

An Aid or a Boon? Measuring Foreign Assistance's Contribution to Economic Growth in Less Developed Countries

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Introduction.

Foreign assistance, defined as the transfer of resources from one government to another without expectation of repayment or reciprocation (Abbot 1970), represents a substantial annual flow of international capital. According to the World Bank (1999), in 1997 alone over forty-eight billion dollars was transferred between countries in the form of foreign assistance. Donors provide foreign assistance to less developed countries for a variety of reasons, including temporary famine relief, natural disaster clean-up operations, macroeconomic stabilization, political support, education initiatives, infrastructure creation, environmental protection, and other development projects. At bottom, *ceteris paribus*, donors of foreign assistance intend to foster and promote broad-based economic growth that can be sustained in the long-term by the recipient. Donors hope to encourage long-term domestically sustainable economic growth in the recipient country by providing near-term economic assistance. However, the actual practice of international foreign assistance indicates mixed results in its ability to foster sustainable long-term economic growth in recipient countries. Some recipients have achieved high levels of sustained economic growth, while economies of other countries have

floundered with the continued receipt or withdraw of foreign assistance. Does foreign assistance contribute to economic growth in less developed countries?

Modern foreign assistance arose from the ashes of the Second World War with the United States' implementation of the Marshall Plan for Europe's reconstruction. Policymakers in the United States believed the best way to assist Europe in restoring its economy was to provide capital and technical assistance to rebuild European infrastructure. Economists and political scientists followed the progress of the Marshall plan, took notice of its success, and formulated lessons to apply to other underdeveloped areas. Capital's critical role in catalyzing economic growth became the central lesson of the Marshall Plan. Throughout the 1950s and into the 1960s scholars and development practitioners focused on capital's ability to ignite economic growth and foster development. Research primarily focused on how capital shortages in less developed countries inhibited broad-based economic development. Foreign assistance became the mechanism of choice to address capital deficiencies, thus spurring economic growth. Providing sufficient amounts of capital to a stagnant economy would create the necessary conditions for long-term, broad-based economic growth to occur. Thus, using Europe's growth experience under the Marshall Plan as a model for development, developed countries

inaugurated foreign assistance programs to channel capital to developing economies.

The Cold War skewed foreign assistance practices in the United States, Soviet Union, and other developed countries. The onset and entrenchment of the Cold War shifted policymaker's motives for foreign assistance away from catalyzing economic growth and toward developing strategic political and military allegiances. Specifically, the United States shifted foreign assistance expenditures from less developed countries truly needing foreign assistance, choosing instead to "reward" loyalty and allegiance to countries sympathetic and committed to the United States' ideologies and policies. Similarly, the Soviet Union shifted its foreign assistance expenditures toward its allies and less developed countries it believed could be lured into aligning with the Soviet Union against the United States. The Cold War altered the incentive structure for providing foreign assistance. Instead of viewing foreign assistance as a critical opportunity to promote development, donors perceived foreign assistance as a critical foreign policy and military tool to be wielded for strategic geopolitical purposes.

During the 1980s and 1990s, as the Cold War concluded and the need for strategic expenditures diminished, the United States, Soviet Union, and other foreign assistance donors once again altered their donation behavior. Governments in developed economies consistently and systematically diminished their

foreign assistance expenditures. Negative, often inaccurate public perceptions of foreign assistance, domestic budget constraints, recessions, and a general feeling of apathy toward foreign affairs contributed to the decline of foreign assistance in developed countries. By the end of the 1990s, real foreign assistance expenditures had fallen to levels seen decades before.

The contribution of foreign assistance to economic growth varies along a host of variables. Some regions of the world, such as Southeast Asia, experience tremendous growth and development with the introduction of foreign assistance while economies of other areas, such as Africa, seem to stagnate or even decline in the presence of foreign assistance. The population of a recipient country also affects the utilization of foreign assistance. Some small countries utilize foreign assistance effectively while others do not, just as some large countries employ foreign assistance efficiently while others do not. Foreign assistance's achievement record in promoting human development and economic growth is fraught with inconsistencies. Ultimately, foreign assistance has been a success for a number of countries at one period while, at other times, it has caused immense economic and human hardship.

Studying the effects of foreign assistance on economic growth in less developed countries is important for three reasons. First, the large annual funding developed countries

allocate to foreign assistance¹ necessitates an examination of the effectiveness of assistance inflows in achieving long-term sustainable economic growth. Developed countries provide foreign assistance to less developed countries as a form of investment. Donors hope to ignite the process of long-term economic growth by providing the catalyst, resources, to less developed countries. The expectation is that recipients will spend and invest foreign assistance wisely in a manner that fosters and nurtures development and economic growth. Determining if the controlling principles and goals of foreign assistance are being met requires an in-depth study of whether or not foreign assistance actually acts as a positive force in fostering economic growth in less developed countries. Donors of foreign assistance require concrete data on the effectiveness of aid to ensure their contributions are being spent efficiently and in a manner consistent with their intent. Examining the effectiveness of foreign assistance in initiating economic growth provides donor countries with definite evidence of the effects of their contributions, which can be used to make rational decisions in future foreign assistance expenditures.

Determining the effect foreign assistance exerts on economic growth in less developed countries is also an important

¹ For a list of contributors and amounts, see "Aid flows from Development Assistance Committee Members." 1999 World Development Indicators. World Bank: 1999.

political issue. Foreign assistance expenditures are politically sensitive, with constituents in major developed countries strongly opposing aid to other nations (Graham and O'Hanlon 1997; *The Economist* 23 March 1996). Overall, most citizens of donor countries perceive foreign assistance in negative terms (Smillie 1998), viewing it as a major component of central government budget allocations. Negative views of foreign assistance persist for a number of reasons, including misinformation and distortion by the media, ethnocentrism, tax fears, and a belief that foreigners should be responsible for and solve their own problems domestically. The electorates of donor countries do not examine the long-term, positive effects foreign assistance can elicit in less developed countries; instead, they think narrowly and look at the short-term costs to themselves and their own countries. Although foreign assistance may be effective and desperately needed by less developed countries, the perpetual negative perceptions of foreign assistance make alterations and additions to foreign assistance budgets extremely troublesome. Opponents of foreign assistance can easily mobilize popular opinion whenever foreign assistance matters arise, rendering foreign assistance a delicate political operation. Determining the effectiveness of foreign assistance on economic growth in less developed countries provides the opportunity to establish balanced, empirical reasons to support, oppose, or alter foreign assistance packages and their implementation. Ascertaining the actual

economic experiences of foreign assistance recipients and publicly disseminating the information provides an excellent opportunity to educate electorates on the need and effects of foreign assistance. Foreign assistance could become de-politicized and publicly legitimated by empirically demonstrating the actual effect foreign assistance has on the development experience of less developed countries.

Finally, the effect foreign assistance has on economic growth in less developed countries must be studied to determine the course economic policies should take in these countries. Less developed countries often rely heavily on international foreign assistance to contribute large amounts to annual budgets (Friedmann, Wolfgang, Kalmanoff, and Meagher 1966). In general, these countries depend on foreign assistance to supplement domestic sources of revenue, which are often difficult to assess and collect. Since foreign assistance originates outside the country from legitimate, reputable sources, it represents a dependable source of revenue for less developed countries that can be exactly measured and allocated during the budget process. Furthermore, because policymakers and other government officials in both donor and recipient states perceive foreign assistance as a primary catalyst for economic growth, officials tailor development programs and projects around foreign assistance. The perception that foreign assistance is an essential ingredient to economic growth creates a climate where questions of economic and development

policies become framed in reference to foreign assistance. That is, foreign assistance becomes the primary impetus and focus for development policy. Unfortunately, such heavy reliance on foreign assistance may be unsubstantiated or incompatible with more effective alternatives. Less developed countries may adopt a policy course that firmly relies on foreign assistance, even though the effects of foreign assistance are unproven and not the most desirable policy prescription. These countries may also choose a foreign assistance-based development strategy that blocks better, more effective solutions. Determining the effect of foreign assistance on economic growth will provide less developed countries more precise prescriptions for development policy. Understanding and evaluating the actual effect foreign assistance has on economic growth will generate insight into which development policies promote economic growth efficiently, thus providing less developed countries with better suggestions for long-term development strategies.

Literature Review.

Although a significant amount of literature has investigated the effect of foreign assistance on economic growth in less developed countries, researchers remain divided in their conclusions regarding its effectiveness. Economists and political scientists achieve varying results and subsequent conclusions depending on a host of variables, including sample year, number of countries included in the sample, longevity of study, geographic regions

represented in the study, type of foreign assistance measured, and methodology. Overall, the research indicates a dichotomous split in conclusions; one branch suggests foreign assistance is an effective method of promoting long-term economic growth, while the other maintains foreign assistance is ineffective and, at times, counterproductive.

Chenery and Strout (1966) develop an intellectual framework from which to judge the effectiveness of foreign assistance at encouraging economic growth in less developed countries. Their work also provides broad prescriptions for both donor and recipient countries to enhance the efficacy of foreign assistance inflows. Chenery and Strout argue that domestic resource limitations and constraints act as the critical obstacle to economic growth in less developed countries. The introduction of foreign assistance allows recipients to supplement and utilize their limited resources in the most productive manner. Chenery and Strout find that recipients of foreign assistance achieve average growth rates higher than they would in the absence of such inflows. The growth rate of less developed countries would be approximately 3.4 percent, or less than 1 percent per capita, without the introduction of foreign assistance. Chenery and Strout's conclusion provides a list of policy prescriptions for donors and recipients to bolster the effectiveness of foreign assistance. For recipients, Chenery and Strout prescribe measures to increase output and increase skills.

Furthermore, recipients must undertake institutional reforms to ensure their success at economic development. Specifically, tax collection, private savings, investment, and export promotion must be supported by foreign assistance recipients. Donor countries must broaden the type of assistance provided to supplement and complement the recipient's pattern of investment and production. Donors should also tie future assistance levels to the recipients' effectiveness at increasing their level of domestic savings and investment rates.

Papanek (1973) analyzes the effect of foreign resources on growth and the relationship between foreign resources and savings. Papanek adopts a linear regression model to measure the effect of foreign assistance on economic growth in less developed countries. Papanek constructs his model regressing savings, foreign assistance, foreign private investment, and other foreign inflows against annual rates of gross domestic product (GDP) growth. Papanek's model indicates that foreign assistance possesses a statistically significant coefficient twice as great as the other independent variables, indicating foreign assistance does contribute to economic growth. Papanek reasons that foreign assistance's large contribution to economic growth occurs because it can fill the foreign exchange gap as well as the savings gap, which the other independent variables are unable to accomplish. Papanek's theory supports Chenery and Strout's contention that foreign assistance encourages economic growth by supplementing

the gap between savings and investment. Papanek also discovers that foreign assistance and domestic savings are inversely (negatively) related. Papanek concludes that foreign assistance has a more significant effect on growth than savings or other forms of foreign resource inflows in less developed countries. Foreign assistance does contribute significantly to economic growth, as measured by rate of change in GDP.

Levy (1987) builds on Papanek's research by examining what proportion of foreign assistance is used to finance current consumption. Levy hypothesizes that assistance transfers include heterogeneous components that maintain different marginal propensities to raise consumption. Levy contends that less developed countries treat foreign assistance the same as domestic income; the marginal propensity to consume and the marginal propensity to save for both domestically generated revenue and foreign assistance receipts are identical. Levy finds that the marginal propensity to consume from foreign assistance funds is .4. Levy concludes that foreign assistance not intended for emergency or disaster relief is not consumed but invested by the recipient government. Levy also concludes that foreign assistance was effective at promoting economic growth during the 1970s.

More recent empirical works has focused on the macroeconomic environment's affect on foreign assistance's utilization. Boone (1996) hypothesizes that the effectiveness of foreign assistance is a function of political

regimes. After constructing a three-part regime typology, he argues that various regime types will utilize foreign assistance receipts in different manners. An elitist government will maximize the welfare of a fixed ruling coalition. An Egalitarian government tries to maximize the welfare of those with low resource endowments. Finally, a laissez-faire government will maximize the welfare of a minimum fraction of the population. Boone contends that regime type influences the goals of the government and its channels of choosing and implementing policy. He suggests that all types of political regimes allocate foreign assistance to the benefit of high-income political elites. Foreign assistance programs do not alter the incentive structure of governments to implement or deliver programs and services to those in need.

Burnside and Dollar (1997) follow Boone's research by focusing on the institutional quality of foreign assistance recipients. Burnside and Dollar contend that the effectiveness of foreign assistance in facilitating economic growth will depend on the overall institutional structure and policy environment of the recipient. Countries with sound financial institutions, a strong regulatory environment, economic stability, and fiscal discipline will utilize foreign assistance better than states lacking these qualities. Using panel regression for fifty-six less developed countries and six 4-year periods between 1970 and 1993, Burnside and Dollar conclude that foreign assistance does have a positive effect on economic growth when

the necessary institutions and policy frameworks exist. Foreign assistance facilitates economic growth in an economic environment with good fiscal, monetary, and trade policies. The World Bank (1998) reaches similar conclusions. The World Bank argues that foreign assistance can stimulate economic growth and development when the recipient creates the proper economic environment through stable fiscal, monetary, and trade policies. Hence, the effectiveness of foreign assistance in facilitating economic growth in less developed countries depends on the fiscal and economic environment of the recipient.

Fayissa and El-Kaissy (1999) develop an explanatory model for economic growth in less developed countries that attempts to explain why some countries utilize foreign assistance better than others. The major contribution of their work is the incorporation of political and human capital variables in their model of economic growth. Fayissa and El-Kaissy include an index of political and civil liberties, as well as a measure of investment in human capital to determine if foreign assistance contributes to economic growth in less developed countries. Using a data from eighty less developed countries between 1971 and 1990, their results confirm that foreign assistance positively affects economic growth in less developed countries for the observed time period. Their research concludes the relationship between foreign assistance and growth of real gross domestic product is

statistically significant at the one percent level, implying that increases in foreign assistance would increase economic growth in less developed countries.

Griffin and Enos (1970) provide a contrasting view of foreign assistance and its contribution to economic growth in less developed countries. Griffin and Enos seek to determine which countries lend foreign assistance, the motives for providing assistance, and the consequences for the recipients. First, Griffin and Enos contend that foreign assistance is a tool powerful countries wield against the less powerful to promote ideology and control in the world arena. Foreign assistance is an instrument of foreign policy that safeguards relationships and perpetuates the status quo. Second, Griffin and Enos argue that foreign assistance is not correlated with economic growth. Using a linear regression model of the amount of foreign assistance received and the rate of GNP growth for fifteen African and Asian countries between 1962 and 1964, Griffin and Enos conclude that there is no relationship between amount of aid received and economic growth as measured by GNP. Griffin and Enos conclude that foreign assistance undermines economic development in several ways. First, foreign assistance lowers domestic savings. Second, foreign assistance distorts investment composition, which raises the capital-output ratio. Third, foreign assistance hinders the development and emergence of an indigenous entrepreneurial class. Finally, foreign assistance

prevents institutional reforms that are prerequisites for economic growth.

In subsequent research Bowles (1987) tests Griffin and Enos' conclusion that foreign assistance undermines economic growth in less developed countries by retarding domestic savings rates while subsequently increasing aggregate consumption. Bowles concludes that a statistically significant relationship between foreign assistance and domestic savings rates does not exist in nine of the twenty countries examined. Furthermore, in ten of the twenty countries studied, no causal relationship could be established between foreign assistance and domestic savings. Given the results, Bowles argues that generalizations concerning causal relationships and mechanisms between foreign assistance and domestic savings rates must be treated with caution. Bowles maintains that the complex social, economic, political, and social structures of less developed countries prevent one unified theory of how foreign assistance affects economic growth.

Snyder (1990) further critiques Griffin and Enos' research. Following Papanek (1973), Snyder first notes that numerous factors, such as per capita income, wars, terms-of-trade changes, natural disasters, and political disturbances can significantly affect the distribution and use of foreign assistance. The existence of these variables can create a spurious relationship between foreign assistance need and foreign assistance receipts. Snyder analyzes the effect of foreign assistance on domestic savings rates

and controls for the effects of per capita income. Snyder's model relates domestic savings as a function of per capita income and foreign assistance, where foreign assistance is determined by need. Snyder employs a panel data set covering fifty low- and middle-income countries across the 1960s, 1970s, and 1980s. Snyder concludes that Griffin and Enos' argument that aid-switching occurs in less developed countries is unfounded; foreign assistance has little influence on domestic savings.

Mosley, Hudson, and Horrell (1987) study the effectiveness of foreign assistance across countries to determine why foreign assistance stimulates economic growth in some regions while not others. Mosley, Hudson, and Horrell criticize previous studies for employing linear regression models to explain the effect of foreign assistance on economic development. They contend foreign assistance does not operate in a straightforward manner, as implied by regression techniques, but operates instead through three subtle, indirect channels. Mosley, Hudson, and Horrell create a sophisticated model where governments attempt to maximize their own welfare in the face of budgetary constraints, with foreign assistance facilitating the removal or diminishment of budget constraints. Mosley, Hudson, and Horrell argue that foreign assistance inflows allow governments to finance re-occurring expenditures that would not be possible without foreign assistance. Mosley, Hudson, and

Horrell's budgetary constraints model of foreign assistance corresponds with the theory outlined by Griffin and Enos. Mosley, Hudson, and Horrell conclude that aid in the aggregate had no demonstrable effect on economic growth in recipient countries during the 1970s or 1980s. It is impossible to establish any statistically significant correlation between aid and the growth rate of GNP in less developed countries.

Dacy (1975) demonstrates that under certain conditions less developed countries may experience lower growth rates after termination of foreign assistance than they would have had foreign assistance not been introduced. The post-aid growth rate for an aid recipient may be lower than it would have been in a non-aid environment. Dacy argues that foreign assistance is a substitute for domestic savings. Recipient countries increase both consumption and investment with the receipt of foreign assistance, resulting in an overall decrease in domestic savings, causing lower levels of economic growth once donors withdraw foreign assistance. Dacy contends that the introduction of foreign assistance facilitates government consumption of expensive re-occurring expenditures that require sustained foreign assistance. Foreign assistance allows recipient governments to increase consumption without undertaking difficult institutional and fiscal changes that would otherwise be necessary to support greater consumption. Foreign assistance erodes the incentive for prudent government expenditures, so governments undertake costly

re-occurring project expenditures that cannot be supported without foreign assistance. Dacy concludes that the marginal propensity to save and government consumption patterns are the critical factors affecting foreign assistance's long-term effectiveness. Higher levels of the marginal propensity to save will likely stimulate economic growth once foreign assistance is withdrawn. Lower levels of government consumption during periods of foreign assistance increase the likelihood that foreign assistance will be effective in promoting economic growth in the long-run.

Khan and Hoshino (1992) study the impact of foreign assistance on the behavior of recipient governments in South and Southeast Asia. They hypothesize that the expenditure and revenue efforts of recipient governments are affected by foreign assistance through categorical budgetary reallocations. Khan and Hoshino sample five South and Southeast Asian countries and create a regression model with pooled time-series, cross-sectional data. They conclude that foreign assistance is distributed between consumption and investment in less developed countries. Khan and Hoshino also find that foreign assistance may divert resources from investment to consumption under certain conditions. Governments treat foreign assistance as an increase in income which, combined with a positive income elasticity, allows an increase in consumption to occur. The marginal propensity to consume from foreign assistance inflows is less than one, indicating

that some investment does occur with the introduction of foreign assistance. Finally, Khan and Hoshino discover that foreign assistance in the form of loans achieves higher rates of investment than does grants. *Ceteris paribus*, governments invest eighty-five cents of every loan dollar, whereas only thirty-two cents of grant inflows are invested by less developed countries.

This research will contribute and supplement the current literature on foreign assistance's contribution to economic growth in less developed countries in three ways. First, this study incorporates more recent data, thereby supplanting the older data of previous studies. Second, this study employs a large scope and breadth of statistical observations to determine the effect of foreign assistance on economic growth in less developed countries. Unlike previous studies that analyze a small sample of less developed countries for a relatively brief time period, this research examines eighty-two countries for the seventeen year period 1976 to 1992. More numerous observations of time-series data allow greater confidence in the results, statistical models, and conclusions drawn by the research. Finally, this study will contribute to the empirical literature by introducing a cross-regional approach to the examination of foreign assistance's effect on economic growth in less developed countries. Whereas previous research only focused on select, isolated examinations of a relatively small number of countries for a short period of

time and then deduced broad conclusions for entire regions, this research examines a broad section of less developed countries across multiple regions. Adopting this approach permits cross-regional comparisons and allows hypotheses to emerge to account for regional differences in foreign assistance-led economic growth.

Hypothesis and Theory.

I hypothesize that foreign assistance positively affects economic growth in less developed countries. Countries that receive high levels of foreign assistance should experience greater levels of economic growth, *ceteris paribus*, than countries that receive little or no inflows of foreign assistance. A positive relationship should exist between receiving foreign assistance and achieving economic growth.

Aside from foreign assistance, I control for six other independent variables that influence economic growth in less developed countries. The focus of this research is how the level of foreign assistance affects economic growth in less developed countries holding other political and economic variables constant. As such, I will briefly describe the six other independent variables' hypothesized effect and then provide a detailed account of how foreign assistance specifically influences economic growth. Domestic savings, domestic consumption, imports, exports, level of democracy, and infant mortality rate significantly affect economic growth. Economic theory indicates that

domestic savings should be positively related to the level of economic growth. Higher levels of domestic savings provide the necessary capital to develop a country's infrastructure and expand output. Consumption should also be positively related to economic growth. Economic growth requires consumption to occur; when consumption levels for government, firms, and individuals are high, the economy may expand through the Keynesian money multiplier effect. Higher levels of aggregate consumption increase demand for goods and services, facilitating economic growth. The effects of the import and export variables can best be understood by analyzing them together as a country's net export position. Net exports' affect on economic growth will depend on whether the country exhibits a positive or negative balance of trade. A positive net export position enhances a country's economic growth by improving its balance of payments. Positive net exports indicate more resources are flowing into a country than are exiting, which facilitates economic growth. Conversely, countries with negative net export positions suffer from balance of payment problems, which hinder economic growth. An increasing level of democracy should positively affect economic growth in less developed countries. According to Boone (1996), Dollar and Burnside (1997), Boone and Faguet (1998), and Riddell (1987), as countries become more democratic, they develop the legal, political, and economic frameworks to facilitate economic growth. Specifically, more

democratic countries better protect property rights, contracts, and economic transactions, thereby creating the proper incentive structure for firms and individuals to develop infrastructure and invest in long-term, value-added projects. Economic growth is negatively related to infant mortality; as infant mortality rates increase, economic growth decreases. Boone (1996) and Boone and Faguet (1998) argue that infant mortality rate acts as a proxy variable for overall human capital and general population health. A high infant mortality rate suggests that a country does not possess the necessary resources or infrastructure to adequately deliver basic nutrition and healthcare to its citizens. An unhealthy, undercapitalized society cannot fully appreciate its productive potential.

Foreign assistance facilitates long-term economic growth in less developed countries in two ways. First, foreign assistance introduces a stream of resources that would fail to exist otherwise, thereby stimulating economic growth. Foreign assistance inserts previously unavailable resources into the less developed country's economy, which provides the necessary impetus to inaugurate economic growth and development. Initially, foreign assistance loosens domestic economic constraints facing governments of less developed countries. Foreign assistance supplants domestic revenue, thereby relaxing budget constraints. Relaxed budget constraints allow government consumption to increase. Government

consumption stimulated by foreign assistance causes an aggregate increase in demand for numerous goods and services, thereby creating the foundation for broad-based economic development. The increase in demand caused by greater government consumption ripples throughout the economy, subsequently stimulating supply and demand reactions in firms and individuals. Increased government demand for products and services encourages firms to increase production, generating additional revenue for those firms. The labor force increases in response to growing public and private sectors. As the labor force grows and finite labor resources diminish, wages begin to rise. Additionally, a larger participating labor force means an equally greater consumer market, so consumer spending also increases. More consumer spending and savings further stimulates economic growth, creating its own rippling effect on the economy. Thus, foreign assistance encourages economic growth in less developed countries in a circular pattern by allowing consumption to expand, which causes an aggregate rise in demand and supply of goods and services, thereby broadening labor markets and increasing wages, leading to greater savings and consumption patterns.

Second, foreign assistance stimulates economic growth in less developed countries by encouraging infrastructure development and the creation and entrenchment of national linkages. As Levy's research indicates, governments invest foreign assistance into development

projects, including large infrastructure programs such as dams, hydroelectric plants, electrical grids, communications systems, railroads, ports, and highways. The construction of major infrastructure projects encourages the development of broader markets and national linkages. As communities become effectively connected to one another through highways, railroads, ports, and communications lines, a greater dependency develops between communities for trade and the exchange of goods, services, and information. Through national linkages, communities that were once isolated and self-dependent achieve the ability to specialize and gain from regional comparative advantages.

The national linkages created through infrastructure development encourage economic growth by broadening and deepening national markets. First, infrastructure development and subsequent national linkages allow firms access to mass consumer markets. Firms gain the ability to reach more consumers and take advantage of economies of scale. Second, a system of national linkages and access to vast consumer markets acts as a catalyst to accelerate the growth of indigenous firms. Firms have an incentive to develop because of greater demand from mass consumer markets. Potential entrepreneurs perceive consumer markets as untapped revenue sources that entice them to incorporate. Third, the introduction of more firms throughout the country implies a greater quantity and variety of products. A richer

diversity of firms distributed throughout a country creates the opportunity for more products to be developed. The combination of a greater number of firms and more products contending for consumer loyalty and spending generates competition. Competition, in turn, eventually translates into lower prices for consumer and higher product quality. Ultimately, once national linkages and the subsequent markets have developed, the country will begin to attract outside investment. As the economy grows and markets strengthen, the country will become more attractive for investors, who will infuse capital into the country. The infusion of foreign capital will encourage its own wave of economic growth throughout the country. Thus, foreign assistance can encourage economic growth in less developed countries by acting as the catalyst that develops the essential prerequisites of economic development. Foreign assistance allows governments to undertake initially large capital investments that are crucial in developing infrastructure and national linkages. Once infrastructure and national linkages are in place, markets may develop and create self-sustaining economic growth.

My hypothesis meets the three criteria necessary to establish causality. First, my hypothesis demonstrates time order; changes in the independent variables precede changes in the dependent variable. The values of the independent variables change on an annual basis. The amount of foreign assistance

received, domestic consumption, domestic savings, domestic investment, net exports, level of democracy, and infant mortality rate all vary across time and across countries in the sample. Given that the independent variables do change on an annual basis, it logically follows that the dependent variable, level of economic growth, also changes on an annual basis because of changes in the independent variables. For the level of economic growth to change, the economic and social variables on the dependent side of the equation must first change. Economic growth only occurs when there is a change in the independent variables. Additionally, my hypothesis exhibits co-variation. Given that the dependent variable, economic growth, depends on changes in the independent variables, it follows that as the independent variables change, so will the dependent variable. If the economy expands and the independent variables increase substantially, the dependent variable should capture the economic expansion and report tremendous annual economic growth. Finally, my hypothesis represents a non-spurious relationship. I include regional dummy variables to control for geopolitical differences in the receipt of foreign assistance. The regional dummy variables control for the possibility that foreign assistance's true effect depends on belonging to a particular geographic region. I also report the independent variables as a percent of gross domestic product to control for economy size and country size, two factors that

could influence foreign assistance's affect on economic growth.

Data and Method.

I employ three sources of data to determine the effect of foreign assistance on economic growth in less developed countries. I collect data from all sources for the years 1975 to 1992. Data for the dependent variable, economic growth as measured by the annual percent change in gross domestic product, comes from World Tables 1994 (1994) published by the World Bank. The same edition of World Tables 1994 also serves as the data source for the independent variables public consumption, domestic savings, imports, and exports. Public consumption and domestic savings are each measured as a percent of annual gross domestic product. Imports and exports are both measured in millions of current United States dollars. I calculate annual imports as a percent of gross domestic product by dividing the value of imports by the value of gross domestic product and then multiplying the quotient by one hundred. I use the same procedure to calculate annual exports as a percent of gross domestic product for each year in the study. Data for net annual foreign assistance receipts comes from the 2000 Organization for Economic Cooperation and Development (OECD) database available on the Internet. I use net annual foreign assistance receipts because it measures the real amount of assistance a country receives in a particular year. Using gross foreign assistance would overestimate the actual amount

of foreign assistance receipts by not accounting for a recipients' contributions to international foreign assistance efforts. I employ the Polity III database of democracy to measure the level of democracy on an annual basis for each country in this study. Polity III ranks countries on a democracy scale of 0 to 10, with 0 indicating a lack of democracy and 10 indicating complete democracy. The database also uses -77 and -88 to indicate periods of revolution or regime change. Appendix I lists the less developed countries employed in regression analysis by region as delineated by World Tables 1994 (1994).

Papanek (1973) develops a linear regression model to determine the effect of foreign assistance on economic growth in less developed countries. Chenery and Strout (1966), Mosley, Hudson, and Horrell (1987), and Khan and Hoshino (1992) adopt similar permutations of the model to determine the effect of foreign assistance receipts on economic growth. Papanek's model holds that economic growth is a function of gross domestic savings, foreign assistance, foreign private investment, and other foreign inflows. Papanek's model understands economic growth to be the annual rate of increase in gross domestic product (GDP). Papanek expresses each independent variable as a percentage of GDP to hold the unit of analysis constant in the model. Papanek's model takes the form:

$$\% \Delta \text{GDP} = c + \beta_1(s / \text{GDP}) + \beta_2(a / \text{GDP}) + \beta_3(i / \text{GDP}) + \beta_4(f / \text{GDP})$$

where c is a constant, s represents gross domestic savings, a signifies total amount of foreign assistance, i is foreign private investment, and f represents other foreign inflows. Papanek justifies this model of economic growth by contending that the multiple components of investment provide the largest impetus to economic growth.

Furthermore, Papanek argues that the primary focus on the effect of foreign assistance on economic growth permits his model. Among others, Chenery and Strout (1966) and Dacy (1975) also acknowledge the importance of including both savings and investment in a model of economic growth when investigating the effects of foreign assistance inflows.

I employ linear regression analysis similar to Papanek's to create a formal mathematical model of foreign assistance's affect on economic growth in less developed countries. I contend that economic growth is a function of foreign assistance, domestic savings, domestic consumption, imports, exports, level of democracy, and regional dummy variables. Specifically, the percent change in annual gross domestic product is a function of foreign assistance as a percent of GDP, domestic savings as a percent of GDP, domestic consumption as a percent of GDP, imports as a percent of GDP, exports as a percent of GDP, level of democracy, and regional dummy variables. Expressing each independent variable as a percent of gross domestic product controls for the geographical and population size

differences of the less developed countries under investigation. The dummy variables control for regional biases in the data, including number of countries represented in each region and differences in foreign assistance received by each region. I exclude foreign investment as an independent variable because it exhibits a high degree of multicollinearity with the domestic savings variable.

My model builds on and enhances previous models in several important ways. First, this model incorporates two important independent variables, imports and exports, that Papanek (1973) and others contend significantly affects economic growth in less developed countries. Second, Khan and Hoshino (1992) stress the importance of consumption in determining economic growth in less developed countries. They contend that consumption contributes to economic growth, so it must be included and controlled for when determining the effect of foreign assistance on economic growth. The model also controls for regional differences through the dummy variables, a component not utilized by previous research. Finally, my model incorporates a measure of regime type which Przeworski and Limongi (1993), Haan and Siermann (1995), and Gasiorowski (2000) contend significantly affects the level of economic growth in less developed countries. Their research collectively indicates that regime type must be controlled when analyzing economic growth because of the

special structural, legal, and economic institutions inherent to democratized states.

The dependent variable, annual percent change in gross domestic product, is calculated by subtracting the gross domestic product of year $t-1$ from the gross domestic product of year t and then dividing the difference by the gross domestic product of year $t-1$. The quotient is then multiplied by one hundred to yield the percent change in gross domestic product between year t and $t-1$. The dummy variables control for regional differences inherent to the data. Each region as specified by the World Bank's World Tables 1994 is assigned a specific number for differentiation. Dummy variable 1 (d_1) represents Sub-Saharan Africa, dummy variable 2 (d_2) delineates South Asia, dummy variable 3 (d_3) represents East Asia, dummy variable 4 (d_4) signifies Latin America and the Caribbean, and dummy variable 5 (d_5) identifies the North Africa and the Middle East. The constant of the regression model indicates the final region, Eastern Europe and Central Asia. Each dummy variable is coded so one indicates a country belonging to that particular region, while zero signifies all other countries.

The democracy rank for several countries contains successive -77 or -88 rankings. These few -77 and -88 scores become outlier cases when plotted against annual economic growth. Including multiple outlier cases skews ordinary least squares regression analysis by substantially altering the sample mean. I correct the outlier cases by creating

average democracy scores for years when the democracy score is -77 or -88. For every year t and every country c where the democracy score equals -77 or -88, I average the democracy scores of $t-1$ and $t+1$ to create a new non-outlier democracy score for year t . If multiple years $t_1 \dots t_k$ contain -77 or -88 for a particular country, I replace the multiple $t_1 \dots t_k$ years with the average of t_1-1 and t_k+1 for the years immediately preceeding and following the transition period of years $t_1 \dots t_k$.

I complete two unique types of regression models for years 1976 to 1992 to estimate the effect of foreign assistance on economic growth in less developed countries. The first regression series employs ordinary least squares (OLS) regression analysis to determine the coefficients and statistical significance of the model:

$$Y_t = \beta_0 + \beta_1(S_t) + \beta_2(C_t) + \beta_3(X_t) + \beta_4(M_t) + \beta_5(O_t) + \beta_6(A_t) + \beta_7(D_1) + \beta_8(D_2) + \beta_9(D_3) + \beta_{10}(D_4) + \beta_{11}(D_5) + e_t$$

Where:

Y equals percent change in gross domestic product between years t and $t-1$;

S equals savings as a percent of gross domestic product in year t ;

C equals consumption as a percent of gross domestic product in year t ;

X equals exports as a percent of gross domestic product in year t ;

M equals imports as a percent of gross domestic product in year t ;

O equals level of democracy in year t ;

A equals foreign assistance as a percent of gross domestic product in year t ;

$D_1 \dots D_5$ indicate the regional dummy variables as previously specified; and

e_t represents the error term.

The null hypothesis for this model is:

$H_0: \beta_6 = 0$, which indicates that foreign assistance has no affect on economic growth.

$$\begin{aligned} \frac{y_t}{\sqrt{A_t}} = & \beta_0 \left(\frac{1}{\sqrt{A_t}} \right) + \beta_1 \left(\frac{S_t}{\sqrt{A_t}} \right) + \beta_2 \left(\frac{C_t}{\sqrt{A_t}} \right) + \beta_3 \left(\frac{X_t}{\sqrt{A_t}} \right) + \beta_4 \left(\frac{M_t}{\sqrt{A_t}} \right) + \beta_5 \left(\frac{O_t}{\sqrt{A_t}} \right) + \beta_6 \left(\frac{A_t}{\sqrt{A_t}} \right) \\ & + \beta_7 \left(\frac{D_1}{\sqrt{A_t}} \right) + \beta_8 \left(\frac{D_2}{\sqrt{A_t}} \right) + \beta_9 \left(\frac{D_3}{\sqrt{A_t}} \right) + \beta_{10} \left(\frac{D_4}{\sqrt{A_t}} \right) + \beta_{11} \left(\frac{D_5}{\sqrt{A_t}} \right) \end{aligned}$$

The alternative hypothesis for this model is:

$H_1: \beta_6 > 0$, which indicates that foreign assistance has a positive affect on economic growth.

Hill, Griffiths, and Judge (1997) indicate that cross-sectional data generally exhibits heteroskedasticity, a violation of the homoskedasticity assumption of ordinary least squares analysis. Heteroskedasticity must be controlled for two reasons. First, linear regression models with heteroskedasticity no longer generate the best linear unbiased estimators. Second, the standard errors computed for least squares estimators with heteroskedasticity are incorrect (Hill, Griffiths, and Judge 1997). To correct for heteroskedastic error, weighted least squares (WLS) regression

analysis should be used. The second model I specify employs WLS analysis to each annual regression model to correct for the heteroskedastic error of the cross-sectional data. Weighted least squares transforms heteroskedastic data into homoskedastic data that conforms to the assumption that the error term is homoskedastic with equal variance for all levels of x . Each parameter of the equation is divided by the square root of A_t to weight the data. The transformed model is:

where the coefficients and variable symbols conform to the specifications of the original model. I transform the original variables into weighted variables for all years in this study. The weight for WLS regression model is foreign assistance as a percent of gross domestic product for year t when the dependent variable is economic growth between t and $t-1$. The weighted least squares model is computed by SPSS when the foreign assistance variable is selected as the WLS weight in the regression model specification menu.

I create seventeen models to demonstrate the effect of foreign assistance on economic growth in less developed countries for both ordinary least squares regression and weighted least squares regression. I apply the

model to a pool of eighty-two countries on an annual basis for the period 1976 to 1992. For each year of the test period a model is constructed to determine the β_6 coefficient and its statistical significance. Appendix II details results from OLS regression analysis, and Appendix III details the WLS results.

Results.

Overall, both the OLS and WLS regression models indicate that foreign assistance does affect economic growth in less developed countries. However, the analysis does not fully support my hypothesis that foreign assistance positively influences economic growth in less developed countries. The OLS regression indicates that foreign assistance positively contributed to economic growth in 1976, 1982, 1984, 1985, 1987, 1988, and 1989, while the other years of this study maintained negative coefficients. WLS regression analysis shows that foreign assistance positively influenced economic growth in 1976, 1981, 1982, 1983, 1984, 1985, 1987, 1988, 1989, and 1990. The remainder of the years in this study possess negative coefficients. Table 1.1 details the annual foreign assistance coefficient (β_6), t-value, and p-value generated by both OLS and WLS regression techniques holding all other independent variables constant.

The coefficients in Table 1.1 indicate that foreign assistance does have a statistically significant affect on economic growth in less developed countries for several of the years of this study. Using OLS regression, foreign

assistance has a statistically significant affect on economic during 1977, 1978, 1981, 1986, and 1992. The 1977 and 1978 coefficients are statistically significant at the 10% level. The 1986 coefficient is statistically significant at the 5% level, while the 1981 and 1992 coefficients are statistically significant at the 1% level. Examining only the statistically significant foreign assistance coefficients generated by OLS techniques indicate that, overall, foreign assistance negatively affects economic growth in less developed countries. The OLS estimates suggest that countries that receive higher levels of foreign assistance will exhibit lower levels of economic growth than non-assistance recipients. In 1977, for every one percent increase in foreign assistance as a percent of gross domestic product, economic growth decreased by .509 percentage points holding all other independent variables constant. Similarly, a one percent increase in foreign assistance as a percent of gross domestic product reduced economic growth by .413 percentage points in 1978, .815 percentage points in 1986, and .485 percentage points in 1992. In 1981, for every one percent increase in foreign assistance as a percent of gross domestic product, economic growth increased by .836 percentage points.

The WLS estimates of foreign assistance's affect on economic growth in less developed countries provide a slightly more optimistic prediction. WLS regression generates statistically significant foreign assistance coefficients for years 1976, 1977, 1978, 1980,

Table 1.1: Annual Foreign Assistance Coefficient						
Year	B_6 : OLS	t-score	p <	B_6 : WLS	t-score	p <
1976	0.461	1.634	0.108	0.677	3.431	0.001
1977	-0.509	-1.739	0.087	-0.460	-2.276	0.027
1978	-0.413	-1.703	0.094	-0.515	-0.259	0.012
1979	-0.016	-0.390	0.698	-0.0003	-0.023	0.981
1980	-0.546	-1.160	0.251	-0.609	-2.561	0.013
1981	0.836	3.623	0.001	1.199	7.073	0.000
1982	0.123	0.444	0.660	0.089	0.645	0.523
1983	-0.060	-0.241	0.810	0.097	0.797	0.429
1984	0.169	0.738	0.463	0.123	0.781	0.438
1985	0.302	1.099	0.276	0.340	1.802	0.077
1986	-0.815	-2.086	0.041	-1.259	-4.482	0.000
1987	0.002	0.067	0.947	0.008	0.473	0.638
1988	0.130	0.378	0.707	0.197	0.851	0.398
1989	0.027	1.545	0.128	0.021	5.800	0.000
1990	-0.102	-0.057	0.955	0.216	0.668	0.507
1991	-0.010	-0.180	0.858	-0.008	0.457	0.650
1992	-0.485	-3.108	0.003	-0.565	-4.044	0.000

1981, 1985, 1986, 1989, and 1992. The 1985 coefficient is statistically significant at the 10% level. The 1977 coefficient is statistically significant at the 5% level. The 1976, 1978, 1980, 1981, 1986, 1989, and 1992 coefficients are statistically significant at the 1% level. The WLS estimates are fairly evenly split in their predicted effects. The 1976, 1981, 1985, and 1989 coefficients indicate that foreign assistance positively contributes to economic growth in less developed countries. In 1976, for every one percent increase in foreign assistance as a percent of gross domestic product, economic growth increased .677 percentage points. Similarly, a one percent increase in foreign assistance as a percent of gross domestic product

increased economic growth by 1.199 percentage points in 1981, .34 percentage points in 1985, and .021 percentage points in 1989. However, in 1977, for every one percent increase in foreign assistance as a percent of gross domestic product, economic growth declined by .46 percentage points. Likewise, for every one percent increase in foreign assistance as a percent of gross domestic product, economic growth declined by .515 percentage points in 1978, .609 percentage points in 1980, 1.259 percentage points in 1986, and .565 percentage points in 1992.

Conclusions.

This study examined the effect of foreign assistance on economic growth in less

developed countries. The purpose of the research was to determine whether foreign assistance was a statistically significant contributor to economic growth in less developed countries. I hypothesized that foreign assistance would significantly contribute to economic growth. Based on the statistically significant estimates of the foreign assistance coefficient, β_6 , generated by both ordinary least squares and weighted least squares regression techniques, I am unable to fully accept my hypothesis. Foreign assistance positively contributes to economic growth in some years, while at other times it significantly decreases economic growth in less developed countries. According to the ordinary least squares model, foreign assistance enhanced economic growth in 1981, while it reduced economic growth in 1977, 1978, 1986, and 1992. The weighted least squares model indicates that foreign assistance facilitated economic growth in 1976, 1981, 1985, and 1989. This model further demonstrates that foreign assistance diminished economic growth during 1977, 1978, 1980, 1986, and 1992. Collectively, these results suggest that no firm, universal conclusion may be drawn on the effectiveness of foreign assistance. The annual foreign assistance coefficient signs do not follow any definite pattern or trend, making it difficult to extrapolate firm predictions from the models. This problem could be addressed in future research by employing pooled time-series cross-sectional regression techniques.

The existence of both negative and positive foreign assistance coefficients may be partially explained by global economic shocks and business cycles. Sign changes for the foreign assistance coefficient roughly correspond with major world economic events. The negative OLS and WLS coefficients for the period 1977 to 1980 could be attributed to the 1970s oil crisis and subsequent economic slowdown. Higher oil prices, coupled with a decreased import demand in developed economies, could disrupt domestic fiscal and monetary stability in less developed countries, undermining the effectiveness of foreign assistance. Similarly, a lag effect from the United States' 1982 recession could explain the negative OLS coefficient in 1983. The mostly positive coefficients between 1984 and 1989 could be explained by the general improvement in the overall global economy and the ripple effect generated by the United States' substantial economic expansion. A strong, robust macroeconomic environment could improve the terms of trade for developing countries, which would provide the fiscal and economic stability necessary for foreign assistance to be harnessed effectively. Finally, the negative coefficients for 1990, 1991, and 1992 could be explained by recession in the United States and the breakup of the Soviet Union. The Soviet Union's dissolution disrupted trade relationships, severely altered aggregate supply and demand, and initiated a period of severe economic hardship for its former members and trading

partners. Furthermore, following Burnside and Dollar (1997) and the World Bank (1998), the Soviet Union's collapse introduced political instability and created a poor fiscal and monetary environment, thereby undermining the effectiveness of foreign assistance. The severe political and economic disruption initiated by the Soviet Union's demise introduced tremendous political and economic shocks that disrupted foreign assistance's delivery channels, thereby hindering its effectiveness.

The estimates of foreign assistance's effectiveness may be used by policymakers in donor and recipient countries to devise new, more efficient development strategies. My results indicate that foreign assistance does not necessarily foster or impede economic growth. This study suggests that foreign assistance can play a significant role in economic growth, but it does not guarantee success. Using this conclusion as a foundation, donors and recipients may focus their attention on creating the necessary political and economic environment that increases the probability for foreign assistance to catalyze economic growth. Understanding that foreign assistance may generate economic growth creates an incentive for donors and recipients to undertake institutional, economic, and political reforms to harness foreign assistance's full development potential

More research needs to be undertaken to examine how foreign assistance behaves in the economies of less developed countries and how

governments of these countries react to foreign assistance inflows. First, more research must be completed to determine why some regions perform better with foreign assistance inflows than do others. Research should commence to determine why some regions are better able to utilize foreign assistance and channel it to achieve significant rates of economic growth. Why are some regions better able to utilize foreign assistance than others? Tentatively, population, level of poverty, unemployment rate, literacy rate, and industrial composition of a region should affect how foreign assistance is utilized and help determine the success of foreign assistance inflows in contributing to economic growth. Future research should focus on the regional level of analysis and attempt to explain why some regions perform better than others when granted foreign assistance.

Second, additional research should be completed to determine the influence foreign assistance exerts on the fiscal behavior of governments in less developed countries. Research needs to be initiated to determine how the receipt of foreign assistance influence fiscal and monetary policy in less developed countries. As other researchers have noted, foreign assistance inflows may allow governments of less developed countries to undertake programs and policies that would otherwise be unobtainable. The results of these foreign assistance-led programs and policies may not be sustainable in the long-term without the perpetuation of foreign assistance inflows.

Research must be initiated to better understand how governments change their fiscal and monetary policies in response to foreign assistance inflows. Better policy prescriptions and foreign assistance packages may be developed once the international development community knows and understands how foreign assistance affects long-term fiscal and monetary behavior of foreign assistance recipients.

Third, subsequent research needs to deconstruct foreign assistance data, fracturing in into its multiple components. For each country, the total foreign assistance receipts should be initially divided into two categories: foreign assistance from multilateral sources and foreign assistance from bilateral donors. Receipts in each category should be further separated into their method of foreign assistance transmission: loaned funds in the form of cash, donations in the form of cash, technical assistance, donations in the form of food products, donations in the form of physical capital, and donations in the form of medical equipment. Such an extensive partition of foreign assistance receipts will facilitate the creation of models that better conceptualize the multiple forms of foreign assistance, allowing researchers to determine what type of foreign assistance contributes the most to economic growth in less developed countries. That knowledge, in turn, will provide better prescriptions to policymakers, donor agencies, and foreign assistance recipients who seek to gain the greatest impact from each foreign assistance dollar.