gap in aid on subsequent years.



(Figure 6)

Since 1990, US aid to Nigeria (Figure 6) has roughly reflected the worldwide trend (Figure 7), steadily increasing as more programs and categorizations of aid have been established since the turn of the 21st century.



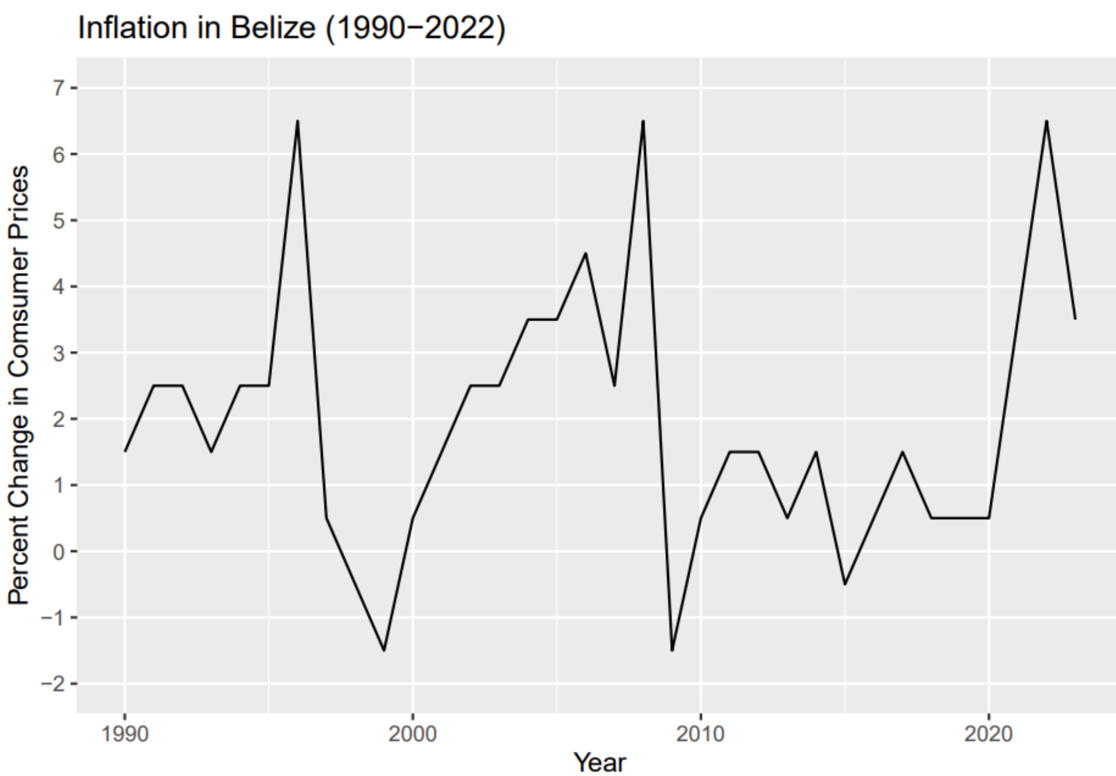
(Figure 7)

Nigeria's reflection of worldwide trends extends to migration patterns, as both the individual country and the world as a whole have displayed steadily increasing rates of migration since 1990. The regression model between aid obligations and migration produced a coefficient of .001 to a p value of less than .001, meaning that this relationship is highly unlikely to be coincidental. Therefore, there is a statistically significant correlation between migration and the amount of aid provided to Nigeria. However, the regression coefficient is positive, meaning that as aid increases, so too does migration, a correlation that does not support the goals of effective foreign aid strategies. Rather, it demonstrates how foreign aid often precipitates amidst circumstances that cause phenomena like increased migration, rather than before these events and crises occur. The regression test between US aid and political rights produced an r coefficient smaller than the summary displays, but that is highly statistically significant, possessing a p value of less than .001. Therefore, though the relationship between aid and political rights is slight, it is very likely due to real correlation rather than mere coincidence. The results, however, illustrate a direct relationship between the variables, and because of the significance of the Freedom House political rights ratings, this relationship demonstrates that as US foreign aid increases, political rights in Nigeria decrease.

Inflation data, on the other hand, though not available until 1996, does not significantly correlate to any extent with aid obligations. The lack of inflation data highlights the turbulent political and civil conditions of the country in the late 1990s and provides further insight into the politics of aid distribution. During the period that the US did not provide aid to Nigeria, the country experienced a series of military coups, undergoing constant regime change (Iyoha 2010, 166). In 1985, Major General Ibrahim Badamosi Babangida overthrew then-president Muhammadu Buhari and promised to encourage liberalization, democratization, and return to civilian rule after decades of military leadership in the country (Falode 2019, 39). This leadership transition corresponds with the reintroduction of US foreign aid to Nigeria, indicating the hopefulness with which the international community treated Babangida's regime. Babangida's government did facilitate liberalization in the country, opening industries to foreign investment and decreasing inflation rates for a period of time (Iyoha 2010, 171). Despite his pro-democracy rhetoric, however, Babangida quickly revealed his intent to remain in power and refrain from allowing the transition to civilian governance. Thus, though Nigeria experienced moderate improvements economically, they do not reflect the sociopolitical environment of the time.

Belize

The Central American country of Belize began receiving financial aid from the US in 1956 and has received aid every year since despite not gaining independence from Great Britain until 1981 (Jamail 1984, 15). Belize, an upper-middle income country, has received little aid relative to its neighbors. The country's Freedom House indices of political and civil freedoms indicate stability, as both ratings have remained "free" throughout the reported period, and migration has broadly reflected worldwide trends, not suggesting human crises that lead to increased migration. Despite these representations of stability, the country's economy has experienced alternating waves of inflation and deflation that deviate from the widely accepted healthy rate of 2% inflation (Figure 8).

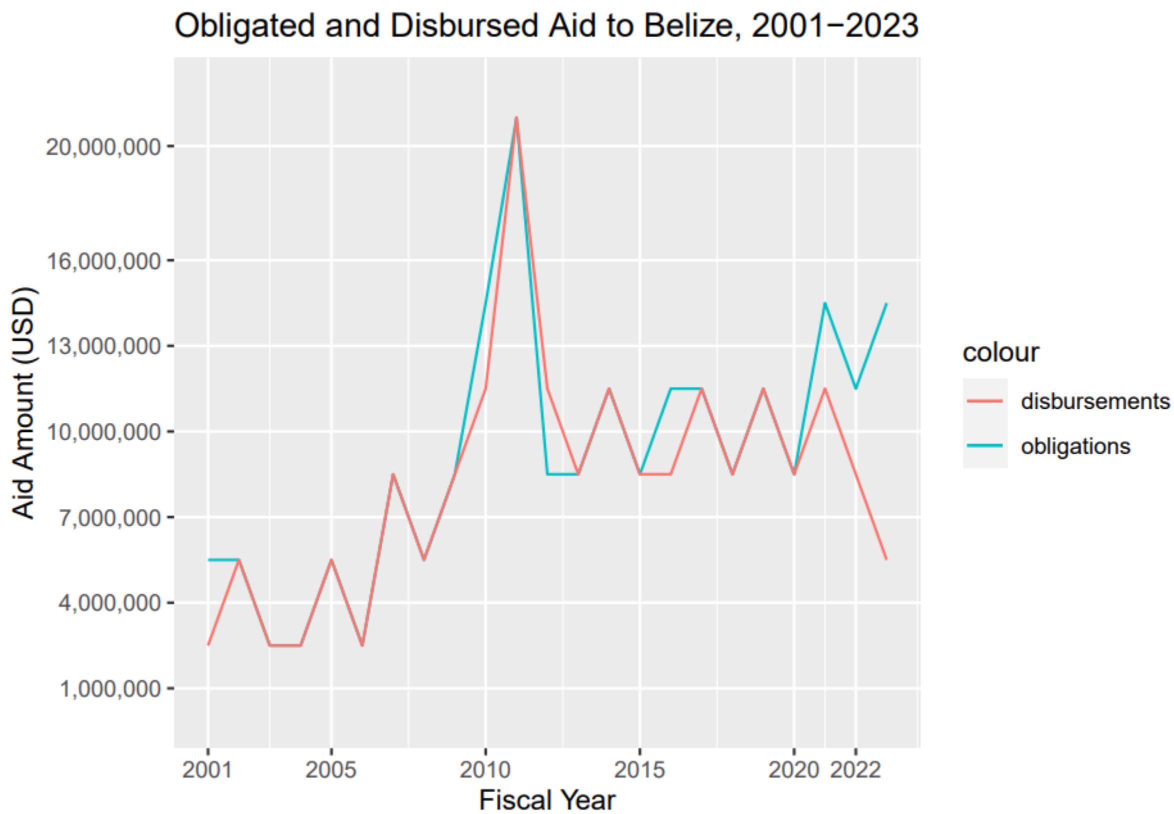


(Figure 8)

As illustrated in Figure 8, the country's inflation rate has repeatedly risen and crashed, rapidly sinking to negative levels that symbolize deflation in average consumer prices, then returning to inflated prices. This instability, not reflected in human or sociopolitical measures, demonstrates how the relative peacefulness of a country cannot be adequately quantified in one signifier as the existence of peace is multifaceted and complex, affecting every aspect of a country differently.

Notably, none of these contradicting measures correlated with US aid obligations to a statistically significant extent.

Regarding the distribution of US aid to Belize, the overall trend broadly reflects global trends in aid (Figure 7). However, one major anomaly disrupts the consistency with worldwide aid statistics. In 2010 and 2011, the US obligated $13 million and $20 million respectively, a disproportionate increase in the gradual upward trend. This dramatic increase in obligated aid, which had remained below $10 million since 1993, may have been sparked by widespread flooding of the country in May 2008 caused by two tropical storms that struck the country within the month (United Nations 2008). In 2009, the government of Belize requested emergency funding from the IMF in response to the looming economic crises caused by the floods' destruction of critical infrastructure and market provisions (Western Hemisphere Department 2009, 6). These impacts would strongly affect Belize and its economy, especially considering the country's heavy reliance on imports and its low export amounts (Export.gov 2019).

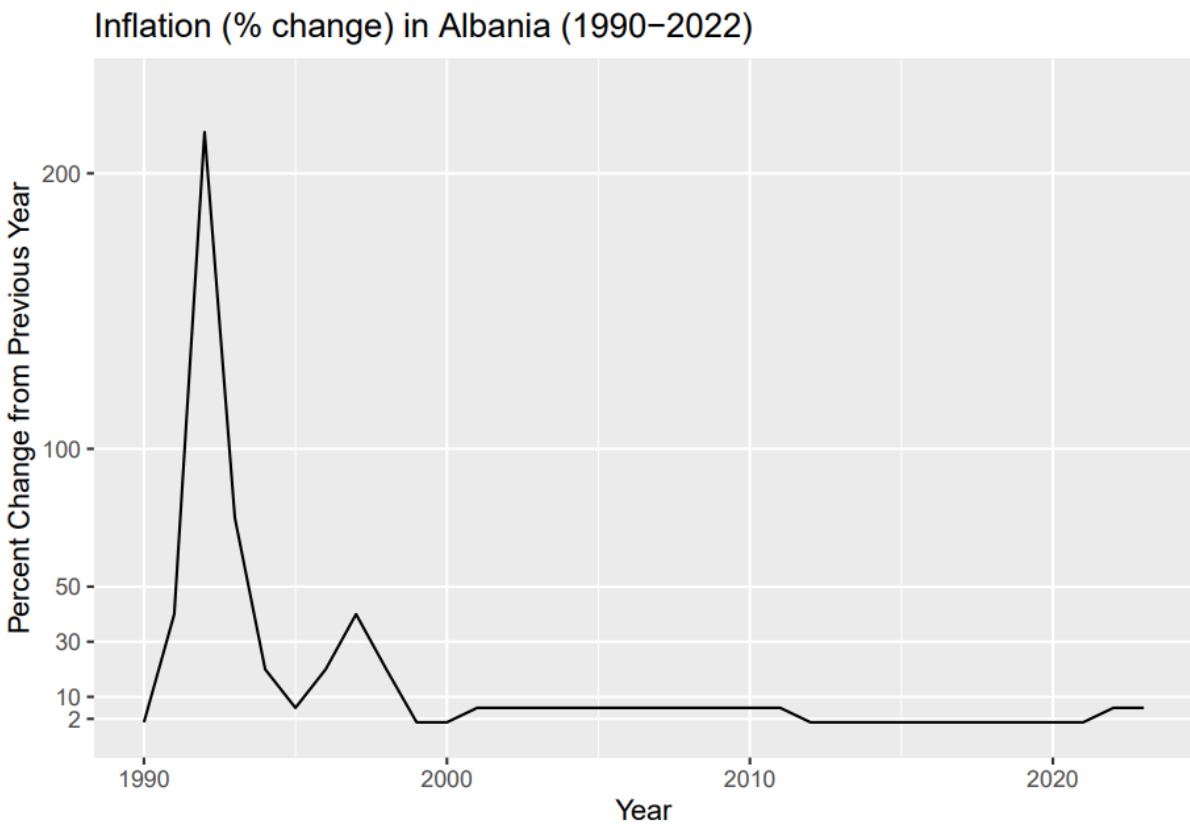


(Figure 9)

Notably, the US has historically matched obligations and disbursements closely, fulfilling all legal requirements for aid provision (Figure 9). The reliability of US foreign aid to Belize and the human and sociopolitical stability of the country reflect the generally stable relationship between the two nations. Because of the relatively balanced, secure state of human and sociopolitical aspects of the country, Belize appears to be very peaceful. However, the country has battled widespread gang violence and organized crime for decades. The country has one of the highest homicide rates in Central America owing to gang violence; still, organized crime and gang violence has been largely neglected in academic and political investigations (Baird 2019, 2). This oversight demonstrates the complexity of "peace" in a country, as many of Belize's indicators reflected a healthy, peaceful country, while entirely ignoring its largest challenge for peace.

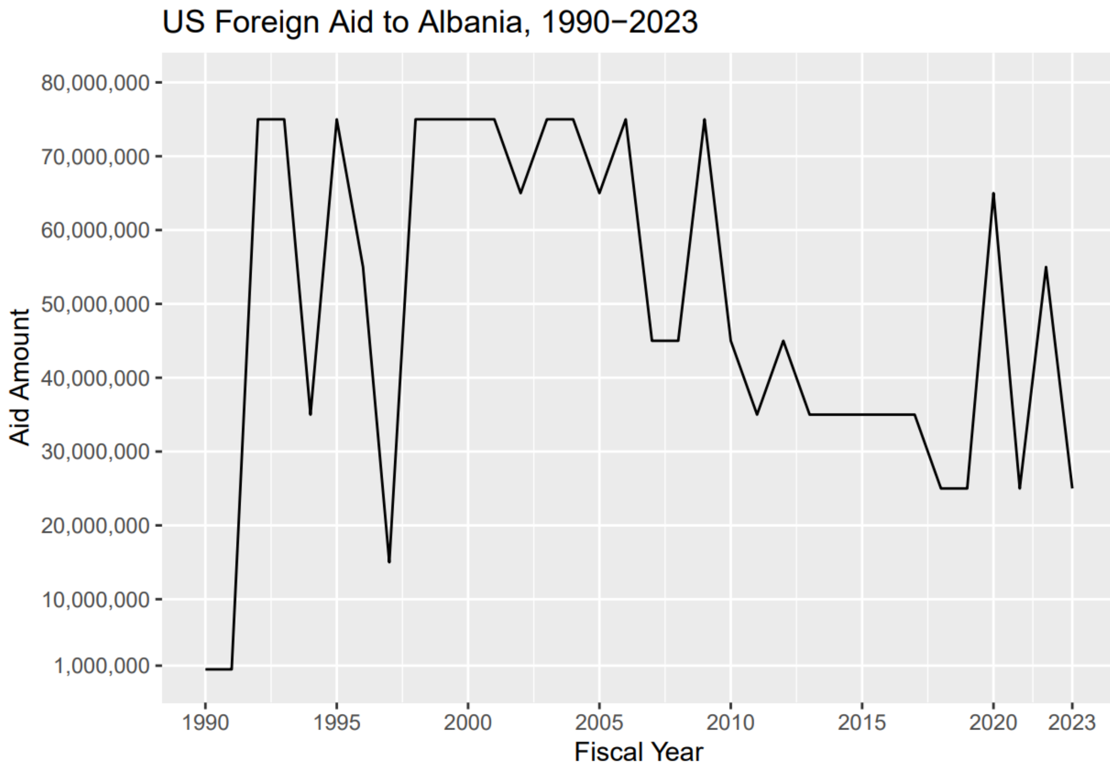
Albania

Albania, an upper-middle income country in Eastern Europe, received US foreign aid at the initial iteration of the US Marshall Plan in 1946, but stopped receiving aid in 1948. The US resumed aid provision to Albania in 1991 amidst the fall of the Soviet Union. Notably, however, communist Albania terminated diplomatic ties with the Soviet Union in 1961 in fears that warming relations between the USSR and Yugoslavia would threaten Albania's sovereignty, instead establishing close ties with China (Marku 2017, 367). The pause in aid, then, was not due to Albania's membership in the USSR specifically, but rather its own communist government. In 1991, the country held parliamentary elections after a period of intense instability and violence, unsteadily transitioning to liberal democracy (Human Rights Watch 1992). That same year, the US resumed foreign aid obligations to Albania, reflecting the US priority of global democratization, especially in the years following the collapse of the Soviet Union. Unsurprisingly, Albania's transition from communism to democracy during the 1990s was marred with conflict and instability as reflected in migration, inflation, and Freedom House data. Inflation spiked to over 200% in 1992 following an overhaul in the country's economic policy, and the shifting political and civil freedoms changed in response to discontent with each government's efforts at transition. However, by 2000, the country's inflation rate was relatively stable, largely remaining under 5% since the turn of the century (Figure 10).



(Figure 10)

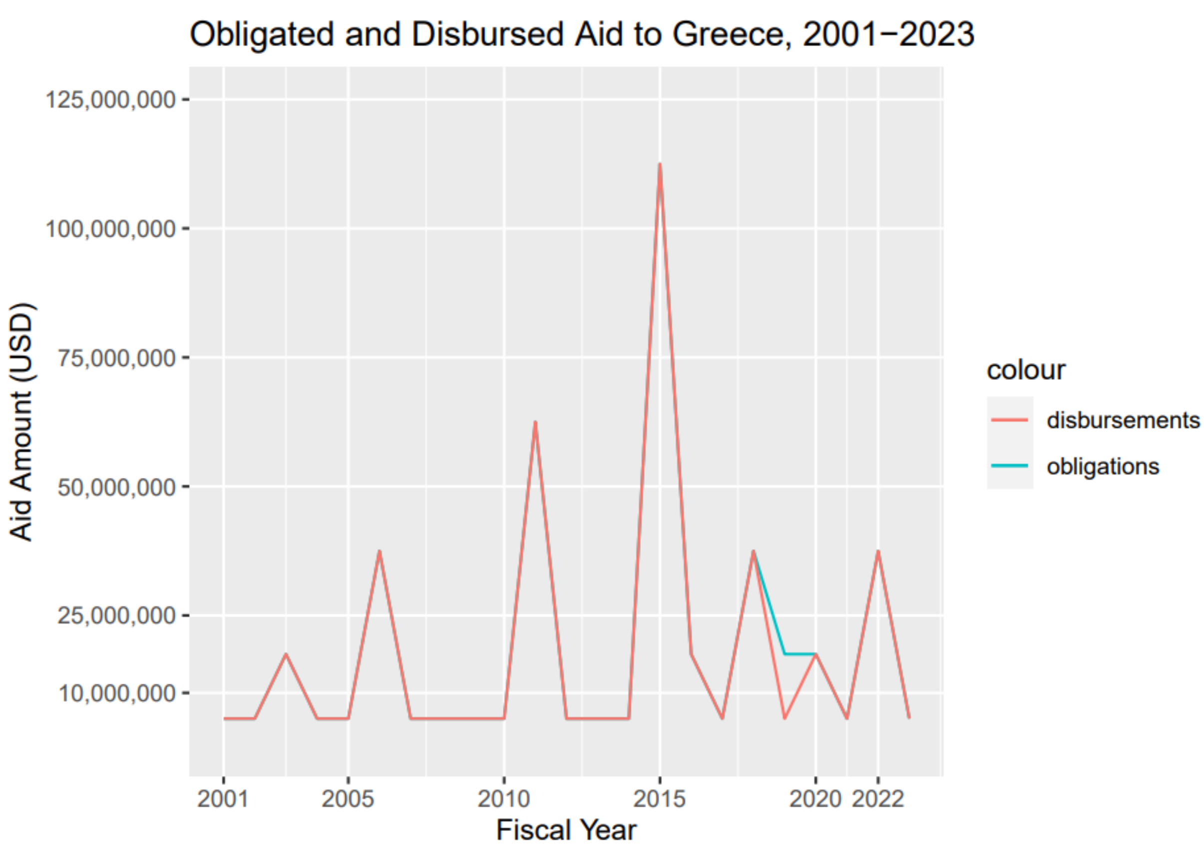
In response to the increasingly stable conditions in Albania, US foreign aid gradually decreased throughout the 2000s, only peaking in recent years in response to the 2020 COVID-19 pandemic (Figure 11). This trend opposes global rates, as the US has steadily increased its allocations of aid; therefore, Albania's decreasing reliance on US foreign aid, and its increasingly stable economic, human, and sociopolitical realms illustrate the philosophy behind aid programs, through which countries establish lasting, stable conditions with the temporary help of foreign assistance. Finally, the regression models produced no statistically significant correlation between aid and any measures, and only the regression between US aid and migration produced a detectable regression coefficient, generating a .003 coefficient, but not one that indicates potential correlation.



(Figure 11)

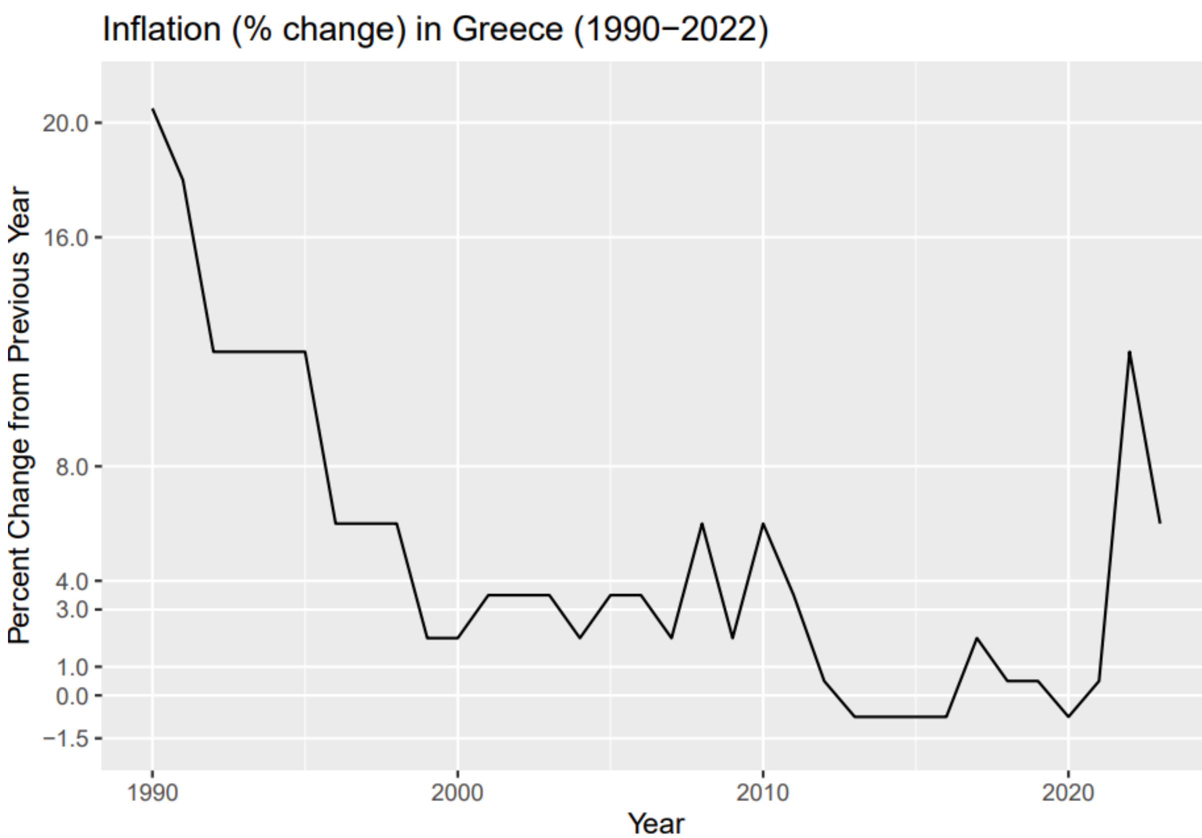
Greece

The case of Greece, a high income country according to the World Bank, demonstrates the complexity of both the classification methods used in the international community, but also the fragility of national peace. Greece has consistently received US foreign aid since the beginning of the Marshall Plan in 1946. At the conclusion of the Marshall Plan in 1996-1997, the amount of aid provided to the country dramatically decreased from over $600 million in a year to just under $10 million between 1993 and 1998 (US Embassy & Consulate in Greece). Since 2000, the US has provided aid sporadically, obligating significant amounts of aid in isolated packages without an overall upward trend of assistance. Further, each aid spike has been met with the appropriate disbursement, indicating the reliability of the US to physically provide aid obligated (Figure 12). Every regression model demonstrated the weak influence of US aid obligations on any measured values, as all tests resulted in regression coefficients near enough to zero that their significant digits were not represented in the summary. However, the models for inflation and political rights both indicate significance, assigning certainty to the slight, but direct, correlation between each variable and obligated US aid.



(Figure 12)

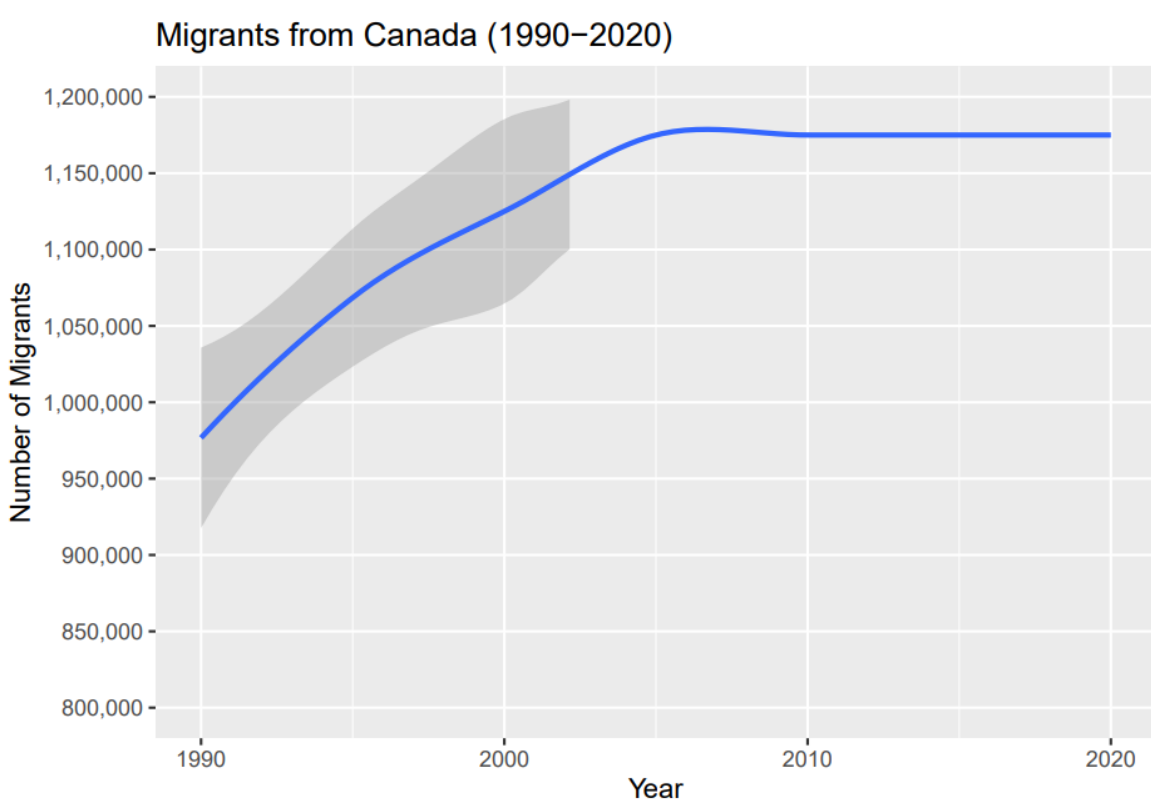
Despite the designation of Greece as a high income country and the relatively low amount of aid provided by the US, Greece has experienced a number of crises. Most notably, Greece was the first “developed” nation to default on a loan from the IMF (Rice 2015). Before this, in both 2010 and 2012, the IMF bailed out Greece in hopes of reviving its economy; however, both failed (Roberts 2015). This instability is reflected in the country's inflation rate, which recovered from extremely high rates throughout the 1990s, but growing increasingly unstable, eventually resulting in extended periods of deflation (Figure 13). This pattern coincides with migration, which decreased throughout the 1990s and early 2000s, but began to rapidly increase in 2010 amidst constant financial crisis. In response, US aid obligations rose from under $75 million in 2014 to $104 million in 2015 and over $150 million in 2016. However, just as quickly as aid increased, it decreased, returning to just over $1.6 million in 2017. Despite the dramatic differences in obligated aid between years, disbursements have largely met these changes, demonstrating US commitment to providing liquid funds to support Greece.



(Figure 13)

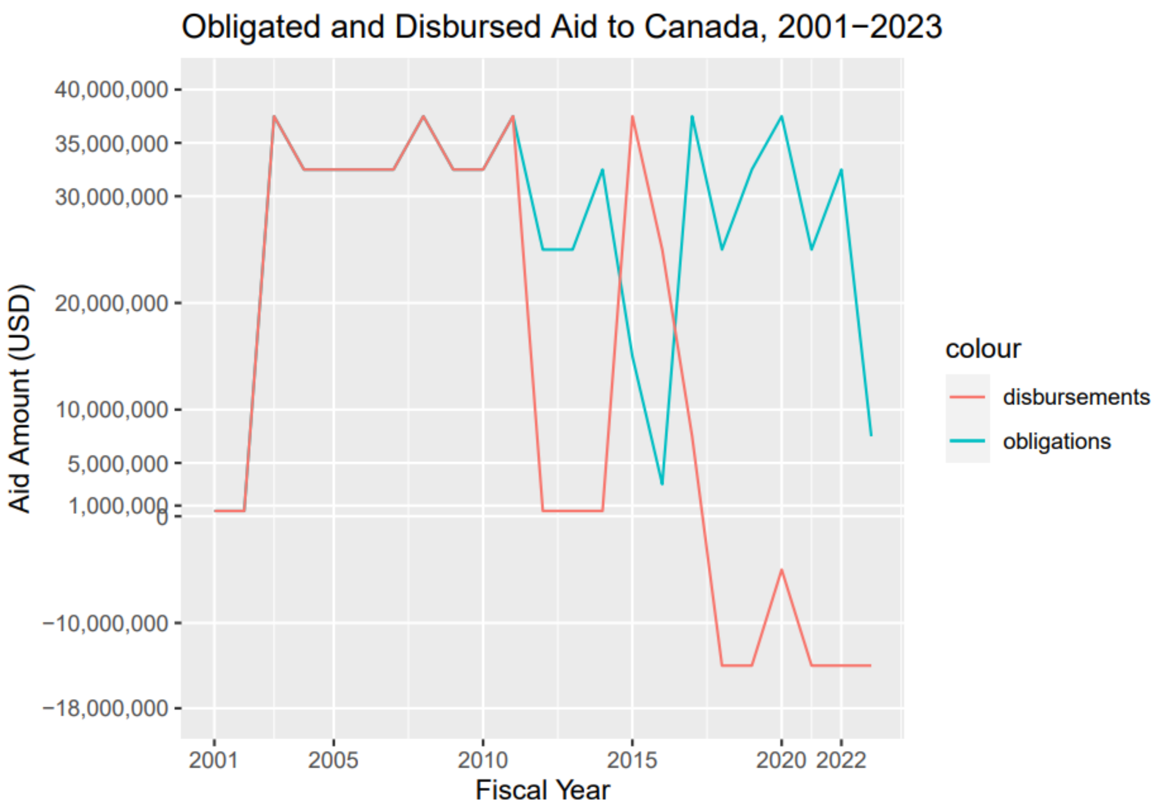
Canada

The activity of US foreign aid in Canada highlights the somewhat counterintuitive nature of foreign aid paradigms. Inflation, as well as political and civil freedoms in Canada all reflect remarkable stability throughout the entire period studied, lacking significant outliers in overall trends or unexpected changes. Migration, after a period of steady increase in the 1990s, leveled out by 2005 and has since remained stable, the only measure that changed over the period of study (Figure 14). The trend in migration correlates with obligated US foreign aid, which, after a pause in 1961, resumed in 1999 and has broadly remained at a steady level for the past 20 years (Figure 15). The regression model between US foreign aid and migration in Canada produced a regression coefficient of .005 with a p value of .05, indicating a direct relationship to a low level of certainty.



(Figure 14)

Though the US resumed aid obligations to Canada in 1999, it did not provide a substantial amount until 2003 when it obligated $36 million, in contrast to the $62,000 obligated in 2002. The spike in foreign aid to Canada possibly reflects the US response to the Severe Acute Respiratory Syndrome (SARS) outbreak, during which Canada was the most affected non-Asian country (Ries 2006, 44; Figure 14). Since 2003, obligations have remained high; however, these levels of obligations do not reflect disbursements.



(Figure 15)

As illustrated in Figure 15, disbursed and obligated US aid to Canada generally coincided with each other until 2012, when the US obligated $29 million, but only disbursed $134,000. This divergence only continued in subsequent years, with Canada repaying the US, as indicated by the negative disbursement figures. Interestingly, the US continued to obligate significant amounts of aid to Canada only to receive "refunds," illustrating the confusing dynamics of foreign aid programs, especially considering Canada's relative stability.

Cross-country Analysis

Few patterns emerged in the regression models across national income levels and the presence of "gaps" in US obligated foreign aid. Countries within the same income level received differing amounts of aid and produced statistically significant results for different variables. For example, Syria received as much as $430 million more aid than Burkina Faso, though both are considered low income countries by the World Bank. Further, the regression models run for Syria produced statistically significant results for all measured variables, while the model for Burkina Faso only produced one significant result. Only the upper-middle income countries, Belize and Albania, produced coinciding regression results, with neither country's measures correlating with US foreign aid obligations. Ironically, the only similarity between countries of the same income level was the lack of influence US foreign aid had on the economic, human, and sociopolitical variables selected. These results draw attention to the complex and often inconsistent effects of aid on recipient countries. Further, they highlight the difficulty of case selection, as even within the countries of similar income levels, great diversity in conflict, culture, economy content, and political style may cause the diverging and irregular statistical results.

Conclusion

Because of the relatively broad scope of this investigation, this project serves as a very broad introduction into the complex system of US foreign aid allocation and its connection to the measures of "peace" in recipient countries. The results of the data visualization and regression models of this project demonstrate that not only it is difficult to conceptualize peace in empirical, simplified figures, but also that the relationships between the economic, political, social, and human spheres of a nation are dynamic, contradictory, and inherently interconnected.

This project has produced minimally significant results in the regression models, which compared the trends of US foreign aid to each marker of "peace." Though they did not produce conclusive results, the regression models can be improved upon by controlling for potential lag in aid effectiveness like Moreira's study did. This would allow for the time it takes for provided aid to affect the elements of peace, rather than running simple regressions that consider only immediate statistics. Still, across half the selected countries, the direct correlation between US foreign aid obligation and political rights was statistically significant, indicating a relationship between the two unlikely due to coincidence. This correlation provides opportunity for further inquiry into why the deterioration of political rights correlates with an increase in obligated US foreign aid, and whether aid plays a mitigating or exacerbating role in the political environment of a nation.

Additionally, in further research more specific units and measures can be used in order to more precisely consider the elements and dynamics of peace and foreign aid paradigms. Data from USAID that breaks down aid provided based on military, humanitarian, and economic, along with each project designation will allow for a more specific description of the intentions behind aid, and where they are allocated to. Additionally, elements of political corruption, efficiency of aid reception, the occurrence of war, and allocation to different targets like national governments, private companies, local NGOs, will focus on the effectiveness of aid on its specific targets, rather than on a country in total. Overall, though, this project introduces themes and trends that should be explored deeper in further research, opening opportunities for peace studies to develop.

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