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Aid effectiveness in sub-saharan Africa and south and southeast Asia : an analysis of substantive measures of development

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Aid Effectiveness in Sub-Saharan Africa and South and Southeast Asia: An Analysis of Substantive Measures of Development

by

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Abstract

Recently, aid effectiveness has become a popular topic in the literature. Generally, it is measured by instrumental measures of well-being, specifically, GDP per capita. This paper uses a substantive approach, pioneered by Amartya Sen, to evaluate aid effectiveness. Substantive measures attempt to measure welfare directly. Specifically, I use infrastructure as measured by telephone lines per 100 people, life expectancy, economic diversification as measured by agriculture as a percentage of GDP, and education as measured by enrollment in primary school, as substantive measures of well-being. I find that aid is not allocated based on substantive need in the regions of sub-Saharan Africa, South Asia and Southeast Asia. I also find that aid has not directly contributed to improvements in substantive measures of well-being with the exception of education. The coefficient on the effective aid variable in the regression modeling education is significant at the 1% level and positive. The results of this regression indicate that effective aid has contributed to an increase in primary school enrollment, *ceterus peribus*, in the regions of sub-Saharan Africa and South and Southeast Asia.

Introduction

William Easterly (2008), a development economist, began his best-selling book *Reinventing Foreign Aid* with the observation that foreign aid is much in the headlines, and its proponents have "big ambitions" (p. 1). From 1999 to 2001 net multilateral aid flows averaged around $11 billion, but this has not produced any significant positive results, according to Easterly (2008, p. 2). The percentage of people living below the poverty line (of $1.25 a day) has declined over the past 25 years from 52 percent in 1981 to 26 percent in 2005; in sub-Saharan Africa the proportion has not changed and remained at about half of the population (Wroughton 2008). In South and Southeast Asia, by contrast, the poverty rate decreased from 60 to 40 percent during this time period. This is a significant reason for the recent probe into foreign aid effectiveness. According to an instrumental measure of development, real income per capita, little progress has been made in sub-Saharan Africa but South and Southeast Asia seem to have developed.

Traditionally, the literature has evaluated foreign aid effectiveness and development instrumentally using economic growth (measured by GDP per capita growth rates). This paper attempts to quantify and explore those factors that may have contributed to South and Southeast Asia's growth, aside from GDP per capita. This paper will contribute to the literature an examination of the effects of aid on certain development indicators that reflect substantive measures of well-being (primary school enrollment, life expectancy, agriculture as a share of GDP, and infrastructure as measured by telephone lines). Understanding substantive measures of well-being can lead to greater insight into the development process. It will also explore if foreign aid has been invested in countries that are less developed according to these indicators.

This paper assesses development using the approach of Amartya Sen and others who focus on direct (substantive) rather than instrumental measures of well-being. Sen argues that the "income-centered view is in serious need of supplementation, in order to have a fuller understanding of the process of development" (2000, p. 47). Sen introduces the example of Kerala, India, a state in Southern India, which has high life expectancy, low fertility, and high literacy, as compared to the rest of India. Kerala also has a low income per capita, its success is evidence that a country, or state does not need to be rich first in order to achieve development based on substantive measures (Sen, 2000, p. 48). Sen also notes that when one uses instrumental measures such as GDP per capita and GDP per capita growth rates to measure development, then increasing GDP per capita becomes the end goal of the process. This is dangerous because it is such a crude measure of the welfare in a country. Development and progress should focus on improving welfare directly as well as economic growth in order to benefit the recipients. This paper will explore whether aid has been going to those countries that are the least developed according to substantive development indicators and attempt to understand whether aid has had a positive effect on these indicators.

II. Literature Review

Aid effectiveness has become a much-debated and controversial topic in the literature. Countries that have received aid have reached varying stages of development and reached varying degrees of aid dependency. Economists are now concerned with why aid proved to be more effective in some regions and countries rather than others. Most economists believe that aid effectiveness is successful if it contributes to sustainable economic growth in a country and foreign aid becomes a minimal source of funds for the

government. In the literature, effectiveness is evaluated using economic growth measured by increases in GDP per capita growth rates, but there is a new emphasis on evaluating welfare directly.

Before the recent obsession began focusing on the effectiveness of aid, it was widely accepted that aid was effective because of its design. According to Mallik (2008) aid was designed to close the savings gap and provide capital for investment. In developing countries, the savings rate is far below optimal so governments and the nation as a whole are unable to fund public goods, impeding the possibility for economic growth. This is based on the Solow growth model. Kenny (2008) addressed this in noting that investment is as much a symptom of growth as it is a cause. Recent empirical data suggests that an investment gap is not the cause of underdevelopment, even in Sub-Saharan Africa. Easterly (1999) notes that, in countries that have experienced "take-offs", periods of rapid economic growth have not occurred after periods of large investment. The concept that aid is designed to close the investment gap may have implications for its effectiveness because recent studies suggest than an investment gap is not the cause of underdevelopment. This supports the concept that aid should be focused where it can provide the most benefit for recipients, which may not be consistent with aid flows targeted towards investment gaps.

In a number of empirical studies, noted in Arimoto and Kono's (1999) paper, there has not been a distinct link found between the amount of foreign aid a country receives and a change in GDP per capita. GDP per capita is a limited form of quantifying development, but it has been established as an effective method in the literature. Girijasankar (2008) studied the six poorest African countries, the Central African

Republic, Malawi, Mali, Niger, Sierra Leone, and Togo. These countries are characterized by low levels of human capital. Using regression analysis with a cointegration technique to study the long-run equilibrium relationship, Girijasankar tested the strength of the relationships between GDP per capita, aid as a percentage of GDP, and openness. In five out of the six countries, the natural log of foreign aid as a percentage of GDP has a significant negative long-run effect on the natural log of GDP per capita. While this paper does not attempt to explain this negative relationship between GDP per capita and foreign aid, Kenny (2008) offered the explanation that some governments become dependent on foreign aid. Governments decrease tax collection and other sustainable ways to fund expenditures and instead rely on foreign aid. Foreign aid projects also offer more lucrative jobs than the government which pulls talent and intelligence from the private and public sectors. Kenny proposes that aid would be more effective if it offered more new and different ways of implementing public goods.

Different patterns and paces of development among countries suggest that internal characteristics of a country have a large impact on aid effectiveness. Angeles and Neanidis (2009) noted that high economic variability, such as agricultural variability and terms of trade variability, have a large impact on aid effectiveness. In countries with higher environmental variability, aid is more effective. Angeles and Neanidis (2009) study the impact of the elite on aid effectiveness because they have a large share of political and economic power and so they determine whether aid reaches its intended destination. In countries with a detached elite, as in the example of European settlers who have remained in a country post-independence, but not become the majority, these elite have little motivation to aid those in a lesser socioeconomic position. In this case, aid

may be used for consumption rather than investment in public goods. Using a two-stage standard least squares estimate and a system GMM estimation which accounts for time and regional differences, the coefficient on the interaction term of aid*settlers was found to be negative and statistically significant in all of their regressions. Given these results, Angeles and Neanidis determined that aid is less effective in countries with a larger proportion of European settlers. Internally, when the elite or those with the most power are more detached from the rest of the citizenry, they are less likely to use foreign aid to effectively alleviate those of a lower socioeconomic status.

Another important internal characteristic that has proven to have a positive impact on aid effectiveness is institutional strength and human capital. Mavrotas (2009) sought to test whether there is a significant link between the strength of institutions and economic growth. Using an empirical study with two stage least squares estimates, social capital (he uses social cohesion as a measure of social capital) has a statistically significant positive correlation with aid effectiveness. Once he accounts for the levels of social capital, policy does not correlate with aid effectiveness. Additionally, Heckleman and Knack (2009) sought to determine whether foreign aid influenced economic freedom since they claim that economic freedom leads to economic growth. Foreign aid agencies give local governments control over at least a portion of aid funds. Agencies do not want to work outside of the government so as to not undermine it. In order to analyze the effects of economic openness, Heckleman and Knack (2009) measured economic freedom using five proxy variables: size of government, legal structures and property rights, sound money exchange with foreigners, and regulation. According to a hedonic index based on the growth-freedom regression, aid has positively influenced institutional

environments favorable to growth. Aid is used more effectively in a country with social capital and strong institutions.

Measuring aid flows has also been controversial in the literature. Chang, Fernandez-Arias, and Servén (1999) developed an improved measure of foreign aid flows that they claim is more accurate than Net Official Development Assistance (ODA). For example, ODA does not distinguish between grants and loans so it over estimates aid flows. The authors developed a new measurement, Effective Aid, which measures aid only as the net value of funds not expected to be repaid. Grants (e.g., gifts) are included entirely, but loans are counted for the interest that is subsidized below market terms. Effective aid also takes debt forgiveness into account and eliminates military aid. This unique measurement of aid allows for a more accurate analysis of aid effectiveness.

Foreign aid effectiveness is a topic that must be studied further in order to truly determine why it has positively impacted some countries while negatively impacting others. It is difficult to quantify all of the characteristics of a country and the welfare of a society. Economists continue to evaluate aid effectiveness to improve methods of achieving development in the future. In order to understand aid effectiveness one must also understand whether aid has been used towards improving welfare in countries or towards other ends. More recently, aid agencies and the development industry have become more aware of the unique nature of development in each country. Evaluating the development process in countries that have made progress can shed light on how welfare can be improved in other countries, but the uniqueness of each country cannot be ignored.

III. Empirical Model

Aid effectiveness has been traditionally measured by development, defined as levels of GDP per capita and growth rates in real GDP per capita. This paper will use an empirical model used by William Easterly, Ross Levine, and David Roodman (2003) that these authors used to evaluate the effect of policy on aid effectiveness. Instead of using GDP per capita growth rates as the dependent variable, as Easterly's paper does, this paper will use substantive measures of development. Economic growth is a limited way to measure development so this paper attempts to use other indicators to better measure quality of life.

I will use these models with the Effective aid variable lagged one time period or not. This will demonstrate if aid is going to those countries with the lowest level of development according to each of these substantive measures (also the dependent variables). Capabilities measure one's access to functionings. Functioning refers to how someone lives. Sen (2000) argues that one should measure development based on the deprivation of capabilities (p. 88). Life Expectancy is a measure of the overall capability of people to form sustainable lives. In particular, a higher life expectancy indicates more children are surviving their most dangerous early years, and thus have a higher potential to live to adulthood. Hence, life expectancy is a key measure of Sen's capabilities approach to substantive well-being.

A second measure, agriculture as a percentage of GDP, is an indication of an agrarian economy. As agriculture as a share of GDP decreases it shows that the economy is diversifying and potential modernization. A diversified economy offers increased capability in the form of varied job opportunities and access to manufactured goods.

A key measure of capabilities is education. Primary school enrollment will be used as a measure of education because literacy rates are not readily available for this time period. Education "makes a direct contribution to the expansion of human capabilities" (Sen, 2000, p. 144). It expands employment opportunities and generally increases welfare by expanding one's knowledge.

A fourth measure looks at infrastructure and will be measured by the number of telephone lines per one hundred people. Access to telephones enables one to live a life of greater affiliation and connectedness to those you love (e.g. many husbands migrate and may only return once a year). Having the capability of communicating with loved ones can be considered an important measure of human well-being. In general, infrastructure also refers to transportation which can expand capability by increasing mobility. Since mobile phone usage was minimal during this time period, as shown in figure 1, land phone lines are a good proxy measure for general infrastructure. In addition, the number of land telephone lines is strongly correlated with the number of paved roads in a country as shown in Table 4.

I am using the control or independent variables from the paper by Easterly, et al. (2003) to assess the correlation between foreign aid and the dependent variables mentioned above. Easterly, et al. measure effective aid using the variable devised by Change, et al. (1999). To control for social cohesion, the effect of a detached local elite, and political instability, they use a measure of ethnic fractionalization that is the probability that two citizens are from a different ethnic group and the number of assassinations per million citizens. For the institutional quality they use the measurement from Knack and Keefer (1995) similar to the one that is used in the above study by

Heckleman and Knack (2003). They address institutional quality by measuring the government's ability to manage the economy, as well, through the government's budget surplus as a proportion of GDP and the log of the inflation. They also use M2 as a share of GDP as a measure of financial depth, but since the financial markets for the countries in this paper are less sophisticated this is not used. The openness of the economy is measured by the Sachs-Warner index which is a value comprised of five components; if an economy is deemed closed in one category it receives a zero. The values are 0 (indicating an economy closed in all categories), 0.25, 0.5, and so on until 1 (an economy open in all categories). These categories include the black market premium, export marketing (given a 0 if the government has a monopoly over the major export crop), a socialist government, and a weighted average of tariffs and non-tariff barriers on capital goods and intermediaries (if this value is above 0.4 for each then the economy is deemed closed in this category). In order to control for the size of a country the model also uses the log of the population of the country. The equations for this paper, modeled off of the paper by Easterly, et al. (2003) will be as follows:

1) Life Expectancy$_t$ = f(Effective Aid$_{t-1}$, Ethnic Fractionalization, Assassinations$_t$, Budget Surplus/GDP$_t$, log(inflation)$_t$, Economic Openness$_t$, Institutional Quality, log (Population))$_t$, Sub-Saharan Africa binary, South/Southeast Asia binary, Period binary

2) Agriculture (Share of GDP)$_t$ = f(Effective Aid$_{t-1}$, Ethnic Fractionalization, Assassinations$_t$, Budget Surplus/GDP$_t$, log(inflation)$_t$, Economic Openness$_t$, Institutional Quality, log (Population))$_t$, Sub-Saharan Africa binary, South/Southeast Asia binary, Period binary

3) Primary School Enrollment$_t$ = f(Share of Population below age 15, Effective Aid$_{t-1}$, Ethnic Fractionalization, Assassinations$_{t-1}$, Budget Surplus/GDP$_t$, log(inflation)$_t$, Economic Openness$_t$, Institutional Quality, log (Population))$_t$, Sub-Saharan Africa binary, South/Southeast Asia binary, Period binary

4) $Infrastructure_t$ = f(Share of Urban Population, Effective Aid_{t-1}, Ethnic Fractionalization, $Assassinations_t$, Budget $Surplus/GDP_t$, $log(inflation)_t$, $Economic\ Openness_t$, Institutional Quality, log $(Population))_t$, South Asia binary, Southeast Asia binary, Period binary

By regressing the dependent variables on effective aid in the same time period, I can test whether aid is going to the countries that are the least developed according to these measures-that is, whether aid is distributed according to substantive need. This can shed light on why aid has been found ineffective in a number of other papers. By showing the correlation when effective aid is lagged one time period (which is four years because the data is in four year aggregates) I can evaluate whether aid has gone directly to improving substantive well-being.

IV. Data

Data is available for the independent variables from 1970 to 1997 in four year aggregates for each country in Sub-Saharan Africa and South and Southeast Asia. This data set is available at www.cgdev.org and was used in the paper by William Easterly, Ross Levine, and David Roodman (2003). The independent variables include: ethnic fractionalization, assassinations per million people, effective aid/GDP, institutional quality, budget surplus/GDP, inflation, the Sachs-Warner index, and the population. Summary measures for the control variables, established to affect aid in the literature are in Table 2. Summary measures to compare the economies of Sub-Saharan Africa and South and Southeast Asia are in Table 1. T-tests were performed on the means of the two regions in three variables, GDP per capita growth rate, GDP per capita, and Effective Aid/GDP. In the time period, from 1966 to 1969, both GDP per capita and GDP per capita growth rates were not statistically significantly different for each region. In the

most recent time period, from 1994 to 1997, the two regions have significantly different GDP per capita and GDP per capita growth means. The amount of effective aid as a proportion of GDP was not statistically significantly different in the time period from 1970 to 1973, but in 1994 to 1997 it is significantly different and the mean is larger in Sub-Saharan Africa. This indicates that South and Southeast Asia have not become increasingly dependent on aid, but have experienced economic growth from 1970 to 1997. During this time period from 1970 to 1997 South and Southeast Asia became less dependent on foreign aid and more successful according to instrumental measures compared to stagnation and increased aid dependency in sub-Saharan Africa.

I have expanded the data set using information from the World Bank Development indicators in order to control for certain variables unique to the dependent variables. I have also obtained the data for the dependent variables using the World Bank Development Indicators. This paper focuses on the effective aid variable to determine whether aid has a significant positive relationship to substantive measures of development. These measures include: infrastructure (telephone lines per 100 people), enrollment in primary school, agriculture as a share of GDP, and life expectancy. Table 3 shows the disparity between these substantive development indicators in Sub-Saharan Africa and South and Southeast Asia. The growing disparity between the two regions is evident in these development indicators, as well. Foreign aid may have been used more effectively and contributed to South and Southeast Asia's development and decreased reliance on foreign aid. Telephone lines per 100 people have, on average, increased by 1.77 in Sub-Saharan Africa and, on average, 6.46 in South and Southeast Asia. This shows a more effective use of funds in investing in public goods. Agriculture has become

less of a share of GDP for counties in South and Southeast Asia, showing modernization and diversification in the economy. Life expectancy demonstrates the initial disparity between the two regions; in 1970, South and Southeast Asia has an average life expectancy of 52 years, compared to an average of 46 years in sub-Saharan Africa. Despite large technological advances in medicine, the average life expectancy in sub-Saharan Africa was 53 years in 1994 and 64 years in South and Southeast Asia. This may be due to the high prevalence of AIDs in sub-Saharan Africa, but also the overall low quality of life in the region as compared to South and Southeast Asia. These regions have not only diverged in economic growth, but also in other substantive measures of development.

V. Analysis

Regressions are presented with standardized coefficients and robust t-values in OLS form. I have attempted to control for fixed effects by using period binaries and regional binaries. In each regression, the coefficient on effective aid is not statistically significantly different from zero at the 5% level with the exception of the regression that models education. In the current time period this would indicate that even though effective aid does not include military aid, effective aid is not going to those countries that are less developed as indicated by these measures. Effective aid is also insignificant in each regression when it is lagged by one time period. This is an indication that aid may not have been used to directly improve welfare as measured by substantive indicators. Even controlling for economic openness, the size of the economy, and political stability, South and Southeast Asia have statistically significantly different results from Sub-Saharan Africa in the majority of the regressions. This is consistent with the literature

that there is something beyond quantifiable factors that has led to growth and modernization in South and Southeast Asia. Effective aid does not seem to be correlated with these substantive measures of development, or indicators of modernization, with the exception of education. The results of this regression do indicate that certain internal aspects of a country have direct correlation with these measures of development. This may contribute to the results I have found related to effective aid because the effects of aid are reliant on internal characteristics for which I have controlled. It is important to note that Indonesia, India, and South Africa are unique cases that do not share the same characteristics of their regional peers; it is difficult to take this into account without biasing the data.

Quality of life is measured by life expectancy at birth in a country; the results of the regression using life expectancy as the dependent variable are in Table 5. GDP per capita is positively correlated with life expectancy, *ceterus peribus.* The two are highly correlated which is to be expected because both are measures of development, one being instrumental and one being substantive. Political instability, measured by the interaction of ethnic fractionalization and political assassinations per million people, is negatively correlated with life expectancy, *ceterus peribus*. This is consistent with expectations because political instability would indicate that the state cannot provide the public goods that increase the quality of life in a country. The coefficient for the variable political assassinations per million people is statistically significant and positively correlated with life expectancy, *ceterus peribus*, which is not consistent with expectations. The coefficient for the Southeast Asia binary is statistically significant and positively correlated with life expectancy, *ceterus peribus*; it is also the coefficient of the greatest

magnitude. One would anticipate this result; it is further indication that factors outside of the control variables contribute to the development success in the region.

Agriculture as a share of GDP is an indicator of the level of modernization and diversification of an economy; the results of the regression using agriculture as a share of GDP as the dependent variable are in Table 6. The coefficient on GDP per capita is statistically significant and negatively correlated with agriculture as a share of GDP, *ceterus peribus*, which supports the hypothesis that decreasing agriculture as a share of GDP can be used as a measure of modernization. This is also the coefficient of the greatest magnitude, indicating that it is the variable that is most correlated with agriculture as a share of GDP. The size of the population is negatively correlated with agriculture as a percentage of GDP, *ceterus peribus*. One possible cause of this negative correlation is that a larger population could indicate that a country has a larger labor force that would then be able to contribute to diversification of the economy. The coefficiemt on ethnic fractionalization is statistically significant and positively correlated with agriculture as a percentage of GDP, *ceterus peribus*, which is accordant with expectations. If ethnic fractionalization translates into social cohesion, a lack of trust and respect for those outside of one's ethnic group may cause a society to remain agrarian rather than expand its industrial sector.

Infrastructure is measured by telephone lines per million people; results for this regression are in Table 7. Institutional quality is positively correlated with infrastructure, *ceterus peribus*. If governments are more stable and less corrupt they should provide public goods including infrastructure and the private sector will be more likely to invest in infrastructure in a certain country. As expected, GDP per capita is positively correlated

with infrastructure, *ceterus peribus*; both infrastructure and GDP per capita are measured of development. The coefficient estimate for GDP per capita is also that of the greatest magnitude, indicating its strong correlation with the amount of infrastructure in a country. The proportion of the population living in an urban area, as a percentage of the total population, is positively correlated with infrastructure, *ceterus peribus*. The coefficient on the urban population variable is that of the second largest magnitude. The theory of economies of scale is consistent with these results. Countries with a larger urban population should invest more in infrastructure because more of its citizens can use the good without additional costs.

Education is measured by total enrollment in primary school; the results of this regression are in Table 8. Effective aid is statistically significant at the 1% level and positively correlated with enrollment in primary school when lagged one time period, *ceterus peribus*. The standardized coefficient on the effective aid variable is that of the smallest magnitude while still being statistically significant, so despite being positively correlated, effective aid may not be strongly correlated with enrollment in primary education. As expected, ethnic fractionalization, a proxy measure of social cohesion, is negatively correlated with enrollment in primary school. The coefficient on the inflation variable is statistically significant and positively correlated with enrollment in primary school, *ceterus peribus*. High inflation is a reflection on the government's poor ability to manage the economy, but under certain reform regimes such as SLP governments were restricted in their ability to manage the economy. This may indicate why these results are inconsistent with expectations. Economic openness is positively correlated with education, *ceterus peribus*, which is consistent with expectations. The coefficient on the

institutional quality variable is negatively correlated and statistically significant, *ceterus peribus*. This is unexpected since institutional quality should indicate that the government is competent and would therefore spend money on public goods such as education. According to this regression, the magnitude of the standardized coefficient is small so education and institutional quality are not strongly negatively correlated. Total population and the proportion of the population under the age of 15 are positively correlated with enrollment in primary school, *ceterus peribus*, as expected. The coefficient for the variable of total population is that of the greatest magnitude. The results of this regression indicate that effective aid has contributed to an increase in primary school enrollment.

VI. Concluding Remarks

East Asia and Southeast Asia have certain qualities that I have been unable to quantify that have contributed to their development and modernization. Factors that contribute to the development of South and Southeast Asia that cannot be quantified include: path dependency, geographic features, and culture. Path dependency refers to history, which could be colonialism, date of exposure to other regions of the world, and policies of past leadership. Geographic features, such as rivers, make transporting goods and developing infrastructure less resource intensive. Culture can refer to any number of defining characteristics in a region or country, such as attitude towards savings and leadership. Some unlikely correlations have indicated that development in all capacities is due to a combination of factors.

Effective aid is not correlated with substantive measures of development with the exception of education as measured by primary school enrollment. Using life expectancy, agriculture as a share of GDP, primary school enrollment, and telephone lines per 100

people as dependent variables and proxy measures for modernization and development does not give us a significantly better understanding of aid effectiveness. It does, however, indicate those internal characteristics of a country that are correlated with these substantive measures could be better studied. Effective aid has contributed to increases in enrollment in primary school which is consistent with a general understanding that education has contributed to progress in South and Southeast Asia. Education is vital to expanding capabilities and creates a skilled workforce.

GDP per capita is strongly correlated with each of these substantive measures of well-being which supports the use of instrumental measures to evaluate development. It is important to remember, however, that a country does not need to achieve success as measured by instrumental measures before investing in welfare directly. The disparity in substantive measures in sub-Saharan Africa and South and Southeast Asia demonstrates that the higher quality of life in South and Southeast Asia may have contributed to its success as measured by economic growth. Additionally, direct increases in substantive well-being should be considered successful outcomes. Development programs should attempt to improve welfare in a country based on both instrumental and substantive measures.

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Appendix

Table 1: Descriptive Statistics
Basic Indicators: Sub-Saharan African and South and Southeast Asia

		GDP per capita growth rate		GDP per capita (US $)		Effective Aid/ GDP	
		1966-1969	1994-1997	1966-1969	1994-1997	1970-1973	1994-1997
Sub-Saharan Africa (48 countries)	Mean	1.3	1.7	970	1,294	0.22	3.68
	Median	1.5	1.8	760	834	0.80	3.18
	Std. Dev.	2.5	4.9	653	1,331	2.62	2.91
South and Southeast Asia (14 countries)	Mean	2.8	3.8	1,270	3,409	0.48	0.60
	Median	2.5	4.0	1,137	1,748	0.38	0.26
	Std. Dev.	3.1	1.9	850	3,960	0.35	1.00
T-Test p-value*		0.08	0.01	0.14	0.03	0.27	0.02

Data is in 4 year aggregates.
*For the time periods 1966-1969 and 1970-1973 a two-tailed t-test was used, for the time period from 1994-1997 a one-tailed test was used.

Table 2: Descriptive Statistics
Independent Variables (excluding Effective Aid)

	Sub-Saharan Africa			South & Southest Asia		
	Mean	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**
Ethnic Fractionalization	0.651	0.715	0.247	0.661	0.700	0.146
Assassinations	0.072	0.000	0.210	0.233	0.000	0.532
Institutional Quality	4.376	4.333	1.339	5.591	5.400	2.650
Budget Surplus/GDP	-0.046	-0.035	0.061	-0.025	-0.024	0.040
Inflation (log(1+infl))	0.651	0.715	0.244	0.094	0.077	0.127
Sachs-Warner	0.138	0.000	0.328	0.480	0.000	0.496
Population (log)	15.070	15.310	1.530	17.018	17.559	2.342

Data is in 4 year aggregates.

Table 3: Descriptive Statistics
Dependent Variables: Substantive Measurements of Development

		Telephone Lines (per 100 people)		Agriculture (value added as share of GDP)		Primary Education Enrollment		Life Expectancy	
		1970	**1994**	**1970**	**1994**	**1970**	**1994**	**1970**	**1994**
Sub-Saharan Africa	**Mean**	0.43	2.20	36.8	31.2	530,638	1,717,739	46	53
	Std. Dev.	0.12	0.67	2.88	2.61	130,262	427,446	0.86	1.09
	Median	0.19	0.55	34.0	32.6	194,499	617,963	45	53
South and Southeast Asia	**Mean**	0.58	7.04	38.1	25.9	6,221,687	12,825,736	52	64
	Std. Dev.	0.36	3.07	4.27	4.30	3,193,202	6,341,306	2.37	2.07
	Median	0.16	1.85	36.8	25.8	1,684,263	3,458,061	49	62

Table 4: Correlation in Infrastructure

Sub-Saharan Africa in 1990		
	Roads	Telephone Lines
Roads	1.000	
Telephone Lines	**0.7653**	1.000
South & Southeast Asia in 1990		
	Roads	Telephone Lines
Roads	1.000	
Telephone Lines	**0.9169**	1.000

Figure 1: Mobile Phone Usage

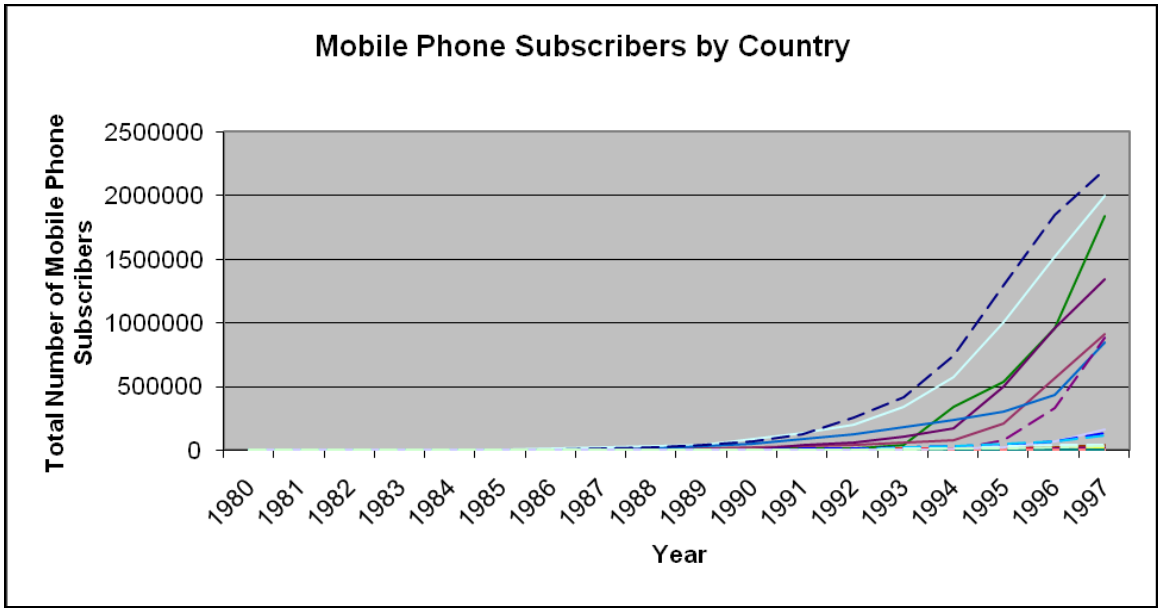

Table 5: Regression Results
Dependent Variable: Life Expectancy

	Current Time Period	Lagged One Time Period
Effective Aid	0.0128 (0.22)	0.0351 (0.55)
Ethnic*Assassinations	-0.1518* (-2.19)	-0.2205** (2.67)
Ethnic	-0.1063* (-2.14)	-0.0967 (-1.48)
Assassinations	0.2006** (2.90)	0.2807** (3.75)
Budget Surplus	0.0300 (0.75)	0.0420 (0.84)
Inflation	-0.0301 (-1.02)	-0.0700 (-1.84)
Economic Openness (Sachs Warner Index)	0.1061 (1.88)	0.0515 (0.77)
Institutional Quality (Knack and Keefer)	0.0395 (1.04)	0.0898 (1.79)
Log of Population	-0.0563 (-0.71)	0.0042 (0.05)
Log of Initial GDP per Capita	0.3702** (5.80)	0.3474** (5.49)
South Asia	0.3927** (7.09)	0.2470** (4.24)
Southeast Asia	0.3882** (6.32)	0.4120** (5.73)
R Squared	0.7337	0.7230

This table presents standardized coefficient estimates with robust t-values in parentheses. The regression also included period binaries. Two tail test results are depicted as such: ** significance at the 1% level. *significance at the 5% level.

Table 6: Regression Results
Dependent Variable: Agriculture (value added ,% of GDP)

	Current Time Period	Lagged One Time Period
Effective Aid	-0.1579 (-1.77)	-0.0347 (-0.59)
Ethnic*Assassinations	-0.0610 (-0.54)	-0.0123 (-0.11)
Ethnic	0.0888 (1.93)	0.1111* (2.23)
Assassinations	-0.0007 (-0.01)	-0.0823 (-0.71)
Budget Surplus	-0.0107 (-0.19)	0.0127 (0.22)
Inflation	0.0310 (0.52)	0.094 (0.96)
Economic Openness (Sachs Warner Index)	-0.0399 (-0.50)	-0.0631 (-0.75)
Institutional Quality (Knack and Keefer)	0.0734 (1.28)	0.0245 (0.42)
Log of Population	-0.1538 (-1.59)	-0.1420* (-2.24)
Log of Initial GDP per Capita	-0.9268** (-9.87)	-0.8711** (-14.38)
South Asia	0.2190* (2.54)	0.2211** (3.07)
Southeast Asia	0.2179* (2.18)	0.2357** (2.67)
R Squared	0.6102	0.6838
This table presents standardized coefficient estimates with robust t-values in parentheses. The regression also included period binaries. Two tail test results are depicted as such: ** significance at the 1% level. *significance at the 5% level.		

Table 7: Regression Results
Dependent Variable: Infrastructure (Telephone Lines per 100 people)

	Current Time Period	Lagged One Time Period
Effective Aid	0.0705 (1.02)	-0.0066 (-0.05)
Ethnic*Assassinations	0.1298 (0.98)	-0.0220 (-0.67)
Ethnic	-0.0589 (-0.97)	-0.1073* (-2.31)
Assassinations	-0.171 (-1.15)	-0.0514 (-0.40)
Budget Surplus	0.1832 (1.34)	0.1758* (2.15)
Inflation	0.1105 (1.64)	0.0741 (1.77)
Economic Openness (Sachs Warner Index)	-0.2251 (-1.55)	-0.1752* (-2.08)
Institutional Quality (Knack and Keefer)	0.3075** (3.87)	0.3016** (4.16)
Log of Population	0.0446 (0.74)	0.0765 (1.07)
Log of Initial GDP per Capita	0.4163* (2.26)	0.1100 (0.82)
Urban Population (% of Total)	0.0433 (0.82)	0.4558** (3.38)
South Asia	0.0376 (0.62)	0.0290 (0.44)
Southeast Asia	0.1939 (1.85)	0.1354 (1.88)
R Squared	0.555	0.7115

This table presents standardized coefficient estimates with robust t-values in parentheses. The regression also included period binaries. Two tail test results are depicted as such: ** significance at the 1% level. *significance at the 5% level. The urban population variable is not lagged in either regression.

Table 8: Regression Results
Dependent Variable: Enrollment in Primary Education

	Current Time Period	Lagged One Time Period
Effective Aid	0.0055 (0.17)	0.0459** (2.84)
Ethnic*Assassinations	0.1146** (2.66)	0.0442 (1.05)
Ethnic	-0.0413** (-3.12)	-0.0666** (-3.75)
Assassinations	-0.1308** (-2.78)	-0.0386 (-0.83)
Budget Surplus	-0.0249 (-1.34)	-0.0157 (-0.81)
Inflation	0.0560** (2.93)	0.0105 (0.62)
Economic Openness (Sachs Warner Index)	0.0175** (0.68)	-0.0203 (-0.75)
Institutional Quality (Knack and Keefer)	-0.0712** (-3.24)	-0.0329 (-1.25)
Log of Population	0.9811** (30.04)	1.0161** (36.65)
Log of Initial GDP per Capita	0.2249** (6.31)	0.1500** (3.96)
Youth (% of Population Under 15 years of age)	0.1273** (3.81)	0.1316** (-4.96)
South Asia	0.0253 (0.69)	-0.0491 (-1.50)
Southeast Asia	0.0230 (1.02)	0.02276 (0.97)
R Squared	0.9434	0.9600

This table presents standardized coefficient estimates with robust t-values in parentheses. The regression also included period binaries. Two tail test results are depicted as such: ** significance at the 1% level. *significance at the 5% level. Log of Youth Population is not lagged in either regression.