Foreign Aid and Global Poverty

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Abstract

Beginning in the 1970s, there was a substantial increase in the amount of foreign aid given to developing countries. While this aid was given for a variety of reasons, two primary reasons were to encourage economic growth and reduce poverty. Much has been written about the impact of foreign aid on growth, but little on poverty. To expand the literature on poverty, this paper examines the impact of foreign aid on both economic institutions and poverty rates. The findings indicate that foreign aid does not exert a significant impact on either economic institutions or reductions in poverty rates. This result suggests that foreign aid, as currently practiced, is ineffective at reducing poverty or promoting market based reforms in developing countries.

1. Introduction

A primary goal of foreign aid is to alleviate poverty in developing countries. During the past several decades, vast sums of foreign aid funds have been transferred to developing countries. This paper seeks to empirically determine the impact of foreign aid during 1976-2005 on the poverty rate in developing countries during recent decades.

There is a vast literature on the subject of foreign aid. Much of this work focuses on weather foreign aid is growth enhancing. The findings of this literature have varied greatly. Evidence exists that aid facilitates economic growth. Others have found inconclusive statistical results, while still others have found that aid has a negative impact on growth. Recent influential work by Rajan and Subramanian (2008) indicates that a statistically significant relationship between aid and growth is difficult to find. Public Choice theory suggests why this may be the case. Developing countries often have poor governing institutions and high levels of corruption. As a result, a sizeable portion of aid funds may be lost to rent seeking and other nonproductive activities. In addition, modern growth theory stresses the importance of institutions supportive of economic freedom. Pressures for constructive reforms often stem from poor economic performance. Provision of aid to countries experiencing sluggish growth or reductions in income levels may reduce the likelihood of growth enhancing institutional reforms.

The link between foreign aid and economic growth is important and has been well researched. The relationship between aid and poverty is equally important, however, it is less developed in the current literature. Using data for the period 1976-2005, this paper attempts to develop this literature by examining two questions. First, has foreign aid exerted any impact on economic institutions supportive of economic freedom? Second, has foreign aid had any impact on reductions in the extreme and moderate poverty rate during 1980-2005?

The results of this analysis indicate that foreign aid did not exert a significant impact on changes in economic institutions or reductions in poverty during the period. This was the case after controlling for initial economic institutions, political institutions, geographic factors, and unobserved time-varying effects.

2. Foreign Aid and Growth

The literature on foreign aid and growth is massive, spanning more than fifty years and covering both theoretical and empirical analysis. In order to accomplish a manageable review of this literature the focus will be primarily on the most recent empirical papers. Several non-empirical papers will be discussed as they provide theoretical insight for aspects of the empirical results.

Before the flurry of empirical work on aid and growth, the aid literature was strongly supportive of the idea that aid was necessary for growth in developing countries. The two lone dissenters of this orthodoxy were Peter T. Bauer and Milton Friedman. The orthodoxy at the time held that poor countries were poor due to an insufficient savings rate. This was known as the savings gap and is best understood in the context of the neoclassical growth model. In this model the difference in the steady-state income levels of countries is a result of differences in savings rates. Therefore, it was believed that if this savings gap was filled with outside aid, developing countries would "take off" due to increased growth rates in the short run and transition to a higher steady-state income level. Verifying whether this theory held was difficult due to a lack of empirical data on aid flows. That changed in the mid 1990s when data on foreign aid became available for a large number of developing countries.

Table 1 lists the papers that used this aid data to examine the relationship between aid and growth between 1996 and 2011.[1] In total 27 papers empirically investigated the aid-growth relationship. Fourteen found statistical results which suggested that aid was growth enhancing, with the results often conditional on good policies or geographic factors. Eight concluded that neither a positive nor negative statistically significant relationship existed between aid and growth. And five found statistically significant evidence that aid inhibited growth. This volume of papers with conflicting results in such a short time span (16 were published between 2000 and 2004) implied that there was no general consensus regarding aid and growth. In addition, many of the papers used different specifications and examined different time periods limiting the comparability of the results. This allowed aid policy makers to choose studies that supported their particular position.

Rather than review each empirical paper, this discussion will focus on the most influential. Boone (1996), the first such paper to perform an empirical analysis with aid data, did not find a statistically significant relationship between aid and growth but did find that aid was fungible. Poor countries demonstrated statistically significant increases in government consumption as a result of increased aid flows. In addition, the results suggested that governments with better policies – those where aid flows were less fungible – might be better candidates for the receipt of aid. Burnside and Dollar (2000) showed that there was a statistically positive relationship between aid and growth in countries with good policies. They performed a panel analysis over the period 1970-1993 with data averaged over four-year periods. They found that a standalone variable for aid was insignificant in the regressions, but that aid interacted with a quality of

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[1] Five of these papers looked at income level, income inequality, poverty, or health measures rather than growth. See the note of table 1 for more details.

government policy measure was positive and significant.[2] At the time the current trend in the aid

community was to provide aid in the form of Structural Adjustment (SA) loans. These SA loans

were given with a share of the money up front and the remainder contingent upon various

government reforms. Burnside and Dollar argued that their result suggested that SA loans were

ineffective for promoting growth. Instead, they argued that the aid community needed to be

selective and channel aid to countries that already had good policies.

The Burnside and Dollar paper was extremely influential in the aid community. It provided

the impetus behind the Millennium Development Corporation, was used as justification for

doubling aid flows (Easterly, 2003), and was responsible for a shift in the approach of the aid

community from SA to selectivity. However, subsequent work by Easterly, Levine and Roodman

(2004) and Easterly (2003) found that the Burnside and Dollar result was not robust. They

demonstrated that the statistical significance of the aid-policy interaction term disappeared when:

additional countries were added to the data set, both the time period and time horizon were

changed, alternative measures of aid were used, and alternative measures for good policy were

used. In short their empirical results suggested that neither SA nor the selective use of aid would

lead to growth in poor countries.

As table 1 illustrates, subsequent papers failed to reach an unambiguous conclusion

regarding the aid-growth question. There were also differing conclusions among papers where

aid positively influenced growth. Burnside and Dollar (2000) argued that aid contributed to

higher growth rates in countries with good policies. This was subject to diminishing returns,

however. Dalgaard, Hansen, and Tarp (2004) found that aid was growth enhancing in countries

with favorable geographic characteristics. And Dalgaard and Hansen (2001) found that aid

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[2] Burnside and Dollar aggregated central government budget surplus, a measure of inflation (M2/GDP), and the Sachs-Warner trade openness index into a policy index.

contributed to growth regardless of the policy environment. Comparability across these results was difficult, however, due to differing specifications, time periods, and explanatory variables. In addition, time periods as short as four years were used restricting the relevancy of the results to the short run.[3] Rajan and Subramanian (2008), (hereafter referred to as RS), addressed these shortcomings with their influential paper. They emphasized that a general empirical specification was needed to test the differing conclusions of the literature. They also stressed that short run analysis failed to account for the influence of business cycle fluctuations. More importantly they argued that it was the long run impact of aid that mattered, not the short run.

To ensure comprehensive results, RS conducted both cross-section and panel data analysis. Time periods no shorter than ten years were used so as to focus on the long run impact of aid. In addition, IV estimation was used to account for any endogeneity between aid and growth. Using this specification they were unable to find any evidence supportive of a positive or negative statistical relationship between aid and growth. This included whether aid was effective conditional on policies or geographic factors. In concluding their analysis, RS suggest a theoretical justification for why one would expect an insignificant impact of foreign aid on growth. Assuming that at least a portion of foreign aid is used productively, one should expect an impact on growth no greater than that of typical investment funds. Estimates from empirical growth regressions indicate that the coefficient of the investment to GDP ratio is roughly 0.03. This implies that a one percentage point increase in the investment to GDP ratio corresponds to a 0.03 percentage point increase in the growth rate. This is a small impact and one that is most likely hidden in noisy data or measurement error. Therefore, RS suggest that the absence of a robust statistical relationship between aid and growth is unsurprising.

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[3] For example see Burnside and Dollar (2000) and Collier and Dollar (2002).

This result adds weight to the view that foreign aid, in its current form, has been an ineffective tool for producing economic growth in developing countries. This leaves open, however, the possibility that aid, if implemented differently in the future, might facilitate economic growth in the developing world. However, there are several reasons why aid, even if implemented differently, may be largely ineffective in promoting growth.

First, institutions consistent with economic freedom are lacking throughout much of the developing world. The growth literature suggests that institutions more consistent with economic freedom are a major determinant of growth, prosperity, and poverty reductions (Berggren 2003; Connors 2011). Therefore, it is unlikely that aid can promote growth in an institutional environment that is largely inconsistent with both growth and poverty reduction.

Second, Vasquez (2003) suggests and Pitlik and Wirth (2003) find evidence indicating that countries often undertake productive reforms in response to various crises. If this is true then aid, which is often given to recipient countries in a time of crisis, could soften the impact of a crisis and reduce the need for productive reforms. In short, aid may reduce the urgency for reforms that lead to increased economic freedom.

Third, the primary goal of the international aid agencies is to move as much aid as possible from developed countries to those that are less developed. This is evidenced by the former head of the World Bank urging a doubling of aid flows (Easterly 2003) and the constant push by international aid organizations for the developed world to meet the 0.7% target.[4] Aid agencies forfeit the ability to promote productive reforms in developing countries when maximizing aid flows is their primary objective. Any attempt to use aid as a carrot is correctly perceived by recipient countries as not credible. This interaction between aid agencies and recipients has been

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[4] The 0.7% target is a goal where 0.7% of the developed world's GNP is directed toward aid (Official Development Assistance more specifically). See the website of the Millennium Project, "the 0.7% target: An in-depth look": http://www.unmillenniumproject.org/press/07.htm

described as a ritual dance (Vasquez 1998). The aid agencies structure the aid package in such a way as to encourage reform. The recipient country promises reform, but reneges once the aid has been disbursed. The dance repeats so long as the primary aim of the aid agencies is "moving money" (Easterly 2003).

While this is by no means an exhaustive list of why aid may be ineffective in promoting growth, it does highlight several flaws underlying the motivation for aid.

3. Foreign Aid and Poverty

Rajan and Subramanian (2008) found no statistically significant relationship between foreign aid and long-term economic growth. This does not imply, however, that the same is true for aid and poverty. Quite often aid is channeled to poor countries for the alleviation of poverty. The Millennium Development Goal of using aid to halve the percentage of people living in extreme poverty between 1990 and 2015 is such an example. In addition, humanitarian aid is sent to countries during times of natural disasters to assist the poor. The possibility that aid can have an impact on those living in poverty is very real. On a trip to Ethiopia, William Easterly, a former economist for the World Bank, witnessed one such example.

> … I visited a project of a British aid organization called Water Aid, which
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> receives funds from official aid agencies. Water Aid has put in a water pipe to
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> carry clean water from springs on top of the mountains bordering the Great Rift
>
> Valley to villages down in the Valley. The project was run entirely by Ethiopians,
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> with representatives from the villages on the board of the agency. At a bustling
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> water tap in one village, the villagers watered their cattle and collected drinking

water for a nominal fee paid to Water Aid, to be used for maintenance of the

system. Previously, the villagers had walked every other day two miles to collect

water from a polluted river that transmitted disease. Children had been kept out of

school, farmers kept out of farming, all to pursue the all-consuming and back-

breaking task of fetching water. With the new water pipe, life was better (Easterly

2003, 40).

While reducing poverty in the developing world is a significant impetus for aid, very few

papers have examined the relationship between aid and poverty.[5] Collier and Dollar (2002) were

the first to explore this relationship and based much of their analysis upon the results of Burnside

and Dollar (2000), which found that aid facilitated growth in countries with good policies.

Collier and Dollar indicated that aid, operating through increased economic growth, was

responsible for lifting approximately 10 million people out of extreme poverty each year. They

argued that aid could be more effective if it was allocated according to the quality of policies in

recipient countries. If the aid agencies adopted their aid allocation strategy they believed roughly

19 million people could be lifted out of poverty each year rather than 10 million.

Chong, Gradstein, and Calderon (2009) used the second-generation World Bank poverty

rates to examine the impact of aid on both poverty and income inequality. Utilizing GMM-IV

panel estimation, which accounts for possible endogeneity by using lagged values of the

regressors, they failed to find a robust statistical relationship between aid and poverty or

inequality.

These two papers comprise the extent of the aid-poverty literature. While Collier and Dollar

found a relationship between aid and poverty through growth, this result appears uncertain in

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[5] Boone (1996) was published before the World Bank poverty rates became available. Instead he utilized public health and quality of life measures as proxies for poverty. As a result his paper will not be discussed here. However, it is worth mentioning that Boone found no impact of aid on these various measures.

light of other findings that aid exerts very little measurable impact on growth. In addition, Chong

et al. achieved inconclusive results. This paper seeks to further this literature in the following

manner. First, the latest poverty data from the World Bank, which encompass more countries

than the previous two papers discussed as well as a larger time period, is used.[6] Second, the

analysis accounts for the impact of both economic and political institutions.

4. Empirical Framework

The previous literature on aid and poverty relied upon an empirical framework from the aid-

growth literature. This approach will be used here. The analysis can be thought of as addressing

two general questions. The first is whether foreign aid has had any impact on economic

institutions during 1985-2005. Connors (2011) found that movements toward institutions more

consistent with economic freedom contribute to reductions in the poverty rate. If aid exerts an

influence upon institutions this suggests both a direct and indirect channel through which aid can

reduce poverty. Investigation of this secondary channel is a method of evaluating whether the SA

loans, the preferred method of aid funding during the 1990s, were effective. The equation below

contains the regression equation used in this portion of the analysis.

(1) $\Delta \text{EFW}_{it} = \alpha + \beta \text{Aid}_{it} + \delta X_{it} + \gamma d_t + u_{it}$

The dependent variable is the change in Economic Freedom as measured by the Economic

Freedom of the World (EFW) Index. The data for the dependent variable spans the period 1985-

2005 and is broken into two ten-year periods, 1985-1995 and 1995-2005. The variable is

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[6] For a thorough discussion of the latest World Bank poverty rates see Connors (2011), chapter 2.

constructed by subtracting the first value of the decade from the last. Therefore, an increase in

economic freedom corresponds to a positive value. The variable Aid_{it} is the average level of aid

over the ten-year period in country i, however, both the current period average as well as the

previous period are used in the regressions. Therefore, the aid data used here spans 1975-2005. X

and X_{it} are matrices of covariates containing the level of economic freedom and political

institutions at the start of the time period as well as geographic and locational variables. The

remaining variables are the time dummy and the white noise error term.

The second question is whether foreign aid contributed to a reduction in poverty rates in

recipient countries during 1985-2005. A significant justification for the provision of foreign aid

is the alleviation of poverty. Hence, this analysis seeks to determine how effective foreign aid

has been in achieving this goal. The regression equation below will be used in this part of the

analysis.

(2) $\Delta\text{Pov}_{it} = \alpha + \beta\text{Aid}_{it\text{-}y} + \delta\text{X}_{it} + \gamma\text{d}_t + u_{it}$

Here the dependent variable is the reduction in the extreme and moderate poverty rate from

the World Bank, *World Development Indicators*, over ten-year periods from 1985-2005 for

country i. The independent variable of interest in this equation is the average level of foreign aid,

$\text{Aid}_{it\text{-}y}$, over the previous ten-year period. The y in the $t\text{-}y$ subscript of the variable is meant to

denote a time lag of ten years. For example, the average level of aid during 1976-1985

corresponds to the change in poverty during 1985-1995. The remaining variables, X_{it}, d_t, and u_{it}

are the same as described above.

The foreign aid variable in the second part of the analysis is lagged by ten years for two reasons. First, to reduce the level of bias resulting from endogeneity between foreign aid and poverty. Second, if foreign aid does exert an impact on poverty it is most likely to do so over an extended period of time. Aid has been used to build schools, create health facilities and factories, and to increase access to clean water. These projects impact a country's population over time and it is likely that previous levels of aid will be better predictors.

Foreign aid, in this analysis, is net Official Development Assistance (ODA) as defined by the OECD. "Flows of official financing administered with the promotion of the economic development and welfare of developing countries as the main objective, and which are concessional in character with a grant element of at least 25 percent (using a fixed 10 percent rate of discount). By convention, ODA flows comprise contributions of donor government agencies, at all levels, to developing countries ("bilateral ODA") and to multilateral institutions. ODA receipts comprise disbursements by bilateral donors and multilateral institutions. Lending by export credit agencies—with the pure purpose of export promotion—is excluded (IMF 2003)." Loans that are concessionary in character are those that have below market interest rates. This definition excludes all military aid. Some development assistance used by NGOs is included in ODA so long as it coordinated through the OECD. While most aid comes from the member countries of the OECD, development aid from non-OECD members is also included in ODA as long as it meets the definition given above and is coordinated through the OECD.

While most of the empirical literature on foreign aid uses ODA as the measurement of development assistance, several studies have used an alternative definition known as Effective Development Assistance (EDA). This measure was created by Chang, Frenandez-Arias, and Serven in 1999. The primary difference between ODA and EDA is the exclusion of loans and

grants tied to technical assistance. Technical assistance is aid that must be used to build or

implement a certain project in the recipient country, but the materials and expertise must be

purchased from the donor country. Often this is a way for politicians in donor countries to create

business for companies they favor. Chang et. al convincingly argue that aid of this type is of little

benefit to the recipient country. This suggests that EDA would be a truer measure of

development assistance. However, most studies use ODA as it is readily available from the

World Bank, *World Development Indicators*, and it is highly correlated with EDA.[7] Several

studies have used both ODA and EDA and concluded that there is little empirical difference

between the two (Ovaska 2003; Burnside and Dollar 2004; Chong, Gradstein, and Calderon

2009). Therefore, the analysis here will follow the literature and use ODA as a share of Gross

National Income (GNI) as the measure of foreign aid.

The extreme and moderate poverty rates from the World Bank, *World Development

Indicators* are the measures of poverty in this analysis. They are the percentage of a country's

population that lives on $1.25 and $2 per day, respectively, in 2005 international dollars. They

have been regularized to five-year intervals over the period 1980-2005.[8] The variable for

economic freedom is the primary variable of interest and is from the 2009 edition of The

Economic Freedom of the World Report, published annually by the Fraser Institute and authored

by James Gwartney and Robert Lawson. The EFW index measures the degree to which a

country's institutions allow voluntary transactions coordinated by markets, respect for private

property rights, and the even handed enforcement of contracts. Forty-two sub-components,

scaled from 0-10, are used to derive the ratings in five areas. The areas are: the size of

government, legal structure and the security of property rights, access to money of stable

[7] Ovaska (2003) indicates the correlation is "very close to one" and Easterly (2003) found it to be 0.93.
[8] See Connors (2011), chapter 2 for details.

purchasing power, openness to trade, and regulation of credit, labor, and business. The ratings for these five areas are aggregated into a summary index with higher values indicating more economic freedom. The data are available for 141 countries. The version of the index used here is chain-linked and spans the period 1980-2005 at five-year intervals covering 102 countries or more in each of the years.

The Polity IV index, a widely used measure of democracy, is used in this analysis. The Polity Project, which publishes the Polity IV index, is part of the Center for Systemic Peace. The data is from the 2009 report by Benjamin R. Cole and Monty G. Marshall. It covers the period 1800 to the present and includes all polities that currently exist or have existed. The Polity IV index rates all countries on an autocracy-democracy scale from -10 to 10, with -10 representing autocracy and 10 representing democracy.

Gallup, Sachs, and Mellinger (1999) and Diamond (1999) argue that geographic and locational factors exert a significant impact on a country's economic outcomes. To control for the influence of these factors the analysis includes three variables from Gallup, Sachs, and Mellinger (1999). The first is the percentage of a country's population that lives within 100 kilometers of a coastline. The second is the country's air distance in kilometers to the nearest of three major markets: New York, Tokyo, or Rotterdam. These two variables capture aspects of the transaction costs associated with accessing international markets. The third variable is the percentage of a country's land area located in the tropical zone between the Tropics of Cancer and Capricorn. This variable captures the impact of the disease environment, especially malaria, as well as other hardships associated with life in the tropics. Summary statistics for all the variables used in this analysis are listed in appendix A.

While there are a number of countries that received aid during 1970-2005, the analysis here will be restricted to countries with poverty rate data in 1980 and with a 2005 population of more than one million. The 86 countries meeting these criteria are listed in appendix B. As the aid and political institutions variables have broad coverage, excluding countries that lack poverty data from this analysis ensures that regressions involving political institutions and foreign aid contain the same set of countries as regressions involving aid and poverty. In addition, excluding countries with low populations ensures that the analysis continues to cover a majority of the world's poor. The aid data used in this analysis is averaged over a ten-year period. A country's average level of aid is computed if at least five observations are present during the ten-year period.

5. Preliminary Analysis

There are various theories pertaining to the relationship between aid and development. Theories where aid is supportive of the development process differ on whether aid should be used to kick-start development or as a reward for implementing productive reforms. The view that aid is ineffective contends that aid will primarily encourage rent seeking, both in the recipient and donor countries, and deter implementation of needed reforms in developing countries. Therefore, a preliminary examination of aid trends over time may suggest which theories better describe aid as it is actually implemented. This will also provide insight for the statistical results of the next section.

Table 2 lists the twelve countries that received foreign aid funding of 10 percent or more of GNI during the period 1980-2005 in order of highest average aid receipt to the lowest. The first

column lists the average over the period 1980-2005 and columns two through five list the average in each of the last four decades. This table indicates that there are a number of countries that have consistently received a large amount of aid since the 1970s. Only four countries on the list received an average level of aid less than 20 percent of GNI during 1980-2005. The country at the top of the list, Guinea-Bissau, is notable as their level of aid averaged almost 52 percent of GNI during the 1990s. In addition, their average level of aid never fell below 20 percent of GNI during any of the decades.

Columns six and seven of table 2 list the average level of aid as a share of government expenditures for the 1990s and during 2000-2005. As can be seen from the table, there are many missing observations due to a lack of government expenditure data for many developing countries. Despite the lack of data, it is apparent that aid is a substantial source of funds for recipient governments. Gambia's 197.5 percent of aid as a share of government expenditures is the highest on the list, while Niger with 167.6 percent during the latter period, is not far behind. The country with the lowest level listed still had a value larger than 80 percent.[9] The last column of the table lists the real GDP per capita for each of the countries in PPP adjusted 2005 international dollars. While these countries have received a large amount of aid during 1970-2005, the level of per capita income in these countries is still very low. Mauritania has the highest per capita income level of $1,684 while the income level of Burundi is the lowest. Burundi's per capita income level of $340 indicates that the average citizen lived below the extreme poverty level in 2005.

Table 3 presents data similar to that of table 2 except that the twelve countries listed are those that exhibited an eight percentage point or more increase in aid as a share of GNI between

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[9] Aid as a share of government expenditures higher than 100 percent could be a result of aid going to NGO's, bypassing the recipient government. However, a majority of a country's aid is received by the central government.

1970 and 2005. The countries are sorted in order of the highest percentage point increase during the period. The first four columns list the level of aid for each decade, while the fifth column lists the corresponding percentage point increase. Five of the countries listed on the previous table – Burundi, Zambia, Guinea-Bissau, Malawi, and Rwanda – are also found on this table, indicating these countries had both high and increasing levels of aid during 1970-2005. In addition, eight of the twelve countries listed had aid levels larger than 20 percent of GNI during 2000-2005. The last column of the table lists the level of real GDP per capita in 2005. Similar to the previous table, these per capita income levels are extremely low. Nicaragua, the only non-African country, has a per capita income level of $2,311, the highest on the list. Only three countries have a per capita income level greater than $1,000. One country, the Democratic Republic of Congo, has an income level of $273, implying that the average citizen of the Democratic Republic of Congo lives well below the extreme poverty line. This table indicates that in spite of increasing receipt of foreign aid during 1970-2005, these countries remained poor in 2005.

The final table of this section, table 4, lists the four countries that have decreased their receipt of aid as a share of GNI by eight percentage points or more during 1970-2005. The columns of this table are identical to that of table 3. This table is noticeably different from the two previous tables in the following ways. First, the number of countries with decreasing aid levels is three times less than the number that have high or increasing levels of aid. Second, only one country in table 4, Cambodia with an aid level of 10.5 percent, received a substantial amount of aid during 2000-2005. Third, Botswana is the only African country that appears on this list while the previous two tables are populated entirely by African countries excluding Nicaragua in table 3. Lastly, the per capita income levels in 2005 are significantly higher than those in the

other tables. Botswana's income is roughly four times higher than that of Nicaragua, which had the highest income level of any country in the previous two tables.

Only the 86 countries with populations larger than 1 million in 2005 and poverty data in 1980, listed in appendix B, are included in these tables. While these restrictions exclude several countries, the excluded countries are mostly island countries with small populations.

While tables 2-4 only provide preliminary analysis, they do suggest several things. First, countries that received large amounts of aid in previous decades continue to do so. Second, many countries increased the level of aid received, while few decreased the level of aid received. Third, countries that are highly dependent upon aid had low per capita income in 2005, especially countries in sub-Saharan African. Botswana appears to be the only exception to this rule. The high levels of aid as both a share of national income and government expenditures is consistent with the view that the institution of foreign aid retards reform in developing countries and is susceptible to rent seeking. While these results are suggestive they do not constitute a robust investigation of the relationship between foreign aid and poverty. This is the focus of the next section.

6. Results

Section 4 discussed two research questions. The first is, whether foreign aid had any impact on changes in economic institutions. The following table focuses on this relationship. Prior research indicates that poor countries that increased their level of economic freedom had significant reductions in poverty. Therefore, if aid exerts any impact on economic freedom, there is a possibility that it may indirectly influence poverty through economic freedom.

Table 5 examines the impact of foreign aid on economic freedom with pooled OLS regressions. Because this analysis utilizes ten-year periods, the period 1980-2000 or 1985-2005 could be used. As either period provided similar results the latter was chosen. In these regressions a positive dependent variable indicates there was an increase in economic freedom over the period. Also, the level of economic freedom at the start of the ten-year period is included as an independent variable in these regressions to control for the differing levels of economic freedom of countries at the beginning of the period.

The first column of table 5 regresses the change in economic freedom during the contemporaneous period on the average level of aid as a share of GNI. The second column contains the impact of foreign aid in the previous ten-year period on the dependent variable.[10] The impact of foreign aid during the same ten-year period, column one, is negative and significant at the 10 percent level. The coefficient is small and indicates that a one percentage point increase in ODA as a share of GNI corresponds to a 0.02 decrease in the EFW index during the period. However, the foreign aid variable in column two, representing the previous ten-year period, is not significant.

Columns three and four of table 5 add the Polity IV democracy index to the regressions. The foreign aid variable during the contemporaneous period is no longer significant. The Polity IV variable, however, is significant at the ten percent level or higher and positive indicating that a higher level of democracy at the start of the period is associated with an increase in economic freedom. This impact is quite small as the coefficient is only 0.02.

Columns five and six of table 5 add the geographic and locational factors to the regression. With the addition of these variables, the foreign aid variables and democracy variable are not

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[10] The average level of aid was computed if there were five or more observations during the period.

significant. The percentage of the population that lives within 100 kilometers of a coastline, however, is positive and significant at the one percent level in both columns five and six. The sign of the coefficient and its significance suggest that increased access to trade routes is conducive to increases in economic freedom.

This table indicates that the evidence that foreign aid exerted a positive impact on economic freedom during 1985-2005 is weak, at best. This is in spite of efforts during the 1990s to use aid as a means to encourage market based reforms (Easterly 2003). Only one regression found a statistically significant relationship between foreign aid and change in economic freedom. Those results however, indicate that higher levels of aid were associated with smaller increases, or possibly a decrease, in economic freedom over the period. But, this result was not robust as the inclusion of democracy, geography, and location variables eliminated all significance of the aid variables. The only robust result from these tables is the impact of the coastal population variable. Regressions containing this variable consistently indicated that, ceteris paribus, countries with a larger percentage of the population within 100 kilometers of the coast had larger increases in economic freedom during 1985-2005. This variable is largely a proxy for the transaction costs of accessing markets. Countries with a significant percentage of their population close to the coast will generally have cheaper transportation costs and better access to international markets. In these regressions it appears that countries with this attribute also experienced larger increases in economic freedom. While investigating this relationship is not the aim of this paper, it is interesting nonetheless.

This table did not include regressions with political institution measures as the dependent variable. Such regressions were analyzed, but the results were insignificant with very little explanatory power. They are available upon request from the author.

This analysis is not the first to investigate aid and institutions. Several papers have examined this relationship, however, not all focused on economic freedom. Heckelman and Knack (2009) found that aid was associated with an increase of some and a decrease of other sub-components of the EFW index. They found that the net result of the changes was positive overall for growth. Knack (2004) found no statistical relationship between foreign aid and political institutions when using the Freedom House Political Rights index. Three papers (Knack 2001; Brautigam and Knack 2004; Heckelman and Knack 2008) found a slightly negative relationship between aid and institutions, however, only one used the EFW index and another focused exclusively on Africa.

Based on the literature and the results presented here, there is little evidence that foreign aid exerts an independent positive impact on economic freedom, either contemporaneously or in the future. If a relationship does exist the results here indicate that aid may retard improvements in economic freedom. However, this result is not robust. Therefore, it does not appear that aid influences poverty indirectly through increases in economic freedom.

The second part of the analysis asks whether the disbursement of foreign aid during 1976-2005 contributed to the reductions in poverty rates. Foreign aid may help alleviate poverty despite the fact that the aid literature indicates that foreign aid has had little impact on economic growth. Table 6 contains pooled OLS regressions of five-year reductions in extreme poverty rate on aid, economic freedom, political institutions, and geographic and locational factors during 1980-2005. The dependent variable is the reduction in extreme poverty during, 1980-1985, 1985-1990, 1990-1995, 1995-2000, and 2000-2005. A positive value indicates a reduction in poverty during the period. The extreme poverty rate at the beginning of each five-year period is included as an independent variable to control for the differing initial poverty levels of the countries in the sample. The positive sign and high significance level of the initial extreme poverty rate in all the

regressions of table 6 indicate that, ceteris paribus, poorer countries exhibited larger reductions in poverty during the period. This result is similar to the conditional convergence result observed in the empirical literature concerning institutions and growth.

Column one of table 6 lists the results of five-year reductions in poverty regressed on the extreme poverty rate at the beginning of the period, the average level of foreign aid as a share of GNI during the previous five-year period, and period dummy variables. The period dummies are included to control for unobservable time-varying effects. The coefficient on the aid variable in this regression of -0.15 is just significant at the ten percent level and negative suggesting that higher levels of aid during a five-year period correspond to smaller reductions in poverty during the subsequent period. This result is extremely tenuous however as the inclusion of additional independent variables eliminates the significance of the aid term. Columns two and three add the economic freedom index and the Polity IV democracy measure to the regressions. While the average level of aid in the previous five-year period remains negative it is no longer significant after controlling for the level of economic freedom and political institutions at the start of each period. The insignificance of the economic freedom level at the beginning of the five-year period in regressions two and three is surprising given what we know from prior research. However, this result indicates that the level of economic freedom exerts a statistically insignificant impact on reductions in poverty after controlling for various factors. Prior research indicates that an increase in economic freedom rather than levels have a substantial impact on reductions in poverty.

The Polity IV democracy variable is significant at the five percent level or higher in regressions three and four, even after the inclusion of the geography variables. This result implies, that after controlling for various factors, more democratic countries exhibited larger

reductions in poverty during 1980-2005. Column four adds the Sachs geography and locational measures to the regressions. Each geographic and locational factor is significant at the ten percent level of higher and the signs of the coefficients indicate that geographic factors are a significant impediment to poverty reduction. The positive coefficient of the coastal population variable is consistent with the view that countries with minimal or no coastline confront higher transaction costs when transporting goods or attempting to engage with international markets. Malaria and other common diseases in the tropics increase mortality rates and lower productivity levels of individuals, which is consistent with the negative coefficient on the tropics term. And lastly, the negative coefficient of the air distance term suggests that a greater distance to global markets increases the transaction costs of international trade. All these factors make economic growth more difficult to achieve and hence are less conducive for reductions in poverty.

Table 7 lists regressions identical to those contained in table 6, except that the dependent variable is now the reduction in the moderate poverty rate over five-year periods during 1980-2005. The coefficient of the average level of aid as a share of GNI in the previous period has results similar to those of table 6. The coefficient is negative and significant at the ten percent level in the first regression, but than insignificant thereafter. Thus, while the first regression indicates that aid hinders reductions in moderate poverty, this result is not robust to the inclusion of additional explanatory variables. In this table, and the previous one, after controlling for other factors, the average level of aid in a particular five-year period appears to have little impact on reductions in poverty in the subsequent period. Interestingly, the level of economic freedom at the beginning of the period is now significant in all the regressions in which it is included. It also indicates that the level of economic freedom has a positive impact on reductions in moderate

poverty, while the previous table indicated the impact on extreme poverty was statistically insignificant.

The democracy measure is less significant in table 7 than it was in the previous table. Lastly, while only two of the three geographic factors are significant in the last regression of table 7, they indicate that unfavorable geographic and locational factors retard reductions in moderate poverty as well. The explanatory power of the regressions of tables 6 and 7 is fairly low. The adjusted r-squared values of the first table range from 0.06 to 0.12 and those of the later table, 0.03 to 0.07, are even lower. This indicates that while the regressions are informative, they explain very little of the cross-country variation in poverty reductions during 1980-2005.

It is possible that five-year periods are too short to ascertain the impact of foreign aid on poverty reduction. The long run impact of aid is arguably more important after all. In order to investigate the possibility that aid may impact poverty over a longer time frame, the next set of tables examines reductions in poverty over ten-year periods.

Table 8 contains regressions of the reduction in the extreme poverty rate on foreign aid, economic freedom, political institutions, and geographic and locational factors over ten-year periods during 1985-2005. The structure of these regressions is identical to those in tables 6 and 7. The extreme poverty rate at the beginning of the period is included as a control variable and the economic freedom and political institutions measures are measured at the start of each ten-year period. The average level of aid as a share of GNI used in these regressions is for the ten-year period just prior to the period of interest. Therefore, the average level of aid for the period 1976-1985 is associated with changes in poverty during 1985-1995 and the level of aid for 1986-1995 corresponds to poverty changes during 1995-2005.

The relationship between aid and reductions in the extreme poverty rate is largely unchanged when the time period is ten years rather than five. The coefficient for the average level of foreign aid as a share of GNI in the previous ten-year period is negative in all regressions, but also insignificant. Again, it appears that the level of economic freedom is less important for reductions in the extreme poverty rate as the coefficient on the EFW index is insignificant in columns two through four. The measures of a country's political institutions however, are positive and significant at the ten percent level or higher in columns three and four. This is similar to that of the table 6, which uses five-year periods. After controlling for other factors, more democratic countries appear to have larger reductions in extreme poverty during 1985-2005. The last three regressions of the table again illustrate the influence of geographic factors. The coastal population variable is significant, while the coefficient of the distance to major markets variable is insignificant. The tropics variable is significant at the one percent level and negative indicating that reductions in extreme poverty are difficult to achieve in areas susceptible to tropical diseases.

Table 9 presents the results for the moderate poverty rate. The structure of this table is identical to that of the previous table, except now the dependent variable is the ten-year reduction in the moderate poverty rate during 1985-2005. In these regressions the level of aid in the previous period has a more significant negative result than in the previous tables. Ceteris paribus, a ten percentage point higher level of aid as a share of GNI during a ten-year period corresponds to a smaller decrease or possibly an increase in moderate poverty over the subsequent period of 2.9 to 3.0 percentage points, after controlling for economic and political institutions. This result becomes insignificant, however, in the last column of the table after the geography and locational variables are included. Similar to the five-year regressions with reductions in moderate poverty,

table 7, the level of economic freedom at the beginning of the period is more significant, while the level of political institutions are less so. Overall, whether the time period is five or ten years, the level of economic freedom appears to be more significant for reductions in moderate poverty while the level of democracy appears to matter more for reductions in extreme poverty. Again, the geographic and locational variables continue to indicate that these factors matter regarding reductions in both extreme and moderate poverty, even after controlling for the level of aid and institutions.

These two tables explain very little of the cross-country variation in poverty rate reductions during 1985-2005. While the adjusted r-squared values are slightly higher than those from the regressions involving five-year periods, the highest value being 0.24 in table 8, they are still relatively low. However, this is partially to be expected as the tables are investigating how levels of the independent variables impact changes in the dependent variable. This suggests that analysis of the impact of changes in the level of aid over time on reductions in poverty might be productive. However, this was not the case. The tables 2-4 of the previous section, explain why. Countries that receive aid in prior decades generally receive similar or increased amounts of aid in subsequent decades. Very few countries reduced their reliance upon aid as is evidenced by the small number of countries contained in table 4. In addition, most countries received similar levels of aid as a share of GNI since the 1970s. Therefore, regressions containing a change in aid levels between decades as an independent variable have very little explanatory power in cross-country regressions when a reduction in poverty is the dependent variable.

After controlling for the initial poverty rate, economic freedom, political institutions, geographic factors, and unobservable time-varying effects, the evidence indicates that foreign aid had little or no impact on poverty rate reductions during 1980-2005. Thus, despite a considerable

effort on the part of the aid community, the evidence presented here indicates that the provision of foreign aid during 1976-2005 failed to significantly reduce either the extreme or moderate poverty rate.

7. Conclusion

Fostering economic growth, encouraging institutional reform, and reducing poverty in the developing world are among the primary goals of foreign aid. The first goal, promoting economic growth, has been extensively examined in the literature. While the findings have been mixed, recent studies suggest that foreign aid has been largely ineffective in promoting economic growth. This chapter empirically investigates the latter of these two goals. To examine whether foreign aid was successful in promoting these goals two questions were raised. 1) What impact does foreign aid have on economic freedom? 2) Has foreign aid contributed to the reductions in poverty during 1980-2005?

Regarding the first question, the results indicate that foreign aid failed to exert a significant impact on changes in economic freedom during 1985-2005. These findings are consistent with the view that foreign aid, as historically practiced, has failed to facilitate the adoption of market-based reforms. In theory, if foreign aid were to have an impact on changes in economic freedom, then there is the possibility of an indirect impact on poverty. Prior research indicates that countries implementing reforms, consistent with economic freedom, achieved larger reductions in both the extreme and moderate poverty rates. However, this analysis indicates that reductions in poverty due to changes in economic freedom were not facilitated by foreign aid.

Lastly, the analysis indicates that foreign aid failed to exert a significant impact on either the extreme or moderate poverty rate during 1980-2005. It appears that while aid is given to countries because they are poor, there is no indication that poverty declines as a result.

In summary, there is little evidence that foreign aid has been an effective tool for the alleviation of poverty. Public choice analysis provides insight with regard to why this may be the case. Foreign aid is prone to rent seeking in both the donor and recipient countries, often resulting in the unproductive use of resources. In addition, reforms compatible with economic freedom are often the result of poor economic performance. To the extent that foreign aid reduces the urgency for constructive reforms, it may undermine institutional change supportive of long-term prosperity. A thorough public choice analysis is beyond the scope of this study, however, and is left for future research.

APPENDIX A

Table A.1: Foreign aid (ODA) as a share of GNI summary statistics

	1975	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**
	Low and middle income countries						
mean	5.3	7.1	7.2	9.2	9.6	6.9	7.5
std. dev.	6.6	9.2	9.1	11.2	13.5	9.1	10.6
max	36.0	42.1	50.0	59.4	96.9	47.5	52.5
min	0.0	0.0	0.0	0.0	-0.3	-0.3	-0.1
No. of countries	97	105	115	126	156	159	158
	Countries with continuous poverty data, 1980-2005						
mean	4.1	5.2	5.5	7.4	8.7	5.6	6.6
std. dev.	4.4	6.1	5.9	8.1	11.1	6.6	9.4
max	21.3	34.8	27.5	42.2	59.7	24.7	38.2
min	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
No. of countries	73	74	79	83	84	85	85

Table A.2: World Bank extreme and moderate poverty rates summary statistics[*]

Extreme poverty rate ($1.25 per day, 2005 international dollars)						
	1980	1985	1990	1995	2000	2005
mean	39.8	36.1	29.5	28.9	27.1	23.4
std. dev.	26..4	26.7	27.8	26.8	25.2	23.3
max	94.8	93.0	92.6	87.3	88.5	83.7
min	2.0	2.0	2.0	2.0	2.0	2.0
No. of countries	92	95	116	125	127	128

Moderate poverty rate ($2 per day, 2005 international dollars)						
	1980	1985	1990	1995	2000	2005
mean	54.0	51.0	42.7	43.3	41.6	37.1
std. dev.	30.6	31.7	33.7	31.9	31.5	30.4
max	99.0	99.0	99.0	99.0	99.0	94.8
min	2.0	2.0	2.0	2.0	2.0	2.0
No. of countries	92	95	116	125	127	128

[*] These summary statistics are not weighted by each country's population.

Table A.3: Economic Freedom of the World (EFW) summary statistics

	1980	1985	1990	1995	2000	2005
All countries						
mean	5.5	5.5	5.8	6.0	6.5	6.6
std. dev.	1.2	1.3	1.3	1.2	1.0	1.0
max	9.2	8.8	8.8	9.1	8.8	8.9
min	2.8	2.1	3.0	3.2	3.9	3.2
No. of countries	102	109	113	123	123	130
High income countries						
mean	6.9	7.0	7.5	7.6	7.7	7.7
std. dev.	0.9	0.9	0.7	0.7	0.6	0.5
max	9.2	8.8	8.8	9.1	8.8	8.9
min	5.4	5.4	6.0	6.2	6.6	6.9
No. of countries	24	24	24	24	24	24
Low and middle income countries						
mean	5.1	5.1	5.3	5.7	6.1	6.3
std. dev.	1.0	1.1	1.1	1.1	0.9	0.9
max	7.9	8.1	8.7	8.8	8.5	8.7
min	2.9	2.1	3.0	3.2	3.9	3.2
No. of countries	78	85	89	99	99	106

Table A.4: Polity IV summary statistics

	1980	1985	1990	1995	2000	2005
All countries						
mean	-2.5	-2.1	0.3	2.3	2.9	3.6
std. dev.	7.2	7.3	7.2	6.8	6.6	6.5
max	10.0	10.0	10.0	10.0	10.0	10.0
min	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
No. of countries	157	157	159	159	159	159
High income countries						
mean	9.7	9.8	10.0	10.0	10.0	10.0
std. dev.	0.7	0.6	0.2	0.2	0.2	0.2
max	10.0	10.0	10.0	10.0	10.0	10.0
min	8.0	8.0	9.0	9.0	9.0	9.0
No. of countries	20	20	21	21	21	21
Low and middle income countries						
mean	-4.3	-3.8	-1.1	1.1	1.9	2.7
std. dev.	5.8	6.1	6.6	6.6	6.4	6.4
max	10.0	10.0	10.0	10.0	10.0	10.0
min	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
No. of countries	137	137	138	138	138	138

Table A.5: Sachs geographic variables summary statistics

	All countries	High income countries	Low and middle income countries
Coastal population (% within 100km)			
mean	0.5	0.6	0.5
std. dev.	0.4	0.4	0.4
max	1.0	1.0	1.0
min	0.0	0.0	0.0
No. of countries	210	24	186
Tropical location (% land area in tropics)			
mean	0.5	0.1	0.6
std. dev.	0.5	0.2	0.5
max	1.0	1.0	1.0
min	0.0	0.0	0.0
No. of countries	210	24	186
Distance to major markets[a]			
mean	4.0	1.6	4.4
std. dev.	2.4	2.3	2.2
max	9.6	9.3	9.6
min	0.1	0.1	0.6
No. of countries	210	24	186

[a] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Rotterdam.

APPENDIX B

Table B.1: Countries with poverty rate data in 1980 and a population larger than 1 million in 2005 (86 countries).

Country	Average aid (ODA as a share of GNI)			
	1970s	1980s	1990s	2000-2005
Algeria	1.2	0.3	0.6	0.4
Angola		2.0	8.7	4.1
Argentina	0.1	0.1	0.1	0.1
Bangladesh	6.1	6.4	4.1	2.2
Benin	6.5	9.0	13.3	9.5
Bolivia	3.0	5.7	10.0	8.6
Botswana	13.3	8.5	2.4	0.5
Brazil	0.2	0.1	0.0	0.0
Burkina Faso	8.8	11.7	16.6	13.2
Burundi	10.3	14.8	19.7	34.0
Cameroon	4.8	2.7	5.3	5.0
Central African Republic	10.2	14.7	13.9	6.9
Chad	7.8	12.5	15.0	10.0
Chile	0.4	0.1	0.3	0.1
China		0.4	0.5	0.1
Colombia	1.0	0.2	0.2	0.5
Congo, Dem. Rep.	2.0	5.1	4.1	31.2
Congo, Rep.	7.1	4.9	12.0	7.7
Costa Rica	1.4	4.0	0.9	0.1
Cote d'Ivoire	2.5	2.6	8.8	3.2
Dominican Republic	1.3	2.1	0.6	0.4
Ecuador	1.2	1.3	1.4	0.8
Egypt, Arab Rep.	10.4	5.4	5.9	1.4
El Salvador	1.6	8.1	4.1	1.5
Ethiopia		5.6	9.7	15.2
Gambia, The	10.5	32.5	19.0	15.2
Ghana	2.8	6.3	9.9	12.6
Guatemala	1.1	1.7	1.7	1.1
Guinea			11.0	7.1
Haiti	5.0	7.9	11.4	6.6

Table B.1: continued

Country	Average aid (ODA as a share of GNI)			
	1970s	1980s	1990s	2000-2005
Honduras	3.2	6.7	10.7	7.1
India	1.1	0.8	0.6	0.2
Indonesia	2.9	1.2	1.2	0.7
Iran, Islamic Rep.	0.1	0.0	0.2	0.1
Jamaica	1.8	6.4	2.3	0.4
Jordan	20.7	14.4	10.2	6.5
Kenya	4.2	7.8	8.6	3.7
Korea, Rep.	1.6	0.1	0.0	0.0
Kuwait	0.0	0.0	0.0	0.0
Lesotho	11.3	14.5	9.7	5.9
Liberia	4.2	11.8		30.3
Madagascar	3.5	8.8	13.2	13.8
Malawi	9.9	16.8	27.0	21.1
Malaysia	0.7	0.7	0.2	0.1
Mali	11.7	20.0	17.9	14.1
Mauritania	21.3	25.4	18.8	18.9
Mauritius		3.6	1.3	0.4
Mexico	0.1	0.1	0.1	0.0
Morocco	2.7	3.8	2.5	1.2
Mozambique		15.8	44.3	28.5
Myanmar				
Namibia		1.1	5.2	3.0
Nepal	3.8	9.6	9.8	6.4
Nicaragua	3.1	8.4	30.7	19.9
Niger	8.7	13.4	16.3	14.8
Nigeria	0.4	0.3	0.8	1.5
Oman	3.7	1.2	0.4	0.1
Pakistan	4.4	2.9	1.9	1.8
Panama	1.7	1.0	1.0	0.2
Papua New Guinea	18.8	12.0	9.0	7.2

Table B.1: continued

Country	Average aid (ODA as a share of GNI)			
	1970s	1980s	1990s	2000-2005
Paraguay	2.5	1.5	1.4	0.9
Peru	0.8	1.5	1.1	0.8
Philippines	1.2	1.7	1.7	0.7
Rwanda	13.1	10.7	29.7	21.4
Saudi Arabia	0.0	0.0	0.0	0.0
Senegal	7.0	12.1	11.9	9.1
Sierra Leone	2.8	9.2	19.7	36.2
Singapore	0.6	0.2	0.0	0.0
South Africa			0.3	0.4
Sri Lanka	4.9	8.5	5.2	2.8
Sudan	3.4	7.2	4.4	3.6
Swaziland			3.2	1.6
Syrian Arab Republic	7.4	5.4	2.8	0.5
Taiwan	0.0	0.0	0.0	0.0
Tanzania			19.3	13.6
Thailand	0.8	1.1	0.6	0.1
Togo	8.1	12.9	11.1	3.7
Trinidad and Tobago	0.3	0.2	0.3	0.0
Tunisia	5.2	2.7	1.5	1.4
Turkey	0.4	0.6	0.3	0.1
Uganda	1.7	6.6	15.9	14.1
United Arab Emirates	0.0	0.1	0.0	0.0
Uruguay	0.4	0.2	0.4	0.1
Venezuela, RB	0.0	0.0	0.1	0.1
Vietnam			4.0	4.3
Zambia	3.4	13.6	26.5	20.2

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Tables and Figures

Table 1: Empirical papers on foreign aid and growth, 1996-2011[*]

Papers	Impact of aid on growth
Svensson, Jakob (1999)	+
Burnside and Dollar (2000)	+
Hansen and Tarp (2000)	+
Hansen and Tarp (2001)	+
Lensink and White (2001)	+
Guillaumont and Chauvet (2001)	+
Collier and Dehn (2001)	+
Dalgaard and Hansen (2001)	+
Collier and Dollar (2002)	+
Burnside and Dollar (2004)	+
Dalgaard, Hansen, and Tarp (2004)	+
Clemens, Radelet, and Bhavnani (2004)	+
Heckelman and Knack (2009)	+
Bearce and Tirone (2010)	+
Boone (1996)	~
Arvin and Barillas (2002)	~
Easterly (2003)	~
Easterly, Levine, and Roodman (2004)	~
Kraay and Raddatz (2007)	~
Rajan and Subramanian (2008)	~
Williamson (2008)	~
Chong, Gradstein, and Calderon (2009)	~
Brumm (2003)	−
Ovaska (2003)	−
Rajan and Subramanian (2005)	−
Djankov, Montalvo, and Reynal-Querol (2006)	−
Rajan and Subramanian (2011)	−

[*] While a majority of these papers examined the relationship between aid and growth several focused on poverty and health indicators. Collier and Dollar (2002) focused on poverty and attempted to determine the poverty efficient allocation of aid. Chong, Gradstein, and Calderon (2009) examined poverty and inequality. Arvin and Barillas (2002) examined poverty, but used GNP per capita as the measure of poverty. Therefore this paper should be considered a study of how aid influences average income levels rather than poverty. Kraay and Raddatz (2007) focused on poverty traps and the link between aid, investment, and growth. Williamson (2008) explored the impact of aid on numerous health measures.

Table 2: Countries with high levels of aid during each decade (ten percent or more), 1980-2005

Country	Average Aid (ODA as a share of GNI)					Average Level of Aid as a Share of Government Expenditures		RGDP per capita, PPP (constant 2005 international dollars)
	1980-2005	1970s	1980s	1990s	2000-2005	1990s	2000-2005	2005
Guinea-Bissau	47.4	20.7	49.3	51.7	37.2			497
Mozambique	29.7		15.8	44.3	28.5			677
Gambia, The	23.3	10.5	32.5	19.0	15.2	197.5		1,142
Malawi	21.7	9.9	16.8	27.0	21.1			648
Mauritania	21.4	21.3	25.4	18.8	18.9			1,684
Burundi	21.1	10.3	14.8	19.7	34.0	83.7		340
Rwanda	20.5	13.1	10.7	29.7	21.4	118.2		793
Zambia	20.1	3.4	13.6	26.5	20.2	82.1	100.5	1,127
Mali	17.8	11.7	20.0	17.9	14.1		97.7	1,004
Niger	14.8	8.7	13.4	16.3	14.8		167.6	584
Burkina Faso	13.9	8.8	11.7	16.6	13.2		118.0	1,026
Chad	12.9	7.8	12.5	15.0	10.0			1,468

Table 3: Countries with increasing amounts of aid (eight percentage points increase or more), 1970-2005

Country	Average Aid (ODA as a share of GNI)				Percentage point increase 1970-2005	RGDP per capita, PPP (constant 2005 international dollars) 2005
	1970s	1980s	1990s	2000-2005		
Sierra Leone	2.8	9.2	19.7	36.2	33.4	640
Congo, Dem. Rep.	2.0	5.1	4.1	31.2	29.1	273
Liberia	4.2	11.8		30.3	26.0	323
Burundi	10.3	14.8	19.7	34.0	23.8	340
Zambia	3.4	13.6	26.5	20.2	16.8	1,127
Nicaragua	3.1	8.4	30.7	19.9	16.8	2,311
Guinea-Bissau	20.7	49.3	51.7	37.2	16.4	497
Uganda	1.7	6.6	15.9	14.1	12.4	901
Malawi	9.9	16.8	27.0	21.1	11.1	648
Madagascar	3.5	8.8	13.2	13.8	10.3	882
Ghana	2.8	6.3	9.9	12.6	9.9	1,193
Rwanda	13.1	10.7	29.7	21.4	8.3	793

Table 4: Countries with decreasing amounts of aid (a decline of eight percentage points or more as a share of GNI), 1970-2005

| Country | Average Aid (ODA as a share of GNI) | | | | Percentage point decrease | RGDP per capita, PPP (constant 2005 international dollars) |
	1970s	1980s	1990s	2000-2005	1970-2005	2005
Jordan	20.7	14.4	10.2	6.5	14.2	4,342
Botswana	13.3	8.5	2.4	0.5	12.7	12,088
Egypt, Arab Rep.	10.4	5.4	5.9	1.4	9.1	4,319
Cambodia	18.6		11.3	10.5	8.1	1,443

Table 5: The impact of foreign aid on changes in economic freedom after controlling for political institutions and geographic/locational factors (pooled OLS for ten-year periods, 1985-1995 and 1995-2005)

| | Dependent variable: Change in Economic Freedom, 1985-1995 and 1995-2005 | | | | | |
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
EFW, beginning of period	-0.45 ***	-0.40 ***	-0.45 ***	-0.41 ***	-0.55 ***	-0.53 ***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)
Polity IV, beginning of period			0.02 *	0.02 **	0.01	0.01
			(0.01)	(0.01)	(0.01)	(0.01)
Average aid (ODA as a share of GNI):						
Previous 10-year period		-0.01		-0.01		0.00
		(0.01)		(0.01)		(0.01)
Contemporaneous 10-year period	-0.02 *		-0.02		-0.01	
	(0.01)		(0.01)		(0.01)	
Coastal population (% within 100km)					0.80 ***	0.84 ***
					(0.23)	(0.23)
Tropical location (% area in tropics)					-0.17	-0.24
					(0.17)	(0.16)
Distance to major markets[a]					0.05	0.05
					(0.04)	(0.04)
Period dummy, 1995-2005	0.07	0.11	-0.01	0.01	0.11	0.10
	(0.10)	(0.11)	(0.11)	(0.12)	(0.11)	(0.11)
Intercept	3.14 ***	2.83 ***	3.17 ***	2.92 ***	3.11 ***	2.96 ***
	(0.45)	(0.42)	(0.45)	(0.42)	(0.45)	(0.43)
R^2 (Adjusted)	0.29	0.26	0.30	0.29	0.36	0.35
Number of observations	141	139	141	139	141	139

Notes:

[a] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.

*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Heteroskedastic robust standard errors are listed in parenthesis.

Table 6: The impact of Foreign aid on reductions in the extreme poverty rate after controlling for political institutions and geographic/locational factors (pooled OLS for five-year periods, 1980-2005)

Independent variable	Dependent variable: Reduction in extreme poverty rate, five-year periods			
	(1)	(2)	(3)	(4)
Extreme poverty rate, start of period	0.07 ***	0.08 ***	0.08 ***	0.12 ***
	(0.02)	(0.02)	(0.02)	(0.02)
Average aid (ODA/GNI), previous 5-year period	-0.15 *	-0.15	-0.14	-0.09
	(0.09)	(0.09)	(0.09)	(0.07)
EFW, beginning of period		0.45	0.38	0.46
		(0.34)	(0.35)	(0.36)
Polity IV, start of period			0.12 **	0.19 ***
			(0.06)	(0.06)
Coastal population (% within 100km)				1.61 *
				(0.91)
Tropical location (% area in tropics)				-3.46 ***
				(0.85)
Distance to major markets[a]				-0.41 ***
				(0.16)
Period dummies:				
1981-1985	2.19 *	2.31 *	2.68 **	2.72 **
	(1.33)	(1.33)	(1.31)	(1.27)
1986-1990	0.46	0.59	0.83	1.01
	(1.42)	(1.41)	(1.43)	(1.40)
1996-2000	1.08	0.87	0.59	0.32
	(1.18)	(1.21)	(1.15)	(1.12)
2001-2005	2.59 **	2.21 *	1.93 *	1.80
	(1.12)	(1.16)	(1.14)	(1.11)
Intercept	-0.31	-2.93	-2.79	-0.74
	(0.88)	(2.12)	(2.21)	(2.13)
R^2 (Adjusted)	0.06	0.06	0.07	0.12
Number of observations	337	337	337	337

Notes:

[a] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.

*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Heteroskedastic robust standard errors, clusterd by country, are listed in parenthesis.

Table 7: The impact of Foreign aid on reductions in the moderate poverty rate after controlling for political institutions and geographic/locational factors (pooled OLS for five-year periods, 1980-2005)

Independent variable	Dependent variable: Reduction in moderate poverty rate, five-year periods			
	(1)	(2)	(3)	(4)
Moderate poverty rate, beginning of period	0.04 ***	0.05 ***	0.05 ***	0.08 ***
	(0.01)	(0.01)	(0.02)	(0.02)
Average aid (ODA/GNI), previous 5-year period	-0.13 *	-0.12	-0.11	-0.06
	(0.08)	(0.08)	(0.08)	(0.06)
EFW, beginning of period		0.82 **	0.77 *	0.80 *
		(0.40)	(0.41)	(0.41)
Polity IV, beginning of period			0.08	0.13 **
			(0.06)	(0.06)
Coastal population (% within 100km)				1.79 *
				(1.03)
Tropical location (% area in tropics)				-3.32 ***
				(0.78)
Distance to major markets[a]				-0.25
				(0.16)
Period dummies:				
1981-1985	1.69	1.92	2.18	2.26
	(1.39)	(1.40)	(1.42)	(1.39)
1986-1990	1.27	1.49	1.66	1.81
	(1.38)	(1.37)	(1.40)	(1.38)
1996-2000	2.12 **	1.73 *	1.54	1.30
	(1.02)	(1.03)	(1.02)	(1.00)
2001-2005	2.97 ***	2.29 *	2.10 *	2.04 *
	(1.17)	(1.24)	(1.25)	(1.24)
Intercept	-0.42	-5.34 **	-5.27 **	-3.94 *
	(0.90)	(2.52)	(2.57)	(2.37)
R^2 (Adjusted)	0.03	0.03	0.04	0.07
Number of observations	337	337	337	337

Notes:
[a] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.
*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Heteroskedastic robust standard errors, clusterd by country, are listed in parenthesis.

Table 8: The impact of Foreign aid on reductions in the extreme poverty rate after controlling for political institutions and geographic/locational factors (pooled OLS for ten-year periods, 1985-1995 and 1995-2005)

Independent variable	Dependent variable: Reduction in extreme poverty rate, 1985-1995 and 1995-2005			
	(1)	(2)	(3)	(4)
Extreme poverty rate, beginning of period	0.13 ***	0.14 ***	0.15 ***	0.21 ***
	(0.04)	(0.04)	(0.04)	(0.04)
Average aid (ODA/GNI), previous 10-year period	-0.15	-0.14	-0.14	-0.07
	(0.17)	(0.17)	(0.17)	(0.14)
EFW, beginning of period		0.89	0.84	0.70
		(0.57)	(0.58)	(0.63)
Polity IV, beginning of period			0.17 *	0.26 ***
			(0.09)	(0.10)
Coastal population (% within 100km)				3.73 *
				(2.13)
Tropical location (% area in tropics)				-6.12 ***
				(1.94)
Distance to major markets[a]				-0.42
				(0.35)
Period dummy, 1995-2005	2.91 **	2.30	1.58	1.21
	(1.40)	(1.49)	(1.45)	(1.45)
Intercept	-0.26	-5.30	-4.95	-1.39
	(0.98)	(3.41)	(3.50)	(3.33)
R^2 (Adjusted)	0.12	0.12	0.13	0.21
Number of observations	136	136	136	136

Notes:
[a] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.
*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Heteroskedastic robust standard errors, clusterd by country, are listed in parenthesis.

Table 9: The impact of Foreign aid on reductions in the moderate poverty rate after controlling for political institutions and geographic/locational factors (pooled OLS for ten-year periods, 1985-1995 and 1995-2005)

Independent variable	Dependent variable: Reduction in moderate poverty rate, 1985-1995 and 1995-2005			
	(1)	(2)	(3)	(4)
Moderate poverty rate, beginning of period	0.10 ***	0.12 ***	0.13 ***	0.17 ***
	(0.03)	(0.03)	(0.03)	(0.04)
Average aid (ODA/GNI), previous 10-year period	-0.31 *	-0.29 *	-0.29 *	-0.20
	(0.17)	(0.17)	(0.17)	(0.15)
EFW, beginning of period		1.73 **	1.70 **	1.43 *
		(0.74)	(0.76)	(0.83)
Polity IV, beginning of period			0.12	0.19 *
			(0.11)	(0.11)
Coastal population (% within 100km)				4.65 *
				(2.83)
Tropical location (% area in tropics)				-5.69 ***
				(2.01)
Distance to major markets[a]				-0.25
				(0.43)
Period dummy, 1995-2005	4.17 ***	2.94 *	2.43	2.19
	(1.45)	(1.67)	(1.71)	(1.70)
Intercept	-0.32	-10.39 **	-10.23 **	-7.84 *
	(1.41)	(4.41)	(4.57)	(4.37)
R² (Adjusted)	0.09	0.11	0.11	0.16
Number of observations	136	136	136	136

Notes:
[a] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.
*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Heteroskedastic robust standard errors, clusterd by country, are listed in parenthesis.