Aiding Inequality: The Effect of Foreign Aid on Income Inequality

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In recent years there has been an increase in literature criticizing the current methods for giving foreign aid. Aid is often politically motivated and misused. In this paper, we extend this argument by investigating the effects of foreign aid on income distribution in recipient countries. Income inequality is a significant problem due to the unrest and stunted growth it can cause. We hypothesize that foreign aid will increase inequality in recipient countries by increasing the incomes of a select few. This study draws on new income inequality data from the University of Texas Inequality Project. Our dataset includes 82 countries and over 1,100 observations from the year 1975 to 2005. Because the relationship between the variables is potentially endogenous, we instrument for aid using the standard aid equation, but we also add a new variable to the equation, the number of development banks of which a country is a member in a specific year. We conclude that the effect of foreign aid on inequality is somewhere between zero and weakly positive (increasing inequality).

Introduction

In recent years there has been an increase in literature criticizing the current methods for giving foreign aid. There is an abundance of literature that suggests that the foreign aid money that the West gives to the developing world is limited in its effectiveness (Easterly 2006; Boone 1996; Easterly 1999; Bornschier and Chase-Dunn 1978). Other scholars continue to argue that foreign aid is effective, but only under the right conditions (Burnside and Dollar 2000; Hansen and Tarp 2001; Collier and Dollar 2001; Nunnenkamp 2005). All of these studies use economic growth to determine the effectiveness of foreign aid. A few researchers have approached the question of what other effects of foreign aid exist, such as its effects on quality of life (Kosack 2003), but many areas affected by foreign aid remain relatively untouched. One of these areas is the effect of foreign aid on income inequality.

Scholars agree that income inequality is detrimental to economic growth in the developed world (Alesina and Rodrik 1994; Persson and Tabellini 1994). Barro concludes that the growth retarding effect of income inequality is even greater in poor countries (2000). In democracies with majority rule or in autocracies where the people have some influence, if the mean income exceeds the median income, redistribution occurs. The redistributive policies retard growth in those economies (Alesina and Rodrik 1994). Inequality also causes socio-political unrest (Alesina and Perotti 1996). Income inequality has been directly linked to a reduction in happiness levels as well (Blanchflower and Oswald 2003). This reduction is greater among those at lower income levels and those with less education. As a result, the poor begin to commit crime and riots and other disruptive activities occur (Barro 2000; Pastor 1995; Alesina and Perotti 1996). This increase in unrest hurts the economy and, more importantly, decreases the quality of life of all people in the country, especially those without the means to protect themselves from that unrest.

Because of the detrimental economic, political, and socio-political effects of inequality, it is important to understand what causes differences in inequality in various countries around the world. Much of the developing world experiences a great deal of inequality, but some countries suffer less from economic differences. Why do these differences exist? How are some countries able to escape extreme inequality while others experience a rift between the rich and the poor that increases in size every day? In this paper, we theorize that one of the causes of inequality in the developing world is the very foreign aid money that the West sends in an attempt to reduce this rift between the rich and the poor. We contend that economic growth is not the only important factor to examine when determining the effectiveness of foreign aid. If aid does increase growth but also increases inequality, then the goal of that aid (to reduce poverty) is not being met. The aid may also be having a reverse effect by increasing inequality, which then retards growth. It is important to understand this relationship so that aid organizations can better determine the effectiveness of their efforts.

Review of Existing Inequality Literature

The study of income inequality has produced a limited amount of literature that addresses the question of what causes changes in inequality. The literature that does exist provides a list of socio-economic and socio-political causes that fall into four related but distinct camps. These camps consist of a political explanations camp, an international integration explanations camp, a macroeconomic explanations camp, and a demographic explanations camp. Each of the camps emphasizes a particular category of independent variables as causes for changes in income inequality. There is some overlap between the camps as some of the theories do not refute, but rather add to, the theories of the other camps.

Political Explanations:

The political explanations camp focuses on four political causes of change in income inequality: Social spending, democracy, public sector expansion, and legislative partisan political power distribution. Rudra and Huber et al. find that social spending must be divided into education spending, health spending, and social security/welfare spending in order to see the true effects of each type of spending (Rudra 2004; Huber et al. 2006). Rudra finds that only education spending decreases inequality. She contends that social security and health spending are subject to greater lobbying and clientelism. Huber et al. find that health and education spending have no effect on income inequality; this finding may be due to their use of an aggregate measure that combines the two variables into one. Huber et al. and Rudra also find that social spending increases inequality, yet Huber et al. only make this conclusion in the context of non-democracies. This phenomenon occurs because social spending only aids those employed in the formal sector who in non-democracies are usually the political-elite.

Several studies look into the effect of democracy on inequality (Reuveny and Li 2003; Huber et al. 2006; Simpson 1990; Bollen and Jackman 1985). While Bollen and Jackman concluded in 1985 that democracy has no effect on inequality, several more recent studies have reversed that conclusion. The most recent of which (Huber et al. 2006) shows that the strength of the democratic tradition is one of the best explanatory variables for changes in inequality in Latin America (see also Muller 1988). Reuveny and Li also made the interesting conclusion that democracy decreases inequality when interacted with globalization, a variable that will be discussed later. Lee also studied the effect of democracy on inequality but in the context of public sector expansion. Lee concludes that public sector expansion in non-democracies

increases inequality. This occurs because in non-democracies the state supports particular core industries and client populations. This does not occur in democracies where the political mechanisms allow the state to help meet the needs of the lower classes (Reuveny and Li 2003).

Another political factor that affects inequality is the "legislative partisan political power distribution." Huber et al. (2006) conclude that in Latin America, countries with strong histories of left-leaning legislatures have lower inequality (see also Mahler 2004). This conclusion points to the idea that income inequality can actually be reduced by political means.

International Integration Explanations:

The second camp of scholars is made up of those that believe factors dealing with international integration explain changes in income inequality. There seems to be a consensus in the literature that foreign direct investment and trade increase inequality (Alderson and Nielsen 1999; Evans and Timberlake 1980; Reuveny and Li 2003, Gustafsson and Johansson 1999). The idea is that the money that comes into a country through FDI and trade go to the sector where the country has a comparative advantage, increasing incomes in that sector while leaving all other sectors of the economy in the dust. Reuveny and Li do suggest that when trade is interacted with democracy, it actually decreases inequality. As previously stated, this occurs because a democracy allows a country to meet the needs of the poor.

Macroeconomic Explanations:

The third group of scholars is mostly made up of economists who believe that macroeconomic factors best explain changes in inequality. The original theory about income inequality falls into this camp. The original theory suggests that all countries are somewhere on

the Kuznets Curve, an upside-down U (Kuznets 1955; Alderson and Nielson 1995; Robinson 1976). Kuznets suggested that income inequality in countries increases as the country develops (defined as increases in per capita income) and then decreases after it reaches a critical point. Much of the literature on inequality seeks to explain why this curve exists because most do not accept changes in per capita income as an adequate explanation.

Morely puts forth several additional macroeconomic explanations for inequality in Latin America. He claims that inflation increases inequality because it hits the poor harder than the rich (Morely 2001; Albanesi 2007; Bulir 2001). This occurs because the rich can invest in capital or land when inflation occurs. These investments do not decrease in value with inflation. The poor are unable to do this because such a large percentage of their income goes toward consumption. Morely also suggests that recessions increase inequality because they also hit the poor harder than the rich (Morely 1995; Psacharopoulos et al. 1995). Recessions cause unemployment, usually at the low end of the income bracket. They also cause the rich to spend less on the goods and services that the poor provide, decreasing the income of the poor and increasing inequality. Morely's final explanation for inequality is change in the minimum wage (1995). He suggests that a decrease in the minimum wage leads to more formal sector jobs, which decreases inequality and that an increase in the minimum wage leads to fewer formal sector jobs, increasing inequality.

Demographic Explanations:

The final group of scholars explains changes in inequality using demographic variables. The most prominent theory in this camp is that an increased youth population increases inequality (Simpson 1990; Bollen and Jackman 1985; Gustafsson and Johansson 1999). This

occurs because young people have less experience and are more often unemployed. They also provide a competitive pool for employers to draw from, decreasing the wages of the youth and increasing the profits of the employers. Huber et al. suggest that youth population actually has limited significance, but when it is significant it decreases inequality. This finding is interesting, yet not well explained. Morely suggests that the real explanation for inequality is not in the size of the youth population but rather in the dependency ratio, the number of workers compared to the size of the family they are supporting (1995).

Another demographic variable that helps explain changes in inequality is the percent of the population employed in the informal sector (Huber 2006 et al.; Gustafsson and Johansson 1999; Alderson and Nielsen 1995; Nielsen 1994). The literature concludes that a higher percent of the population employed in agriculture (high sector dualism) increases inequality. This occurs because wages are often lower in the informal sector, and the people not employed in the formal sector do not receive much of the benefit of government social spending through social security and welfare programs.

Another demographic factor that can affect income inequality is ethnic diversity. There are certain levels of ethnic diversity or racial diversity that cause large discrepancies in income distribution (Meisenberg 2007). When the political leaders come from a particular race or ethnic group, they tend to reward that race or ethnic group. In his article, Bayart lists African dictators who diverted money to tribe members (1992). This tendency to divert funds to the leader's ethnic group leads to inequality because one group is preferred over others causing that group to get better jobs and government contracts allowing them to have a higher level of income.

The final demographic explanatory variable is education. Most scholars argue that education decreases inequality over time (Lee 2005; Morely 1995; Alderson and Nielsen 1995;

Crenshaw 1992). This occurs because education allows the poor to escape poverty and enter into jobs that pay better wages. Widespread education also attracts widespread foreign direct investment, not just FDI in certain sectors, but in all sectors where there are educated individuals.

Our theory that foreign aid affects changes in inequality would fall into the international integration explanation camp. Although foreign intervention through foreign aid is not the same as intervention through trade and FDI, it still involves foreign powers or organizations inputting money into an economy. The only differences are that the aid organizations input this money through the governments of the developing countries, and the goal of the money is to improve the welfare of the poor instead of to gain profits. The foreign aid theory does not contradict any of the established theories about the causes for changes in income inequality. Instead it seems that foreign aid money acts as a catalyst for many of the already established theories about what increases inequality. Aid is used by developing countries to fund various programs that the literature concludes increase inequality: education spending, health spending, social security/welfare sending, public-sector expansion in non-democracies, attracting FDI, liberalizing trade, and economic growth. Because foreign aid supports these inequality increasing programs, it should lead to increased inequality.

Theoretical Framework: Why foreign aid leads to inequality

Several mechanisms describe how foreign aid money leads to an increase in inequality. All of the mechanisms play some role in the process of aid money flowing to certain groups and away from other groups.

The first causal mechanism exists through politics. As rational actors, politicians act to please their supporters. Often, a politician's supporters are made up of a group of high-income

private citizens and special interests. The politicians have a vested interest in pleasing their supporters so that the supporters will help them win subsequent elections and help them with living expenses and employment after several faithful terms in public office. In his study of the effectiveness of foreign aid, Boone concludes that all political systems favor a "high-income political elite" when it comes to aid distribution (Boone 1996). He divides countries into three groups: those with elitist governments, egalitarian governments, and laissez-faire governments. His theory says that only the elitist governments will prefer the elites, but from his evidence he concludes that all three government types favor the "high-income political elite." Since the governments are the organizations that ultimately control how the aid money is used, it can be assumed that the money will be distributed in a manner that favors those high-income individuals who support the politicians in office. This will increase the incomes of a small group of individuals including the politicians and their supporters but will leave the poor essentially in the same position they were in before the government received the aid money. This will increase income inequality. Even if the government decides to give equal amounts of aid money to the poor and to their group of supporters, income inequality will increase. This will occur because the money given to the poor has to be distributed among a very large group while the money given to the supporters will be distributed among a much smaller group allowing each individual to receive a much larger share. Easterly claims that governments also have little incentive to help increase the productive potential of the poor because this might foster political activism that would threaten the politicians' and their supporters' social and political standing (Easterly 2003).

Some argue that the conditionalities that aid agencies include in loans and grants are designed to force governments to use aid in ways that benefit the poor. The conditionalities often require a liberalization of economic policies (which may or may not help the poor) and

improvements in institutions. Over the last couple of decades, these conditionalities have been under attack because of ineffectiveness, lack of enforcement, and lack of credibility (see Bauer 1993; Collier et al. 1997; Leandro et al. 1999; Morrissey 2004; Svensson 2000). The conditionalities force policies on governments that refused to implement them on their own and are reluctant to be forced to implement them. Because of this, the governments find ways to get around the conditionalities. Sometimes they do not fully implement the policies, sometimes they repeal the policies as soon as they get the money, and sometimes they refuse to implement the policies and count on the benevolence of the aid organization to induce the giving of the loan or grant without the conditionalities. Because of these problems with aid conditionalities, the money still goes to the "high-income political elites," increasing inequality.

This could, however, still improve inequality if these high-income individuals invest the money in the domestic economy. This increase in investment could cause economic growth by increasing the number of jobs and the amount of credit available to all members of society. This is commonly referred to as a "trickle down" effect (Azam and Laffont 2003). This trickle down effect does not fully occur, however, because the money is not invested domestically (See Easterly 1999 and Boone 1996). Investors in poor countries favor foreign markets for several reasons. Investments in developing economies may provide more opportunity for profit, but the associated risk often encourages local investors to look abroad. Globalization has facilitated international investment and expanded investment choices, enabling a broader and more stable portfolio. In cases such as these where the "trickle down" effect does occur, inequality still increases because the political elite still receives the majority of the benefit.

The aid organizations' selection process for giving aid causes another disincentive for politicians to improve the welfare of the poor. Logically, aid organizations make these decisions

based, in part, on the needs of the poor. Because of this, the governments that receive the aid money have little incentive to actually help the poor because if the welfare of the poor does not improve, the aid money will keep coming; if the welfare of the poor increases, the aid money will eventually slow (Svensson 2000). Bauer claims that the problem is that aid goes to governments whose policies retard growth and create poverty (1993). These countries actually have an incentive to make sure their institutions remain of poor quality because that will eventually lead to more economic crises which means an increase in aid money (Azam and Laffont 2003). The improvement of institutions is crucial to decreasing inequality because better, more democratic institutions allow the government to meet the needs of the poor (Reuveny and Lee 2003). Better institutions and governance could also decrease inequality by redistributing income through effective taxation and by decreasing the influence of the "high-income political elites" through crackdowns on corruption.

International aid-giving organizations are also subject to the interests of their member states (Nielson and Tierney 2003). This idea gives a new incentive to the politicians in aid-receiving countries. If they want to receive aid, they need to do favor programs that will cause the member countries of the aid organizations to desire to give them aid. This suggests that it is more important for politicians in developing countries to show developed countries that it is in the best interest of the developed world to invest in their country. This means that the developing country is more likely to use the money to improve its standing with the donor countries than to help the poor. This will cause an increase in income inequality because the money will be spent on programs that favor the elite that are well-connected with the West, rather than those programs that will aid the lowest income groups.

For a moment let us assume that aid money does actually get through the government and is invested wisely in the domestic economy. It is logical to assume that the aid will be directed to the sector that has the highest potential to generate profits and, thus, cause economic growth to occur. If the money is directed to this sector or sectors, the owners of those sectors will be the ones who profit most. The workers in those sectors should profit some as well. While the other sectors will probably experience some growth due to the success of the highly profitable sector, the growth will be much less. This will cause an increase in income inequality because while the incomes of the members of the specified sector will increase significantly, everyone else's incomes will remain unchanged or increase to a far lesser extent.

Foreign aid can also affect inequality through the ethnic diversity hypotheses listed above in the literature review. If the political leaders that distribute the aid money belong to a particular ethnic group, they will tend to prefer that ethnic group when distributing foreign aid. They will use the aid to make sure that the members of that ethnic group receive better paying jobs that the aid eventually provides. They will also use the money to directly improve infrastructure in the areas where members of their ethnic group reside. Since the literature has already established that ethnic diversity tends to lead to inequality, we add to that literature by suggesting that one way that this relationship exists is through the distribution of foreign aid.

From this theoretical discussion we extract two hypotheses: 1) Foreign aid will lead to income inequality, and 2) Foreign aid will cause more inequality in autocracies than democracies. We suggest that this increase in inequality will be caused by aggregate aid. It may the case that some aid programs actually improve inequality, but the goal of this study is to discover the effect of net inflows of foreign aid money. We hypothesize that most of the aid that is distributed in the form of projects that are meant to improve inequality is not spent in the

fashion that is dictated by the donors. The aid is often used for other purposes that actually worsen inequality. Because of this misuse of aid and the other natural effects of aid mentioned in our theoretical framework, we hypothesize that the net impact of aid on inequality will be positive. We also use aggregate aid as our dependent variable because of its availability and because it is the measure of aid most frequently used in the foreign aid literature (see Burnside and Dollar 2000, Hansen and Tarp 2001, Easterly 2003).

Data Collection

Income inequality data is relatively scarce because it requires annual surveys to be conducted. There are several datasets that exist and try to combine all the data available. The largest of these is the World Income Inequality Database produced by the UN. However, this database combines a number of different studies and a number of different methods for calculating the inequality indices. In our study we use a dataset compiled by the University of Texas Inequality Project (Galbraith 2008). This dataset uses information for the US, the OECD, and the UN to compile a dataset of inequality based on industrial pay rates which is comparable across countries and across time. In future studies, we will compare the results produced by the analysis of this data with results using the WIID data.

Data for our independent variable, foreign aid, comes from the WDI (2005). We use a measure of aid per capita. We take the natural log of this variable because we assume that the relationship is non-linear with the effects of aid on inequality dwindling as aid flows get larger. We chose to use aid per capita rather than the traditionally used aid as a percentage of GDP due to the fact that our analysis concerns the effect of aid flows on inequality rather than aid dependence.

Our study also includes several independent variables established in the literature to allow us to understand the effects of our independent variables after controlling for the explanatory variables that scholars have already established to exist. Summary statistics for these variables, along with our independent and dependent variables, appear in Table 1 of the appendix.

Youth Population

The argument of inflation hurting unskilled workers is extended to the variable of demography. The youth population is one of the principal suppliers of unskilled labor. Many authors make a link between youth population and income inequality. Alderson and Nielsen argue that a large youth population causes an oversupply of unskilled workers, thus driving down the wage of unskilled labor (1999). Therefore, we expect that a high youth population will increase inequality. For this data we used the World Bank's World Development Indicators, WDI (2005). This data set provides a percentage of each nation's population that was younger than 15 years. We used this percentage as the measure of youth population in a society.

Agricultural Share of GDP

There are differing views regarding employment in agriculture and its effects on income inequality. Alderson and Nielson argue that decreasing proportions of employment in agriculture will increase inequality (1999). This is based on the assumption that inequality in the agricultural sector is lower. Huber et al. argue the opposite for Latin America. They found that the Gini index in urban areas suggests less inequality than in rural areas (2006). Thus, increased employment in agriculture will lead to greater inequality. Because of the limited availability of data on employment in agriculture, we used the World Bank's WDI (2005) to obtain a agricultural share of GDP. We used this data as the measurement of employment in agriculture.

Democracy

Many theorists agree that democracy provides institutions that empower the poor. This provides more opportunity for redistribution mechanisms. As the level of democracy increases, politicians are more responsive to the needs of the citizens. Thus, one would expect that democracy would decrease inequality. The empirical data has been ambiguous in many studies, but Reuveny and Li (2003) found a significant relationship between democracy and inequality when controlling for trade openness. We agree with Reuveny and Li and hypothesize that our model will yield a negative relationship between the level of democracy and income inequality. We use data from Polity IV as a measure for democracy (CIDCM 2004). The Polity data set provides a measure of democracy and a measure of autocracy. The sum of these two measures is the polity score. This measure of democracy will also act as a proxy for the level of social spending under the assumption that more democratic countries spend more on social programs.

GDP per capita (PPP)

The dominating theory regarding economic development and income inequality is Simon Kuznets' (1995) inverted U-shaped curve. At lower levels of development, income inequality increases as per capita income increases. At higher levels of development, income inequality decreases as per capita income increases. In our data set, we focus on countries that receive foreign aid. It is safe to assume that most of these countries are at lower levels of development, so we predict that per capita GDP growth will increase income inequality. Our measurement of real per capita GDP (Purchasing Power Parity) comes from the Penn World Tables.

Log FDI

Many authors agree that inflows of foreign direct investment has a positive effect on inequality. Reuveny and Li found this to be the case for sample of countries from around the

world (2003). Tsai found that this effect of foreign direct investment on inequality is region specific (1995). Huber et al. hypothesize that FDI increases inequality in Latin American and the Caribbean because this type of investment is in capital-intensive industries that provide relatively few jobs (2006). However, the jobs provided are relatively well paying. For this variable we took the natural log of a measure of aid inflows from the WDI.

Other Variables

In our review of the literature, several additional variables are mentioned. The first of these is social spending. Both Huber et al. (2006) and Rudra (2004) suggest that social spending has a positive impact on inequality in developing countries. The logic behind this effect is sound, but the results seem to still be somewhat questionable. When deciding whether or not to include this variable, we weighed the cost of losing a large number of cases due to holes in the social spending data against the benefit of including a slightly significant control variable. We decided that the cost outweighed the benefit and left out the variable. For the same reasons we left out the dependency ratio under the assumption that any effects of the dependency ratio on inequality should be controlled for by including population and GDP per capita in our analysis.

Huber et al. (2006) also found that the legislative partisan political power distribution has an effect on income inequality. We would have controlled for this variable, but we were not able to obtain the data required. However, the variable only became extremely significant after controlling for the interaction between democracy and social spending. Since we were not able to include the social spending variable, we determined that our results would not be harmed by omitting the legislative partisan political power variable.

We also chose not to include inflation as a control. In our initial analysis inflation was not a significant predictor of inequality, and its inclusion caused us to lose a large number of cases.

We decided our results would be more biased by losing a significant number of countries than by leaving out inflation. There is also no theoretical foundation for inflation to have an effect on inequality, meaning that if inflation is included in the error term the results will not be biased because there is no correlation between it and aid.

The final variable omitted from our study was the minimum wage. Morely (1995) suggested that a high minimum wage tends to increase inequality because of its effect on employment in the formal sector. A high minimum wage causes a lower number of people to be employed in the formal sector, increasing inequality. There is also sufficient justification for the exclusion of this variable on the grounds that there is no theoretical relationship between the level of the minimum wage and foreign aid flows.

Methodology

To test the relationship between foreign aid and income inequality (gini coefficient), we use an unbalanced panel dataset. Our models include about 1,131 observations from eighty-two developing countries. All of the countries qualify as either least developed countries, other low income countries, lower middle income countries, or upper middle income countries as categorized by the OECD (OECD 2009). A list of the countries used in the analysis can be found in table 2 of the appendix.

We begin the analysis using classic Ordinary Least Squares (OLS). We include the control variables which could be correlated with both inequality and aid, and which, therefore, if included in the error term could cause our results to be biased. Because of the potential for incorrect standard errors due to heteroskedasticity and autocorrelation we use robust standard errors.

Analysis using OLS presents several problems. The first problems, biased standard errors due to heteroskedasticity and autocorrelation, are will be resolved using robust standard errors. Since these problems will only affect the standard errors and not the coefficient of interest (logged aid per capita), we will not be terribly concerned about their presence.

The next set of problems is due to a set of assumptions about the error term. In order for the coefficient of interest to be unbiased, the independent variable must be orthogonal to the error term, meaning if there is any omitted variable that is correlated with inequality and with aid, the coefficient will be biased. Due to the fact that a number of variables fall into this category, the OLS results are probably biased. One way to fix this problem is to used a random or a fixed effects model. These models include a set of country-specific intercepts which essentially control for any variables that vary by country but not over time. Some examples of variables affecting inequality and aid which should be controlled for using one of these models are, initial inequality, resource endowment, the land-tenure system set up by colonial powers, and any other governing institution characteristics instituted by colonial powers. The random- and fixed-effects models differ in the assumptions made about the country-specific intercepts. To check for the robustness of our results, we include both models in our analysis.

Another potential source of correlation between aid and the error term is the potential for an endogenous relationship between inequality and aid. As discussed above, it could be the case that inequality is related to the amount of aid a country receives. We suggest that countries with more inequality receive more aid because they often have a larger proportion of their population in poverty. These countries would tend to receive more aid because donors see them as an opportunity to have greater success at bringing more people out of poverty. It is possible, however, that the relationship is negative, more inequality leads to less aid. This could be the

case due to the possibility that aid donors see the most unequal countries as lost causes and, hence, send their money to areas that have seen improvement in the past. No matter the direction of the relationship, the possibility that *a* relationship seems fairly high. Hence, to solve this problem we will instrument for aid using a series of regional dummies including Sub-Saharan Africa, the CFA Franc Zone, Central America, and Egypt (Burnside and Dollar 2000). All of these areas tend to receive more aid than other areas. Burnside and Dollar also advocate the use of a measure of arms imports, but when we include this measure it proved insignificant and it cut our sample size in half and biased our results, so we decided to omit the variable. Instead, we chose to include a new instrument for aid, development bank membership. We include dummy variables for whether a country is a member of the Inter-American Development Bank, the International Bank for Reconstruction and Development, the International Development Association, and the Asian Development Bank at time t. Development bank membership dramatically increases the aid a country receives and should only affect inequality through the aid flows; hence, it should prove to be a valid instrument. The first stage regression found in table 3 of the appendix provides results when predicting current aid and aid lagged one period. Both of the regressions show that all of the variables except for membership in the International Bank for Reconstruction and Development are highly significant, although membership in the Inter-American Development Bank and the Asian Development Bank seem to decrease the aid a country receives. We have no theoretical reason to explain this result. The instruments should also remove any bias caused by measurement error which could potentially exist due to the large amount of missing information about aid flows.

All of these robustness checks should provide us with fairly accurate information about the relationship between aid and inequality. However, because of the potential for problems

discussed above, the results should be taken with a grain of salt because our solutions to these problems may not completely remove all potential bias.

Results

Our results are somewhat inconclusive, but seem to indicate a robust zero to positive correlation between aid and inequality. Starting with the OLS regressions, we find a significant positive coefficient on aid. This coefficient is robust across most of the different types of model specifications and is around 0.25, suggesting that a 1% increase in aid per capita would lead to an increase of 0.25 points on the 100 point inequality scale. In other words, an increase in aid of 10% would increase inequality by 2.5 points, which is substantively significant due to the slow moving nature of income inequality. The only model in this first round of tests that doesn't have a significant positive coefficient is the fixed-effects model. We ran a Hausman test and found that the fixed-effects model is more appropriate, so these results must be taken seriously. However, even with the fixed-effects results, out analysis indicates that the effect of aid on inequality is most likely positive or non-existent. The results using aid lagged one period are almost identical.

Next we ran the two-stage least squares regressions instrumenting for aid. This time we stick only with the fixed- and random-effects models because of the results of the Hausman test in the previous set of regressions. It is interesting to note that in all of the 2SLS regressions, the aid variable remains positive and actually somewhat larger than before, but is now statistically insignificant. This is probably due more to a lack of statistical power caused by the use of 2SLS rather than a change in the results. Instrumenting for aid caused the coefficients for aid in the fixed-effects model to increase dramatically. This suggests that the OLS coefficients were biased

downward due to countries with more inequality receiving less aid. It could also potentially be the case that some other omitted variable was biasing the aid coefficient and the endogeneity problem discussed above is non-existent. The results for aid lagged one period are also positive, but the coefficient in the random effects model is significant at the .10 level. It is interesting to note that our fixed-effects 2SLS regression (which we argue is the least biased) including lagged aid has a significantly smaller coefficient than the regression with current aid, suggesting that today's aid's effect today is bigger than today's aid's effect next year.

All of these results taken together suggest somewhere between a zero correlation and a weak positive relationship between aid and inequality.

Robustness Checks

Now we will discuss some additional analysis that we performed in order to better understand the relationship between aid and inequality. This analysis is all somewhat preliminary but will provide the beginnings of a deeper understanding of the relationship.

First, we disaggregated the effect by the countries' income categories to attempt to extract differences between the groups. All of these regressions use fixed-effects models. Most of these groups had insignificant coefficients due to the decreased sample size, but we will try to explain the differences in their coefficients nonetheless. It is interesting to note that aid seems to be decreasing inequality slightly in lower middle income countries and significantly in the least developed countries, while increasing it in other low income countries and upper middle income countries. This suggests that in the poorest countries, the aid actually gets to those in poverty, while in richer countries the aid seems to increase the incomes of the wealthier groups or not affect incomes at all. This fits with one part of the theory we outlined above because wealthier

countries tend to have more industry and tend to be building up the areas of their economies where they have a comparative advantage. Hence, the government uses the aid money to build up those sectors, strengthening the economy, but also worsening inequality by increasing the incomes of those employed in that sector and not affecting those in the deepest poverty. Hence, while some incomes increase, others remain low or decrease due to the over-attention to one or two specific sectors and the inattention to all other sectors.

As another robustness check, we reran the analysis leaving out Latin American countries. We feared that our positive results were driven by the Latin American countries which receive a lot of aid and have always suffered extreme inequality. The random-effects coefficient remained positive and significant, but the fixed-effects coefficient became slightly negative and insignificant. This confirms our theory that Latin America was inflating the coefficients, yet the analysis still indicates a zero to slightly positive effect of aid on inequality due to the fact that the fixed-effects coefficient is quite small and not statistically significantly different from zero.

Lastly, we included democracy as a control in our fixed-effects regressions. The aid coefficient was unchanged, but the inclusion an interaction term between democracy and aid produced interesting results. A significant positive coefficient on the interaction term suggests that as democracy levels increase, the effect of aid on inequality becomes more positive. This is inconsistent with our theory that aid will cause more inequality in autocracies than democracies. This may be due to the fact that our study only includes developing countries where democracy is far from perfect. Most of the countries are probably fairly low on the democracy scale. It is also possible that they are just less autocratic than their counterparts. Democracy opens the door to corruption and interest group politics which may lead to certain groups being favored by the government which would increase inequality.

Implications and Conclusions

The analysis of these data supports our theoretical framework suggesting that foreign aid increases income inequality in developing and transition nations. The quantitative tests show that foreign aid is a somewhat robust explanatory variable for increases in inequality in these nations. The varying characteristics of the countries studied allow for some conclusions to be made.

The quantitative analysis suggests that the effect of foreign aid on income inequality is somewhere between zero and weakly positive. After controlling for all the other factors, increases in foreign aid are related with limited increases in inequality. It must be remembered, however, that foreign aid is intended to increase the well-being of the poor alone. Most aid giving organizations obtain contributions and operate under the goal of decreasing world poverty. Because of this fact, our finding that foreign aid has a small but positive effect on inequality is very important. This finding shows that while aid may help the poor, it is obviously helping the rich more. This is a problem. Most contributors to organizations that provide aid assume that their money is used for the poor. While there is a chance that these donors would still be satisfied if they knew a small portion of their money helped the rich, they would probably not be satisfied to know that their money is being used to allow the incomes of the rich to increase more than the incomes of the poor, an implication of our findings.

While the effect of foreign aid on income inequality may be small, it is not negative as it should be, rather it potentially causes inequality to increase in these developing countries where inequality is already a huge problem. Inequality causes slowed growth, higher crime rates, and other serious problems across the world. One goal of foreign aid is to *decrease* this inequality

and provide better lives for the poor. This goal is not being met; even worse is the fact that the opposite is potentially occurring.

Foreign aid money is given to these countries every year in amounts equaling millions and sometimes billions of dollars. If those amounts are causing even a small increase in inequality every year, after ten or fifteen years, inequality will be much higher than it is today. This will cause the growth that foreign aid is meant to encourage to slow or even stop. This will also cause extreme hardship for many of the citizens of these developing countries while providing unnecessary luxuries for a select few.

We do not mean to suggest that aid organizations should cease giving aid. We do suggest, however, that the way in which aid is given to these developing countries be improved. It is obvious from our results that foreign aid is not decreasing inequality but increasing it. Because of this, aid organizations should reevaluate their methods for giving foreign aid. Careful analysis should be performed to determine which types of aid cause inequality to increase and which help relieve the problem of extreme inequality. We suggest that aid organizations increase their level of responsibility and use their money to improve the conditions and the incomes of the poor more than the conditions and the incomes of the rich. If one of the key goals of foreign aid giving, reducing inequality, is not being met, the way in which aid is distributed should be changed.

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Appendix:

Summary Stats here

Table 2: Countries Included in Analysis

Albania	Gabon	Paraguay
Angola	Gambia	Peru
Armenia	Ghana	Philippines
Argentina	Guatemala	Rwanda
Azerbaijan	Honduras	Senegal
Bangladesh	India	Sierra Leone
Barbados	Indonesia	Somalia
Belize	Iran	South Africa
Bolivia	Jamaica	Sri Lanka
Botswana	Jordan	Swaziland
Brazil	Kenya	Syria
Burkina Faso	Kyrgyzstan	Thailand
Cameroon	Lesotho	Togo
Cape Verde	Macedonia	Trinidad and Tobago
Central African Republic	Madagascar	Tunisia
Chile	Malawi	Turkey
China	Mauritania	Uganda
Colombia	Mauritius	Ukraine
Congo	Mexico	Uruguay
Costa Rica	Moldova	Venezuela
Croatia	Mongolia	Zambia
Cote d'Ivoire	Morocco	Zimbabwe
Dominican Republic	Mozambique	
Ecuador	Nepal	
Egypt	Nicaragua	
El Salvador	Nigeria	
Equatorial Guinea	Pakistan	
Ethiopia	Panama	
Fiji	Papua New Guinea	

Table 3: 1st Stage Regressions Predicting ln(aid per capita)

	OLS, time t	OLS, time t-1
Egypt	0.442***	0.378*
	(0.150)	(0.202)
Sub-Saharan Africa	0.198*	0.246**
	(0.108)	(0.111)
Franc Zone	0.254***	0.243***
	(0.0697)	(0.0643)
Central America	1.411***	1.366***
	(0.152)	(0.152)
Inter-American Development Bank	-1.403***	-1.333***
	(0.137)	(0.140)
International Bank for	0.0317	0.214
And Development	(0.149)	(0.239)
International Development	0.672***	0.749***
Association	(0.209)	(0.217)
Asian Development Bank	-0.455***	-0.418***
	(0.118)	(0.120)
Constant	9.233***	8.928***
	(0.224)	(0.319)
Observations	2494	2492
R-squared	0.147	0.146

Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Aid and Inequality Regressions

	OLS	Random Effects	Fixed Effects	MLE
ln(aid)	0.297***	0.254***	0.0783	0.246***
	(0.0882)	(0.0580)	(0.0707)	(0.0669)
Youth Population	0.0766**	-0.0689*	-0.00424	-0.0745*
	(0.0312)	(0.0408)	(0.103)	(0.0387)
Agricultural share of GDP	-0.0124	-0.0373	-0.00599	-0.0373*
	(0.0169)	(0.0271)	(0.0434)	(0.0207)
Ln(FDI)	0.420***	0.304***	0.181	0.294***
	(0.0767)	(0.0732)	(0.118)	(0.0730)
Ln(Real GDP per Capita)	-2.074***	-2.772***	-4.043**	-2.839***
	(0.365)	(0.583)	(1.680)	(0.536)
Ln(Population)	-0.457***	0.337	5.359***	0.504
	(0.101)	(0.274)	(1.975)	(0.330)
Constant	57.13***	59.06***	-11.43	57.43***
	(4.942)	(7.835)	(33.33)	(7.563)
Observations	1131	1131	1131	1131
R-squared	0.144	0.07	0.133	
Countries		82	82	82

Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Lagged Aid and Inequality

	OLS	Random	Fixed Effects	MLE
Ln(aid), t-1	0.340***	0.264***	0.0727	0.252***
	(0.0918)	(0.0669)	(0.0932)	(0.0631)
Youth Population	0.0769**	-0.0638	-0.00169	-0.0704*
	(0.0309)	(0.0411)	(0.103)	(0.0387)
Agriculture Share of GDP	-0.0113	-0.0369	-0.00604	-0.0370*
	(0.0169)	(0.0271)	(0.0433)	(0.0207)
Ln(FDI)	0.408***	0.298***	0.181	0.287***
	(0.0771)	(0.0747)	(0.120)	(0.0736)
Ln(Real GDP per Capita)	-2.016***	-2.745***	-4.049**	-2.822***
	(0.367)	(0.580)	(1.673)	(0.534)
Ln(Population)	-0.435***	0.282	5.336***	0.461
	(0.102)	(0.269)	(1.940)	(0.324)
Constant	56.10***	59.53***	-11.06	57.88***
	(5.040)	(7.807)	(33.08)	(7.474)
Observations	1129	1129	1129	1129
R-squared	0.151	0.07	0.132	
Number of Countries		82	82	82

IV Regressions for ln(aid per capita) and Inequality

	Random Effects	Fixed Effects
ln(aid)	0.574	0.692
	(0.546)	(0.822)
Youth Population	-0.0476	-0.0306
	(0.0380)	(0.0579)
Agricultural share of GDP	-0.0334	-0.0107
	(0.0209)	(0.0237)
Ln(FDI)	0.301***	0.162**
	(0.0865)	(0.0792)
Ln(Real GDP per Capita)	-2.485***	-3.740***
	(0.570)	(0.762)
Ln(Population)	0.150	4.145**
	(0.274)	(1.738)
Constant	55.71***	1.462
	(11.74)	(20.94)
Observations	1131	1131
R-squared	0.01	0.09
Number of ccodecow	82	82

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

IV Regressions for ln(aid per capita) at time t-1 and Inequality

	Random Effects	Fixed Effects
ln(aid), t-1	0.664*	0.325
	(0.371)	(0.435)
Youth Population	-0.0438	-0.0125
	(0.0374)	(0.0482)
Agricultural share of GDP	-0.0319	-0.00868
	(0.0208)	(0.0226)
Ln(FDI)	0.268***	0.165**
	(0.0885)	(0.0784)
Ln(Real GDP per Capita)	-2.412***	-3.901***
	(0.541)	(0.676)
Ln(Population)	0.152	4.757***
	(0.245)	(1.161)
Constant	54.70***	-4.473
	(9.067)	(16.16)
Observations	1129	1129
Number of ccodecow	82	82
R-squared	0.10	0.12

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Aid and Inequality Regressions Disaggregated by Country Wealth

	Least developed	Other low income	Lower middle	Upper middle
ln(aid), t-1	-2.364**	0.612	-0.205	0.110
	(0.975)	(0.654)	(0.425)	(0.0756)
Youth	0.499	0.0412	0.158	-0.0184
	(0.760)	(0.151)	(0.177)	(0.147)
Agricultural	0.0585	-0.0406	-0.00895	0.0339
	(0.0853)	(0.0633)	(0.0760)	(0.0984)
Ln(FDI)	0.162	0.366*	0.194	0.162
	(0.250)	(0.192)	(0.215)	(0.232)
Ln(Real GDP per	-1.511	1.431	-2.891	-9.045***
	(3.814)	(2.209)	(2.716)	(1.947)
Ln(Population)	13.76***	-0.431	7.001*	12.60**
	(3.606)	(2.140)	(3.547)	(4.730)
Constant	-160.7***	31.92	-54.13	-74.50
	(53.12)	(36.19)	(60.91)	(67.05)
Observations	171	136	495	327
Countries	21	8	33	20
R-squared	0.250	0.208	0.123	0.335

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Regressions for ln(aid per capita) Omitting Latin America

	Random Effects	Fixed Effects
ln(aid), t-1	0.152*	-0.0265
	(0.0788)	(0.111)
Youth Population	0.0143	0.0755
	(0.0445)	(0.121)
Agricultural share of GDP	-0.0172	0.00426
	(0.0297)	(0.0485)
Ln(FDI)	0.273***	0.172
	(0.0841)	(0.125)
Ln(Real GDP per Capita)	-1.957***	-2.897
	(0.650)	(1.883)
Ln(Population)	0.406	4.852**
	(0.271)	(2.061)
Constant	49.58***	-14.86
	(8.499)	(36.32)
Observations	877	877
Number of ccodecow	65	65
R-squared	0.06	0.085

Notes: Robust Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Regressions for ln(aid per capita) and Inequality including democracy

	Democracy	Interaction
ln(aid), t-1	0.0758	0.0220
	(0.112)	(0.106)
Youth Population	0.0293	0.0548
	(0.114)	(0.114)
Agricultural share of GDP	-0.00529	0.00442
	(0.0428)	(0.0416)
Ln(FDI)	0.188	0.187
	(0.121)	(0.124)
Ln(Real GDP per Capita)	-3.906**	-3.418**
	(1.665)	(1.699)
Ln(Population)	4.878**	5.168***
	(1.912)	(1.900)
Polity Democracy Score	0.0819*	-0.274*
	(0.0435)	(0.147)
Democracy*Aid		0.0388**
		(0.0163)
Constant	-6.845	-16.16
	(33.72)	(33.67)
Observations	1097	1097
Number of ccodecow	79	79
R-squared	0.145	0.164

Notes: Robust Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1