1-1-2008

Foreign Aid, Rent-Seeking and Economic Growth in Sub-Saharan Africa

Takele Tassew Mojire

FOREIGN AID, RENT-SEEKING AND ECONOMIC GROWTH

IN SUB-SAHARAN AFRICA

By

Takele Tassew Mojire

A Dissertation
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Applied Economics
in the Department of Finance and Economics

Mississippi State, Mississippi

August 2008

FOREIGN AID, RENT-SEEKING AND ECONOMIC GROWTH

IN SUB-SAHARAN AFRICA

By

Takele Tassew Mojire

Approved:

Benjamin F. Blair Associate Professor of Economics (Director of Dissertation)	Randy Campbell Assistant Professor of Economics (Committee Member)
Charles Campbell Professor of Economics (Committee Member)	Paul W. Grimes Professor of Economics Head, Department of Finance & Economics Director, Center for Economic Education and Financial Literacy (Committee Member)
Jon Rezek Assistant Professor of Economics (Committee Member)	Walter N. Taylor Assistant Dean, Professor of Human Sciences (Committee Member)
Barbara Spencer Director, Graduate Studies in Business in the College of Business and Industry	Lynne Richardson Dean of the College of Business and Industry

Name: Takele Tassew Mojire

Date of Degree: August 9, 2008

Institution: Mississippi State University

Major Field: Applied Economics

Major Professor: Benjamin F. Blair

Title of Study: FOREIGN AID, RENT-SEEKING AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICA

Pages in Study: 124

Candidate for Degree of Doctor of Philosophy

Three studies on foreign aid, rent-seeking, and economic growth in sub-Saharan Africa are presented. The first study examines the possible simultaneity that may exist between a donor's provision of aid and the rent-seeking (corruption) activities in the recipient country. Does the amount of aid depend on the lack of corruption in a country? Simultaneously, does the level of corruption depend on the amount of aid and the type of donor? The main goals of this paper are to examine whether such simultaneity exists and whether the impact of aid depends on the type of the donor, either multilateral or bilateral.

The second study extends the first model by incorporating an additional equation for GDP per capita. It examines whether simultaneity exists between the three variables: foreign aid, corruption, and GDP per capita and whether the relationship depends upon the source of the foreign aid. Adding GDP per capita as an endogenous variable will provide another key to understanding the lack of long-term effectiveness for foreign aid in sub-Saharan Africa.

The third and final study uses a fixed effects model to examine the relationship between foreign aid and the level of corruption in sub-Saharan Africa. Accounting for fixed effects allows me to examine whether unobserved characteristics of recipient countries play a role in explaining the impact of aid on corruption.

Key words: economic development, foreign aid, corruption

DEDICATION

This dissertation is dedicated to my mom, Matafe Tigiro, who never had the chance to go to school but gave me the best education even with limited resources, and to my father, Tassew Mojire, who passed away without seeing the fruit of his struggle at my graduation.

ACKNOWLEDGEMENTS

Given that writing a dissertation can be a lonely experience, this work would never have been possible if it were not for the generous support of many people. I would especially like to thank my advisor and dissertation director, Dr. Benjamin F. Blair, for his encouragement and considerable mentoring throughout my doctoral work. Dr. Blair set for me a high standard of scholarship to which I aspire. His family has also always opened their door for my family and me.

I am also very grateful to my exceptional dissertation committee for their significant contribution to my research. Dr. Charles Campbell, Dr. Jon Rezek, Dr. Randy Campbell, Dr. Paul Grimes, and Dr. Walter Taylor have provided valuable input and generous support throughout the duration of my program. I am convinced that without the moral and intellectual support of Dr. Charles Campbell, and without the kindness and understanding of Dr. Paul Grimes, this work would have been extremely difficult if not impossible. Dr. Rezek generously offered comments and suggestions that helped me to refine the work. I am grateful to Dr. Randy Campbell for helping me with my econometric questions. Dr. Taylor was instrumental in my coming to the

Finance and Economics Department. I have greatly benefited from the entire economics faculty, both in class and in conversation. I am also thankful to my friend Sosten Lungu for his encouragement over the past several years.

I am extremely grateful to my American family, Dr. T.R. Carr, Dr. Lucy Carr, and Dr. Douglas Carr, for their unconditional love and invaluable support both in good and difficult times, and throughout the duration of my masters and doctoral programs. Without the support of my American family this dissertation would have been unthinkable. Dr. Douglas Carr has been a great mentor and his valuable input, encouragement, and enlightened mentoring throughout my higher education career is always appreciated. I would like to also thank Dick & Jeanne Carr and Frank & Liz Nelson for their generous support and encouragement. I sincerely thank my wife, Faith Mekuria, for her encouragement and prayer that caries me day by day. I am grateful to my son Nathan for his smile that helps me to at times forget the lonely dissertation work. I also want to thank my mother and father who have made possible the impossible dream of higher education through their prayer and selfless support. Finally, I am eternally grateful to God for his provision throughout my life.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Africa, and especially sub-Saharan Africa, has been and continues to be one of the largest targets of foreign aid. According to a recent United Nations (2006) report, Africa has received $580 billion in aid since 1960. Eberstadt (2000) reported that aid to Africa from 1960 to 1997 totaled nearly $400 billion in real terms, an amount he equated to six Marshall Plans. In July 2005, the G-8 agreed to double foreign aid to Africa from $25 billion per year to $50 billion per year, while at the same time forgiving previous debt for highly indebted countries. The World Bank (2007) reported that, as of April 2007, its portfolio of aid to Africa amounted to $19.2 billion. Figure 1.1 shows foreign aid flows for 32 sub-Saharan African countries over the period 1984-2003[1].

[1] The countries included in the sample are listed in Appendix A.

Total Aid Received (in Millions of 2000 dollars), 1984-2003

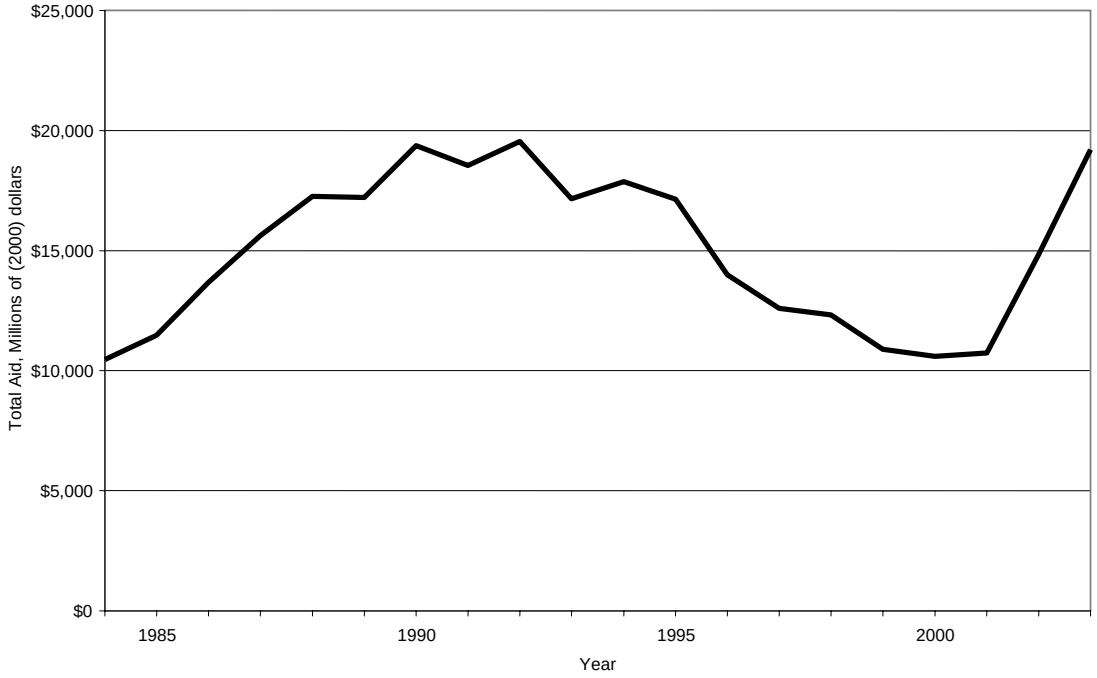


Figure 1.1

Foreign Aid Flows

This outpouring of aid has produced few tangible results and African nations remain some of the poorest and least-developed countries in the world. In its 1989 report, the World Bank concluded that "overall, Africans are almost as poor today as they were 30 years ago (at independence)" (World Bank, 1989; 1). In 1997, the GDP per capita for Africa, excluding South Africa, was $336 compared to $449 for South Asia, $715 for East Asia and $1890 for Latin America. The median African nation, has more than 40 percent of the population living on less than a dollar a day, with income averaging just $0.65

per day (adjusted for purchasing power) (World Bank, 2001; 8-10). The average growth rate over 1984 to 2003 period is depicted in Figure 1.2.

Growth Rate of Per Capita GDP, 1984-2003

Figure 1.2

Growth Rate of Per Capita GDP

So why has foreign aid failed to stimulate development and provide for economic growth? Examining the links between foreign aid, rent-seeking and GDP per capita in recipient governments provides one key to understanding the lack of long-term effectiveness of foreign aid. Nearly a half-century ago, Friedman (1958) suggested that foreign aid has failed to achieve its desired results because it has served to strengthen the government sector of local

economies. This strengthening, in turn, has served to lessen the economic pressure on government institutions to create an environment which facilitates the development of private markets. In a similar argument supported by their empirical results, Burnside and Dollar (2000) put the blame on the "poor policy environment" that exists in recipient countries. According to their study, aid promotes growth only when combined with sound fiscal, monetary, and trade policies. As a result, they suggest a carrot and stick approach to foreign aid allocation in which aid should be diverted to countries with better policies.[2]

Both of the theories advanced above focus on the macroeconomic policies of the recipient country. Recent research has focused on more microeconomic issues; specifically, the micro-motives of the recipient government through which the foreign aid is disbursed. In these models foreign aid may not stimulate development because it is diverted to non-productive rent-seeking activities or more simply, corruption.[3] According to Bauer (1991), since aid dollars are funneled through the recipient government and then into the local economy, government officials have incentives to use the funds for

[2] The empirical results of Burnside and Dollar have been criticized for lack of robustness and for being data dependent. See Easterly et al, (2004), Harms and Lutz (2004), and Rajan and Subramanian, (2005).

[3] See for example, Svensson (1998, 2000), Alesina And Weder (1999), Economides, et.al., (2004), and Kasper (2006).

economically non-productive activities such as increasing patronage, prestige and power.

In Chapters IV and V, I empirically examine the claims of this latter argument in explaining the failure of foreign aid; i.e., that aid is diverted to non-productive rent-seeking activities. In Chapter IV, I examine the relationship between rent-seeking or corruption and foreign aid.[4] Chapter V expands the first model by incorporating an additional equation for GDP per capita. It examines whether simultaneity exists between foreign aid, corruption, and GDP per capita, and whether the relationships depend upon the source of the foreign aid. Thus, adding GDP per capita as an endogenous variable will provide another key to understanding the lack of long-term effectiveness for foreign aid in sub-Saharan Africa.

The body of this dissertation is organized as follows. In chapter II, I present a review of the pertinent economic literature. I begin that section by considering the alternative views regarding corruption and economic growth. In chapter III the data and estimation method is explained. In chapter IV, I turn to the question of the supposed linkages between foreign aid and rent-seeking activity. In chapter V, I examine whether simultaneity exists between foreign aid, corruption, and GDP per capita, and whether the relationship depends upon the source of the foreign aid. This will explain the effect of

[4] Throughout the remaining portion of the paper, the terms "rent-seeking activities" and "corruption" will be used interchangeably.

bilateral and multilateral foreign aid on economic growth. In chapter VI, I add country specific dummies to control for differences between countries. The use of this fixed effects model helps me to explain whether the differences between individual countries play a role in explaining the relationship between foreign aid and corruption. Concluding comments and policy implications are found in Chapter VII.

Before proceeding, I provide a brief description of the history and institutions involved in the distribution of foreign aid.

Brief History of Foreign Aid

Although development assistance existed prior to World War II, the structure of modern day assistance arises from two post-war institutions; the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (the World Bank). These institutions were formed to help rebuild post-war Europe; however, their success, and that of the European Recovery Program (later known as the Marshall Plan) led President Truman to propose an increase in the role of the United States in providing foreign aid elsewhere in the world. In his inaugural address, January 20, 1949:

> "We must embark on a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas…what we

> envisage is a program of development based on the concept of democratic fair dealing"[5]

With Truman's speech, the United States committed itself to providing assistance not only to Europe, but also to other developing countries including those in Africa. Development began to be treated as an economic phenomenon that required aid in the form of "scientific advances and industrial progress" to create increased economic growth. The notion of development has evolved to include foreign aid in additional areas such as famine and debt relief.[6]

Types of Foreign Aid

Foreign aid can be broadly divided into two types: bilateral and multilateral aid. Bilateral aid is given by the government of one country to another directly through an aid agency, such as the United States Agency for International Development (USAID), Britain's Department for International Development (DFID), the International Development Agencies of Canada (CIDA), or the Sweden International Development Agency (SIDA). Multilateral aid is given to a particular country through international agencies

[5] 19 Inaugural address: President Harry Truman, retrieved from Harry Truman Library and Museum located at http://www.trumanlibrary.org/calendar/viewpapers.php?pid=1030 on September 12, 2007.

[6] The exact meaning of "development" is debatable. Schumpeter defines development as "such changes in economic life as are not forced upon it from without but arise by its own initiative, from within" (Prendergast, 2005; 4). In other words, development arises from innovation within a country. According to Todaro and Smith (2006; 17) "Development is a multidimensional process involving major changes in social structures, popular attitudes, and national institutions, as well as the acceleration of economic growth, the reduction of inequality and the eradication of poverty". In this case, development implies more, and needs the participation not only of the country involved but also outside participation.

such as the World Bank, the International Monetary Fund (IMF), regional development banks (e.g., the African Development Bank) or the United Nations.

This paper argues that there may be a significant difference between multilateral aid and bilateral aid with regard to its impact on corruption. Multilateral aid is given to a particular country through an international agency with specific development conditions attached to the aid, while bilateral aid typically excludes these provisions. Furthermore, the inclusion of development conditions for multilateral aid is a relatively recent phenomenon. However, unlike multilateral aid, the provision of bilateral aid is more closely related to taxpayers in the donor country and therefore may be held under greater scrutiny (Martines, 2004).

Foreign aid can also be disaggregated as project aid, program aid, technical assistance, and food aid. Funds designated as project aid are restricted to specific projects for specific purposes. For example, aid to build a new healthcare facility or elementary school would be considered project aid. Aid in this form allows donors to better monitor the use of their funds by the recipient country. However, since budget amounts are fungible, this monitoring is incomplete. Since designating aid for a particular project does not necessarily mean that the recipient's spending in that area will simply increase by the amount of the aid, the recipient could reallocate already

designated resources away from the project once they receive the project aid (see for example, World Bank, 1998, Feyzioglu et.al., 1998). Fungibility of funds is a potential problem from the donor's point of view; however, for the economic development researcher, calling it a "problem" implicitly assumes that the donor's judgment about resource allocation is better than that of the recipient country.

While project aid is designated for a specific project, program aid is designated for spending in a particular sector regardless of the particulars. For example, program aid may be designated for spending on health care or education. Technical assistance provides trained personnel from donor countries or agencies in order to assist with a specific project or development program. Typically this occurs when local professionals are either not qualified or in short supply; most often this occurs in areas such as medicine, computer technology, public health, and law. Eaton (1998) has argued that the provision of technical assistance may not only alleviate qualified labor shortages, but may also alleviate inefficiencies when the recipient country lacks the necessary expertise to hire appropriate contractors themselves. Opponents of technical assistance argue that it erodes the decision-making ability of the recipient country and creates discontent among the local skilled workforce (Cliff, 1993). In addition, outside technical assistance and decision-making is, in some cases, ignorant of local customs, culture and history. To this end, some studies have

warned that technical assistance should be delivered "in a manner which is both complementary of, and congruent with, cultural, economic, organizational, and technological factors in place at the local level" (Hellinger, Hellinger, and O'Regan 1988; 42).

Food aid is usually provided as a response to a disaster or emergency situation such as drought, famine or other natural calamities. It is usually bilateral aid providing mostly food grains to disaster-torn areas. The United States contributes approximately 2.5 million metric tons of food aid each year worth over $1 billion, making the US the single largest deliverer of food aid across the globe. The main criticism of food aid is that it depresses agricultural and farm output in the recipient country. This idea has been argued on the ground that, "food aid lowers food prices because it satisfies part of domestic demand and hence reduces the incentive for domestic farmers to produce grains and other foods" (Perkins et al. 2001; 416).

CHAPTER II

REVIEW OF RELATED LITERATURE

There are two contrasting perspectives regarding the effect of corruption on economic growth and development. The first view assumes a negative relationship between corruption and economic growth and development.[7] Corruption discourages private entrepreneurs, provides incentives for workers to engage in nonproductive activities, hinders private foreign investment, increases the size of government, and decreases the quality of existing infrastructure.

Rather than hindering growth and development, the second view concludes that corruption may actually promote economic growth.[8] When corruption results in fewer bureaucratic delays, it can enhance efficiency and facilitate growth. In a system that is already distorted, this type of corruption can be the "second-best" solution to existing bureaucratic inefficiencies. For example, according to Leff "if the government has erred in its decision, the

[7] See Murphy, Shleifer and Vishny (1993), Mauro (1995, 1996), Keefer and Knack (1995), Triesman (2000), Tanzi and Davoddi (1997), Gupta, et al. (1998), Elliott (1997), Wei (1997a), Brunetti, et al. (1997), Lambsdorff (1999), Rose-Ackerman (1997) and Bardhan (1997).

[8] See Leff (1964), Huntington (1968)

course made possible by corruption may well be the better one" (Leff, 1964; 11). In other words, if a government makes poor policy decisions in the absence of corruption, it may be the case that corrupt decisions are actually superior because they limit the government's ability to implement poor decisions. The possibility of engaging in corrupt activities may also provide an incentive for bureaucrats to be productive. Lui (1985) provides a model which illustrates that bribery can enhance efficiency by reducing bureaucratic delay.

In Chapter V, I further explore this debate by examining whether the source of aid has different effects on corruption and GDP per capita. For example, does bilateral aid affect the level of corruption, and GDP per capita differently from multilateral aid?

The effect of foreign aid on developing countries remains one of the most controversial topics in development economics. No consensus on the effectiveness of aid on growth and development has been reached. Lack of economic growth in recipient countries, government corruption, and numerous policy failures have been frequently used to criticize foreign aid as ineffective.

Foreign aid has been criticized for many years as being detrimental for development. Friedman (1958) suggested that foreign aid has failed to achieve its desired results because it has served to strengthen the government sector of local economies. This strengthening, in turn, has served to lessen the economic pressure on government institutions to create an environment which

facilitates the development of private markets. Other authors have also arrived at similar conclusions regarding the impact of foreign aid, and argue that foreign aid simply increases current consumption rather than promoting long-term economic growth. Eaton states that "foreign capital can reduce welfare by exacerbating an existing domestic distortion" (Eaton, 1998; 1324). According to Griffin (1978), foreign aid decreases savings, increases consumption, increases the capital-output ratio, and thus results in negative economic growth. Rather than addressing the underlying hindrances to economic growth, foreign aid ultimately results in furthering these underlying problems.

Conversely, others, such as Rosentein-Rodan (1961) and Cheney and Strout (1966), argue that there is a positive relationship between foreign aid and economic growth. According to Cheney and Strout, foreign aid fills the gap in savings to match investment opportunities, and foreign aid fills the gap in foreign exchange earnings (export earnings) to finance imports of capital that are important to ensuring growth in developing countries. Chenery and Carter arrive at a similar conclusion. They state: "In general, the countries that have raised their savings rates as a result of the aid-supported growth processes greatly outweigh the cases in which an unnecessary diversion to consumption [occurs]" (Chenery and Carter, 1973; 468). This "two-gap" model and its

supporters, however, do not account for the most important factor regarding foreign aid — the behavior of recipient governments.

The debate regarding the relationship between foreign aid and the government activities of the recipient country received attention after Heller (1975) estimated the effect of foreign aid on government fiscal responses. Using a cross-section time series econometric model of the public sector for eleven African countries (Nigeria, Ghana, Zambia, Kenya, Uganda, Tanzania, Malawi, Liberia, Ethiopia, Tunisia, and Morocco), Heller suggested that "aid not only increases investment, but simultaneously facilitates a reduction in the level of domestic taxes and borrowing" (p.429). Since then, many researchers (Mosely et al., 1987; Gang and Khan, 1991; Gupta, 1997; Franco-Rodriguez et al., 1998; McGillivray, 2000; Franco-Rodriguez, 2000, and Mavrotas and Ouattara, 2006) have analyzed the effect of aid on the fiscal behavior of the recipient country and argued that the recipient country's fiscal policies can influence the effectiveness of aid. For instance, Burnside and Dollar (2000) argue that aid promotes growth only when combined with sound fiscal, monetary, and trade policies. As a result, they suggest a carrot and stick approach to foreign aid allocation in which aid should be diverted to countries with better policies.

Since foreign aid is given primarily to governments in developing countries, the impact of foreign aid on a recipient economy relies heavily on

behavior of the government officials (Franco-Rodriguez et al., 1998). This is particularly true in Africa, where governments mobilize and manage resources, including foreign aid transfers. Therefore, it is important to understand what impact aid has on the government of the developing country itself and how this relates to economic growth. One view is that foreign aid is diverted to non productive activities and, therefore fosters corruption. The possibility that foreign aid may foster corruption has been examined in the recent economic development literature (Svensson, 2000; Alesina and Weder, 2002; Economides et.al., 2004).

Using a game-theoretic, rent-seeking model and employing a system of simultaneous equations, Svensson finds that foreign aid is positively associated with corruption and has been a source of rent in recipient countries. Aid fosters corruption by increasing the size of resources fought over by different ethnic and several interest groups. Corruption is more prevalent in places where ethno-lingual fractionalization and weak political institutions are present.[9] Therefore, an increase in foreign aid does not necessarily lead to an increase in recipient country's welfare. Similarly, Tornell and Lane (1999) suggest that since foreign aid is influenced by the corrupt activities of political

[9] Ethno-lingual fractionalization is defined as the probability that two randomly drawn members of the population belong to different ethno-linguistic groups (Easterly and Levine, 1997; Svensson, 2000). For instance, Svensson finds that in a country where ethno-lingual fractionalization is high, a 1 standard deviation increase in aid is associated with an increase of 0.8 standard deviation in the corruption index.

leaders and bureaucrats, it increases "their appropriation rates leading to a dissipation of the revenues and no gain in welfare." This point is consistent with Pack and Pack (1993), Alesina and Weder (2002), Economides, et. al. (2004), and Kasper (2006), who argue that in the presence of powerful groups, foreign aid can increase corruption and thus can be counter-productive to policy reforms in developing countries. To the question of whether corrupt countries receive less aid, Alesina and Weder suggest that more corrupt countries may actually receive more aid. They interpret this finding to indicate that donors are ignoring the extent of corruption present in recipient countries, thus making poor aid allocation decisions.

The research presented here examines the relationship between foreign aid and corruption in Africa. Using a simultaneous equations model I examine both whether foreign aid spreads corruption and if the level of corruption determines the amount of foreign aid received (as in Alesina & Weder 2002). Furthermore, I examine if the results depend on whether the inflow of aid comes from bilateral or multilateral organizations.

A Principal-Agent Model of Foreign Aid and Corruption

Since the bulk of foreign aid flows through the recipient government, the impact of foreign aid on a recipient economy relies heavily on behavior of the government officials (Franco-Rodriguez et al., 1998). This behavior can, to some extent, be influenced by the donor agency which may impose conditions

of behavior in the foreign aid contract. This contracting relationship can be examined by applying a principal-agent model to the donor-recipient relationship.

Following Svensson (2003) I model a foreign aid donor with an exogenously determined aid budget, B, which can be transferred to the recipient country's government. The donor derives utility from the "performance" of the recipient's economy. This performance can be measured along several possible dimensions including poverty, literacy, infant mortality, or democracy. Performance is determined by reforms instituted at the behest of the donor country. Since aid dollars can be used for productive activities or skimmed off for non-productive activities, I assume that the level of performance is related both to the level of aid as well as the level of corruption in the recipient government. The level of corruption is influenced by the success of reforms in the recipient country. Reforms require costly effort by the recipient government. However, due to institutional conditions and the extent of corruption apparatus in the recipient country, government efforts at reform may not be successful.

Let $\Omega \in \{\text{success, failure}\}$ represent the outcome of the reform effort. The value of the performance measure, M, depends upon whether reform is a success or a failure and upon the level of aid, $\alpha \leq B$, provided by the donor. Specifically, I assume that

$$M = (1 - r(\Omega))h(\alpha)$$

where $r(\Omega)$ is the level of rent-seeking activity or corruption dependent upon the result of reform effort; also, $h' > 0$ and $h'' < 0$. I also assume that

$$(1 - r(success))h(\alpha) > (1 - r(failure))h(\alpha) \ \forall \alpha$$

and

$$r(success) = 0 \ ; \ r(failure) \leq 1 .$$

The recipient country chooses reform effort, $e \in \{\underline{e}, \bar{e}\}$ where $\bar{e}$ refers to high effort and $\underline{e}$ indicates low effort by the recipient. The probability of successful reform, e, is given by $q(e)$, where $q(\bar{e}) > q(\underline{e})$. While the donor cannot observe the degree of success of the reforms directly, it can observe a signal, σ, which is correlated with the reform outcome. Let $\sigma \in \{\bar{\sigma}, \underline{\sigma}\}$ where $\bar{\sigma}$ refers to a signal of high reform effort and $\underline{\sigma}$ refers to a signal of low reform effort. I assume that

$$z(\bar{\sigma} \mid successful\ reform) = z(\underline{\sigma} \mid unsuccessful\ reform) = z$$
$$z(\underline{\sigma} \mid successful\ reform) = z(\bar{\sigma} \mid unsuccessful\ reform) = 1 - z$$
$$z > q(\bar{e}) > \frac{1}{2}$$

where $z(\sigma \mid reform\ outcome)$ is the probability of observing signal σ given the particular reform outcome, either successful or unsuccessful. In the above equation z is the probability of observing correctly and 1-z is the probability of observing incorrectly. The equation $z > q(\bar{e}) > \frac{1}{2}$ implies that, if the recipient country exerts a high level of effort for reform the odds that they will be

successful are better than 50%. Note that $z > q(\bar{e})$ implies that it is expected that the observed signal is correct.

The problem for the donor is to design a contract for the provision of aid to the recipient that will induce the highest effort at reform ($\bar{e}$) despite the fact actual effort is not observable. Specifically, the donor seeks to design an aid contract that maximizes its welfare, $W_D = E[M] = E[(1 - r(\Omega))h(\alpha)]$, where E represents expected value. Since the donor is able to observe the signal σ which is correlated with effort, the optimal contract will be a menu of aid amounts, $\{\alpha(\sigma)\}$, that successfully induces the recipient to exert the highest level of reform effort. Since there are only two observable signals, $\bar{\sigma}$, $\underline{\sigma}$, the contract includes only two aid provisions: $\alpha(\bar{\sigma}), \alpha(\underline{\sigma})$.

I now turn to the utility of the decision maker in the recipient country. Exerting effort is costly. Assume that the disutility per unit of effort is δ and utility derived from aid is $v(\alpha)$. The welfare of the recipient country can then be written as follows.

$$W_R = E[v(\alpha) - \delta e]$$

In order for the contract designed by the donor to work successfully, it must satisfy two constraints[10]. The first constraint is called the "individual rationality" (IR) constraint. This constraint requires that the agent is better off

[10] See Mas-Coell et.al (1995) for a discussion of the IR and IC constraint.

accepting the aid rather than refusing it. The second constraint is called the "incentive compatibility" (IC) constraint. This constraint requires that once the contract is accepted, the agent is at least as well-off exerting the high level of effort as the low level of effort. In other words, the optimal contract should induce the desired level of effort. These two conditions appear below as constraints in the full statement of the donor's maximization problem:

$$\begin{array}{ll} \textit{Maximize} & W_D = E[(1-r(\Omega))h(\alpha(\overline{\sigma}))\mid \overline{\sigma}] + E[(1-r(\Omega))h(\alpha(\underline{\sigma}))\mid \underline{\sigma}] \\ \alpha(\overline{\sigma}), \alpha(\underline{\sigma}) & \textit{subject to} \\ & \alpha(\sigma) \le B, \sigma \in \{\overline{\sigma}, \underline{\sigma}\} \\ & v(\alpha(\underline{\sigma}))[q(\overline{e}) - zq(\overline{e}) + z - zq(\overline{e})] + v(\alpha(\overline{\sigma}))[zq(\overline{e}) + (1-z)(1-q(\overline{e}))] \ge \delta \quad (IR) \\ & [2zq(\overline{e}) - 2zq(\underline{e}) - q(\overline{e}) + q(\underline{e})][v(\alpha(\underline{\sigma})) - v(\alpha(\overline{\sigma}))] \ge \delta \quad (IC) \end{array}$$

Proposition 1: (Svensson, 2003) Provided that $r(\Omega)$ is sufficiently low, the optimal contract is given as

$$\alpha(\overline{\sigma}) = B$$

$$\alpha(\underline{\sigma}) = v^{-1}(\theta) \text{ where } \theta = v(B) - \frac{\delta}{[(2z-1)(q(\overline{e}) - q(\underline{e}))]}$$

Only the incentive compatibility constraint binds and $\overline{e}$ is chosen.[11]

Proposition 1 says that when the donor observes the high signal ($\overline{\sigma}$), the optimal contract is to provide the total aid budget, B. However if the donor observes the low signal ($\underline{\sigma}$) the optimal amount is as defined in the second equation under Proposition 1, which is lower than the total budget, B. Thus, the optimal amount is contingent upon whether the donor observes the lower

[11] For a proof of this conclusion see Appendix B

or higher signal. The recipient knows that to be able to receive the full amount, B, it should put forward its best effort. However, even if the recipient puts forth high effort, the donor could still see the low signal, which will result in a lower level of aid.

For the purposes of this paper, the above model predicts that if a donor makes aid contingent upon some signal related to reform effort then the provision of aid will induce reform efforts and reduce rent-seeking activities. Thus, the model predicts that reform effort is influenced by the amount of foreign aid and that the amount of aid is simultaneously determined by reform efforts. In a later section I provide empirical tests of these hypotheses.

CHAPTER III

DESCRIPTION OF DATA

In this section I describe the data used to test hypotheses regarding foreign aid, corruption, and economic growth. The variables and their definitions used in the empirical analyses are described in Table 1.

Table 1

Variable Definitions and Descriptive Statistics

Variables	Definition	Descriptive Statistics
BIL	Bilateral aid: official development assistance disbursed to a country by a country that is part of the Development Assistance Committee (millions of US 2000 dollars)	Mean=298.8178 SD=297.0070
MUL	Multilateral aid: aid distributed by an international organization such as the World Bank or the International Monetary Fund (millions of US 2000 dollars)	Mean=171.6593 SD=166.0526
TAID	Total aid: the sum of BIL and MUL; total aid to a country (current loan repayments are subtracted and military assistance is excluded, millions of US 2000 dollars)	Mean=470.4771 SD=416.9437
LBIL	Natural log of BIL	Mean=5.6998** SD =1.1116
LMUL	Natural log of MUL	Mean =4.6250** SD = 1.2334
LTAID	Natural log of TAID	Mean =5.7875** SD = 0.9931
COR	Corruption Index: an index from 0 to 6 where 0 indicates the least corrupt and 6 represents the most corrupt.	Mean =3.4277 SD = 1.1228
LGDPC	Natural log of gross domestic product per capita, where GDP is measured in millions of US 2000 dollars	Mean=6.0519** SD=1.1755

Table 1 (Continued)

LPOP	Natural log of total population	Mean=16.0073** SD=1.1870
INF	Annual inflation as measured by the consumer price index (%)	Mean=97.3515 SD=1036.61
SURPNEG1	First deficit quintile: a binary variable equaling one for a country in a particular year that runs a deficit and that deficit is in the lowest 20% of all deficits run by African countries in that year, equals zero otherwise.	Mean 0.1578* SD= 0.3648
SURPNEG2	Second deficit quintile: a binary variable equaling one for a country in a particular year that runs a deficit and that deficit is in the second lowest 20% of all deficits run by African countries in that year, equals zero otherwise	Mean=0.1609* SD=0.3677
SURPNEG3	Third deficit quintile: a binary variable equaling one for a country in a particular year that runs a deficit and that deficit is in the third lowest 20% of all deficits run by African countries in that year, equals zero otherwise	Mean=0.1593 * SD=0.3663
SURPNEG4	Fourth deficit quintile: a binary variable equaling one for a country in a particular year that runs a deficit and that deficit is in the fourth lowest 20% of all deficits run by African countries in that year, equals zero otherwise	Mean=0.1578* SD=0.3648
SURPNEG5	Fifth deficit quintile: a binary variable equaling one for a country in a particular year that runs a deficit and that deficit is in the largest 20% of all deficits run by African countries in that year, equals zero otherwise	Mean=0.1593* SD=0.3663
LTDEBT	Natural log of total external debt, where total debt is measured in millions of US 2000 dollars	Mean=22.0669** SD=1.1522
ILLITERACY	The percentage of people ages 15 and above who cannot, with understanding, read and write a short, simple statement on their everyday life.	Mean=46.4162 SD=20.9831
ETHT	Ethnic Tension Index: an index from 0 to 6 where 0 indicates minimal tension and 6 represents countries where tensions are high	Mean=3.0192 SD=1.1555
OP	Openness: the sum of exports and imports of goods and services as a share of gross domestic product (%)	Mean=64.9123 SD=31.3111
ARMS	Arms transfer: a binary variable that equals one if a country received transfer of conventional weapons in a given year. Equals zero otherwise	Mean=0.2707* SD=0.4446
DEM	Democracy Index: an index from 1 to 7 where 1 indicates less freedom and 7 indicates more freedom	Mean=3.0559 SD=1.4416

*Means of binary variables indicate the percentage of the observations in that category
**The means of the natural log variables are the means of the logged observations and not the log of the mean value of the underlying variable.

The data was compiled from the World Bank Africa database, the International Country Risk Guide (ICRG) Index, the United Nations Statistics Division-National Accounts, the United Nations Population Division, World Population Prospects, and the Stockholm International Peace Research Institute (SIPRI).

The World Bank Africa database provides original data for net official development assistance (ODA) from multilateral and bilateral donors. ODA is defined as all transfers (grants and loans) from official sources that include foreign aid targeted to improve human welfare. The data covers the time period 1960-2003. The data on debt (LTDEBT), adult illiteracy (ILLITERACY), deficit, SURPNEG and inflation, INF are also obtained from the World Bank Africa database (2005).

The data on total debt is used to explore whether highly indebted countries receive more or less bilateral aid. To this end, the total external debt variable is used as a proxy for the likelihood of debt repayment. My conjecture is that, while multilateral aid organizations are interested in debt repayment, their decisions are not based on the likelihood of repayment. Instead, multilateral organizations such as the World Bank orientate their aid decisions around identifying effective development projects; effective development is the central concern for multilateral aid organizations. To this end, Kindleberger argues that multilateral aid is less driven by political

interest or donor's self interest and therefore can increase economic development (Kindleberger, 1970; 141). In contrast, bilateral donors such as the US are politically more directly accountable to taxpayers than are multilateral aid organizations. Thus, bilateral donors pay attention to the likelihood of debt repayment when making aid decisions. In short, bilateral donors face greater political scrutiny for aid decisions than do multilateral donors, causing bilateral donors to consider the likelihood of debt repayment when making aid decisions. The standard deviation of 1.15 indicates that the debt observations are fairly closely clustered around the mean of 22.07. As the final dataset spans 1984 through 2003, it is interesting to note that sub-Saharan debt has remained clustered around this mark throughout these two decades.

Along with the inflation variable, which measures soundness of monetary policy, I created five dummy variables (SURPNEG1through SURPNEG5) representing the spectrum of government deficits for the period 1984-2003. All observations for each country were sorted in each year according to their budget balance. The countries running a deficit were broken into quintiles with the first quintile representing those countries with the least deficit and the fifth quintile representing those countries with the greatest deficits. The variable SURPNEG1 is coded as 1 if the country's annual deficit fell within the first quintile or the least deficit, and 0 otherwise; SURPNEG2 is

likewise a dummy variable equal to 1 if the country's annual deficit fell within the second quintile; SURPNEG3 is a dummy variable equal to 1 if the country's annual deficit fell within the third quintile; SURPNEG4 is likewise a dummy variable equal to 1 if the country's annual deficit fell within the fourth; the variable SURPNEG5 is coded as 1 if the country's annual deficit fell within the fifth quintile or the largest deficit, and 0 otherwise. These variables are used first, to explore whether multilateral aid allocations favor sound fiscal and monetary policy and second, to examine the relationship between different degrees of deficit and GDP per capita. Burnside and Dollar (2000) also used fiscal surplus/deficit and inflation variables to explore whether good policy plays a role in allocating foreign aid. There is great variation in inflation rates in this dataset; the mean rate is 97.35%, while the standard deviation is 1,036.61%.

To measure rent-seeking, I use an index of corruption from the ICRG, which is part of the Political Risk Services (PRS) Group. The data set is a survey-based indicator that offers information for foreign investors on political risk[12]. In short, it provides an assessment of the degree of corruption in a country to foreign investors and lenders. The index considers corruption to be "high government officials' demand for special payments and bribes connected

[12] All the information on ICRG data is obtained from the PRS Group of Syracuse, NY, a group that provides information primarily to overseas investors. For detail visit http://www.prsgroup.com/ICRG_Methodology.aspx

with import and export licenses, exchange controls, tax assessments, police protection or loans."[13] One of the main problems of this assessment is that corruption is hard to quantify due to its illegal and hidden nature (Coolidge and Rose-Ackerman, 1997), and moreover, what is perceived as corruption in one country is considered normal in another country (Lindgreen, 2004). Therefore, the ICRG and other corruption measures are subjective in nature, and analysis based on this assessment should be interpreted as only suggestive rather than comprehensive[14]. However, ICRG is the only data source that offers annual data covering most of the sub-Saharan countries from 1984 to 2006. This dataset has been used frequently by many researchers including Svensson (2000) and Alesia and Weder (2002). The original index, which ranged from 0 representing high corruption to 6 showing low corruption, has been rescaled so that higher values of the re-scaled index represent the more corrupt countries. The re-scaled variable is denoted by COR. A notable observation from summary statistics in Table 1 is the relatively high average of the corruption index of 3.43, when compared to Asia's 2.77 (Samia, 2007) suggests that African countries used in this analysis are perceived to be highly corrupt.

---

[13] See The PRS Group website for detail located at http://www.prsgroup.com/ICRG_Methodology.aspx

[14] "The political risk assessments including corruption are made on the basis of subjective analysis of the available information" statement is quoted from The PRS Group website located at http://www.prsgroup.com/ICRG_Methodology.aspx. See also Sadholtz and Koetzle (2000).

The ICRG was also used to obtain an index of ethnic tension. This index includes "an assessment of the degree of tension within a country attributable to racial, nationality, or language divisions."[15] The index ranges from 0 indicating high racial, nationality or language divisions to 6 indicating such tensions are minimal. I reverse the scale so that 0 indicates minimal tension and 6 indicates the highest tension. This re-scaled variable is denoted by ETHT. The mean score on this index is 3.02, which is roughly the midpoint on the scale. I also use data on adult illiteracy to explore the effect of an educated work force on the economic growth of recipient countries.

Data on democracy was obtained from Freedom House who computes what is known as the Gastil Index for the period 1975-2004. Freedom House provide an expert assessment of civil and political rights in a country based on information about political pluralism and participation, freedom of expression and belief, openness and accountability of government, rule of law, and personal autonomy and individual rights.[16] The index on civil and political liberties ranges from 1-7 where 1 indicates greatest freedom and 7 indicates the least freedom. I reverse the scale so that higher values indicate greater freedom rather than less, denoting the rescaled variable by DEM. This dataset is commonly used; for example, see Ades and Di Tella (1999), Sandholtz and

[15] The PRS Group website located at http://www.prsgroup.com/ICRG_Methodology.aspx P. 33

[16] Source: Freedom in the World (2004); http://www.freedomhouse.org.

Koetzle (2000), and Fisman and Gatti (2002). The average of 3.06 for the democracy index indicates low levels of civil and political freedom in sub-Saharan Africa.

Data on GDP and openness for the years 1970 to 2003 were obtained from the World Bank Africa database. Openness (OP) is a measure of how much a recipient country participates in international trade. It is defined as the ratio of a recipient country's exports and imports to its GDP. The data on population was taken from the United Nations Statistics Division-National Accounts and the UN Population Division, World Population Prospects. There is significant variation in the openness observed in this dataset; the standard deviation of OP is 31.31, while the mean is 64.91.

Finally, data on transfers of major conventional weapons (ARMS) was obtained from the Stockholm International Peace Research Institute (SIPRI). I created the dummy variable ARMS, indicating whether a country received transfers of conventional weapons in a given year, to use as a proxy for donor interest. It has been shown that aid is given based not only on recipient needs, but also on donors' strategic interest; for example, see Svensson (2000), Boone (1996), Burnside and Dollar (2000), and World Bank (1998). Arms transfers occurred in only 27% of the observations in the dataset.

CHAPTER IV

FOREIGN AID AND CORRUPTION

Introduction

Using annual data from sub-Saharan African countries covering 1984-2003, I address three main questions regarding the relationship between rent-seeking or corruption and foreign aid. Specifically, I examine whether the empirical data supports the supposition that recipient governments divert foreign aid to non-productive rent-seeking activities. Simultaneously, I examine whether the level of corruption has an impact on the amount of aid received. Finally, I examine whether the source of foreign aid, bilateral or multilateral, has an impact on the diversion of aid toward rent-seeking activities. This final question allows me to address whether multilateral aid agencies affect the allocation and diversion of aid differently than bilateral aid agencies. The answers to these questions will help determine whether the rent-seeking theory of the failure of foreign aid has empirical support with respect to sub-Saharan Africa. Results will illuminate policy decisions with regard to foreign aid allocation.

Model 1: Total Aid and Corruption

The possibility that foreign aid may foster corruption has been examined in the recent economic development literature (Svensson, 2000). Conversely, Alesina and Weder (2002) indicate that more corrupt countries may actually receive more aid. These simultaneous lines of research suggest that the cause-and-effect relationship, if any, between foreign aid and corruption is not unidirectional. In other words, there is a two way influence between foreign aid and corruption; foreign aid seems to affect corruption and is, in turn, affected by it. To test the hypothesis that foreign aid is a function of corruption and simultaneously, corruption is a function of foreign aid, I estimate two simultaneous equations – one for foreign aid and one for corruption.

The explanatory variables in the aid equation include real GDP per capita (GDPC), population (LPOP), government fiscal and monetary variables (SURPNEG1-SURPNEG5 and INF), democracy (DEM), arms transfer (ARMS), and total external debt (LTDEBT). Following Svensson (2000) and Burnside and Dollar (2000), I include the variables on GDP per capita and population to explain whether the recipient's income and population play a significant role in the allocation of aid. Following Burnside and Dollar (2000), fiscal and monetary policy variables are included to explain whether aid is given in response to sound fiscal and monetary policy. The democracy variable is

included as a proxy for whether the political environment has any significant effect on the provision of aid, and the variable on arms transfer is included to capture whether donors strategic interests play a significant role in the allocation of foreign aid. Finally, as explained in Chapter III, the variable on total external debt is included to explain whether highly indebted countries receive more or less aid.

The explanatory variables in the corruption equation include real GDP per capita (GDPC), openness (OP), ethnic tension (ETHT), and democracy (DEM). Following Braun and Di Tella (2004) I include the GDPC variable to explain whether income plays a significant role in explaining corruption. Following Sandholtz and Koetzle (2000), the openness variable is included to explain whether the recipient country's increased involvement with the outside world plays a significant role in determining corruption. As suggested by Svensson (2000), the ethnic tension variable was included to determine whether ethnic fractionalization plays a significant role in determining corruption. Finally, the democracy variable was included to determine whether an increase in the level of democracy has any significant effect on the level of corruption in the recipient country.

To begin, I examine the relationship between total foreign aid and corruption. This model is represented by the system of equations, [M1]:

$$LTAID = \alpha_0 + \alpha_1 COR + \alpha_2 LGDPC + \alpha_3 LPOP + \alpha_4 SURPNEG1 + \alpha_5 SURPNEG2 + \alpha_6 SURPNEG3 + \alpha_7 SURPNEG4 + \alpha_8 SURPNEG5 + \alpha_9 INF + \alpha_{10} DEM + \alpha_{11} ARMS + \alpha_{12} LTDEBT + \varepsilon_\alpha \quad [M1.1]$$

$$\text{COR} = \beta_0 + \beta_1 LTAID + \beta_2 LGDPC + \beta_3 OP + \beta_4 ETHT + \beta_5 DEM + \varepsilon_\beta \quad [M1.2]$$

Following Hill, Griffiths and Judge (1997), [M1] can be estimated by first estimating the parameters of the reduced form equations using ordinary least squares (OLS) and obtaining the predicted values for both the aid ($\overline{\text{LTAID}}$) and the corruption ($\overline{\text{COR.}}$) variables.

The second stage of the process uses these predicted values and involves estimating the following system of equations:

$$LTAID = \alpha_0 + \alpha_1 \overline{COR} + \alpha_2 LGDPC + \alpha_3 LPOP + \alpha_4 SURPNEG1 + \alpha_5 SURPNEG2 + \alpha_6 SURPNEG3 + \alpha_7 SURPNEG4 + \alpha_8 SURPNEG5 + \alpha_9 INF + \alpha_{10} DEM + \alpha_{11} ARMS + \alpha_{12} LTDEBT + V_A \quad [M1.3]$$

$$\text{COR} = \beta_0 + \beta_1 \overline{LTAID} + \beta_2 LGDPC + \beta_3 OP + \beta_4 ETHT + \beta_5 DEM + V_B \quad [M1.4]$$

where both [M1.3] and [M1.4] are estimated using ordinary least squares (OLS). The estimation results of this system of equations are provided in Table 2[17],[18].

[17] The interpretation methods for all of the variables included in this model and the models that follow are found in Appendix D.

[18] Results of the "first-stage" regressions are presented in Table 10 Appendix E

Table 2

Second Stage Regression Results Examining the Simultaneity Between Total Foreign Aid and Corruption in Sub-Saharan Africa

	Dependent Variable	
Coefficient	**LTAID**	**COR**
Intercept	-0.14003 (0.998585)	4.973008* (0.666358)
COR	0.354925** (0.193063)	
LTAID		-0.17573* (0.078080)
LGDPC	-0.17555* (0.062476)	-0.09142** (0.053431)
LPOP	0.222808* (0.060547)	
SURPNEG1	-0.08790 (0.143608)	
SURPNEG2	0.562577* (0.158446)	
SURPNEG3	0.848786* (0.194439)	
SURPNEG4	0.912445* (0.168501)	
SURPNEG5	0.733041* (0.174002)	
INF	-0.00007** (0.000037)	
OP		-0.00477* (0.001600)
ETHT		0.205508* (0.036742)
DEM	0.082636** (0.030278)	-0.07922 (0.030033)
ARMS	0.106978 (0.0085686)	
LTDEBT	0.065104 (0.068184)	
	$R^2 = 0.38949$, F = 27.38	$R^2 = 0.12388$, F = 14.76

(standard errors in parenthesis)
*Statistically significant at the 95% level
** Statistically significant at the 90% level.

Model 1: Discussion

The significance of the corruption variable (COR) in the total aid equation and of the total aid variable (LTAID) in the corruption equation indicates that a simultaneous relationship exists between corruption and total aid. The positive sign on the COR coefficient in the LTAID column indicates that more corrupt governments receive more total aid. The result indicates, for example, a unit increase in the corruption index will lead to receiving, on average, about 35% more in total aid. This is consistent with the results of Alesina and Weder (2002), who also find that highly corrupt countries receive more aid.

The negative coefficient on LTAID in the corruption equation indicates that a higher level of foreign aid leads to lower levels of corruption. In other words, aid seems to reduce corruption. One possibility for the result could be that a condition for continued aid is a reduction in corruption.

Total foreign aid is negatively related to GDP per capita and positively related to population, indicating that foreign aid is driven by both the recipient's need, as measured by GDP per capita, and donor's interest, as measured by population size. The negative and significant coefficient on LGDPC in the aid equation indicates that a one percentage point decrease in the recipient's real GDP per capita raises the amount of total aid received by about 0.18 percent, while the coefficient on population size (LPOP) indicates a

ten percentage point increase in population size leads to an increase in the total amount of foreign aid received by about 2.2 percent. In other words, the result suggests that donors give aid to poorer, more populace countries.

The coefficients on the fiscal policy variables SURPNEG2 through SURPNEG5 are significant and positively related to total foreign aid. This indicates that, relative to countries with a surplus, countries with medium or large deficit receive more total foreign aid. For example, compared to countries with a surplus, ceteris paribus, countries with a deficit in the highest quintile are expected to receive about 108% more in aid; this is indicated by the positive coefficient on the SURPNEG5 variable. This could be explained by the willingness of the donors to help countries in poor fiscal shape. In practice, this result could be explained by a donor country's push for debt relief for very poor countries through the Heavily Indebted Poor Countries (HIPCs) Initiative, the program which was launched by the IMF and the World Bank is based on the assumption that a poor country's economy is poor due to the heavy debt burden. Thus, debt cancellation was seen as a solution for the long standing poverty for some of the heavily indebted countries, such those in sub-Saharan Africa. But debt cancellation has its own negative incentive in that it may lead to more government borrowing, creating even worse fiscal policy. Finally, the monetary policy variable INF is negatively related to total foreign aid, indicating that foreign aid is given in favor of sound monetary policy.

The coefficient on the debt (LTDEBT) is statistically insignificant, indicating that the amount of debt the country has is not significant determinant for foreign aid allocation. The coefficient on the democracy variable is positive and highly significant, indicating that more democratic countries receive larger amounts of aid. This result could be related to the fact that most donor countries are democracies and give aid to other democratic governments. The coefficient of the arms transfer variable (ARMS), which is used to measure whether total aid is given for strategic reasons, has an intuitive sign but is statistically insignificant. This indicates that strategic or political reasons did not explain aid decisions in sub-Saharan Africa over the sample period.

The results for the corruption equation show that ethnic tension is positively related to corruption. This is in line with Svensson's finding that a high degree of ethnic fractionalization is associated with higher corruption (Svensson, 2003). The results also show that corruption declines as countries become more open. The negative coefficient on the openness variable suggests that increased involvement in trade can reduce corruption by facilitating economic competition (Sandholtz and Koetzle, 2000). These results are as expected. However, the democracy variable (DEM) in the corruption equation is slightly negative but statistically insignificant, indicating that being a democratic country has no significant effect on the level of corruption in the

recipient country; the model in the next section investigates this unexpected result.

Model 2: Bilateral Aid and Corruption

I now refine the above results and examine whether there are any differences between multilateral and bilateral aid with respect to their effects on corruption. To this end, total aid is divided into its component parts – bilateral aid and multilateral aid. In this section, I examine the relationship between bilateral aid and corruption.

The possibility that corruption may reduce the amount of bilateral aid received by a recipient country has been examined in the recent economic development literature (Schudel, 2008). Schudel argues that the level of corruption in the recipient country has a significant effect on the amount of aid received. Schudel finds that bilateral donors allocate more aid to less corrupt countries than more corrupt countries. By extending the research to account for the level of corruption in the donor countries, Schudel also finds that relatively less corrupt donors are less likely to give aid to more corrupt countries. In this section I am interested in examining Schudel's former claim — whether bilateral donors discriminate against corrupt countries.

I examine the relationship between bilateral aid and corruption using the same basic model as before. The model is represented by the system of equations [M2]:

$$LBIL = \mu_0 + \mu_1 COR + \mu_2 LGDPC + \mu_3 LPOP + \mu_4 SURPNEG1 + \mu_5 SURPNEG2 + \mu_6 SURPNEG3 + \mu_7 SURPNEG4 + \mu_8 SURPNEG5 + \mu_9 INF + \mu_{10} DEM + \mu_{11} ARMS + \mu_{12} LTDEBT + \varepsilon_\mu \quad [M2.1]$$

$$COR = \theta_0 + \theta_1 LBIL + \theta_2 LGDPC + \theta_3 OP + \theta_4 ETHT + \theta_{56} DEM + \varepsilon_\theta \quad [M2.2]$$

The system of equations in [M2] can be estimated by first estimating the parameters of the reduced form equations using ordinary least squares (OLS) and obtaining the predicted values for both the bilateral aid ($\overline{\text{LBIL}}$) and the corruption ($\overline{\text{COR}}$) variables[19].

The corresponding second stage of the process uses these estimates and involves estimating the following system of equations:

$$LBIL = \mu_0 + \mu_1 \overline{COR} + \mu_2 LGDPC + \mu_3 LPOP + \mu_4 SURPNEG1 + \mu_5 SURPNEG2 + \mu_6 SURPNEG3 + \mu_7 SURPNEG4 + \mu_8 SURPNEG5 + \mu_9 INF + \mu_{10} DEM + \mu_{11} ARMS + \mu_{12} LTDEBT + error_A \quad [M2.3]$$

$$COR = \theta_0 + \theta_1 \overline{LBIL} + \theta_2 LGDPC + \theta_3 OP + \theta_4 ETHT + \theta_5 DEM + error_B \quad [M2.4]$$

where both [M2.3] and [M2.4] are estimated using OLS. The results of this estimation are provided in Table 3.

[19] Results of the "first-stage" regressions are presented in Table 11 Appendix E

Table 3

Second Stage Regression Results Examining the Simultaneity Between Corruption and Bilateral Aid in sub-Saharan Africa

	Dependent Variable	
Coefficient	**LBIL**	**COR**
Intercept	-1.41117 (1.288550)	4.811361* (0.548429)
COR	0.583659* (0.249124)	
LBIL		-0.18790* (0.072987)
LGDPC	-0.04520 (0.080619)	-0.06940 (0.050619)
LPOP	0.196625* (0.078128)	
SURPNEG1	-0.09877 (0.185309)	
SURPNEG2	0.710291* (0.204455)	
SURPNEG3	1.075639* (0.250899)	
SURPNEG4	1.159961* (0.217429)	
SURPNEG5	1.05520* (0.2224528)	
INF	-0.00010* (0.000048)	
OP		-0.00500* (0.001599)
ETHT		0.210355* (0.036783)
DEM	0.108389* (0. 039070)	-0.07658* (0.030019)
ARMS	0.147523 (0.110567)	
LTDEBT	0.037734 (0.087983)	
	R^2 = 0.27574, F = 16.34	R^2 = 0.12672, F = 15.15

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level.

Model 2: Discussion

A simultaneous relationship exists between corruption and bilateral aid; this is seen from the significance of the corruption variable (COR) in the bilateral aid equation and of the bilateral aid variable (LBIL) in the corruption equation. The positive sign on the COR coefficient in the LBIL column indicates that more corrupt governments receive more bilateral aid. The result indicates, for example, a unit increase in the corruption index will lead to receiving, on average, about 58% more in bilateral aid. This is consistent with the results of Alesina and Weder (2002), who also find that highly corrupt countries receive more aid. The negative sign on the LBIL coefficient in the COR column indicates that bilateral aid reduces corruption just as in the previous model.

Taken together, the above results support the hypothesis that foreign aid and corruption are related. More corrupt countries receive greater amounts of bilateral aid but this aid, in turn, reduces the level of corruption. The result of this simultaneous equations model does not support the conjecture that foreign aid leads to greater amounts of rent-seeking activity; rather, it supports the conjecture that corruption is an underlying condition and aid improves the situation.

This model for bilateral aid indicates that the recipient country's need is not a significant determinant for bilateral aid decisions. This is indicated by

the negative but insignificant coefficient on the LGDPC variable. However, bilateral aid is positively related to population, confirming the result in the first model that foreign aid increases with the size of population in the recipient country. Compared with the coefficient estimates for the first model, the magnitude of the coefficient on the population variable (LPOP) decreased in size. The positive and significant coefficient on population (LPOP) in the aid equation indicates that a ten percentage point increase in population size raises the amount of bilateral aid received by about 1.9 percent.

Similar to the first model, which combined bilateral and multilateral aid, the coefficients on the fiscal policy variables SURPNEG2 through SURPNEG5 are significant and positively related to bilateral aid. This indicates that relative to countries with a surplus, countries with a medium or high deficit receive more bilateral aid. For example, compared to countries with a surplus, countries with a medium deficit are expected receive 193% more in bilateral aid, and countries with largest deficit are expected to receive about 187% more in bilateral aid. This is indicated by the positive coefficient on the SURPNEG3 and SURPNEG5 variables respectively. Thus, the decisions to give both total aid and specifically bilateral aid are focused on helping countries in poor fiscal shape; the initiative to help the highly indebted poor countries (HIPCs) is an example of this motivation in aid decisions. Similarly, Burnside and Dollar (2000) found no "significant tendency for total

aid or bilateral aid to favor good policy." In contrast to the role of fiscal policy, donors do favor sound monetary policy. Similar to the results from Model 1, the recipient country's monetary policy (INF) plays a significant role, indicating bilateral aid decisions favor sound monetary policy.

The hypothesis that bilateral aid is given for strategic reasons is not supported by this model. This is indicated by the insignificant coefficient of the arms transfer variable, ARMS. The coefficient on the debt variable is also insignificant, indicating that debt is not a significant determinant for bilateral aid decisions. The coefficient on the democracy variable continues to be positive and highly significant, indicating that countries that are more democratic receive more bilateral aid; for example, each unit increase in the democracy index results in receiving, on average, about 11% more bilateral aid.

Unlike the model combining bilateral and multilateral aid, this model leads to a negative and significant relationship between democracy and corruption. This model suggests that as country becomes more democratic, the level of corruption in the recipient country decreases. This result could be explained by the following argument: as a country becomes democratic, the level of transparency and accountability increases along with the level of individual civil and political rights.

Similar to the first model, the results for the corruption equation in this model show that ethnic tension is positively related to corruption, and corruption declines as a country become more open. The possibility that ethnic division may foster corruption has been examined in the recent economic development literature (Treisman 2000, Svensson 2003, and Yehoue 2007). Treisman argues that by slowing economic development, ethnic division may indirectly increase the level of corruption. According to Yehoue, ethnicity fosters corruption by acting as "a rent-extracting technology." The rent-extracting behavior is more prevalent in places where ethnic fractionalization and weak democracy are present.

Model 3: Multilateral Aid and Corruption

In this section, I examine the relationship between multilateral aid and corruption. The main argument in favor of multilateral aid is the fact that multilateral aid is less dependent on the strategic or political interests of the donor; rather, it is based on a united effort to help the developing world (Rodrik, 1995). As Alesina and Weder (2002) point out, one should expect multilateral donors to discriminate against corrupt countries. In this section, I examine whether multilateral donors pay attention to corruption in the recipient countries when allocating aid. Specifically, this model will shed some light on the motivations for multilateral aid in sub-Saharan Africa.

Along with Svensson (2000), I use a two system equation to examine the relationship between multilateral aid and corruption using the same basic model described previously. The model is represented by the systems of equations [M3]:

$$LMUL = \Pi_0 + \Pi_1 COR + \Pi_2 LGDPC + \Pi_3 LPOP + \Pi_4 SURPNEG1 + \Pi_5 SURPNEG2 + \Pi_6 SURPNEG3 + \Pi_7 SURPNEG4 + \Pi_8 SURPNEG5 + \Pi_9 INF + \Pi_{10} DEM + \Pi_{11} ARMS + \Pi_{12} LTDEBT + \varepsilon_\Pi \quad [M3.1]$$

$$COR = \Psi_0 + \Psi_1 LMUL + \Psi_2 LGDPC + \Psi_3 OP + \Psi_4 ETHT + \Psi_5 DEM + \varepsilon_\Psi \quad [M3.2]$$

The system of equations, [M3] can be estimated by first estimating the parameters of the reduced form equations using ordinary least squares (OLS) and obtaining the predicted values for both the multilateral aid ($\overline{\text{LMUL}}$) and the corruption ($\overline{\text{COR}}$) variables[20].

The corresponding second stage of the process uses these estimates and involves estimating the following system of equations:

$$LMUL = \Pi_0 + \Pi_1 \overline{COR} + \Pi_2 LGDPC + \Pi_3 LPOP + \Pi_4 SURPNEG1 + \Pi_5 SURPNEG2 + \Pi_6 SURPNEG3 + \Pi_7 SURPNEG4 + \Pi_8 SURPNEG5 + \Pi_9 INF + \Pi_{10} DEM + \Pi_{11} ARMS + \Pi_{12} LTDEBT + \mu_A \quad [M3.3]$$

$$COR = \Psi_0 + \Psi_1 \overline{LMUL} + \Psi_2 LGDPC + \Psi_3 OP + \Psi_4 ETHT + \Psi_5 DEM + \mu_B \quad [M3.4]$$

where both [M3.3] and [M3.4] are estimated using OLS. The results of this estimation are provided in Table 4.

[20] Results of the "first-stage" regressions are presented in Table 12 Appendix E

Table 4

Second Stage Regression Results Examining the Simultaneity Between Corruption and Multilateral Aid in sub-Saharan Africa

	Dependent Variable	
Coefficient	**LMUL**	**COR**
Intercept	1.091376 (1.109087)	5.006138* (0.799717)
COR	-0.23431 (0.214428)	
LMUL		-0.15541** (0.084147)
LGDPC	-0.57293* (0.069390)	-0.15357* (0.075281)
LPOP	0.334291* (0.067247)	
SURPNEG1	-0.03030 (0.159500)	
SURPNEG2	0.220453 (0.175980)	
SURPNEG3	0.380096** (0.215955)	
SURPNEG4	0.328958** (0.187147)	
SURPNEG5	0.162296 (0.193257)	
INF	0.000001847 (0.000042)	
OP		-0.00425** (0.001553)
ETHT		0.197390* (0.036821)
DEM	0.083153* (0.033629)	-0.07268* (0.030799)
ARMS	-0.014004 (0.095168)	
LTDEBT	0.087903 (0.075729)	
	R^2 = 0.46039, F = 36.62	R^2 = 0.12062, F = 14.32

(standard errors in parenthesis)
*Statistically significant at the 95% level
** Statistically significant at the 90% level.

Model 3: Discussion

These results indicate that corruption in recipient countries is not a significant determinant for multilateral aid allocation decisions. In other words, these results seem to indicate that multilateral donors do not pay attention to the level of corruption in the recipient countries. Multilateral aid is not directed toward more (or less) corrupt countries. However, unlike the findings by Alesina and Weder (2002), the negative sign on the LMUL coefficient in the COR column indicates that multilateral aid reduces the level of corruption in the recipient country[21]. Thus, both bilateral aid and multilateral aid seem to discourage corruption.

One interesting difference between the two types of aid is related to the size of the recipient country's economy. The results indicate that, while recipient need is not a significant determinant for bilateral aid allocation, countries with lower levels of GDP per capita receive greater amounts of multilateral aid; multilateral aid seems to favor poorer countries, whereas bilateral aid does not. Similar to the bilateral aid equation, the coefficients on the population variable (LPOP) indicate that multilateral aid increases with population; for example, a ten percentage point increase in population size raises the amount of multilateral aid received by a country by about 3.3

[21] Note that in this model multilateral aid and corruption are simultaneously determined. The previous discussion in this chapter of the Alesina and Weder (2002) findings focuses on whether corruption leads to increased aid. The present discussion of Model 3 focuses on a different causal relationship, which is also discussed in Alesina and Weder (2002). Here the relationship in question is the impact of aid on corruption.

percent. The result seems to suggest that while both bilateral and multilateral aid increase with population, multilateral aid responds to the increases in size more than bilateral aid.

Unlike the previous research by Burnside and Dollar (2000), I find that there is no evidence that multilateral aid favors sound fiscal policy. In fact, if anything, I find the opposite; according to the significant coefficient on the fiscal policy variable SURPNEG3 and SURPNEG4 in the LMUL column, countries with high deficits receive more multilateral aid than do countries with a surplus. The other coefficients for the fiscal policy variables, SURPNEG1, SURPNEG2, and SURPNEG5, are statistically not significant indicating that, overall, a recipient country's fiscal policy is not the main determinant for multilateral aid decisions. This could be explained by the fact that multilateral aid is need based, and donors' are willing to help very poor countries regardless of their poor fiscal or monetary policy. Similarly, the result seems to indicate that a recipient country's monetary policy is not a determinant for multilateral aid allocation. This is indicated by the insignificant coefficients on the INF variable.

The results for the corruption equation show that GDP per capita is negatively related to corruption. Contrary to the Braun and Di Tella (2004) argument that corruption increases with income, this result indicates that corruption decreases with an increase in the recipient country's real GDP per

capita. This could be due to the fact that the need for rent-seeking may fall as individuals become more self-sufficient due to the increase in income in the economy as a whole.

The coefficient on the openness variable (OP) indicates that the level of corruption will fall as a country becomes more open. This result is consistent with the results in Model 1 and Model 2. Consistent with previous research, such as Svensson (2000), the positive and significant coefficient on the ethnic tension variable (ETHT) indicates that corruption increases with high racial, nationality or language divisions.

The coefficient on the debt (LTDEBT) and arms transfer (ARMS) variables are statistically insignificant, indicating that both strategic or political reasons and the amount of debt the county has are not significant determinants for multilateral aid allocation.

The coefficient on the democracy variable (DEM) continues to be positive and highly significant, indicating that countries that are more democratic receive more multilateral aid; for example, each unit increase in the democracy variable will result in getting , on average, about 8% more multilateral aid. Similar to Model 2, this model also indicates that as country becomes more democratic, the level of corruption in the recipient country decreases. This is indicated by the negative and highly significant coefficient on the DEM variable in the corruption equation.

Concluding Comments

Exploring the impact of foreign aid on rent-seeking activities I find that there are significant differences between multilateral and bilateral aid which are obscured by combining the two types of aid into a single measure. Using a simultaneous system of equations describing aid and corruption, I find that while both multilateral aid and bilateral aid have a negative effect on the level of corruption in the recipient country, more corrupt countries receive more bilateral aid but corruption is statistically insignificant in determining the multilateral aid allocation.

Taken together, these results indicate that neither multilateral nor bilateral donors penalize recipient countries for corruption. This result is consistent with Alesina and Weder (2002) who found that neither multilateral nor bilateral aid organizations gave more aid to less corrupt countries. In fact, my result show bilateral aid is given to more corrupt countries.

It should be noted that these results may or may not true of more recent aid allocations, although they do describe aid decisions over the longer period of time included in this analysis. It should also be noted that this research concerns aid only in terms of gifts and grants — does not account for loans. Thus, the possible trade off between aid, as defined, and loans is ignored. Any such relationship may affect both bilateral and multilateral economic help provided to any specific nation.

CHAPTER V

FOREIGN AID, CORRUPTION, AND ECONOMIC GROWTH

Introduction

That economic development in Africa has been slow is an understatement. In 1997, the GDP per capita for Africa, excluding South Africa, was $336, compared to $449 for South Asia, $715 for East Asia and $1,890 for Latin America. In the median African nation, more than 40 percent of the population lives on less than a dollar a day, with income averaging just $0.65 per day adjusted for purchasing power (World Bank, 2001; 8-10).

There are many reasons for this under-development including famine, drought, social and political instability, government corruption, and structural problems in economic and financial institutions. The developed world, acting either out of self interest or humanitarian reasons, has sought ways to alleviate these problems. However, the problems remain and no clear solution is forthcoming.

In this chapter, I extend Model 1 presented in Chapter IV by incorporating an additional equation for GDP per capita growth. Adding GDP per capita as an endogenous variable will provide another key to understanding the lack of long-term effectiveness for foreign aid in sub-

Saharan Africa. Svensson (2000) argues that foreign aid fails to stimulate growth because it is diverted to corruption, and Mauro (1995) finds that corruption reduces growth. However, using panel data analysis, Braun and Di Tella (2004) find that recipient country GDP per capita is positively related to corruption.

Therefore, to test for the possible simultaneity between aid, corruption, and growth, I consider a model with three simultaneous equations – one for foreign aid, one for corruption, and one for GDP per capita growth. In other words, I examine whether simultaneity exists between the three variables: foreign aid, corruption, and GDP per capita and whether the relationship depends upon the source of the aid.

Model 4: Total Foreign Aid, Corruption, and Economic Growth

The objective in this section is to examine the simultaneity between total foreign aid received, corruption, and GDP per capita. The GDP per capita equation includes ethnic tension (ETHT), democracy (DEM), population (LPOP), government fiscal and monetary variables (SURPNEG1 through SURPNEG5 and INF), and adult illiteracy (ILLITERACY). Following Lucas (1988), I included the adult illiteracy variable to account for the effect of an educated work force on a country's economy. The ethnic tension variable was included to explain the impact of racial or language divisions on the economy. Following Barro (1996), the democracy variable was included to explain

whether democracy stimulates GDP per capita growth, and following Malthus (1798), Kuznets (1960), and Cassen (1994), the population variable was included to determine whether population is a significant determinant for growth. Finally, fiscal and monetary policy variables were included to explain whether the recipient country's GDP per capita is dependent on sound fiscal and monetary policy. The variables in the aid and corruption equations and the motivation behind their inclusion are described in Chapter IV.

To investigate the simultaneity between the three variables, the model uses the following system of equations, [M4]:

$$LTAID = \Phi_0 + \Phi_1 COR + \Phi_2 LGDPC + \Phi_3 LPOP + \Phi_4 SURPNEG1 + \Phi_5 SURPNEG2 + \Phi_6 SURPNEG3 + \Phi_7 SURPNEG4 + \Phi_8 SURPNEG5 + \Phi_9 INF + \Phi_{10} DEM + \Phi_{11} ARMS + \Phi_{12} LTDEBT + \varepsilon_\Phi \quad [\text{M4.1}]$$

$$COR = \kappa_0 + \kappa_1 LTAID + \kappa_2 LGDPC + \kappa_3 OP + \kappa_4 ETHT + \kappa_5 DEM + \varepsilon_\kappa \quad [\text{M4.2}]$$

$$LGDPC = \rho_0 + \rho_1 COR + \rho_2 LTAID + \rho_3 LPOP + \rho_4 SURPNEG1 + \rho_5 SURPNEG2 + \rho_6 SURPNEG3 + \rho_7 SURPNEG4 + \rho_8 SURPNEG5 + \rho_9 INF + \rho_{10} DEM + \rho_{11} ETHT + \rho_{12} ILLITERACY + \varepsilon_\rho \quad [\text{M4.3}]$$

This specification allows LTAID, COR, and LGDPC to be simultaneously determined.

Following Hill, Griffiths and Judge (1997), [M4] can be estimated by first estimating the parameters of the reduced form equations using ordinary least squares (OLS) and obtaining the predicted values for aid (LTAID), corruption (COR), and GDP per capita (LGDPC). The reduced form equations express each endogenous variable, LTAID, COR, and LGDPC, in terms of the exogenous

variables LPOP, SURPNEG1, SURPNEG2, SURPNEG3, SURPNEG4, SURPNEG5, INF, DEM, ARMS, LTDEBT, OP, ETHT, ILLITERACY, and the intercept term, plus an error term. Let $\overline{\text{LTAID}}$, $\overline{\text{COR}}$, and $\overline{\text{LGDPC}}$ denote the predicted values in the regression of LTAID, COR, and LGDPC on all predetermined variables in the system[22].

The second stage of the process uses these estimates and involves estimating the following system of equations:

$$LTAID = \Phi_0 + \Phi_1 \overline{COR} + \Phi_2 \overline{LGDPC} + \Phi_3 LPOP + \Phi_4 SURPNEG1 + \Phi_5 SURPNEG2 + \Phi_6 SURPNEG3 + \Phi_7 SURPNEG4 + \Phi_8 SURPNEG5 + \Phi_9 INF + \Phi_{10} DEM + \Phi_{11} ARMS + \Phi_{12} LTDEBT + u_A \quad [\text{M4.4}]$$

$$COR = \kappa_0 + \kappa_1 \overline{LTAID} + \kappa_2 \overline{LGDPC} + \kappa_3 OP + \kappa_4 ETHT + \kappa_5 DEM + u_B \quad [\text{M4.5}]$$

$$LGDPC = \rho_0 + \rho_1 \overline{COR} + \rho_2 \overline{LTAID} + \rho_3 LPOP + \rho_4 SURPNEG1 + \rho_5 SURPNEG2 + \rho_6 SURPNEG3 + \rho_7 SURPNEG4 + \rho_8 SURPNEG5 + \rho_9 INF + \rho_{10} DEM + \rho_{11} ETHT + \rho_{12} ILLITERACY + u_C \quad [\text{M4.6}]$$

where [M4.4], [M4.5], and [M4.6] are all estimated using ordinary least squares (OLS). The results of this estimation are provided in Table 5.

[22] The results of the "first-stage" regressions are presented in Table 13 Appendix E

Table 5

Second Stage Regression Results Examining the Simultaneity Between Total Foreign Aid, Corruption, and per capita GDP in Africa

	Dependent Variable		
Coefficient	**LTAID**	**COR**	**LGDPC**
Intercept	2.507497* (1.099016)	6.138126* (1.167222)	12.18974* (0.747185)
COR	-0.04954 (0.181021)		-0.38016 (0.256612)
LTAID		-0.19689 (0.126861)	0.582132* (0.213612)
LGDPC	-0.32821* (0.093868)	-0.32126* (0.088871)	
LPOP	0.078915 (0.071063)		-0.42487* (0.094535)
SURPNEG1	0.021121 (0.130011)		-0.55796* (0.175384)
SURPNEG2	0.339734* (0.133206)		-0.97848* (0.172660)
SURPNEG3	0.623311* (0.169242)		-1.17334* (0.234043)
SURPNEG4	0.791128* (0.143249)		-1.33804* (0.263184)
SURPNEG5	0.603581* (0.143900)		-0.83529 (0.237196)
INF	0.000883 (0.001085)		-0.00510* (0.001596)
OP		-0.00237 (0.002444)	
ETHT		0.189950* (0.041151)	0.068974 (0.057505)
DEM	0.077792* (0.030233)	-0.04099 (0.036634)	0.064895** (0.035281)
ARMS	0.017945 (0.084386)		
LTDEBT	0.163791* (0.053475)		
ILLITERACY			-0.02322* (0.002926)
	R^2=0.45167 F=24.16	R^2=0.114548 F=12.22	R^2=0.44004 F=23.05

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level.

Model 4: Discussion

The results indicate that the receipt of foreign aid appears to boost GDP per capita; for example, the positive and a highly significant coefficient on LTAID in the GDP per capita equation indicates that a one percentage point increase in the amount of total foreign aid received raises recipient country's GDP per capita by about 0.58 percent. The results also show that poorer countries receive more aid. To this end, the negative and significant coefficient on LGDPC in the aid equation indicates that a one percentage point decrease in the recipient's real GDP per capita raises the amount of total aid received by about 0.32 percent. However, the result indicates that low corruption does not explain total foreign aid and foreign aid does not affect corruption levels. GDP per capita does appear to lower corruption but higher corruption does not affect GDP per capita.

The estimated coefficients also show that population does not affect aid allocation decisions but is associated with a decrease in GDP per capita. The debate over whether a large population is detrimental to economic growth goes back to Malthus (1798). For instance, Kuznets (1960) argues that an increase in population leads to an increase in per capita output, whereas Cassen (1994) suggests a slow growth in population is better for economic growth in developing countries. To this end, the negative and significant coefficient on LPOP in the GDP per capita equation indicates that a one percentage point

increase in population size reduces the recipient country's GDP per capita by about 0.43 percent. This could be explained by the strain high population may create on infrastructure such as roads, schools, and clinics. In addition, high population can also reduce GDP per worker since the existing capital stock must now be distributed among the increasing population.

Like the results of the model in the previous chapter, the results here indicate that total foreign aid increases with the recipient country's deficit. Thus, similar to Model 1, the coefficients on the fiscal policy variables SURPNEG2 through SURPNEG5 are significant and positively related to total foreign aid. The result indicates that, relative to countries with a surplus, countries with a medium or large deficit receive more total foreign aid. However, note that the magnitudes of all the coefficients (SURPNEG2 through SURPNEG5) in the aid equation are smaller than in model 1. For example, compared to countries with a surplus, ceteris paribus, countries with a deficit in the highest quintile are expected to receive about 83% more in aid, while countries in the medium quintile are expected to receive about 87% more in aid; this is indicated by the positive coefficients on the SURPNEG5 and SURPNEG3 variables respectively. As indicated in the previous chapter, this result could be explained by the willingness of the donors to help countries in poor fiscal shape. The World Bank and the IMF efforts through the Highly Indebted Poor countries (HIPCs) Initiative is an example of this motivation in

aid decisions. The coefficients on the policy variable SURPNEG1 and the monetary policy variable INF are positive but insignificant indicating that the recipient country's monetary policy or the existence of a small deficit is not a significant determinant for aid allocation decisions.

The estimated coefficients also show that the recipient country's deficit has a large negative effect on GDP per capita. The results indicate that, in general, countries with a deficit have a smaller GDP per capita than do countries with a surplus. The effects of a deficit on GDP per capita vary according to the size of the deficit. The significant negative effect of a deficit on GDP per capita increases in the deficit spectrum except in the fifth quintile where the magnitude becomes smaller and insignificant. The results indicate that compared to countries with a surplus, on average, countries with a deficit in fourth quintile, captured by SURPNEG4, are expected to have about 74% lower GDP per capita, while countries with a deficit in the first quintile, captured by SURPNEG1, have about 43% lower GDP per capita. Thus, it appears that fiscal policy leading to deficits in general results in a smaller GDP per capita, with small to moderately high deficits having a bigger negative effect on a country's economy than running a surplus. The negative coefficient for inflation indicates that responsible monetary policy, resulting in lower inflation, increases GDP per capita.

Similar to the results of the model in the previous chapter, the results here indicate that highly indebted countries receive more foreign aid. This could be explained by the willingness of donors to help highly indebted countries. The positive and significant coefficient on LTAID in the aid equation indicates that, on average, a one percentage point increase in recipient country's total external debt raises the amount of total aid received by about 0.16 percent. The coefficient of the arms transfer variable (ARMS), which is used to measure whether total aid is given for strategic reasons, has an intuitive sign but is statistically insignificant indicating that strategic or political reasons captured by this variable are not a significant determinant for aid allocation decisions.

The results indicate that democracy is positively related to GDP per capita. This is in line with Barro (1996), who argues that greater democracy stimulates growth; however, he later suggests that "democracy enhances growth at lower levels of political freedom," implying diminishing returns to additional democracy. The results also show that the democracy variable is positively related to total aid and highly significant, indicating that countries that are more democratic receive more aid; for example, each unit increase in the democracy index results in receiving, on average, approximately 8% more total aid. However, the democracy variable does not explain corruption in the recipient country. Taken together, the results indicate that foreign aid directed

to promote democracy has a positive impact in improving the economic condition of the recipient country.

As expected, the recipient country's adult illiteracy rate (ILLITERACY) is negatively related to GDP per capita; Specifically, a one percent increase in the illiteracy rate will reduce the recipient country's GDP per capita by about 2.3 percent. This result is in line with Lucas (1988), who finds that countries with a highly educated work force have higher economic growth opportunities.

The estimated coefficient of the openness variable (OP) in the corruption equation has an intuitive negative sign but is statistically insignificant; thus, openness does not explain corruption in the recipient country. Similar to the results in the previous chapter, the results here suggest that corruption increases with high racial, nationality or language divisions; this is indicated by the positive and significant coefficient on the ETHT variable. However, ethnic tension does not explain GDP per capita.

Model 5: Bilateral Aid, Corruption, and Economic Growth

In order to refine the above results and examine whether there are any differences between the source of aid with respect to their effect on growth, I break total aid up into its component parts – bilateral aid and multilateral aid. I begin with the examination of the relationship between bilateral aid, corruption, and economic growth. The dependent variables, the natural log of

bilateral aid, corruption, and the natural log of GDP per capita are represented by the following system of equations, [M5]:

$$LBIL = \delta_0 + \delta_1 COR + \delta_2 LGDPC + \delta_3 LPOP + \delta_4 SURPNEG1 + \delta_5 SURPNEG2 + \delta_6 SURPNEG3 + \delta_7 SURPNEG4 + \delta_8 SURPNEG5 + \delta_9 INF + \delta_{10} DEM + \delta_{11} ARMS + \delta_{12} LTDEBT + \varepsilon_\delta \quad [\text{M5.1}]$$

$$COR = \gamma_0 + \gamma_1 LBIL + \gamma_2 LGDPC + \gamma_3 OP + \gamma_4 ETHT + \gamma_5 DEM + \varepsilon_\gamma \quad [\text{M5.2}]$$

$$LGDPC = \lambda_0 + \lambda_1 COR + \lambda_2 LBIL + \lambda_3 LPOP + \lambda_4 SURPNEG1 + \lambda_5 SURPNEG2 + \lambda_6 SURPNEG3 + \lambda_7 SURPNEG4 + \lambda_8 SURPNEG5 + \lambda_9 INF + \lambda_{10} DEM + \lambda_{11} ETHT + \lambda_{12} ILLITERACY + \varepsilon_\lambda \quad [\text{M5.3}]$$

This specification allows LBIL, COR, and LGDPC to be simultaneously determined.

Following Hill, Griffiths and Judge (1997), [M5] can be estimated by first estimating the parameters of the reduced form equations using ordinary least squares (OLS) and obtaining the predicted values for the bilateral aid (LBIL), corruption (COR), and GDP per capita (LGDPC) equations. The reduced form equation expresses each endogenous variable, LBIL, COR, and LGDPC, in terms of the exogenous variables LPOP, SURPNEG1 SURPNEG2, SURPNEG3, SURPNEG4, SURPNEG5, INF, DEM, ARMS, LTDEBT, OP, ETHT, ILLITERACY, and the intercept variable, plus an error term. Let $\overline{\text{LBIL}}$, $\overline{\text{COR}}$, and $\overline{\text{LGDPC}}$ denote these predicted values[23].

The second stage of the process uses these estimates and involves estimating the following system of equations:

[23] The result of these "first-stage" regressions are presented in Table 14 Appendix E

$$LBIL = \delta_0 + \delta_1 \overline{COR} + \delta_2 \overline{LGDPC} + \delta_3 LPOP + \delta_4 SURPNEG1 + \delta_5 SURPNEG2 + \delta_6 SURPNEG3 + \delta_7 SURPNEG4 + \delta_8 SURPNEG5 + \delta_9 INF + \delta_{10} DEM + \delta_{11} ARMS + \delta_{12} LTDEBT + u_1 \quad [\text{M5.4}]$$

$$COR = \gamma_0 + \gamma_1 \overline{LBIL} + \gamma_2 \overline{LGDPC} + \gamma_3 OP + \gamma_4 ETHT + \gamma_5 DEM + u_2 \quad [\text{M5.5}]$$

$$LGDPC = \lambda_0 + \lambda_1 \overline{COR} + \lambda_2 \overline{LBIL} + \lambda_3 LPOP + \lambda_4 SURPNEG1 + \lambda_5 SURPNEG2 + \lambda_6 SURPNEG3 + \lambda_7 SURPNEG4 + \lambda_8 SURPNEG5 + \lambda_9 INF + \lambda_{10} DEM + \lambda_{11} ETHT + \lambda_{12} ILLITERACY + u_3 \quad [\text{M5.6}]$$

where [M5.4], [M5.5], and [M5.6] are estimated using ordinary least squares (OLS). The results of this estimation are provided in Table 6.

Table 6

Second Stage Regression Results Examining the Simultaneity Between Bilateral Aid, Corruption, and per capita GDP in Africa

	Dependent Variable		
Coefficient	**LBIL**	**COR**	**LGDPC**
Intercept	1.899885 (1.219664)	6.090241* (0.885754)	11.53084* (0.736783)
COR	0.004694 (0.200893)		-0.38718 (0.240477)
LBIL		-0.23538* (0.112508)	0.496835* (0.145517)
LGDPC	-0.19907* (0.104173)	-0.28305* (0.078533)	
LPOP	-0.02258 (0.078864)		-0.34412* (0.069718)
SURPNEG1	0.016940 (0.145393)		-0.50871* (0.162277)
SURPNEG2	0.373284* (0.147829)		-0.990289* (0.144240)
SURPNEG3	0.736374* (0.187821)		-1.11675* (0.193849)
SURPNEG4	0.926102* (0.158975)		-1.27565* (0.207983)
SURPNEG5	0.794473* (0.159697)		-0.84833* (0.213086)
INF	-0.00081 (0.001204)		-0.00384* (0.001385)
OP		-0.00318 (0.002417)	
ETHT		0.188287* (0.040773)	0.063309 (0.054083)
DEM	0.077842* (0.033552)	-0.04113 (0.035664)	0.063520** (0.033091)
ARMS	0.003888 (0.093649)		
LTDEBT	0.199363* (0.059345)		
ILLITERACY			-0.02155* (0.002373)
	R^2=0.36163 F=16.62	R^2=0.15169 F=12.84	R^2=0.47372 F=26.40

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level.

Model 5: Discussion

Examining the bilateral portion of total aid reveals some interesting differences between this type of aid and total aid in their relation to corruption and GDP per capita. The results of this model indicate that corruption has no significant effect on the amount of bilateral aid received but the continued receipt of bilateral aid appears to reduce corruption. This result could be explained by the fact that reductions in corruption may be a pre-condition for continued receipt of bilateral aid. To this end, Tavares (2003) argues that one possibility for the negative relationship between aid and corruption is "a conditionality effect"; donor countries may require potential recipients to reduce corruption as a pre-condition for aid. These results support the conjecture that corruption is an underlying problem and aid improves the situation. The coefficient on COR in the LGDPC column is negative, although is insignificant; corruption does not affect GDP per capita.

The estimated coefficients also show that bilateral aid favors poorer countries and the receipt of bilateral aid appears to boost GDP per capita; the negative and highly significant coefficient on LGDPC in the bilateral aid equation indicates that a one percentage point decrease in the recipient's real GDP per capita raises the amount of bilateral aid received by about 0.2 percent, while the positive and a highly significant coefficient on LBIL in the GDP per capita equation indicates that a one percentage point increase in the

amount of bilateral aid received raises the recipient country's GDP per capita by about 0.5 percent. Taken together, the result shows that bilateral aid and GDP per capita are simultaneously determined. The results also indicate that corruption does not explain GDP per capita in the recipient country, but an increase in GDP per capita does appear to lower the level of corruption.

Like the results of the model in the previous chapter, the results here indicate that an increase in population reduces GDP per capita; the negative and highly significant coefficient on LPOP in the GDP per capita equation indicates that a one percentage point increase in population size reduces the recipient country's GDP per capita by about 0.34 percent. However, unlike previous results, the population variable (LPOP) is negatively associated with the amount of bilateral aid received, but is statistically insignificant.

Examining only bilateral aid did not change the overall effects of the fiscal policy variables (SURPNEG1 through SURPNEG5) on the bilateral aid allocation decision and on GDP per capita. The results indicate that bilateral aid increases with the recipient country's deficit. Specifically, compared to countries with a surplus, on average, countries with a medium deficit in the third quintile are expected to receive about 109% more in bilateral aid, while countries with a deficit in the highest quintile are expected to receive about 121% more in bilateral aid. This result is indicated by the positive coefficients on the SURPNEG3 and SURPNEG5 variables respectively.

Similarly, as in combined model, the result shows that a deficit is negatively related to the recipient country's GDP per capita; the result indicates that compared to countries with a surplus, on average, countries with a small deficit in the first quintile captured by SURPNEG1 are expected to have about 40% less per capita GDP, while countries with a deficit in the fourth quintile captured by SURPNEG4 are expected to have about 58% less GDP per capita. Again, compared to countries with a surplus, it appears that fiscal policy leading to a deficit in general leads to smaller GDP per capita. Like in the combined model, this model focusing on bilateral aid indicates that responsible monetary policy, resulting in lower inflation, increases GDP; this is indicated by the negative and significant coefficient on the INF variable.

As expected, ethnic tension is positively related to corruption but does not appear to explain the recipient country's GDP per capita. The result also shows that the openness of the recipient economy has no statistically significant effect on corruption. Similarly, the results indicate that being a democratic country has no significant effect on the level of corruption in the recipient country. However, consistent with the results of Model 4, countries with higher freedom, those that are more democratic, receive more bilateral aid. Also, countries with higher degrees of freedom have higher GDP per capita than those that are under a more dictatorial regime; for example, each unit increase in the democracy index results in receiving, on average, about 8%

more bilateral aid, while increasing the recipient country's GDP per capita by about 6.3%. The results also show that the coefficient on the democracy variable, DEM, in the corruption equation has an intuitive sign but is statistically insignificant.

Not surprisingly, illiteracy is negatively related to the recipient country's economy suggesting that an educated work force is vital for the growth of the economy; for example, a one percentage point increase in the illiteracy rate reduces the recipient country's GDP per capita by about 2.2 percent.

Finally, the total external debt of the recipient's economy is positively related to bilateral aid. As explained in Model 1, the result could be explained by the willingness of donors to help highly indebted countries. The coefficient of the arms transfer variable (ARMS), which is used to measure whether aid is given for strategic reasons, has an intuitive sign but is statistically insignificant, indicating that strategic or political reasons are not a significant determinant of bilateral aid allocation to sub-Saharan African countries over the sample period.

Model 6: Multilateral Aid, Corruption, and Economic Growth

In this section I examine the relationship between multilateral aid, corruption, and economic growth. All the variables are as defined in the previous models. The dependent variables, natural log of multilateral aid,

corruption, and natural log of GDP per capita, are represented by the following system of equations, which runs parallel to Models IV and V, [M6]:

$$LMUL = \phi_0 + \phi_1 COR + \phi_2 LGDPC + \phi_3 LPOP + \phi_4 SURPNEG1 + \phi_5 SURPNEG2 + \phi_6 SURPNEG3 + \phi_7 SURPNEG4 + \phi_8 SURPNEG5 + \phi_9 INF + \phi_{10} DEM + \phi_{11} ARMS + \phi_{12} LTDEBT + \varepsilon_\phi \quad [\text{M6.1}]$$

$$COR = \varphi_0 + \varphi_1 LMUL + \varphi_2 LGDPC + \varphi_3 OP + \varphi_4 ETHT + \varphi_5 DEM + \varepsilon_\varphi \quad [\text{M6.2}]$$

$$LGDPC = \Gamma_0 + \Gamma_1 COR + \Gamma_2 LMUL + \Gamma_3 LPOP + \Gamma_4 SURPNEG1 + \Gamma_5 SURPNEG2 + \Gamma_6 SURPNEG3 + \Gamma_7 SURPNEG4 + \Gamma_8 SURPNEG5 + \Gamma_9 INF + \Gamma_{10} DEM + \Gamma_{11} ETHT + \Gamma_{12} ILLITERACY + \varepsilon_\Gamma \quad [\text{M6.3}]$$

This specification allows LMUL, COR, and LGDPC to be simultaneously determined.

Following Hill, Griffiths and Judge (1997), [M6] can be estimated by first estimating the parameters of the reduced form equations using ordinary least squares (OLS) and obtaining the predicted values for the multilateral aid (LMUL), corruption (COR), and GDP per capita (LGDPC) equations. The reduced form equations express each endogenous variable, LMUL, COR, and LGDPC, in terms of the exogenous variables LPOP, SURPNEG1, SURPNEG2, SURPNEG3, SURPNEG4, SURPNEG5, INF, DEM, ARMS, LTDEBT, OP, ETHT, ILLITERACY, and the intercept variable, plus an error term. Let $\overline{\text{LMUL}}$, $\overline{\text{COR}}$, and $\overline{\text{LGDPC}}$ denote the predicted values[24].

[24] The result of these "first-stage" regressions are presented in Table 15 Appendix E

The second stage of the process uses these estimates and involves estimating the following system of equations:

$$LMUL = \phi_0 + \phi_1 \overline{COR} + \phi_2 \overline{LGDPC} + \phi_3 LPOP + \phi_4 SURPNEG1 + \phi_5 SURPNEG2 + \phi_6 SURPNEG3 + \phi_7 SURPNEG4 + \phi_8 SURPNEG5 + \phi_9 INF + \phi_{10} DEM + \phi_{11} ARMS + \phi_{12} LTDEBT + \nu_1 \quad [\text{M6.4}]$$

$$COR = \varphi_0 + \varphi_1 \overline{LMUL} + \varphi_2 \overline{LGDPC} + \varphi_3 OP + \varphi_4 ETHT + \varphi_5 DEM + \nu_2 \quad [\text{M6.5}]$$

$$LGDPC = \Gamma_0 + \Gamma_1 \overline{COR} + \Gamma_2 \overline{LMUL} + \Gamma_3 LPOP + \Gamma_4 SURPNEG1 + \Gamma_5 SURPNEG2 + \Gamma_6 SURPNEG3 + \Gamma_7 SURPNEG4 + \Gamma_8 SURPNEG5 + \Gamma_9 INF + \Gamma_{10} DEM + \Gamma_{11} ETHT + \Gamma_{12} ILLITERACY + \nu_3 \quad [\text{M6.6}]$$

where [M6.4], [M6.5], and [M6.6] are estimated using ordinary least squares (OLS). The results of this estimation are provided in Table 7.

Table 7

Second Stage Regression Results Examining the Simultaneity Between Multilateral Aid, Corruption, and per capita GDP in Africa

	Dependent Variable		
Coefficient	**LMUL**	**COR**	**LGDPC**
Intercept	2.454156 (1.521749)	5.095586* (1.494626)	7.914646* (2.263019)
COR	-0.14122 (0.250650)		-0.65732* (0.276395)
LMUL		-0.06554 (0.143499)	-0.83228* (0.404025)
LGDPC	-0.770968* (0.129974)	-0.31142* (0.146192)	
LPOP	0.248860* (0.098397)		0.231008 (0.240449)
SURPNEG1	0.085535 (0.181404)		-0.10977 (0.246451)
SURPNEG2	0.240473 (0.184443)		-0.18584 (289719)
SURPNEG3	0.478578* (0.234340)		-0.04246 (0.371001)
SURPNEG4	0.571333* (0.198349)		0.103810 (0.435381)
SURPNEG5	0.152762 (0.199250)		-0.22053 (0.217873)
INF	0.002118 (0.001502)		0.001443 (0.002775)
OP		-0.00055 (0.002360)	
ETHT		0.192027* (0.042365)	0.111687* (0.058601)
DEM	0.156837* (0.041862)	-0.04510 (0.044129)	0.132808* (0.044056)
ARMS	0.115834 (0.116844)		
LTDEBT	0.096087 (0.074044)		
ILLITERACY			-0.00571* (0.006583)
	R^2=0.44892 F=23.90	R^2=0.13441 F=11.15	R^2=0.43406 F=22.50

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level.

Model 6: Discussion

Similar to the results in the previous chapter, these results also indicate that the level of corruption in the recipient country does not explain the amount of multilateral aid received. However, unlike the result in chapter IV, the slightly negative but insignificant coefficient on multilateral aid variable, LMUL, in the corruption equation indicates that multilateral aid does not affect the level of corruption in the recipient country.

The corruption variable (COR) in the GDP per capita equation indicates that corruption is negatively related to GDP per capita. The negative and highly significant coefficient on COR in the GDP per capita equation indicates that a one unit increase in the corruption index, on average, reduces the recipient country's GDP per capita by about 65% percent. This result is in line with other authors such as Mauro (1995) who argue that corruption has a negative impact on investment and growth. Mauro finds that an increase in corruption of one standard deviation reduces investment by 5% of GDP and growth by 0.05% of GDP. Other authors arrive at similar conclusions; for example, see Rose-Ackerman (1997), Shleifer and Vishny (1993), and Keefer and Knack (1995).

The results indicate that multilateral aid is negatively related to the recipient country's GDP per capita, but does not appear to explain the level of corruption in the recipient country. In other words, multilateral aid appears to

lower the recipient country's GDP per capita. The negative and statistically significant coefficient on the multilateral aid variable, LMUL, in the GDP per capita equation indicates that a one percent increase in multilateral aid reduces the recipient country's GDP per capita by about 0.8 percent. Along this line, Ram (2003) finds that a one percentage point increase in multilateral aid reduces the growth rate by one half to one percentage point. Ram argues that although aid in general positively affects growth, multilateral aid in its current form is unlike bilateral aid does not improve growth in the recipient countries.

This model for multilateral aid indicates that the recipient country's need is a significant determinant for multilateral aid decisions; the negative and highly significant coefficient on LGDPC in the multilateral aid equation indicates that a one percentage point decrease in the recipient's real GDP per capita raises the amount of multilateral aid received by about 0.77 percent. The result also shows that an increase in real GDP per capita reduces the level of corruption in the recipient country. These results could be explained by the fact that as income increases the need for rent-seeking activity will fall, since individuals are now more self-sufficient and the moral cost of engaging in rent-seeking activity in society will more likely outweigh the benefit of bribes.

The estimated coefficients also show that multilateral aid increases with population, but does not appear to explain the recipient country's GDP per capita; for example, the positive and highly significant coefficient on LPOP in

the multilateral aid equation indicates that a one percentage point increase in population raises the amount of multilateral aid received by about 0.25 percent, while the positive but statistically insignificant coefficient on LPOP in the GDP per capita equation indicates that population is not a significant determinant for GDP per capita in sub-Saharan African countries over the sample period. Taken together, the results show that while multilateral aid increases with population, population has no significant impact on GDP per capita.

Consistent with the results of the model in Chapter IV, the results here indicate that overall, sound fiscal or monetary policy in the recipient country does not affect multilateral aid allocations. In fact, as indicated by the positive coefficients on the fiscal policy variables SURPNEG3 and SURPNEG4 in the multilateral aid equation, countries with average deficits get more aid than do countries with a surplus. The coefficients on the remaining fiscal policy variables (SURPNEG1, SURPNEG2, and SURPNEG5) and the monetary policy variable (INF) remain insignificant, confirming my previous result that sound fiscal and monetary policies are not the main determinant for multilateral aid decisions. Rather, it appears that the recipient country's need plays a significant role in determining the allocation of multilateral aid.

The results also show that the coefficients on the openness variable (OP) and the democracy variable (DEM) in the corruption equation have an

intuitive sign, but are statistically insignificant; this indicates that the openness of the recipient country's economy as well as being democratic has no significant impact on the level of corruption in the recipient country. However, consistent with previous results, ethnic tension appears to foster corruption. Unlike the finding by Easterly and Levine (1997) who argue that ethno-linguistic fractionalization reduces economic growth, the ethnic tension variable, ETHT, in the GDP per capita equation indicates that high racial, nationality, or language division is positively associated with the recipient country's GDP per capita. This result is surprising given high ethnic tension most likely will encourage internal conflict and civil war which, in turn, may negatively affect growth.

As expected, more democratic countries receive more multilateral aid, and democracy boosts GDP per capita; this is indicated by the democracy variable (DEM) in the multilateral aid and GDP per capita equations respectively. Each unit increase in the democracy index results in receiving, on average, about 15.7% more multilateral aid, while each unit increase in the democracy index appears to boost the recipient country's GDP per capita by about 13%. Taken together, the results suggest that aid increases the level of democracy in the recipient country, and in turn, democracy has a significantly positive effect on the recipient country's overall economy.

Similar to my finding in Model 4 where I combined both multilateral and bilateral aid together, illiteracy appears to negatively affect the recipient country's GDP per capita growth; the results here indicate that a one percent increase in the recipient country's illiteracy rate will reduce the real GDP per capita by about 0.5 percent. This confirms the previous result that an educated work force is vital for the growth of the overall economy.

Finally, the estimated coefficients on the total external debt (LTDEBT) and arms transfer (ARMS) variables in the multilateral aid equation indicate that both political or strategic reasons as well as the level of debt in the recipient country have no significant effect on the level of multilateral aid given to that country. This finding is not surprising; these results imply that multilateral aid is given based on the need of the recipient country as indicated by the LGDPC variable in multilateral aid equation.

Concluding Comments

Examining the relationship between foreign aid, corruption, and GDP in sub-Saharan Africa provides evidence that, overall, there is a negative and significant association between the recipient country's GDP per capita and its deficit. According to Mankiw (2004), budget deficits reduce national saving, which in turn increase interest rates and reduce investment. Thus, this fall in private investment will lead to a fall in growth. Given that any size deficit has

a negative impact on GDP per capita, the key policy implication of these findings is for countries to address the deficit problem.

The results also provide some evidence that foreign aid is positively related to democracy, and democracy positively affects the recipient country's real GDP per capita. Therefore, it appears that aid given to promote democracy boosts economic growth. Given this positive effect of democracy on GDP per capita, one implication for donors is to condition both multilateral and bilateral aid on the recipient country's actions in promoting democratic reforms.

The findings also suggest that illiteracy is one of the significant detrimental factors for long-term growth in sub-Saharan Africa. Consistently throughout the models, the coefficient on the adult illiteracy variable (ILLITERACY) is negatively associated with the recipient country's GDP per capita. It is not surprising that education is very important for any nation's standard of living. An educated person has a better chance to generate new ideas on how to best increase productivity. Therefore, key policy implications for sub-Saharan governments are to continue to encourage private investment in education and to create public awareness of the benefits of education.

Finally, in exploring the relationship between foreign aid, corruption, and GDP per capita, I find that there are significant differences between multilateral and bilateral aid that are obscured by combining the two types of

aid into a single measure. Using a simultaneous system of equations describing aid, corruption, and GDP per capita, I find that while the receipt of both bilateral aid and multilateral aid appears to reduce the level of corruption, there is significant difference between the two types of aid in relation to the recipient country's GDP per capita. The results suggest that while bilateral aid increases the recipient country's real GDP per capita, multilateral aid appears to reduce GDP per capita and has no significant effect on the level of corruption in the recipient country. This result suggests that requirements placed in multilateral aid contracts are not effective in reducing corruption; it may be that much of multilateral aid is skimmed off through rent-seeking rather than being used for productive activities.

CHAPTER VI

FOREIGN AID AND CORRUPTION: A FIXED EFFECTS MODEL APPROACH

INTRODUCTION

While there are a number of studies focusing on the relationship between foreign aid and corruption, disagreement persists. One view is that foreign aid increases corruption (see for example Svensson, 2000 and Economides et. al., 2004). An opposing view concludes that rather than fostering corruption, foreign aid actually reduces corruption in recipient countries (Tavares 2003).

In this chapter I use a two stage least squares fixed effects model to examine the linkage between foreign aid and the level of corruption. Accounting for fixed effects allows me to examine whether unobserved characteristics of recipient countries play a role in explaining the impact of aid on corruption. Possible unobserved characteristics include each country's unique colonial history and strategic value to potential donors. These country-specific characteristics may be particularly important since they play a significant role in the allocation of foreign aid. According to Capellán and

Gomez (2007), former French colonies on average receive about 18 million dollars more in French aid than non-French colonies, whereas the UK and Canada are generous to members of the former British Commonwealth. Contrary to the findings in the previous chapter, where I found democratic countries receive more aid, Alesina and Dollar (2000) find that former colonies that are not democratic get about twice as much aid as democratic countries that are not former colonies. In addition, they find that countries that have a relatively long colonial history receive about 87 percent more in aid than do non-former colonies. Since previous studies indicate that country specific characteristics are important in influencing the provision of aid and the linkages between aid and corruption, a fixed effects model is appropriate.

In order to implement the fixed effects model, I extend the model in Chapter IV by adding country specific dummy variables to the equations. The revised system of equations is given as [M7]:

$$\begin{aligned} LTAID = {} & \alpha_0 + \alpha_1 COR + \alpha_2 LGDPC + \alpha_3 LPOP + \alpha_4 SURPNEG1 + \alpha_5 SURPNEG2 + \\ & \alpha_6 SURPNEG3 + \alpha_7 SURPNEG4 + \alpha_8 SURPNEG5 + \alpha_9 INF + \alpha_{10} DEM + \\ & \alpha_{11} ARMS + \alpha_{12} LTDEBT + (\delta_1 + \delta_2 + ... + \delta_{N-1}) + \varepsilon_\alpha \end{aligned} \quad [M7.1]$$

$$\begin{aligned} COR = {} & \beta_0 + \beta_1 LTAID + \beta_2 LGDPC + \beta_3 OP + \beta_4 ETHT + \beta_5 DEM + \\ & (\eta_1 + \eta_2 ... + \eta_{N-1}) + \varepsilon_\beta \end{aligned} \quad [M7.2]$$

where $(\delta_1 + \delta_2 + ... + \delta_{N-1})$ and $(\eta_1 + \eta_2 ... + \eta_{N-1})$ are the fixed effects variables for each country except Somalia in the sample. Somalia is chosen as a reference country on the grounds that it had no reliable government for over a decade.

This country, Somalia, was and still is in complete anarchy, without a stable government. Somalia's unfortunate position as a country without a viable government makes it a benchmark against which to compare the rest of sub-Saharan Africa with regard to corruption, inflow of aid, ethnic tension, democracy and the other variables included in the model.

Following Hill, Griffiths and Judge (1997), [M7] can be estimated by first estimating the parameters of the reduced form equations using ordinary least squares (OLS) and obtaining the predicted values for both the aid $(\overline{\text{LTAID}})$ and the corruption $(\overline{COR})$ variables[25].

The second stage of the process incorporates these estimates as independent variables and involves re-estimating the following system of equations:

$$LTAID = \alpha_0 + \alpha_1 \overline{COR} + \alpha_2 LGDPC + \alpha_3 LPOP + \alpha_4 SURPNEG1 + \alpha_5 SURPNEG2 + \alpha_6 SURPNEG3 + \alpha_7 SURPNEG4 + \alpha_8 SURPNEG5 + \alpha_9 INF + \alpha_{10} DEM + \alpha_{11} ARMS + \alpha_{12} LTDEBT + (\delta_1 + \delta_2 + ... + \delta_{N-1}) + V_A \quad \text{[M7.3]}$$

$$COR = \beta_0 + \beta_1 \overline{LTAID} + \beta_2 LGDPC + \beta_3 OP + \beta_4 ETHT + \beta_5 DEM + (\eta_1 + \eta_2 ... + \eta_{N-1}) + V_B \quad \text{[M7.4]}.$$

Equations [M7.3] and [M7.4] are estimated using OLS. The estimation results of this system of equations are provided in Table 8, and are contrasted with the "pooled" results obtained previously in Chapter IV. Table 9 presents the country specific effects from the two equations.

[25] The results of these "first-stage" regressions are presented in Table 16 Appendix E

Table 8

Second Stage Regression Results Examining the Simultaneity Between Corruption and Foreign Aid in Africa Using a Fixed Effects Model

	Pooled Results		**Fixed Effects Results**	
Coefficient	**LTAID**	**COR**	**LTAID**	**COR**
Intercept	-0.14003 (0.998585)	4.973008* (0.666358)	12.75034* (3.724640)	-3.93631* (1.581262)
COR	0.354925** (0.193063)		0.223980 (0.209735)	
LTAID		-0.17573* (0.078080)		-0.11359 (0.127437)
LGDPC	-0.17555* (0.062476)	-0.09142** (0.053431)	-0.00381 (0.154542)	1.222821* (0.188878)
LPOP	0.222808* (0.060547)		-1.00544* (0.176219)	
SURPNEG1	-0.08790 (0.143608)		-0.14370 (0.114772)	
SURPNEG2	0.562577* (0.158446)		-0.032893 (0.137668)	
SURPNEG3	0.848786* (0.194439)		0.189926 (0.183164)	
SURPNEG4	0.912445* (0.168501)		0.213462 (0.147973)	
SURPNEG5	0.733041* (0.174002)		0.228002 (0.156328)	
INF	-0.00007** (0.000037)		-0.00004 (0.000028)	
OP		-0.00477* (0.001600)		-0.00474** (0.002737)
ETHT		0.205508* (0.036742)		0.032516 (0.036721)
DEM	0.082636** (0.030278)	-0.07922 (0.030033)	0.077050* (0.026496)	0.121602* (0.032911)
ARMS	0.106978 (0.0085686)		0.089657 (0.0667254)	
LTDEBT	0.065104 (0.068184)		0.374621* (0.094795)	
	R^2 = 0.38949, F = 27.38	R^2 = 0.12388, F = 14.76	R^2 = 0.71315 F = 28.71	R^2 = 0.59694 F = 20.82

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level.

Table 9

Fixed Effects by Country: Total foreign Aid and Corruption

	Dependent Variable	
Country	**LTAID**	**COR**
Angola	-0.08256 (0.215112)	0.551379 (0.360811)
Botswana	-2.59630* (0.482795)	-2.88652* (0.401460)
Burkina Faso	0.595602* (0.250900)	0.806704* (0.287873)
Cameroon	0.297316* (0.187917)	0.239436 (0.214795)
Congo.Dem.Rep(Zaire)	0.926582* (0.366499)	3.855194* (0.332008)
Congo Republic	-2.23383* (0.314977)	-0.87581* (0.306481)
Cote d Ivoire	0.091112 (0.0214612)	-0.33844 (0.224486)
Ethiopia	2.367586* (0.406115)	2.686105* (0.401107)
Gabon	-3.63459* (0.509197)	-1.23896* (0.444281)
Gambia, The	-2.75753* (0.536092)	0.390472 (0.360873)
Ghana	0.845703* (0.223443)	1.305739* (0.299305)
Guinea	-0.31835 (0.212956)	-0.16273 (0.236105)
Guinea Bissau	-2.56606* (0.516719)	2.019261* (0.364473)
Kenya	1.308640* (0.237388)	0.601719* (0.226896)
Liberia	-2.42524* (0.349726)	1.864250* (0.303124)
Madagascar	0.280673 (0.225303)	-0.48939** (0.280464)
Malawi	0.401353 (0.282967)	1.190867 (0.347649)
Mali	0.181523 (0.253356)	1.353113* (0.295659)
Mozambique	1.258200* (0.266246)	0.862686* (0.334564)
Namibia	-1.09932* (0.548193)	-2.35537* (0.394861)

Table 9 (Continued)

Country	LTAID	COR
Niger	0.188309 (0.253933)	1.678281* (0.301107)
Nigeria	0.827203** (0.467506)	1.834133* (0.259842)
Senegal	0.313886 (0.204375)	-0.060680 (0.235851)
Sierra Leone	-1.15390* (0.319348)	1.738571* (0.311380)
South Africa	0.809403* (0.420574)	-3.58659* (0.414117)
Sudan	0.879433* (0.304675)	1.805311* (0.252609)
Tanzania	1.959466* (0.255001)	0.512197* (0.258125)
Togo	-1.30331* (0.288244)	1.835053* (0.312756)
Uganda	1.222112* (0.233999)	1.551929* (0.284352)
Zambia	0.205645 (0.213514)	0.633317* (0.242945)
Zimbabwe	0.082560 (0.215112)	-0.55133 (0.360811)

(standard errors in parenthesis)
*Statistically significant at the 95% level
** Statistically significant at the 90% level.

Model Diagnostics

Before discussing the results, a few words are necessary about the diagnostic checks performed to determine whether the usage of the fixed effects model is appropriate. The high value of the F test statistic (20.37) and its associated low p value ($p<.0001$) in the aid equation (LTAID), and the F test statistic (12.59) and its associated low p value ($p<.0001$) in the corruption equation (COR) both show that the null hypotheses (all dummy parameters except one are zero) in both equations are rejected; no individual fixed effect is

rejected. This establishes the fact that country-specific characteristics do play a vital role. Therefore, I conclude that the fixed effects model is better than the pooled OLS model. Further more, the use of a random effects model was rejected based on the Hausman specification test. The high value of the Hausman test statistic (15.70), referred to as the m-statistic, and its associated low p value (0.0734) in the aid equation (LTAID), and the Hausman test statistic (17.98) and its associated low p value (0.0354) in the corruption equation show that the null hypotheses that the individual country effects are uncorrelated with the other regressors are rejected in both models; thus, a fixed effect model is preferred.

Fixed Effects Model: Discussion

Unlike the pooled OLS model where foreign aid is positively related to corruption, the coefficient on the corruption variable (COR) in the fixed effects model is not statistically significant; corruption has no significant effect on the amount of total aid received. This is in line with the Alesina and Weder (2002) findings that corruption does not affect aid levels. In addition, unlike the pooled result, the coefficient on total foreign aid (LTAID) in the fixed effects model is statistically insignificant suggesting that foreign aid does not affect the level of corruption in a recipient country.

Using the fixed effects model reduces the statistical significance of the effect of the recipient country's economy (LGDPC) on the amount of foreign aid

received; in the fixed effects model the GDP per capita variable is insignificant. It also reduces the statistical significance of both fiscal and monetary policy variables (SURPNEG2, SURPNEG3, SURPNEG4, SURPNEG5, and INF) on the amount of foreign aid received. In the fixed effects model, both fiscal and monetary policy variables are insignificant, although they have the same sign as the significant coefficients in the pooled OLS model. This implies that donors do not necessarily give aid based on good fiscal or monetary policy. This is consistent with the Burnside and Dollar (2000) findings that total foreign aid does not favor good monetary and/or fiscal policy.

One of the main differences between the two estimation results concerns the sign and size of the population variable (LPOP). In the fixed effects model, the coefficient on the population variable is negative and significant, and the size of coefficient is more than quadruple compared to the pooled model. This result of the fixed effects model implies that, ceteris paribus, countries with a higher population receive less aid. For example, the negative and significant coefficient on LPOP in the aid equation indicates that a one percentage point increase in population size leads to a decrease in the amount of total foreign aid received by about 1 percent. In other words, when accounting for country-specific effects, the amount of aid allocation falls with population size. Alesina and Dollar (2000) show that population plays a key role in determining the allocation of aid. They argue that countries with a small population receive

more foreign aid. It may be in the donors' best interest to give to small countries where the effect per dollar spent may be larger, thereby providing some evidence of success. Boone (1996) finds that a 10% increase in the size of population reduces the aid/GNP ratio by 0.0032. He argues that one of the main reasons is that large nominal transfers will come under greater public scrutiny than relatively smaller amounts; thus donors hesitate to give large amounts to any one country. Similarly, Trumbull and Wall (1994) find that a country twice the size of another country receives about 67% less official development assistance (ODA) per capita.

Another significant difference between the results of the two models is that including fixed effects causes the coefficient of the recipient GDP per capita variable (LGDPC) to change sign in the COR equation; this indicates a positive relationship between the size of the recipient's economy and corruption. To this end, the results indicate that the higher the country's per capita GDP, the higher the level of corruption, implying different levels of corruption across countries due to differences in per capita GDP. This is consistent with Frechette (2006) and Braun and Di Tella (2004), who argue that corruption increases with income. Using panel data analysis, Braun and Di Tella find that recipient country GDP per capita is positively related to corruption.

The third significant difference between the two types of models is related to the impact of democracy on corruption in the recipient country. In the fixed effects model, the coefficient on the democracy variable (DEM) in the corruption equation is positive and highly significant. This result of the fixed effects model implies that, ceteris paribus, more democracy is associated with more corruption. The result is surprising given democracy should encourage more open and transparent government, thereby reducing the rent-seeking activities often associated with more autocratic, non-transparent governments. However, Mohtadi and Roe (2003) argue that democracy at its initial stage suffers from an inadequate level of transparency and public scrutiny, causing the level of corruption to initially increase, although it falls as democracy becomes more mature. The coefficient on the democracy variable in the aid equation (LTAID) continues to be positive and highly significant in both models, indicating that countries that are more democratic receive more foreign aid; this result indicates that each unit increase in the democracy variable (DEM) will result in getting, on average, about 7.7% more total foreign aid. The result supports the Alesina and Dollar (2000) initial findings that more democratic countries receive 39 percent more aid than do non-democratic countries.

The coefficient for the openness variable (OP) under the fixed effects model is line with that of the pooled OLS estimation; it is negatively related to

corruption in both models. This confirms the argument that openness in a recipient country reduces corruption. The possibility that openness may reduce corruption has been examined in the recent economic development literature (Sandholtz and Koetzle 2000, Knorich and Gokcekus 2006). Sandholtz and Koetzle argue that by facilitating economic competition through increased involvement in trade openness can reduce corruption. Knorich and Gokcekus found that an increase in the quality and degree of openness reduces corruption.

The fixed effect model reduces the statistical significance of the effect of ethnic tension on corruption. In the fixed effects model, this variable is not found to be important in explaining corruption once individual country-specific characteristics are accounted for, although it has the same sign as the significant coefficient in the pooled OLS model. Thus, the result does not support the results of the pooled OLS model, which argues that ethnic tension in a recipient country fosters corruption.

Unlike the pooled OLS model, the result here indicates that total external debt (LTDEBT), an indicator for whether highly indebted countries receive more or less aid, is positively related to total foreign aid. As discussed in Chapter IV, this may be explained by the observation that foreign aid, especially bilateral aid, is given primarily out of strategic interest and therefore existing debt is overlooked when allocating aid. In addition, it may

also be the case that donors are simply more willing to help highly indebted countries; this can be seen by the donors' push for debt forgiveness through the Heavily Indebted Countries (HIPCs) Initiative. The coefficient of the arms transfer variable (ARMS) has an intuitive sign but is statistically insignificant, confirming the results of the pooled OLS model that strategic or political reasons are not the main determinants of aid decisions to the sub-Saharan African countries.

Further comments on the use of Fixed Effects Model

In a fixed effects model the country fixed effects capture the unique characteristics of each country not accounted for by the other variables. Thus, holding all of the other independent variables constant, a country's unique characteristics result in it receiving more or less aid and being more or less corrupt. The fixed effects estimates indicate these country-specific characteristics significantly impact aid and corruption.

Therefore, I ask the following question: do unique characteristics of each country make a difference as to whether it receives more or less aid, and do these characteristics affect whether the country is more or less corrupt? Given the results in Table 9, the answer is yes. For example, compared to Somalia, holding all other independent variables constant, Ethiopia is expected to receive 10.67 times more total aid, Gabon is expected to receive 0.03 times more aid, and Cameroon is expected to receive 1.34 times more aid. These

results indicate that, on average, Ethiopia receives more aid than all others. This could be explained by the fact that drought and famine is more prevalent in Ethiopia, and Ethiopia during 80s and 90s engaged in a civil war with Eritrea; thus donors were generous during this period of famine and post-war rebuilding. The results also indicate that Gabon receives slightly less aid than all others except Somalia. Although its natural resources have yet to be exploited and its people remain poor, the fact that Gabon is privileged with natural resources such as oil may play a role in not receiving as much aid as other nations. Thus, the differences in the magnitudes of the fixed effects coefficients highlight the importance of including country specific characteristics. Note that not only are the differences between countries statistically significant, but they are also economically relevant magnitudes.

Now consider the corruption equation. The negative and significant coefficients for the included fixed effects variables indicate that Somalia is more corrupt than most of the other countries in the data. The results show that, all else equal, the Democratic Republic of Congo is more corrupt than all others, whereas South Africa is less corrupt than all others. This result confirms that, in addition to the independent variables identified in the model, corruption is significantly influenced by the unique characteristics of each country. Thus, it is important to include fixed effects in this model.

Concluding Comments

I found interesting and significant differences between the fixed effects model and the pooled OLS model in terms of the relationship between corruption and foreign aid. While corruption was positively associated with foreign aid and the receipt of this aid appears to reduce corruption in the pooled OLS model, it had no significant relationship with foreign aid in the fixed effects model. This result is in line with Knack's (2001) finding that there is no significant relationship between foreign aid and corruption. The results imply that if I control for country specific characteristics, the hypothesis that foreign aid and corruption are related is rejected.

Using the fixed effects model, I find a substantial increase in the coefficient that measures the effect of population size on the amount of aid received. The size of the coefficient more than quadrupled when compared to the pooled model. The fixed effects model results also show that democracy plays a significant role on the amount of aid received. Therefore, the argument that smaller and more democratic countries receive more aid is supported by the results of the fixed effects model. Total foreign aid falls with increases in population size, and aid increases as countries become more democratic. In addition, both models consistently support the argument that openness reduces corruption in the recipient country.

CHAPTER VII

DISCUSSION AND CONCLUSIONS

Three interrelated subjects of interest in applied development economics have been investigated in this dissertation: the relationship between foreign aid and corruption, the interaction between foreign aid, corruption, and GDP, and the application of fixed effects when modeling foreign aid and corruption.

The first study examined the simultaneous relationship between foreign aid and corruption using a system of two equations: one modeling aid and the other modeling corruption. Using two stage least squares, the results indicate that poorer counties receive more aid, while the receipt of this aid, in turn, reduces the level of corruption in the recipient country. The result also indicate that more corrupt countries receive more aid, confirming the results by Alesina and Weder (2002) that highly corrupt countries may actually receive more aid .

In order to refine these results, I divided aid into its bilateral and multilateral aid components. The subsequent results show that bilateral aid and corruption are simultaneously determined. These results indicate that while more corrupt countries receive a greater amount of bilateral aid, the receipt of both bilateral and multilateral aid reduces the level of corruption. One possibility for the negative effect of foreign aid on corruption could be

what Tavares (2003) calls a "conditionality effect"; recipient countries may risk losing aid if reform efforts are not undertaken. The above result suggests that reform requirements in current aid decisions are responsible for the reduction in corruption. Thus, donors should continue to incorporate reform requirements when granting aid. However, this result disappears when I refine the model by including the simultaneity of GDP per capita.

The second study analyzed the simultaneity between foreign aid, corruption, and GDP per capita, and whether these relationships depend upon the source of the foreign aid. The addition of per capita GDP to the model provides several insights. These results confirm that total foreign aid and GDP per capita are simultaneously determined. Poorer countries receive more aid, while the receipt of this aid, in turn, increases GDP per capita. However, the results indicate that low corruption does not explain total foreign aid and foreign aid does not induce corruption. Thus, in this model, the hypothesis that foreign aid fosters corruption is rejected.

In addition, the results confirm a negative effect of high population on GDP per capita, a conclusion in line with other authors such as Malthus (1798) and Cassen (1994). Therefore, addressing the problem of increasing population in sub-Saharan Africa should be a primary focus of donors in order to promote growth and development in the continent. Consistent with other authors, such as Alesina and Dollar (2000), more democratic countries receive more aid while

democracy, in turn, positively affects GDP. This result is similar to the findings of Barro (1996). One implication is that foreign aid targeted to improve democracy in the recipient country may be a more effective means of promoting growth and development. The results also indicate that fiscal policy leading to deficits in general results in a smaller GDP per capita, with small to moderately high deficits having a bigger negative effect on a country's economy than running a surplus.

The last study, found in Chapter VI, investigated the relationship between foreign aid and the level of corruption in sub-Saharan Africa using a fixed effects model. Contrary to the pooled OLS model, the results from the fixed effects model indicated no significant effect of corruption on the amount of total foreign aid received. Similarly, unlike the results from the pooled OLS model in which aid reduces corruption, these results show that the receipt of aid has no significant impact on the level of corruption in the recipient country. Furthermore, in this study I find that more aid is given to poorer countries, while the amount of aid given to poor countries decreases with the size of the population. This analysis also finds that corruption increases with income. The possibility that corruption increases with the recipient's GDP per capita is consistent with other authors' findings such as that of Braun and Di Tella (2004). Finally, including fixed effects in the model confirms that, in addition to the independent variables identified in the model, the likelihood of

high corruption is significantly influenced by the unique characteristics of each country. Similarly, the unique characteristics of each country also significantly affect the amount of total foreign aid received.

Policy Recommendations

It is interesting that in the model refinements in Chapters V and VI, corruption does not affect total aid decisions, and it does not affect bilateral or multilateral aid decisions. Donors do not consider the extent of existing corruption when making aid decisions; corrupt countries are not penalized in aid decisions. The incorporation of such penalties into aid decisions may provide an effective incentive to recipient countries to fight corruption. It should however be noted that sub-Saharan African countries should not wait for outside solutions to fight corruption; this fight must start with the government itself, otherwise the solution is not sustainable. Donors can help in this fight by creating incentives through aid requirements. In this way sub-Saharan governments will be more likely to engage in effective internal reform efforts.

Analogous to the "conditionality effect" discussed in the first model, in which donors' condition aid on reform efforts, donors should also condition aid on democratization. Democracy is seen to increase GDP per capita, and so should be included in the toolbox of development strategies in sub-Saharan

Africa. By incorporating democratization requirements for aid recipients, donors can improve their effectiveness in increasing GDP per capita.

Also, it is important to note that bilateral aid is effective at reducing corruption, while multilateral aid is not. This may result from differences in corruption reform requirements on aid recipients for these two types of aid. Future analysis should consider the differences in reform requirements for bilateral and multilateral aid; multilateral aid should be designed to be effective in fighting corruption. It should be noted that, overall, bilateral aid appears to works at increasing GDP per capita through reducing corruption and encouraging democracy. It should also be noted that, although, the result in Chapter V appears to suggest that multilateral aid negatively affects GDP per capita, overall, multilateral aid may affect GDP per capita positively through other means other than through reducing corruption or encouraging democracy as it is the case with bilateral aid.

Another important finding of this dissertation is that deficits are negatively related to GDP per capita in the recipient country. Therefore, sub-Saharan African countries must find a way to reduce government budget deficits. When budget deficits increase, national savings decrease, which leads to a decrease in private investment. In other words, a large budget deficit will increase the interest rate, thereby reducing private investment. This lower investment will lead to lower productivity, which will reduce future income.

One possible solution is to reduce taxes for private investors, thus encouraging private investment; such investment is made possible by reduced government spending. However, reductions in taxes may increase deficits and reduced government spending may reduce GDP in short term.

REFERENCES

Ades, A. and R. Di Tella. 1999. Rents, Competition, and Corruption. *American Economic Review,* 89(4), 982-993.

Alesina, A. and B. Weder .2002. Do corrupt governments receive less foreign aid? *American Economic Review*, 92, 1126-1137.

Alesina, A. and Dollar D. 2000. Who Gives Foreign Aid to Whom and Why? *Journal of Economic Growth*, 5, 33-63.

Bardhan, P. (1997). Corruption and Development: A Review of Issues. *Journal of Economic Literature,* 35(09), 1320-1346.

Bauer, P. T. (1991). The development frontier: essays in applied economics. London: Sydney: Harvester Wheatsheaf.

Barro, R. 1996. Democracy and Growth. *Journal of Economic Growth*, 1 (03), 1-27.

Boone, P. (1996). Politics and the effectiveness of foreign aid. *European Economic Review,* 40, 289-329.

Braun, Miguel and Rafael Di Tella.2004. Inflation, Inflation variability, and Corruption. *Economics and Politics*, 16, 77-110.

Brunetti, A. G. Kisunko and B. Weder (1997). Credibility of Rules and Economic Growth -Evidence from a World Wide Private Sector Survey. *Policy Research Working Paper* No. 1760, The World Bank.

Burnside, C., and D. Dollar (2000). Aid, Policies, and Growth. *American Economic Review*, 90, No 4 (09), 847–68.

Capellán Joel A. and Gomez S. 2007. Foreign aid and Human Rights: The Latin American Experience, *Revista De Ciencia Poli`tica*, 27 ,No 1, 67 – 87.

Cassen, R. and contributors. 1994. Population and Development: Old debates, new conclusions, Transactions Publishers, New Brunswick and Oxford.

Chenery Hollis B., and Carter Nicholas G. 1973. Foreign Assistance and Development performance, 1960-1970. *The American Economic Review*, 63, No.2. PP.459-468.

Chenery Hollis B., and Strout Alan M. 1966. Foreign Assistance and Economic Development. *American Economic Review*, 56, No. 4. 679-733.

Cliff, J. 1993. Donor-dependence or donor control? The case of Mozambique. *Community Development Journal*, 28 (3), 237-244.

Coolidge J. and Rose-Ackerman S. 1997. High-Level Rent-Seeking and Corruption in African Regimes: Theory and Cases. *Policy Research Working Paper* No.1780, The World Bank.

Easterly, W., Levine, R. 1997. Africa's Tragedy: Politics and Ethnic Divisions. *Quarterly Journal of Economics,* 112 (2), 1203-1250.

Easterly, W., Levine R. and Roodman D. 2004. Aid, Policies, and Growth: Comment. *The American Economic Review*, 94, 3 (06), 774-780.

Eaton J.1998. Foreign Public Capital Flows, in Handbook of Development Economics Volume II edited by Hollis Chenery and T.N. Srinivasan, 1305-1386.

Eberstadt, N. 2000. Pursuit of south of the Sahara. Washington Times, August 27, 2000; P.B4.

Economides G., Kalyvitis S., and Philippopoulos A. 2004. Does foreign aid distort incentives and hurt growth? Theory and evidence from 75 aid-recipient countries. *CESifo Working Paper Series* no 1156.

Elliot, Kimberly A. 1997. Corruption as an international policy problem: Overview and recommendations, in Corruption and the Global Economy, Elliot, K.A. ed., Washington DC: Institute for International Economics, 175-233.

Feyzioglu T., Swaroop V., and Zhu M. 1998. A Panel data Analysis of the Fungibility of Foreign Aid, *The World Bank Economic Review*, 12, No.1, 29-58.

Fisman, R. and R. Gatti. 2002. Decentralization and Corruption: Evidence across countries. *Journal of Public Economics*, 83 (3), 32-345.

Franco-Rodriguez, S., M., Mcgillivray and Morrissey O.1998. Aid and the Public Sector in Pakistan: Evidence with Endogenous Aid. *World Development* 26, 1241-1250.

Franco-Rodriguez, S. 2000. Recent Advances in Fiscal Response Models with an Application to Costa Rica, *Journal of International Development* 12, 429-442.

Frechette, Guillaus R. 2006. A Panel Data Analysis of the Time-Varying Determinants of Corruption. *Scientific Series paper* 2006s-28.

Freedom House (2004). Freedom in the World. Retrieved September 06, 2007, from http://www.freedomhouse.org

Friedman, M. 1958. Foreign Economic Aid. *Yale Review* 47, 500 – 516.

Gupta S., Davoodi H. & Alonso-Terus R. 1998. Does Corruption Affect Income Inequality and Poverty? : *International Monetary Fund Working Paper* 98/76.

Gang, I. N., and H. A. Khan. 1991. Foreign Aid, Taxes and Public Investment. *Journal of Development Economics,* 34, (1), 355-369.

Griffin, K. 1978. International inequality and national poverty. London: Macmillan.

Gupta Kanhaya, L. 1997. Public Fiscal Behaviour and Foreign Aid: Some Model Solutions. *Economic Modelling* 14, 203-214.

Gupta, S., Davoodi, H., Alonse-Terme, R. 1998. Does corruption affect income inequality and poverty? *IMF Working Paper*, 98/76. International Monetary Fund, Washington, D.C.

Heller P.S. 1975. A model of Public Fiscal behavior in Developing Countries: Aid, Investment and Taxation, *American Economic Review*, 65, (3) 429-425.

Harms, P. and Lutz M. 2004. The Macroeconomic Effects of Foreign Aid: A Survey. *Discussion Paper* No. 2004-11.

Hellinger, D., Hellinger, S. & O'Regan, F. 1988. Aid for just development. Boulder, Colo.: Lynn Riener.

Huntington, S.P. 1968. Political Order in Changing Societies. New Haven: Yale University Press.

ICRG (2005). International Country Risk Guide. The PRS Group. New York.

Inaugural address: President Harry Truman retrieved from Harry Truman Library and Museum located at http://www.trumanlibrary.org/calendar/viewpapers.php?pid=1030 on September 12, 2007.

Kasper W. 2006. Issue Analysis: Make Poverty History: Tackle Corruption. The center for Independent Studies, No. 67.

Keefer, P. and Knack S. 1995. Institutions and Economic Performance: Cross-Country Tests using Alternative Institutional Measures. *Economics and Politics*, 7, 207–227.

Kindleberger C. 1970. Power and Money: The Economics of International Politics and the Politics of International Economics. Basic Books, Inc., New York/London.

Knack, S. 2001. Aid Dependence and the Quality of Governance: Cross-Country Empirical Tests. *Southern Economic Journal,* 68, (2), 310–329.

Kno¨rich J. and Gokcekus O. 2006. Does quality of openness affect corruption? *Economics Letters*, 91, 190–196.

Kuznets, S. 1960. Population change and aggregate output, in: Demographic in demographic and economic change in developing countries: Princeton University Press, Princeton, NJ.

Lambsdorff, G.1999. Corruption in Empirical Research - A Review. Transparency International Working Paper.

Leff, N.H.1964. Economic development through bureaucratic corruption. American Behavioral Scientist, 8(3), 8-14.

Lindgreen A. 2004. Corruption and Unethical Behavior: Report on a set of Danish guidelines. *Journal of Business Ethics,* 51, 31-39.

Lucas, R. 1988. On the mechanism of economic development. *Journal of Monetary Economics,* 22 (1) 3-42.

Lui, F.T.1985. An Equilibrium Queuing Model of Bribery. *Journal of Political Economy* 93, 337-41.

Malthus T. 1798. An essay on the principle of population; edited with an introduction and notes by Geoffrey Gilbert. New York: Oxford Press, 1999.

Mankiw, G. 2006. Principles of macroeconomics. Mason, OH: Thomson South-Western.

Mas-Colell A., Whinston Michael.D. and Green Jerry R. 1995. Microeconomic Theory. Oxford University Press, 477-510.

Mauro P. 1995. Corruption and growth. *Quarterly Journal of Economics*, 110, 681-712.

Mauro P. 1996. The Effects of Corruption on Growth, Investment, and Government Expenditure. *International Monetary Fund, Working paper* No. 98.

Martens Bertin.2004. Development Outreach: Aid Agencies and Aid Effectiveness, The World Bank group. Retrieved September 20, 2007, from http://www1.worldbank.org/devoutreach/fall01/textonly.asp?id=240#top.

Mavrotas G., and Ouattara B. 2006. Public Fiscal Behavior & Aid Heterogeneity in Aid-Recipient Economies. *The Journal of developing Areas*, 39, (2) 1-15.

McGillivray, M .2000. Aid and Public Sector Fiscal Behaviour in Developing Countries, *Review of Development Economics*, 4, No. 2, 156-163.

Mosley,P., J. Hudson, and S. Horrell. 1987. Aid, the Public Sector and the Market in LDCs. *Economic Journal* ,97, (09), 616-641.

Murphy, Kevin M., AndreI Shleifer, and Robert W. Vishny. 1993. Why Is Rent-Seeking so Costly to Growth? *American Economic Review,* 83,(2), 409–14.

Pack, H. and Janet R., Pack.1993. Foreign Aid and the Question of Fungibility. *Review of Economics and Statistics*, 75, 258-265.

Perkins Dwight H., Radelet Steven, and Snodgrass Donald R. 2001. Economics of Development. W.W.Norton & Company,Inc 408-419.

Prendergast, R. 2005. Schumpeter, Hegel and the Vision of Development. *Cambridge Journal of Economics*, 30, No. 2, 253-275 Available at: http://cje.oxfordjournals.org/cji/content/full/30/2/253.

Rajan, Raghuram and Arvind Subrananian. 2005. Aid and growth: What Does the Cross-Country Evidence Really Show? Washington: International Monetary Fund. *IMF Working Paper* 05/127.

Ram R. 2003. Roles of Bilateral and Multilateral Aid in economic Growth of Developing Countries, *Kyklos*, 56, 95-110.

Rodrik D. 1995. Why is there Multilateral Lending? *NBER Working Paper Series*, 5160, National Bureau of Economic Research, Cambridge, MA.

Rose-Ackerman, S. 1997. The Political Economy of Corruption, In Elliott, K. A. ed. Corruption and the Global Economy, Washington, D. C., Institute for International Economics, 31-60.

Rosenstein-Rodan N. 1961. International Aid for Underdeveloped Countries. *Review of Economics and Statistics*, 43, 107-138.

Samia T.2007. Do Freedom of Information Laws Decrease Corruption? *MPRA Paper,* 3560, available at http://mpra.ub.uni-muenchen.de/3560/.

Sandholtz, W. and W. Koetzle. 2000. Accounting for Corruption: Economic Structure, Democracy, and Trade. *International Studies Quarterly*, 44, 31–50.

Schudel C.J.W. 2008. Corruption and Bilateral Aid: A Dyadic Approach. *Journal of Conflict Resolution OnlineFirst*, published on May 13, 2008 as doi: 10.1177/0022002708316646 Retrieved June 20, 2008, from http://jcr.sagepub.com/cgi/rapidpdf/0022002708316646v1.

Shleifer, A. and Vishny, Robert W. 1993. Corruption. *The Quarterly Journal of Economics*, 108, (3), 599-617.

Stockholm International Peace Research Institute (2007). SIPRI Arms Transfers Database. Retrieved May 06, 2008 from http://armstrade.sipri.org.

Svensson J. 2000. Foreign aid and rent-seeking. *Journal of International Economics,* 51, 437-461.

Svensson J. 2003. Why conditional aid does not work and what can be done about it? *Journal of Development Economics*, 70, 381-402.

Tanzi, V. and H. Davoodi.1997. Corruption, Public Investment, and Growth. *International Monetary Fund Working Paper*, 97/139.

Tavares J.2003. Does foreign aid corrupt? *Economic Letters*, 79, 99-106.

Todaro Michael P., and Smith Stephen C. 2006. Economic Development. The Addison-Wesley series in Economics.

Tornell A., and Lane Philip .1999. The Voracity Effect. *American Economic Review*, 89, No. 1, (03), 22-46.

Treisman, D.2000. The Causes of Corruption: A Cross-National Study. *Journal of Public Economics,* 76, (3), 399–457.

Trumbull, W. N. and Wall, H. J. 1994. Estimating aid-allocation criteria with panel data. E*conomic Journal*, 104, No 425, 876-882.

United Nations (2008). United Nations Statistics Division, National Accounts. Retrieved September 20, 2007, from http://mdgs.un.org/unsd/snaama/selectionbasicFast.asp.

United Nations (2006). United Nations Conference on Trade and Development: Economic Development in Africa, United Nations report, New York and Geneva.

Wei S. 1997. How Taxing is Corruption on International Investors: National Bureau of Economic Research *Working Paper* 6030.

World Bank (1989). Sub-Saharan Africa: From Crisis to Self-Sustainable Growth. Washington, D.C.: World Bank.

World Bank (1998). Assessing Aid: What works, what doesn't, and why? (oxford University Press, New York).

World Bank (2001). Can Africa Claim The 21st Century. Washington, D.C. World Bank. PP.8-10.

World Bank (2005). World Bank Africa Database 2005 CD-ROM. Washington DC, World Bank.

World Bank (2007). Africa: Projects and Programs. Retrieved September 20, 2007, from http://web.worldbank.org/external/default/main?menuPK=258670&pagePK=146756&piPK=146825&theSitePK=258644.

Yehoue, E.B. 2007. Ethnic diversity, Democracy, and Corruption. *IMF Working Paper* WP/07/218.

APPENDIX A

COUNTRIES IN BASE SAMPLE FOR CORRUPTION AND AID REGRESSION

Countries in base sample for corruption and aid regression

Angola	Malawi
Botswana	Mali
Burkina Faso	Mozambique
Cameroon	Namibia
Congo.Dem.Rep(Zaire)	Niger
Congo Republic	Nigeria
Cote d Ivoire	Senegal
Ethiopia	Sierra Leone
Gabon	Somalia
Gambia, The	South Africa
Ghana	Sudan
Guinea	Tanzania
Guinea Bissau	Togo
Kenya	Uganda
Liberia	Zambia
Madagascar	Zimbabwe

APPENDIX B

PROOF OF PROPOSITION 1

The donor's maximization problem can be written as:

$$\begin{array}{ll} \textit{Maximize} & W_D = E[(1-r(\Omega))h(\alpha(\overline{\sigma}) \mid \overline{\sigma}] + E[(1-r(\Omega))h(\alpha(\underline{\sigma}) \mid \underline{\sigma}] \\ \alpha(\overline{\sigma}),\ \alpha(\underline{\sigma}) & \textit{subject to} \\ & \alpha(\sigma) \le \mathrm{B},\ \sigma \in \{\overline{\sigma},\ \underline{\sigma}\} \\ & v(\alpha(\underline{\sigma}))\ [\mathrm{q}(\overline{\mathrm{e}})\text{-}\mathrm{zq}(\overline{\mathrm{e}}) + \mathrm{z}\text{-}\mathrm{zq}(\overline{\mathrm{e}})] + \mathrm{v}(\alpha(\overline{\sigma}))[\mathrm{zq}(\overline{\mathrm{e}}) + (1-z)(1-q(\overline{e}))] \ge \delta \quad IR \\ & [2\mathrm{z}\ \mathrm{q}(\overline{\mathrm{e}}) \text{-}2\mathrm{zq}(\underline{\mathrm{e}}) - \mathrm{q}(\overline{\mathrm{e}}) + \mathrm{q}(\underline{\mathrm{e}})][v(\alpha(\underline{\sigma})) - \mathrm{v}(\alpha(\overline{\sigma}))] \ge \delta \quad IC \end{array}$$

A. Assume that only the IR-constraint binds:

$$\mathrm{L} = \mathrm{E}[(1\text{-}\mathrm{r}(\Omega))\mathrm{h}(\alpha(\overline{\sigma})] + \mathrm{E}[1\text{-}\mathrm{r}(\Omega)\mathrm{h}(\alpha(\underline{\sigma})] + \lambda[-\delta + v(\alpha(\underline{\sigma})[\mathrm{q}(\overline{\mathrm{e}}) - \mathrm{zq}(\overline{\mathrm{e}}) + \mathrm{z} - \mathrm{zq}(\overline{\mathrm{e}})] + \mathrm{v}(\alpha(\overline{\sigma})[\mathrm{zq}(\overline{\mathrm{e}}) + (1-z) * (1-q(\overline{e}))]$$

$$\frac{\partial L}{\partial \alpha(\overline{\sigma})} = 1\text{-}\mathrm{r}(\Omega)\mathrm{h}'(\alpha(\overline{\sigma})) + \lambda(\mathrm{v}'(\alpha(\overline{\sigma})) * [1\text{-}\mathrm{q}(\overline{e}) \text{-}\mathrm{z} + 2\mathrm{zq}(\overline{e})] = 0$$

$$\frac{\partial L}{\partial \alpha(\underline{\sigma})} = 1\text{-}\mathrm{r}(\Omega)\mathrm{h}'(\alpha(\underline{\sigma})) + \lambda(\mathrm{v}'(\alpha(\underline{\sigma}))*[\mathrm{q}(\overline{e}) + \mathrm{z}\text{-}2\mathrm{zq}(\overline{e})] = 0$$

$$\frac{\partial L}{\partial \lambda} = [-\delta + v(\alpha(\underline{\sigma})[\mathrm{q}(\overline{\mathrm{e}}) - \mathrm{zq}(\overline{\mathrm{e}}) + \mathrm{z} - \mathrm{zq}(\overline{\mathrm{e}})] + \mathrm{v}(\alpha(\overline{\sigma})[\mathrm{zq}(\overline{\mathrm{e}}) + (1-z) * (1-q(\overline{e}))] = 0$$

Since the donor drives strictly positive marginal utility of aid, the result is:

$$\alpha(\overline{\sigma}) = B = \alpha(\underline{\sigma})$$

This implies that B dollar is provided no matter what the signal.

B. Assume that IC-constraint binds

$$L = E[(1-r(\Omega))h(\alpha(\bar{\sigma})] + E[(1-r(\Omega))h(\alpha(\underline{\sigma})] + [2z-1](q(\bar{e})-q(\underline{e}))[v(\alpha(\bar{\sigma})) - v(\alpha(\underline{\sigma}))] \geq \delta$$

$$L = E[(1-r(\Omega))h(B)] + E[1-r(\Omega)h(\alpha(\underline{\sigma})] + \lambda[-\delta + [2z-1](q(\bar{e})-q(\underline{e}))[v(B) - v(\alpha(\underline{\sigma}))] = 0$$

$$L = E[(1-r(\Omega))h(B)] + E[1-r(\Omega)h(\alpha(\underline{\sigma})] + \lambda\Big[-\delta + [v(\alpha(\bar{\sigma})2zq(\bar{e}) - v(\alpha(\bar{\sigma})2zq((\underline{e}) - v(\alpha(\bar{\sigma})q(\bar{e})\Big) + v(\alpha(\bar{\sigma}))q(\underline{e}) - v(\alpha(\underline{\sigma})2zq(\bar{e}) + v(\alpha(\underline{\sigma}))2zq(\underline{e}) + v(\alpha(\underline{\sigma}))q(\bar{e})] - v(\alpha(\underline{\sigma}))q(\underline{e})]] = 0$$

$$L = E[(1-r(\Omega))h(B)] + E[1-r(\Omega)h(\alpha(\underline{\sigma})] + \lambda\Big[-\delta + [v(B)2zq(\bar{e}) - v(t)2zq((\underline{e}) - v(B)q(\bar{e})\Big) + v(B))q(\underline{e}) - v(\alpha(\underline{\sigma})2zq(\bar{e}) + v(\alpha(\underline{\sigma}))2zq(\underline{e}) + v(\alpha(\underline{\sigma}))q(\bar{e})] - v(\alpha(\underline{\sigma}))q(\underline{e})]] = 0$$

$$\frac{\partial L}{\partial B} = h'(B)*(1-r(\Omega)) - v'(B)[2zq(\bar{e}) - 2zq(\underline{e}) - q(\bar{e}) + q(\underline{e})]\lambda = 0$$

$$\frac{\partial L}{\partial \alpha(\underline{\sigma})} = h'(\alpha(\underline{\sigma})*(1-r(\Omega)) - v'(\alpha(\underline{\sigma}))[2z\, q(\bar{e}) + 2zq(\underline{e}) + q(\bar{e}) - q(\underline{e})]\lambda = 0$$

$$\frac{\partial L}{\partial \lambda} = -\delta + v(B)[2zq(\bar{e}) - 2zq(\underline{e}) - q(\bar{e}) + q(\underline{e})] - v(\alpha(\underline{\sigma}))[2z\, q(\bar{e}) + 2zq(\underline{e}) + q(\bar{e}) - q(\underline{e})] = 0$$

$$v(\alpha(\underline{\sigma}) = \frac{-\delta + v(B)[2zq(\bar{e}) - 2zq(\underline{e}) - q(\bar{e}) + q(\underline{e})]}{[2z\, q(\bar{e}) - 2zq(\underline{e}) - q(\bar{e}) + q(\underline{e})]}$$

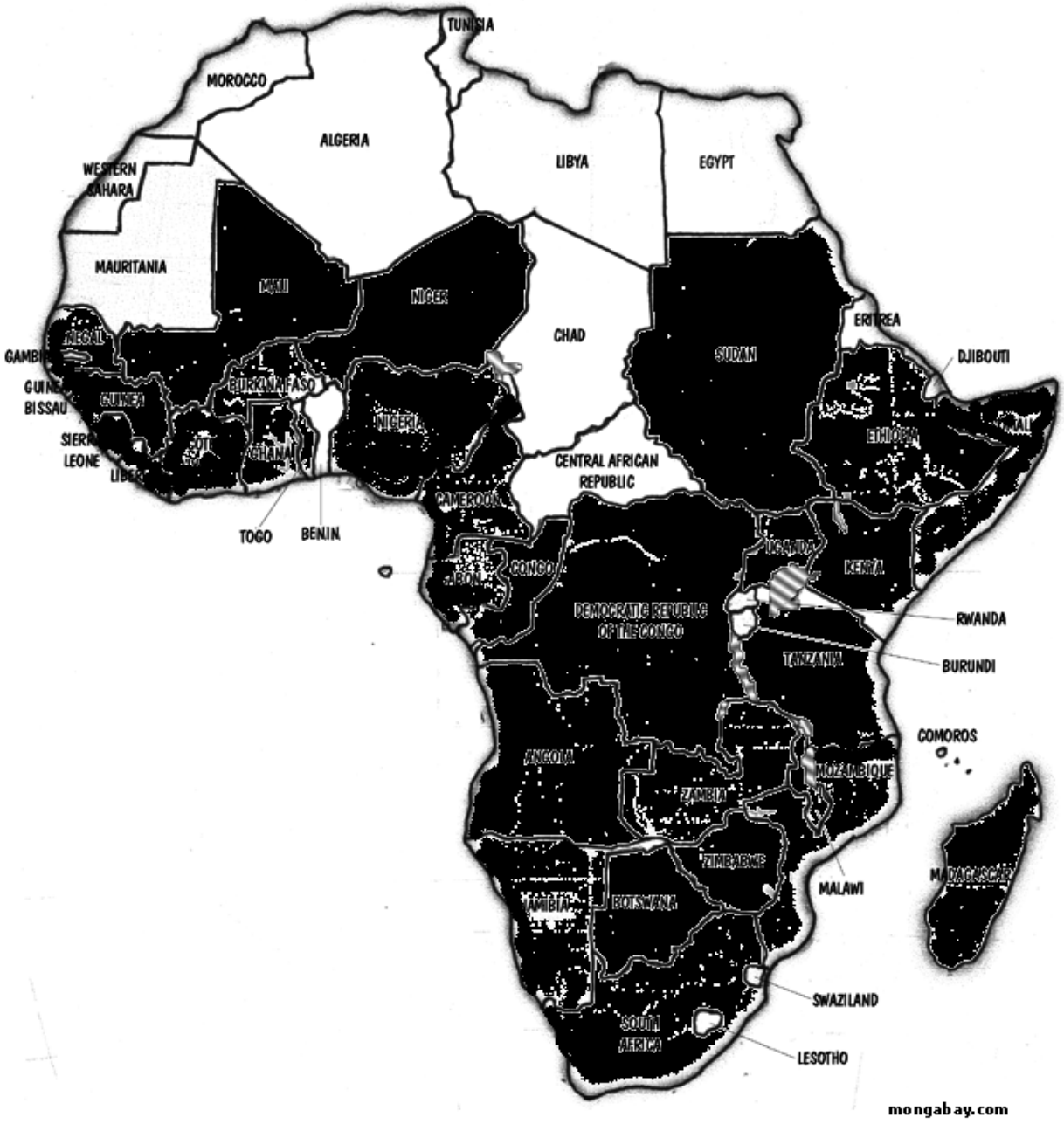
$$v(\alpha(\underline{\sigma}) = v(B) - \delta / [2z\, q(\bar{e}) - 2zq(\underline{e}) - q(\bar{e}) + q(\underline{e})]$$

Let $[v(B) - \delta / [2z\, q(\bar{e}) - 2zq(\underline{e}) - q(\bar{e}) + q(\underline{e})]] = \theta$

$\Rightarrow \alpha(\underline{\sigma}) = \mathbf{V}^{-1}(\theta)$

APPENDIX C

MAP OF AFRICA



Africa map courtesy of Graphic Maps: Downloaded from worldatlas.com on 6/13/08.

APPENDIX D

INTERPRETING THE COEFFICIENT ESTIMATES

Interpreting the Coefficient Estimates

There are three types of variables in my equations: logged variables, continuous non-log variables, and dummy variables. I estimate the following equation:

$$\ln G = \beta_0 + \beta_x \ln x + \beta_y y + \beta_z z$$

In this equation x is a logged variable (such as LBIL and LPOP), y is a continuous variable (such as COR, DEM, and ETHT), and z is a dummy variable (such as SURPNEG1).

(1) β_x, the coefficient of a logged variable:

This coefficient is interpreted as an elasticity.

(2) β_y, the coefficient of a continuous variable:

To interpret β_y, note that

$$\begin{aligned} G &= e^{\beta_0 + \beta_x \ln x + \beta_y y + \beta_z z} \\ &= e^{\beta_0} e^{\beta_x \ln x} e^{\beta_y y} e^{\beta_z z} \\ &= e^{\beta_0} x^{\beta_x} e^{\beta_y y} e^{\beta_z z} \end{aligned}$$

Since y is continuous,

$$\frac{dG}{dy} = \beta_y e^{\beta_0} x^{\beta_x} e^{\beta_y y} e^{\beta_z z} = \beta_y G$$

$$\Rightarrow \frac{\left(\frac{dG}{dy}\right)}{G} = \beta_y$$

β_y is the percent change in *G* for a one-unit change in *y*. Thus, a one-unit change in *y* is associated with a β_y *100 % change in *G*.

Example: If $\beta_y = 0.5$, then a one unit change in *y* will increase *G* by 50%.

(3) β_z, the coefficient of a dummy variable:

If the dummy variable equals zero, such as is the case for observations of countries running a surplus, then

$$G_0 = e^{\beta_0} x^{\beta_x} e^{\beta_y y}$$

When the dummy variable equals one, then

$$G_1 = e^{\beta_0} x^{\beta_x} e^{\beta_y y} e^{\beta_z z} = e^{\beta_z} G_0$$

Thus,

$$G_1 = e^{\beta_z} \cdot G_0$$

β_z give the impact of the dummy variable on *G* relative to the reference group; the reference group consists of observations of countries running a surplus in this analysis.

Example: If $\beta_z = 0.5$, then $e^{0.5} = 1.65$.

$\Rightarrow$ G_1 is 165% of G_0

In this example, the dummy variable results in a 65% increase from the expected value of G for the reference group.

APPENDIX E

FIRST STAGE REGRESSION RESULTS

Table 10

First Stage Regression Results Examining the Simultaneity Between Total Foreign Aid and Corruption in Sub-Saharan Africa

	Dependent Variable	
Coefficient	**LTAID**	**COR**
Intercept	0.746078 (0.761748)	1.925844** (1.134894)
DEM	0.065017* (0.021519)	-0.05168 (0.032061)
LGDPC	-0.21382* (0.043354)	-0.10094 (0.064588)
LPOP	0.147996* (0.048528)	-0.09965 (0.072299)
OP	-0.00447* (0.001053)	-0.00419** (0.001569)
ETHT	-0.02556 (0.0277896)	0.128397* (0.041553)
SURPNEG1	-0.14847 (0.108350)	-0.14260 (0.161426)
SURPNEG2	0.386576* (0.099168)	-0.41879* (0.147746)
SURPNEG3	0.531995* (0.102370)	-0.66733* (0.152516)
SURPNEG4	0.672256* (0.100759)	-0.48412* (0.150116)
SURPNEG5	0.555618* (0.098158)	-0.56508* (0.146241)
INF	-0.00003 (0.000026)	0.000082* (0.000038)
ARMS	0.080613 (0.063771)	-0.16237** (0.095010)
LTDEBT	0.171618* (0.044658)	0.189609* (0.066534)
	R^2 =0.51955, F = 42.76	R^2 =0.18199, F = 8.80

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level.

Table 11

First Stage Regression Results Examining the Simultaneity Between Bilateral Aid and Corruption in Sub-Saharan Africa

	Dependent Variable	
Coefficient	**LBIL**	**COR**
Intercept	-0.09675 (0.890024)	1.925844 (1.134894)
DEM	0.078907* (0.025143)	-0.05168 (0.032061)
LGDPC	-0.10642* (0.050653)	-0.10094 (0.064588)
LPOP	0.101393** (0.056699)	-0.09965 (0.072299)
OP	-0.00525* (0.001230)	-0.00419** (0.001566)
ETHT	0.008090 (0.032588)	0.128397* (0.041553)
SURPNEG1	-0.19136 (0.126596)	-0.14260 (0.161426)
SURPNEG2	0.440143* (0.115867)	-0.41879* (0.147746)
SURPNEG3	0.611015* (0.119609)	-0.66733* (0.152516)
SURPNEG4	0.813150* (0.117727)	-0.48412* (0.150116)
SURPNEG5	0.697452* (0.114688)	-0.56508* (0.146241)
INF	-0.00005 (0.000030)	0.000082* (0.000038)
ARMS	0.082136 (0.074510)	-0.16237** (0.095010)
LTDEBT	0.185260* (0.052179)	0.189609* (0.066534)
	R^2 =0.43984, F = 31.05	R^2 =0.18199, F =8.80

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level.

Table 12

First Stage Regression Results Examining the Simultaneity Between Multilateral Aid and Corruption in Sub-Saharan Africa

	Dependent Variable	
Coefficient	**LMUL**	**COR**
Intercept	801273 (1.123921)	1.925844** (1.134894)
DEM	0.095837* (0.031835)	-0.05168 (0.032061)
LGDPC	-0.55123* (0.064135)	-0.10094 (0.064588)
LPOP	0.3226261* (0.071791)	-0.09965 (0.072299)
OP	-0.00139 (0.001558)	-0.00419* (0.001569)
ETHT	-0.08667* (0.041261)	0.128397* (0.041553)
SURPNEG1	0.00481 (0.160292)	-0.14260 (0.161426)
SURPNEG2	0.296814* (0.146708)	-0.41879* (0.147746)
SURPNEG3	0.472871* (0.151444)	-0.66733* (0.152516)
SURPNEG4	0.388009* (0.149062)	-0.48412* (0.150116)
SURPNEG5	0.313109* (0.145214)	-0.56508* (0.146241)
INF	-0.00001 (0.000038)	0.000082* (0.000038)
ARMS	0.076922 (0.094343)	-0.16237** (0.095010)
LTDEBT	0.074673 (0.066067)	0.189609* (0.066534)
	R^2 =0.44574, F =31.80	R^2 =0.18199, F = 8.80

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level.

Table 13

First Stage Regression Results Examining the Simultaneity Between Total Foreign Aid, Corruption, and per capita GDP in Africa

	Dependent Variable		
Coefficient	**LTAID**	**COR**	**LGDPC**
Intercept	0.748514 (0.787623)	-0.30209 (1.140658)	9.830753* (0.0.624273)
DEM	0.058118* (0.023989)	-0.06385** (0.034741)	0.149226* (0.019014)
LPOP	0.096725** (0.051820)	0.215699* (0.075048)	-0.57895* (0.041073)
OP	-0.00881* (0.001494)	0.001216 (0.002164)	-0.00335* (0.001184)
ETHT	-0.01872 (0.032326)	0.183371* (0.046815)	-0.02382 (0.025622)
SURPNEG1	0.156391** (0.129739)	0.094672 (0.187892)	-0.38507* (0.102832)
SURPNEG2	0.492592* (0.106680)	-0.17831 (0.154498)	-0.51500* (0.084555)
SURPNEG3	0.689869* (0.116500)	-0.38111* (0.168719)	-0.54746* (0.092339)
SURPNEG4	0.909340* (0.110980)	-0.24167 (0.160725)	-0.67567* (0.087963)
SURPNEG5	0.631508* (0.113272)	-0.51091* (0.164044)	0.25149* (0.089780)
INF	0.000806 (0.001084)	0.002670** (0.001570)	-0.00548* (0.000859)
ARMS	0.042317 (0.069605)	-0.35527* (0.100804)	0.188343** (0.055169)
LTDEBT	0.149732* (0.0458352)	0.00644 (0.066379)	0.299770* (0.036329)
ILLITERACY	0.0066151* (0.001681)	0.002867 (0.002434)	-0.01951* (0.001332)
	R^2=0.48818 F=25.75	R^2=0.19949 F=6.73	R^2=0.69379 F=61.17

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level

Table 14

First Stage Regression Results Examining the Simultaneity Between Bilateral Aid, Corruption, and per capita GDP in Africa

	Dependent Variable		
Coefficient	**LBIL**	**COR**	**LGDPC**
Intercept	1.749603* (0.815210)	-0.30209 (1.140658)	9.830753* (0.624273)
DEM	0.080374* (0.024829)	-0.06385** (0.034741)	0.149226* (0.019014)
LPOP	-0.10737* (0.053635)	0.215699* (0.075048)	-0.57895* (0.041073)
OP	-0.01159* (0.001547)	0.001216 (0.002164)	-0.00335* (0.001184)
ETHT	-0.01612 (0.033458)	0.183371* (0.046815)	-0.02382 (0.025622)
SURPNEG1	0.110937 (0.134283)	0.094672 (0.187892)	-0.38507* (0.102832)
SURPNEG2	0.443843* (0.110417)	-0.17831 (0.154498)	-0.51500* (0.084555)
SURPNEG3	0.679254* (0.120581)	-0.38111* (0.168719)	-0.54746* (0.092339)
SURPNEG4	0.915675* (0.114868)	-0.24167 (0.160725)	-0.67567* (0.087963)
SURPNEG5	0.742653* (0.117240)	-0.51091* (0.164044)	0.25149* (0.089780)
INF	-0.00188** (0.001122)	0.002670** (0.001570)	-0.00548* (0.000859)
ARMS	0.050103 (0.072043)	-0.35527* (0.100804)	0.188343* (0.055169)
LTDEBT	0.244229* (0.047440)	0.00644 (0.066379)	0.299770* (0.036329)
ILLITERACY	0.003759* (0.001739)	0.002867 (0.002434)	-0.01951* (0.001332)
	R^2=0.45516 F=22.56	R^2=0.19949 F=6.73	R^2=0.69379 F=61.17

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level

Table 15

First Stage Regression Results Examining the Simultaneity Between Multilateral Aid, Corruption, and per capita GDP in Africa

	Dependent Variable		
Coefficient	**LMUL**	**COR**	**LGDPC**
Intercept	-3.58096* (1.184063)	-0.30209 (1.140658)	9.830753* (0.624273)
DEM	0.076127* (0.036063)	-0.06385** (0.034741)	0.149226* (0.019014)
LPOP	0.529312* (0.077904)	0.215699* (0.075048)	-0.557895* (0.041073)
OP	-0.00389* (0.002247)	0.001216 (0.002164)	-0.00335* (0.001184)
ETHT	-0.01979 (0.048597)	0.183371* (0.046815)	-0.02382 (0.025622)
SURPNEG1	0.353844** (0.187837)	0.094672 (0.187892)	-0.38507* (0.102832)
SURPNEG2	0.615665* (0.160377)	-0.17831 (0.154498)	-0.51500* (0.084555)
SURPNEG3	0.839233* (0.175139)	-0.38111* (0.168719)	-0.54746* (0.092339)
SURPNEG4	1.013485* (0.166841)	-0.24167 (0.160725)	-0.67567* (0.087963)
SURPNEG5	0.353932 (0.170286)	-0.51091* (0.164044)	0.25149* (0.089780)
INF	0.004550* (0.001630)	0.002670** (0.001570)	-0.00548* (0.000859)
ARMS	0.074786 (0.104640)	-0.35527* (0.100804)	0.188343* (0.055169)
LTDEBT	-0.06376 (0.068905)	0.00644 (0.066379)	0.299770* (0.036329)
ILLITERACY	0.013375* (0.002526)	0.002867 (0.002434)	-0.01951* (0.001332)
	R^2=0.41766 F=19.36	R^2=0.19949 F=6.73	R^2=0.69379 F=61.17

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level

Table 16

First Stage Regression Results Examining the Simultaneity Between Total Foreign Aid and Corruption Using Fixed Effects Approach

	Dependent Variable	
Coefficient	**LTAID**	**COR**
Intercept	0.746078 (0.761748)	1.925844* (1.134894)
DEM	0.065017* (0.021519)	-0.05168 (0.032061)
LGDPC	-0.21382* (0.043352)	-0.10094 (0.064588)
LPOP	0.147996* (0.048528)	-0.09965 (0.072299)
OP	-0.00447* (0.001053)	-0.00419* (0.001569)
ETHT	-0.02556 (0.027891)	0.128397* (0.041553)
SURPNEG1	-0.14847 (0.108350)	-0.14260 (0.161426)
SURPNEG2	-0.386576* (0.099168)	-0.41879* (0.147746)
SURPNEG3	-0.531995* (0.102370)	-0.66733* (0.152516)
SURPNEG4	0.672256* (0.100759)	-0.48412* (0.150116)
SURPNEG5	0.555618* (0.098158)	-0.56508* (0.146241)
INF	-0.00003 (0.000026)	0.000082* (0.000038)
ARMS	0.080613 (0.063771)	-0.16237** (0.095010)
LTDEBT	0.171618* (0.044658)	0.189609* (0.066534)
	R^2 =0.51365, F = 41.76	R^2 =0.18199, F = 8.80

(standard errors in parenthesis)

*Statistically significant at the 95% level

** Statistically significant at the 90% level.