ECONOMIC DEVELOPMENT, SOCIAL DISLOCATION AND POLITICAL TURMOIL IN SUB-SAHARAN AFRICA: A POOLED TIME-SERIES ANALYSIS AND A TEST OF CAUSALITY

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This study focuses on economic development and political turmoil in post-independence Sub-Saharan Africa. There has been a resurgence of interest in the region following the end of the Cold War. In 1997 U.S. president Bill Clinton took a 12-day tour of the region. In 1999 the U.S. Congress (106th Congress) passed the Growth and Opportunity Act and the Hope for Africa Act, designed to encourage political stability and economic development in the region. Although most Sub-Saharan African countries attained independence from colonial rule in the 1960s, more than 30 years of self-government have brought little economic development and political stability to the region.

This study attempts to analyze, theoretically and empirically, the relationship among economic development, social dislocation and political turmoil. Social dislocation, as defined in this study, means "urbanization," and it is used as an exogenous variable to model and test the hypothesized causal relationship between economic development and political turmoil.

This study employs pooled cross-sectional time-series and seemingly unrelated regression analyses, as well as Granger-causality, to examine the hypothesized relationships and causality in 24 Sub-Saharan African countries from 1971 to 1995.

The results confirm the classical economic development theory's argument that an increase in economic development leads to a decrease in political turmoil. The result of the pooled analysis is confirmed by a SUR analysis on the strength of the relationship at the individual country level in 21 of the 24 countries. However, an indirect positive relationship exist between economic development and political turmoil through social dislocation. At lag periods 1 and 2, I found a causal ordering leading from economic development to political turmoil, indicating a causal relationship from economic development to social dislocation and from social dislocation to political turmoil.

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CHAPTER 1

INTRODUCTION

There has been a resurgence of interest in the economic and political structures of the less-developed countries. The heightened interest in developing nations could be attributed to the end of the politics of the Cold War and the subsequent disintegration of the Soviet Union. In recent years, following the end of the politics of East-West and Cold War, the U.S. Congress has been showing interest in economic development and investment in Sub-Saharan Africa. In 1998 President Clinton embarked on a 12-day tour of the Sub-Saharan Africa, one of the longest and most extensive tours of this region by any U.S. president.

To understand the trend in development studies, one has to review the research that has been done on developing countries in regards to their economic performance and political systems. Therefore, the focus of this study is on economic development and political turmoil. The foundational literature on the subject of

development and polities postulates that economic development leads to political stability in the developing nations of Africa, Asia and Latin America. 2 Thus, to the proponents of this school of thought, the panacea for the political distress of the developing nations is more economic aid and economic growth and development. Hence, the prodevelopment scholars see in development the solution to strikes, political assassinations, riots, civil strife and other forms of unconventional political expression(Arendt 1963; Gurr 1968, 1971; Millikan and Blackmer 1960).

Yet there is a counterintuitive approach to the study and analysis of development and turmoil in developing countries. According to this approach, economic development can have a destabilizing influence upon the polities of less-developed countries. Within this antithetical intellectual vein are scholars, such as Feierabend and Feierabend 1972, Gurr 1968, Olson 1963 and Tocqueville 1955. The literature on development and comparative politics is replete with works that posit that economic development leads to political turmoil. Hence, it is normal some to theorize an association or causal relationship between economic development and political turmoil. In his study of conflict, Rummel (1977,21) notes

that conflict and violence stem from certain social and political transitions, such as those brought about by economic development:

> Change produces conflict, namely the change that alters power relationships, promotes conflict and the change from one society (power configuration) to another type involves the most violence; as the change (rate) in education and communication increases relative to economic development, the probability of conflict also grows.

Rummel's central thesis is that conditions that lead to instability (revolutions and political violence) generally exist, not at a time of economic impoverishment, but during periods "when conditions are better or have been improving" (Rummel 1977, 71). Similarly, Davies (1969, 1970, 1973, 247) argues that revolution and violence follow periods of rising expectations and improved conditions. As the lot of the masses improves, more citizens become accustomed to improved living conditions and expect their standard of living to continually improve. Therefore, according to Davies, political turmoil arises when citizens are concerned that the economic and social status that they have attained or hoped to attain is an elusive goal. In his J-curve theory of political violence, Davies reviewed the economic and political factors prevalent in the United States during the Dorr's Rebellion of 1842; in Russia during the Russian

Revolution of 1917; and, in Egypt before the Egyptian Revolution of 1952, and he discovered that preceding these revolutions were periods of economic prosperity followed by periods of economic decline. In each of these revolutions, it is at the point at which economic growth and prosperity begin a downward trend that political turmoil occurs. The Davies J-curve theory of political violence has its theoretical origin in Marx's and Tocqueville's theories of revolution. Describing the economic conditions that gave rise to the French Revolution, Tocqueville observed that, while peasants in other European countries lived as serfs and were economically and politically dependent upon their landlords, in France the peasants were independent of landowners. The vestiges of serfdom had been removed, as restrictions on peasants had been relaxed. The peasants had also become landowners as their economic lot continued to improve (Tocqueville 1955, 22,23,30, 31). Clearly, while the classical approach to the development-stability hypothesis posits that hunger begets violence, the antithetical views espoused in the works of the analysts such as Tocqueville, Davies, Olson and others see periods of economic development as leading to political turmoil and political violence.

In this study, I examine the merits of the argument advanced by the economic development-political instability theorists. I examine the relationship among economic development and social dislocation and political turmoil and also explore whether there is a causal link between economic development and political turmoil; economic development and social dislocation; and social dislocation and political turmoil, using Granger-causality. The central question that this study attempts to answer is: Can political turmoil accrue from economic development and social dislocation, and if so, are there causal relationships among the variables in Granger-sense?

In this study, economic development is used interchangeably with economic growth and is measured as the rate of change rather than the level of economic development. The rationale for this operational definition and the variable from which the index of economic development are explained fully elsewhere in this study.

Chapter 2 is a discussion of economic development and models of political turmoil. The crux of the contending models is presented, and the points of divergence with the current analysis are highlighted. Chapter 3 examines the political, economic and population trends of modern Sub-

Saharan Africa and attempts to place this in a historical context. The competing models of political and economic development are also presented. Chapter 4 presents the definitions and measurement of dependent and independent variables of interest; the hypotheses to be tested; the analytical models; and the discussion of the data-transformation strategy implemented in this study. In chapter 5, I test the hypotheses and present the results. Conclusions drawn from the findings and suggestions for future research are discussed in chapter 6.

CHAPTER 2

ECONOMIC DEVELOPMENT AND MODELS OF POLITICAL TURMOIL

A Review of Pertinent Literature

The relationship among economic development, social dislocation and political turmoil in developing countries has continued to arouse the interest of comparative politics and development specialist. In the foundational literature, economic development is viewed as leading political stability. The rationale for the development-begets-stability (also referred to hereafter as "development-stability linkage") hypothesis is based on the assumption that developed nations have a moral obligation and an economic as well as political interest in the stability and development of the Third World countries. It is the view of the proponents of this approach that to ameliorate the instability that marks the polities of the developing regions of Africa, Asia and Latin America, more economic development and growth should be encouraged in those regions. Consequently, the development-led stability scholars ascribe to lack of

economic development the conditions of political turmoil, such as revolt, strikes, political strife and protest, poverty and deprivation (Arendt 1963, Gurr 1968, McGowan and Johnson 1984, Millikan and Blackmer 1960, Rostow 1960, and Zeitlin 1966).

The linkage between development and turmoil has also been a subject of interest to comparative political theorists and econometricians. Traditionally, economists have argued that sustainable economic growth cannot be achieved in an unstable political system (Bashir and Darrat, 1994, 69). Thus, Hoselitz and Weiner note that this ideology, more than any other, formed the basis of American programs for economic aid in developing nations (Hoselitz and Weiner 1961, 172). Much of the evidence in extant literature that supports the development-led-stability hypothesis is anecdotal and for decades had formed the basis for the foreign aid policies of the industrialized nations toward the developing countries. Needler has examined the role of the military in Latin American politics and finds that "the [military] overthrow of a government is more likely when economic conditions are deteriorating" (1966, 624). However, in a later study, he finds that political stability and economic development are commensurable (1968, 86-91). Needler

defines political instability as the observance of constitutional norms and conventional political participation, such as popular voting, and he defines economic development as life expectancy.

Contrary to the view that economic development precedes political stability, other scholars have noted that economic development produces political instability in developing countries. For example, in a longitudinal study of economic development and political instability in India, Hoselitz and Weiner (1961,173) observe that provinces where the most economic prosperity is registered (such as in Bengal, Bombay, Madras and Punjab) are also the provinces that logged the most severe forms of political violence:

> In other words, a simple correlation between the level of economic performance and political stability in different areas of India would show that, on the whole, the economically most-advanced regions also exhibited more violence and other signs of stark political instability than the economically less-developed ones.

Rummel tends to share this view. He argues that most often, unconventional forms of political expression such as revolution and violence occur "when conditions are better or have been improving" (1971,71). In a cross-national study of domestic conflict, Feierabend and Feierabend (1966, 1972) find that states that registered

the highest levels of socioeconomic change, in the form of growth, tend to be the least stable, while those that registered the lowest levels of change tend to exhibit stability. In short, they argue that high socioeconomic growth begets political turmoil.

Olson (1963) offers the most direct theoretical causal linkage between economic development and political instability. In his seminal article "Rapid Growth as a Destabilizing Force," Olson argues that it is the replacement of traditional economy by factories and modern business institutions, combined with the diminution of the family ties upon which traditional economies are built that creates the conditions that lead to political instability. Olson introduces the element of social institution as an intervening variable as he argues that it is the disconnection of the masses from these institutions (from their ties to the nuclear and extended families) that foments political agitation and the resultant political instability. Thus, Olson postulates the following:

> Even the family group, and especially the clan or extended family, can be destroyed by the occupational and geographic mobility associated with economic development. The replacement of subsistence agriculture and cottage industry, normally organized around the family, with factory production by workers hired individually, can weaken family ties.

> Similarly, modern business institutions are bound to weaken or even destroy the tribe, the manor, the guild, and the rural village. The uprooted souls torn or enticed out of these groups by economic development are naturally susceptible to the temptation of revolutionary agitation. (1963, 532-33)

From the foregoing, the Olsonian hypothesis is clearly within the framework of the development-led-instability hypothesis. The Olsonian hypothesis forms the crux of this study for two reasons: 1) The hypothesis straightforwardly links political instability to economic development. 2) The model explicitly specifies a causal explanation of political instability that cannot be modeled with economic development variables alone. In light of Olson's proposition, I have introduced an intervening social variable, which, in this study, is the "social dislocation" variable.

However, Olson offered little guidance about how one can explicate the hypothesized causal implication of the disintegration of social institutions (the family structure, the village and tribal bonds) for developing nations. How one is to measure the hypothesized deleterious effect of "geographic mobility," "modern business institutions" or the resultant effects of economic development on the social institutions is not explained. The paucity of data on social institutions and

population migration patterns of Sub-Saharan African countries poses a challenge to research and impedes the ability to model and measure social dislocation in the region.

Because social dislocation is an imprecise concept, a practical definition of the application and measurement of the concept is imperative. Lack of data is pervasive in Sub-Saharan African countries and poses formidable problems for research in the region. To minimize the problem of lack of data on social trends, I have used population data to create a proxy variable for social dislocation. Olson implicitly argues that population pressure would shift from rural to urban centers as citizens emigrate to urban centers with the hopes of improving their economic condition through employment in nonagricultural sectors of the economy. To measure social dislocation, I have used urban population as a percentage of the entire population. The variable that resulted from this operational definition for social dislocation is "urbanization." The practice of explicating social dislocation with population is a common practice in the literature. Cuikerman, Edwards and Tabellini have used urban population as a percentage of total population to measure urbanization (1992:554).

In modeling Olson's theory of economic development-political instability, I argue that population data are empirically sound as a proxy for social dislocation, because factories, industries and other nonagricultural sectors of the economy are often located in urban areas and are far removed from the remote locations of the villages of the Sub-Sahara African countries. In order to access employment in the industries, workers often migrate to areas where the industries are located, which is most often in the urban centers. For those who have relocated into these urban areas, contact with traditional family units, left in distant villages, is infrequent and irregular due to the absence of functional communication and transportation infrastructures. Therefore, the new urban dwellers are likely to be dislocated and detached from their nuclear and extended families for long periods of time. The operational definition of social dislocation that I have offered in this study enables me to use "urbanization" as an exogenous variable in modeling political instability and to test the hypothesized relationship among economic development, social dislocation (urbanization) and political turmoil.

Other scholars who have linked economic development to political turmoil are the modernization-instability

theorists, exemplified by Black (1966), Deutsch (1961), and Huntington (1968, 1971). Central to the thesis of the modernization-instability theorists is that political instability results from social mobilization, political participation, economic development and political institutionalization. For Deutsch, transitional changes such as urbanization, industrialization, literacy, economic development and social mobilization result in "the process in which major clusters of old social, economic and psychological commitments are eroded or broken, and people become available for new patterns of socialization and behavior" (1961,494). While Olson postulates that economic development and political instability are directly correlated and are caused by social dislocation, to Deutsch the relationship between economic development and political turmoil is an indirect relationship. However, Deutsch argues that the relationship stems from the need to mobilize socially along new allegiances and new cleavages. Also referred to as the "social-process," due to its emphasis on "industrialization, urbanization, commercialization, literacy expansion and occupational mobility" (Huntington 1971, 309), the modernization-instability model arguably leads to political instability through social changes:

> Urbanization, increase in literacy, education, and media exposure and the resultant enhanced aspirations and expectations which, if unsatisfied, galvanize individuals and groups into politics. In the absence of strong and adaptable political institutions, such increases in participation mean instability and violence. (1968, 47)

Huntington notes that the primary problem of politics is the "lag in the development of political institutions behind social and economic change" (Huntington, 1968, 5). He argues that it is the absence of developed political institutions to moderate the pressure that social and economic changes exert on political systems that effects political instability. Therefore, in Huntington's construct, economic development is subsumed in the model of modernization and political instability as an intervening variable:

> Economic development increases economic inequality at the same time that social mobilization decreases the legitimacy of that inequality. Both aspects of modernization combine to produce political instability. (Huntington 1968, 58-9)

Huntington concludes that the evidence exists to support an association between development and instability, but that the apparent relationship is unclear, conflicting, and at the very least, complicated (Huntington, 1968, 51-52). Other analysts have also noted that the theorized relationship between economic

development and political instability is unclear, and they caution against drawing hasty conclusions concerning the effects of economic growth on the stability of political systems (Hagen 1966, Hoselitz and Weiner 1961).

To Gurr and Ruttenberg (1967) political instability accrues from relative deprivation and frustration. In his causal model of civil strife, Gurr (1968) notes that relative deprivation results when the value expectations and the capacities to fulfill those expectations are misaligned. If the capacity to improve one's quality of life is declining, Gurr and Ruttenberg argue, then frustration can give way to manifest unconventional political behavior such as riots and violent protests:

> The necessary precondition for violent civil conflict is relative deprivation, defined as actors' perception of discrepancy between their value expectations and their environment's value capacity. Value expectations are the goals and conditions of life to which people believe they are justifiably entitled. (Gurr and Ruttenberg 1967)

In the same vein, Davies posits that revolution is most likely to occur when a "...prolonged period of rising expectations and rising gratifications [quality of life] is followed by a short period of sharp reversal of hope and expectations, during which time the gap between expectations and gratifications" becomes increasingly unbridgeable (Davies 1971, 691). Using the ratio of

deaths per million population to annual rate of economic growth, Russett (1967) showed that, while deaths initially increased, the increase did not sustain after a period of time. He found that deaths per million population declined, causing a curvilinear trend between economic growth and political violence. Despite Russet's findings, I point out that the singularity of the dependent variable "death" poses a problem for the reported result. It is possible that while "deaths" may have declined after a period of time, other proxy measures of instability, such as riot, government crisis, violent demonstrations and guerrilla warfare, may have continued to increase. Therefore, the noted curvilinear relationship between economic development and deaths resulting from political violence must be evaluated carefully. Additionally, the repression-aggression scholars' tendency to measure deprivation, which is a psychological and physiological concept, with national aggregate data poses a theoretical problem (Rummel 1977). Secondly, the findings reported in these studies may have been confounded by the research designs. For example, in Gurr's (1968) study, the event data he used to measure the causal linkage between deprivation and aggression were collected for only a period of five years, a period of time that would normally

be considered insufficient for a pooled time series study. When modeling for the complexities of time and space interactions and lag factors, as in pooled times series analysis, it is doubtful that one can establish causality in such a short period of time.

From the foregoing review of pertinent literature, it is clear that the evidence in the extant literature concerning the relationships among economic development, social dislocation and political instability is inconclusive. I argue that this lack of clarity in existing literature stems from the application of inappropriate methodology or model misspecification. The lack of coherence and clarity in the findings of prior studies can be remedied by employing a more robust methodology, such as pooled time-series to investigate the effects of space and time interaction. Additionally, for too long, analysts have measured economic development in terms of the welfare of the average person. As a result, prior studies have used variables, such as primary and secondary school enrollment (literacy rate), infant mortality rate, life expectancy at birth, calorie intake and the number of hospital beds per thousand population to measure economic development. The rationale for the use of these person-based welfare variables is that such

variables indicate how well the average person is faring (Sewell 1977, Zartman, Paul and Entelis 1971). As a result, economic performance data are presumed inadequate measures of economic development. For example, Zartman, Paul and Entelis noted of GNP per capita that it is "inaccurate and specifically it is realistically inapplicable to the man in the street" (Zartman, Paul and Entelis 1971, 298), because a new oil well or mineral mine may greatly improve "the gross national product with almost nothing reaching the man in the street" (1971, 298).

If we accept the thesis that economic development is the "growth in the total economic activity and output of a society," using Huntington's definition (1968, 33-4), then I argue that the "welfare" variables (referred to in the literature as physical quality-of-life variables) do not yield accurate results as measures of economic development. Besides, while welfare variables can be used to assess the ability of the average citizen to have an improved quality of life, the persistent lack of reliable data, as well as the gaps in reporting social data in developing countries, substantially hampers the value of quality-of-life measures.

In light of these problems, the need for a better and

more effective measure of economic development becomes a salient task. Thus, in this study, I use the indicators of economic activities, namely gross national product per capita (GNP/capita), personal consumption (PC) and industries' contribution to gross domestic product (GDI) data to measure economic development. The view that growth in the aggregate economic performance of countries does not translate directly to the welfare of the citizens is unfounded and based upon intuitions and hunches. To propose that the economic performance of countries would not have implications for a great majority of the citizens is to argue that national economic policies do not matter. The level of economic growth that Japan and Asia have attained has, in large measure, led to an improved quality of life for their citizens. After all, to extract the minerals in a new oil field or in a gold mine would require the construction of proper infrastructures and the employment of the right size of labor force. In essence, these factories and mines do yield employment and produce national wealth. The average person who is employed in the nonagricultural sector of the economy does become a beneficiary of the improved national economy.
Additionally, the measures that I employ in this study (i.e., aggregate economic data) are consistent with the

measures used by Darrat (1987), Gyimah-Brempong and Traynor (1996), Schneider and Schneider (1971) in economic literature. National economic aggregate indicators have been used in political economy literature as well, by scholars such as Bollen and Jackman (1985), Bradshaw and Tshandu (1990), Cutwright (1963), Diamond (1978). The use of aggregate economic indicators to measure economic growth and development is not a recent practice in the field of Political Science. Olson (1983) and Choi (1979) used rate of growth of "income of labor" and "private nonfarm income," and Gray and Lowery (1988) extended these measures by including growth rate of "manufacturing income" in the study of interest group politics and economic growth in the states.

To summarize, the modernization-instability paradigm is similar to Olson's economic development-instability model. In fact, Huntington notes that "it can, however, also be argued to the contrary that economic development itself is a highly destabilizing process and that the very changes which are needed to satisfy aspirations in fact tend to exacerbate those aspirations" (1968, 49). The following is a review the various definitions and measures of political instability in the literature.

Models of Political Turmoil

From the foregoing discussion, it can be concluded that the relationship between economic development and social dislocation on the one hand and political instability on the other is complex and one that would require that the term "political instability" be defined with precision. The literature on the meaning of political instability and how it is defined and measured can be categorized into four broad approaches, namely, a) the frustration-aggression approach, b) the frequent government turnover model, c) the absence of constitutional/legitimate governance model, and 4) the structural change approach. In the following section, I review these four models, along with their merits and demerits, and present solutions to the deficiencies of each, including a case as to why the term "political turmoil" would be a better descriptive term than "political instability". I use as my starting point the frustration-aggression hypothesis of political instability.

Frustration-Aggression Hypothesis

This approach views political instability as the outcome of an anomic process by which political stress is resolved through manifest conflict. The proponents of the frustration-aggression model argue that unconventional

political behavior, such as political protests, riots, civil strife, armed attacks and assassinations provide useful indicators for measuring political instability (Davies 1971, Feierbend and Feierbend 1966, Gurr 1968, Gurr and Ruttenberg 1967, Rummel 1974, Russett 1964, Taylor and Jodice 1983). This model forms the staple of the research in comparative politics and development literature.

For example, Davies (1971) defines political instability as revolution, and revolution is a form of political violence carried to the extreme that it is

> most likely to occur when a long periods of rising expectations and gratifications are followed by a period during which gratifications (socioeconomic or otherwise) suddenly drop off while expectations (socioeconomic or otherwise) continue to rise. (Davies 1971,133)

To the frustration-aggression theorists, the conditions for political violence and revolution are conducive when the gap between expectation and the fulfillment of those expectations rapidly expands. It is the widening of unmet expectations and the resultant economic distress and "social dislocation" that heighten anger and frustration among the affected population and provide the right political and social climate for revolution (Davies 1971,133).

Davies examines the American, French, Russian and

other revolutions and pointed out that these revolutions did not occur because of hardship. The revolutions resulted from the disruption of the expectations of improved quality of life that the citizens had grown accustomed to during the period of economic growth (1971, 137-47). The point that Davies makes is that economic development creates hope and expectations and that, when these expectations go unmet, citizens become agitated and grow more apt to engage in violent forms of political expression.

Feierabend and Feierabend (1971), in a cross-national study, show that the predictors of political instability are the levels of change in the ecological variables of development; namely, caloric intake, literacy, primary and post-primary educations, national income, cost of living, infant mortality, urbanization and radio sets per thousand population. Their work supports the development-instability hypothesis and fits within the framework of the frustration-aggression theoretical approach.

Viewed in the context of Sub-Saharan Africa, and within the framework of the frustration-aggression theorists, one can reasonably expect that higher levels of socioeconomic development (i.e., sustained upward trend in economic development and urbanization) would lead to an

unfulfilled false sense of economic well-being and greater expectations. Political turmoil and other forms of political distress would become manifest when the masses can no longer hope for a better standard of living or think that their aspirations cannot be attained. Social dislocation and the resultant increase in urban population then will lead to more political instability.

Although the theoretical underpinnings of the present study stems from Olson's model, this study diverges from the Olsonian model in one significant way. It is concerned with the increments in the indicators of economic development rather than in the pace of economic growth, as suggested in Olson's use of the term "rapid growth." I reiterate that in Sub-Saharan Africa, the question is not so much about the rate at which the engine of economic development turns, but about the size of the annual percentage change in GNP/capita, industries' contribution to GDP and personal consumption. Because rapid economic development is an imprecise term, its use creates a conceptual quagmire for anyone who is interested in measuring the rate of change.

Frequent Government Turnover Model

Proponents of the frequent government turnover model of political instability argue that frequent change of

government, or the longevity of a regime, constitutes a measure of the presence or absence of political instability (Banks and Textor 1968, Blondel 1968, Russett 1964, Taylor and Herman 1971, Goldberg 1968). Russett's stability index looks at the average longevity in office of the top executive (i.e., the head of state) as a measure of a country's political stability. The longer an executive stays in office the more stable the polity (Russett 1964, 102-4). Russett's work is representative of the literature on the frequent government turnover approach to studying political instability. The frequent government turnover model assumes that systems that are characteristically ephemeral are politically unstable, even when the transition of leadership is peaceful and orderly. This assumption represents a major flaw for the government-turnover model, because "change" in leadership, whether at the executive or party level, is not synonymous to political instability. When one equates change to political instability, one simply makes political instability ubiquitous and implies that it is diffused throughout the system. Characterizing every change in political leadership as an indication of political instability muddles the task of differentiating among the real and nontheoretical types of government change. When

one equates every change to instability, one is in essence arguing that any change in political leadership, irrespective of its nature and process, represents instability. Hurwitz makes this point well:

> It is obvious without even adequately defining this concept of stability, that some types of government change are more (or less) stable than other types. These non-theoretical differentiated types include, for example, assassination, revolution, coups d'etat, withdrawal of party from the governing coalition, loss of a vote of confidence, voluntary resignation of the prime minister, illness, accidental death, and the normal process of governmental change resulting from a regularly scheduled and institutionalized general parliamentary elections. (Hurwitz 1973, 453)

It is the lack of differentiation among the various kinds of processes and characteristics of change that renders Russett's taxonomy of political instability empirically indefensible. The executive turnover as a result of a parliamentary vote of "no confidence" that led to the resignation of Japanese Prime Minister Ryutaro Hashimoto should be sufficiently differentiated from other kinds of political actions that lead to leadership turnovers. For example, the student demonstrations in Indonesia in 1998 that led to the deaths of hundreds of Indonesians, and the subsequent resignation of President Suharto (the Indonesia president for 32 years) is substantively different from an executive turnover that

results from the replacement of an executive due to a parliamentary vote of no confidence. Therefore, as a model of political turmoil, the government-turnover model is significantly inadequate, for it does not delineate turnovers that result from mass protest, demonstrations or normal political processes such as a peaceful change in leadership.

Absence of Constitutional/Legitimate Governance

The constitutional/legitimate governance approach to defining and measuring political instability relies on the constitutionality and legitimacy of governments and their policies. This view was advanced by both Lipset and Needler. Proponents of this approach argue that, if the process of selecting the chief executive is tainted by deviant and undocumented procedures, then both the regime and its policies are illegitimate and unconstitutional and lack the support of the citizens (Lipset 1960 and Needler 1968). Lipset measures stability by the length of time a political system successfully resists the challenges of an antidemocratic opponent.

Using regime duration in office as a measure of stability, Lipset posits that, when a government loses 20 percent of its electoral support to an antidemocratic opposition within a period of 25 years, this represents a

form of political instability for the country. Further, Lipset argues that, if a legitimate political leadership is replaced after being in office for less than 25 years, or if it is seriously challenged by an antidemocratic movement that obtained at least 20 percent of the votes cast in an election, then the polity is unstable. In Lipset's construct, 25 years of uninterrupted governance with a gain of 19 percent of the electoral ballot by an anti-incumbent opponent would represent stability, since the threshold of 20 percent that is required in order to attain political stability is not achieved.

But the application of an arbitrary threshold limits the usefulness of the legitimacy model as a framework for measuring political turmoil. Lipset did not offer a rationale for accepting his threshold of 25 years of incumbency plus 61 percent of the electoral support as the threshold of political stability. The arbitrary nature of the threshold weakens the usefulness of the model as a theoretical scheme for measuring political instability (see Hurwitz 1973, 456).

Needler (1968) defines political instability as the absence of democracy, and democracy as the absence of free elections and civil liberties. For Needler, political instability is measured by the lack of free electoral

participation and civil liberties.

Conceptually, Needler seems to be equating the legitimacy of the process of governance to democracy. It is known that a political system can be democratic and also exhibit instability, and vice versa. For instance, India's multiparty system tends to yield fractionalized and fragile coalition governments. As a result, India's polity exhibits the characteristics of instability, in spite of the legitimacy of the process by which the governing regime is formed. In Indian politics, the political coalition that governs usually consists of a coalition of multipolitical parties that are led by one nationally dominant party, such as the Hindu Nationalist Party. Although the government is legitimate, political instability, marked by political violence, has a long pedigree in India's political process. It is for this reason that I argue that Needler's concept of political instability is ambiguous and poses an insurmountable obstacle for research design.

The Structural Change Approach

The proponents of the structural change model view change in the basic structure of political systems as an indication of political instability. Ake defines political structure as the network of political roles and

expectations that a society expects and accepts as a standard within "general limits of permissible behavior" (Ake 1974, 586). He continues:

> Political stability is the regularity of the flow of political exchanges. To the extent that the flow of political exchanges is irregular, the political system is unstable; to the extent that it is regular, the political system is stable... Politically destabilizing acts are irregular exchanges; all acts which are not irregular exchanges are politically stabilizing. (Ake 1974, 586-87)

Therefore, for the structural change theorists, the appropriate indicator of political instability is one that measures instances in which political role-expectations and norms of exchange are violated. A system, therefore, is said to be politically unstable when the conduct of political participants violates the political norms that have formed the bedrock of citizens' expectations of their political system, more so when such political conduct is judged to be irregular and devious. Political stability, therefore, is achieved when the observed political behavior is reconciled to the expected political role of the participants in the political process.

The above thesis implies that instability is system-bound and varies from one polity to another, according to each political system's rules of political conduct and the expectations of citizens of their particular polity. The

structural change approach to studying political instability lacks a common unit of analysis that can be invariably applied across systems.

The survey of extant literature shows a lack of consensus among analysts on the approach to measuring and defining political instability, in spite of more than three decades of research. It presents a problem for scientific inquiry. This lack of clear guidance prompted Sigelman (1979) to conclude that the reason research in the field on systems stability has yielded widely varied and conflicting results is that "different indicators of political instability have been factored into different dimensions; and different lag structures, or none at all, have been used" (224).

From the foregoing review of pertinent literature, we can conclude that political instability is variously defined; the definition is capricious; and it is what a polity determines it to be, based on individual polity's definition of political norms. This presents a problem for research, in that varied conceptual frameworks yield varied results, and as such they cannot be empirically generalized across political boundaries. If scientific knowledge is based on the notion of applicability of knowledge across systems (Johnson and Joslyn 1991, 17),

then the multiplicity of approaches and varied results makes generalization of research findings and replication of knowledge difficult.

What is anyone interested in exploring the causes of political instability in developing regions to make of the various approaches espoused in the literature? Despite the lack of consensus about how to define and measure political instability, it has become prevalent in the literature to define and measure political instability in terms of manifest political violence. Thus, for the purpose of this study, I adopt manifest political turmoil as a proxy measure for political instability. By "manifest political turmoil" I mean politically motivated unrest and violence initiated by the masses and directed at government officials or official policies of the state. Specifically, the measures of unrest that are employed in this study are general strikes, riots, antigovernment demonstrations and government crises, while violence is measured by political assassination and guerrilla warfare. These indices combined constitute the indicators of political turmoil.

In recent years, manifest political turmoil and civil strife initiated by the masses have led to changes in the political leadership in the Philippines (former President

Ferdinand Marcos of the Philippines); in Zaire (former President Mobutu of Zaire); and in Indonesia (former President Mohammed Suharto). Some forms of destabilizing political actions, such as coups d'etat are elitist-initiated and are not considered in this study. Such an action is conceived and implemented at the elite level of power and therefore requires little active involvement on the part of masses.

Banks's political event data are used[1] in this study. I exclude revolutions and coups from the variable list for two reasons: 1) Revolution is an extreme form of political violence and tends to be highly organized (Gurr 1970,10). It includes civil war, coups, mutinies and plots to overthrow the incumbent regime. These forms of political violence, as noted above, tend to be associated with elites and therefore differ from the types of political violence that are initiated by ordinary citizens. 2) Coups are excluded because they are elite-led attempt to overthrow of governments that are initiated from within

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[1] I am grateful to Professor David Leblang, a member of my dissertation committee, for making Banks's political event data available for this study. The data consist of assassinations, general strikes, guerrilla warfare, government crises, purges, riots, revolutions, antigovernment demonstrations and coups d'etat. They can be obtained from the Cross-National Time-Series Data Archive User's Manual 1995, through the Center for Social Analysis, State University of New York at Binghamton.

the halls of power.

Unlike prior studies in which time series and simple regression analysis were the statistical methods of choice, pooled time-series analyses are used in this study to examine relationships between the dependent and independent variables. In addition, Granger causality has been implemented to explore hypothesized causal linkages between the dependent and the independent variables. The implementation of these more sophisticated methods is one of the areas in which this study differs from prior ones.

In this chapter, I have reviewed the literature on political instability and argued that political turmoil is a more apt concept in examining the political and economic climate of nations of Sub-Saharan Africa. I concluded by examining the strengths and weaknesses of the various models that have been used in the literature to study political turmoil. In the next chapter, I examine the political economic and population trends in Sub-Saharan Africa, and provide some historical background on the performance of the region on some key indicators of economic development and growth. This is done in the context of the various approaches that are used in the literature to explain the causes of underdevelopment and political turmoil.

CHAPTER 3

THE POLITICS, ECONOMICS, POPULATION AND POST-INDEPENDENCE GOVERNANCE MODELS

The Political and Economic Trends

This chapter reviews the economic, political and population trends in post-independence Sub-Saharan Africa and attempts to place this study in a historical context. The map of the region, known today as Sub-Saharan Africa, is shown in Appendix E. Most Sub-Saharan African countries became independent in the 1950s and early 1960s. Prior to independence, most of the countries of Sub-Saharan Africa were partitioned enclaves governed as dependent colonies of the colonial governments of Great Britain, France, Portugal and Belgium. Great Britain, France and Belgium had a dominant influence on the economics and cultures of the region. Consequently, more than four decades after independence, English and French remain the lingua franca in most Sub-Sahara Africa. In Nigeria, with more than 200 ethnic languages and three dominant languages (Ibo, Hausa and Yoruba), English is the

dominant language of government, business and commerce.

Economically, Sub-Saharan Africa is the least developed region in the world. Seventy-five percent of the countries that make up the region are low-income ones, considering the level of economic development as depicted in Table 3.1 and Figure 3.1 (World Bank, 1995a). Taken together, the contribution of the region to the world economy is quite negligible. The lack of sustainable economic development in Sub-Saharan Africa has been attributed to the legacy of colonialism and the imperial policies of the colonists. However, some have argued that the dismal economic performance of the region has a direct correlation with the failed policies of the state and government interventionist policies of the post-colonial indigenous leaders (Bates 1981, Coleman and Halisi 1983, World Bank 1981). This view is often referred to in the literature as the new political economy, with strong roots in the work of both Berg and Bates. Berg and Bates argue that the economic maladies of the Sub-Saharan African countries have deep pedigrees in the post-independence political and economic policies of the region (Bates 1981, Berg in World Bank 1981). Lofchie (1984)notes that, although Sub-Saharan African countries varied in their approach to economic policies, a more homogenous policy

framework that was characteristically similar did emerge in the region. Invariably, the countries pursued post-independence industrialization policies that emphasized importation of light consumer and manufactured goods and dependency on government control of all facets of the economy. As a result, in country after country, governments control exchange rate and foreign exchange and implement quantitative control on the importation of certain goods in order to restrict competition (Lofchie 1994, 149-51). Yet others argue that the underdevelopment in Sub-Saharan Africa emanated from the master-servant and aid-recipient relationship that post-independence countries of Sub-Saharan Africa have maintained with their former colonists decades after independence. This view crystalizes the central thesis of the colonial-legacy and the dependency theorists represented by the work of scholars such as Rodney (1974), Cardoso (1977), Crawford (1988), Rothchild and Chazan (1988), Smith (1991), Chew and Denemark (1996).

In the context of Sub-Saharan Africa, the dependency theorists argue that Sub-Saharan African economy is tied to the master-servant relationship or the aid-recipient relationship that Sub-Saharan African countries experienced with their colonial masters.

Table 3.1: Level of Economic Development in Sub-Saharan Africa*

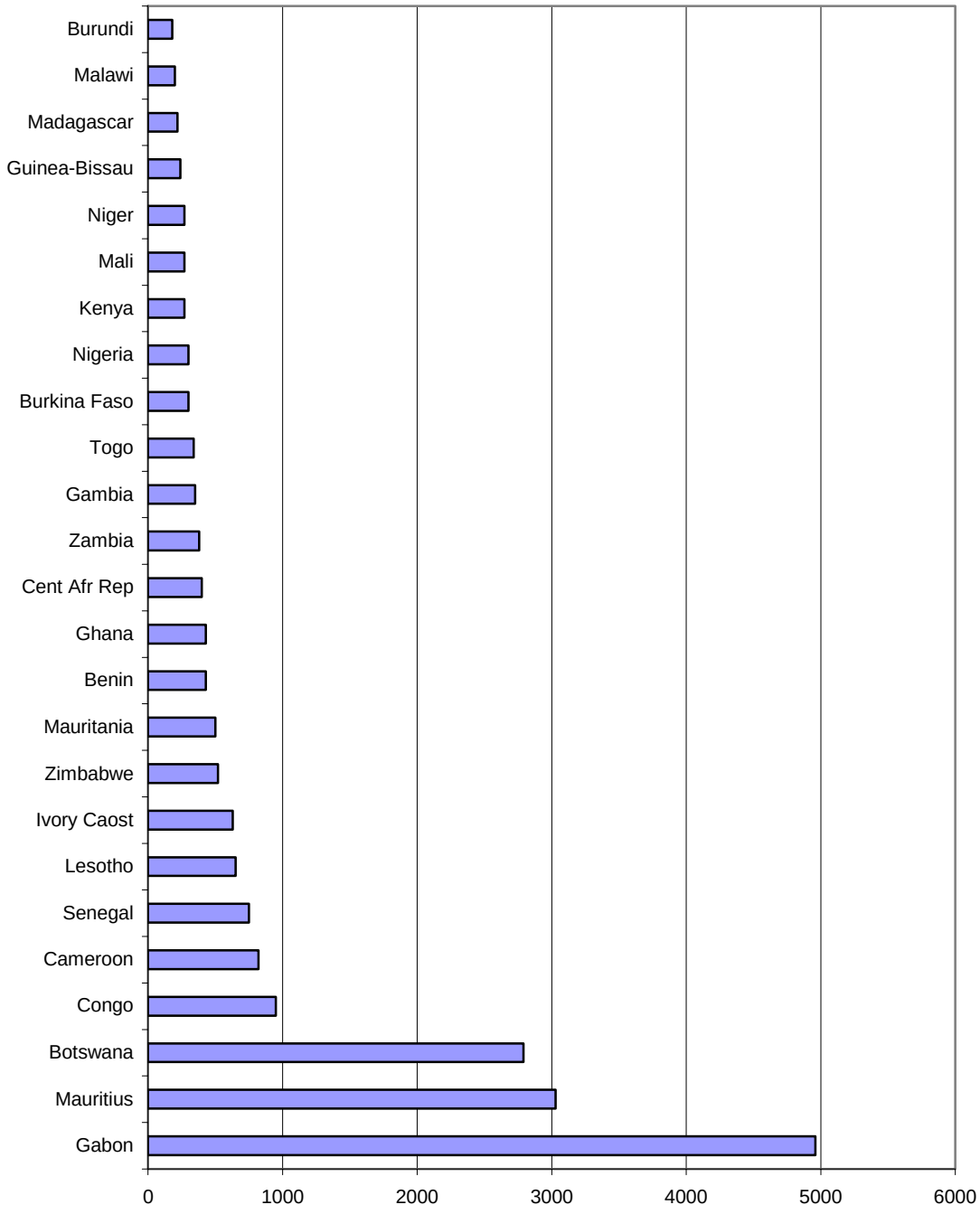
Countries	GNP/Capita In 1993 US	Total Pop 1993**	Urban Pop. as % of Total Pop.1993
Gabon	$4,960	1,007	48.3
Mauritius	3,030	1,091	40.6
Botswana	2,790	1,401	26.1
Congo	950	2,443	56.7
Cameroon	820	12,522	43.1
Senegal	750	7,902	41.3
Lesotho	650	1,943	21.6
Ivory Coast	630	13,316	42.3
Zimbabwe	520	10,739	30.7
Mauritania	500	2,161	51.0
Benin	430	5,086	30.4
Ghana	430	16,446	35.4
Central Afr. Rep	400	3,156	38.6
Zambia	380	8,936	42.1
Gambia	350	1,042	24.3
Togo	340	3,885	29.5
Burkina Faso	300	9,772	23.5
Nigeria	300	105,000	37.7
Kenya	270	25,347	26.1
Mali	270	10,135	25.7
Niger	270	8,550	16.3
Guinea-Bissau	240	1,028	21.3
Madagascar	220	13,854	25.8
Malawi	200	10,520	12.8
Burundi	180	6,026	7.0

Source: World Bank (1995b, 152-747) and World Bank (1995a, 157).

*The criterion used in this study to classify economies by levels of development is based upon the World Bank's GNP per capita approach, which classifies low-income, middle-income and high-income economies as those countries where GNP per capita in 1993 U.S. dollars in $695 or less, $696-$8,625 and $8,626 and up, respectively. But for the purpose of analysis, I have used "rate," rather than "level" of economic development to calibrate economic growth in Sub-Saharan.

** In million.

Figure 3.1: Gross National Product/Capita
in 1993 U.S. Dollars



Most countries in Sub-Saharan Africa gained political independence in the 1950s and 1960s. However, since gaining independence, most Sub-Saharan African countries have been governed by successive military regimes. The dominant role of military regimes in the political landscape of the region is affirmed by the frequency of military coups and plots from 1956 to the early 1980s. As shown in Table 3.2 and Figure 3.2, in the 27 countries for which there are data on military intervention in politics, there were 45 successful coups, 42 attempted coups, and 81 plots from 1950 to 1984. Attempted coups occurred in more than 70 percent of the countries, while nearly 63 percent experienced successful military takeovers of government during the period (Johnson and McGowan, 1984). With the exception of Uganda, the countries in which the military most frequently intervene in politics are Ghana, Benin, Burkina Faso and Nigeria (in West Africa) and Central African Republic and Congo (in East Africa).

One aftermath of colonialism seems to be the strong presence of the military in government. Zolberg (1966, 1968) notes that the most prominent feature of post-independent Sub-Saharan Africa might be instability,

cleavages and conflict. The initial expectation of orderly transition from colonialism to self-governance has not been realized amid the internal conflict, civil war, military coups and the intractable economic problems of the region. Military and authoritarian regimes have become the norm in much of Sub-Saharan Africa. Much of the region has been governed at various times by repressive governments, mostly military regimes.

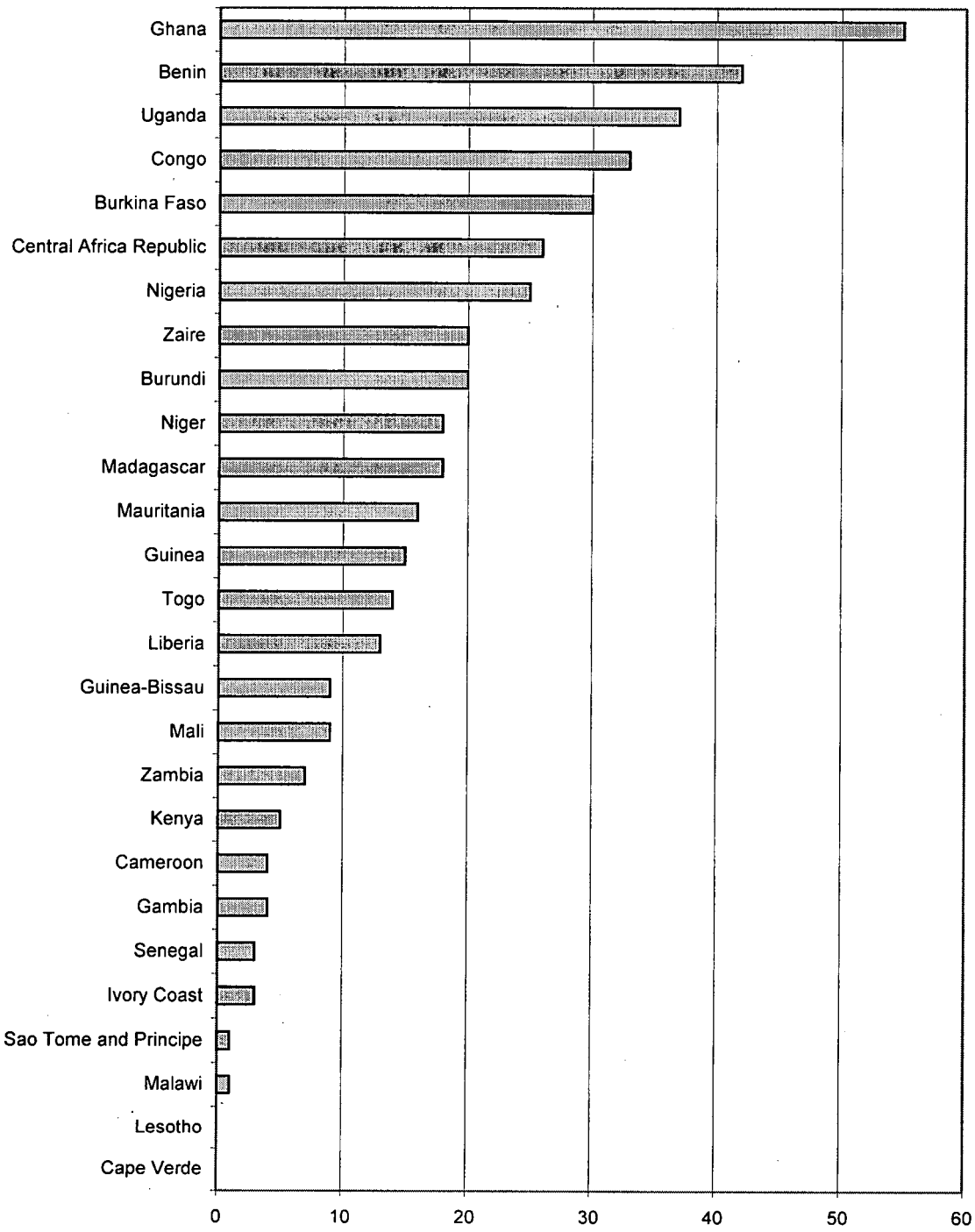
Reasons abound why military officers assert themselves in the politics of Sub-Saharan Africa. The armed forces often see their role as the guardian of the country; protector of the constitution; restorer of peace and tranquility; or the cleanser of corruption in the body politic (Nordlinger 1977, 20-3, 204-5). Often, the officers in uniform leave a political and economic legacy that is worse than the performance of the civilian regimes they toppled. The officers, upon taking over, take measures to tackle corruption and purge officers who had strong ties with the toppled regime. As a result, they convey the impression that they are assiduously defending the expressed political values in the constitution and restoring order, and economic development. But as Nordlinger (1977) has noted, shortly after ascendance to power, the military leaders' lack of training and

Table 3.2: Miliary Intervention in Sub-Saharan Africa from 1956-1984

Countries	T.M.I.S*	Coups	Attempted Coups	Reported Plots
Ghana	55	5	6	12
Benin	42	6	3	3
Kenya	5	0	1	2
Madagascar	18	2	2	2
Malawi	1	0	0	1
Burkina Faso	30	5	1	2
Cape Verde	0	0	0	0
Ivory Coast	3	0	0	3
Liberia	13	1	0	8
Mali	9	1	0	4
Mauritania	16	2	1	3
Nigeria	25	4	1	2
Niger	18	1	4	1
San Tome/Principe	1	0	0	1
Senegal	3	0	1	0
Uganda	37	3	6	4
Togo	14	2	0	8
Gambia	4	0	1	1
Guinea	15	1	1	7
Guinea-Bissau	9	1	1	1
Burundi	20	3	1	2
Cameroon	4	0	1	1
Central Afr. Rep.	26	3	3	2
Congo	33	3	5	3
Lesotho	0	0	0	0
Zambia	7	0	2	1
Zaire	20	2	1	7
Total Score	428	45	42	81
Mean Score	15.9	1.7	1.6	3.0

*Total Military Intervention Score.
N = 27.

Figure 3.2: Military Intervention Score in Sub-Saharan Africa Politics



preparation in state administration begins to hamper their ability to provide political leadership. Unprepared to govern, the soldiers engage in nefarious and wrongheaded policies that, in almost all cases, plunge the countries they have vowed to save into more intractable economic and political problems. Hence, Nordlinger notes that

> the relatively poor performance of miliary governments means that the successor governments are usually faced with problems that are at least as severe as those that confronted their civilian predecessors before the takeover. Not having markedly improved the rate of economic growth, and having rarely brought about major economic changes of a modernizing and progressive variety, the praetorians have not eased the problems of material scarcities and inequalities... And due to their inadequate performance, military governments have not eased and often exacerbated, the problems confronting the successor governments, without having enhanced their capabilities for dealing with them. (Nordlinger 1977, 206)

But as McKinlay and Cohan (1976) find in a comparative study of the economic and political performance of civilian and military-regime types, the performance of both regime types, regarding economic development, cannot be differentiated. Neither the duration of the miliary regime nor the number of successful miliary interventions had any effect upon regime performance. Military regimes did not perform worse than civilian regimes in economic development (McKinlay and Cohan 1976, 863). However, there are marked

differences in political performance between the two regime types when political turmoil is measured as the level of political activities or changes. McKinlay and Cohan find that civilian regimes performed better than military regimes (1976, 863).

In yet another study, McGowan and Johnson (1984,651) examine the frequency of military intervention in Sub-Saharan Africa and found that the countries of former colonies of France and Great Britain had coups more frequently than countries that were formerly colonized by Portugal and Spain (see Table 3.2 and Figure 3.2). Although the trend toward military intervention in former British and French colonies may not be directly related to the legacy of colonization, the dictatorial tendencies of Sub-Saharan African leaders in the post-independence era may have their roots in decades of forcible diminution of indigenous institutions of governance and the installation of district administrators by the colonists. As shown in Table 3.2 and Figure 3.2, the military has maintained a noted presence in the politics of Sub-Saharan Africa, especially in Ghana, Benin, Burkina Faso, Nigeria, Uganda, Central African Republic and Congo.

Economically, the trend in Sub-Saharan Africa depicts a region that endured economic distress during much of the

1980s and 1990s. Empirical data suggest that the predictions of sustainable growth and development for post-colonial Africa have not been realized. As the economic and political data on the region indicate, the gains made immediately after independence have been erased. The region has undergone cycles of political and economic crises and mismanagement of both human and natural resources. The economic development data presented in Table 3.1 and Figure 3.1 show the ranking of the Sub-Saharan Africa countries on the basis of economic development. The ranking is based on the World Bank's classification of economies by low, middle and high-income economies (World Bank 1994). Low income economies are countries with a GNP per capita of $697 or less in 1993 US dollars; middle economies are countries with a GNP per capita range of $696 to $8,625; and high-income countries have a GNP per capita of $8,626 or more in 1993 U.S. dollars (World Bank 1995a, 157). The use of GNP/capita to measure the level of economic development is supported in the literature (Banks and Textor 1968). The countries of Sub-Saharan Africa, with the exception of six countries (i.e., Senegal, Cameroon, Congo, Botswana, Mauritius and Gabon), are predominantly low-income economies. The average GNP per capita for Sub-Sahara Africa, excluding

the six middle-income countries, is a meager $372 in 1993 U.S. dollars, with Burundi lagging behind the 25 countries with a miserly $180 per capita.

Despite the poor performance of the region as conveyed in the economic development data, low income does not necessarily mean lack of development. If we liken low income to lack of development, then there would not be a need for this study or many of the development studies that focus on Sub-Saharan Africa, because Table 3.1 shows that much of Sub-Saharan Africa is low income. But because development is relative and can be serially measured as rate of change in economic activities, from one time point to another, a country can be low income (as measured in GNP per capita) and still register some impressive growth and development indices from one year to another, and cumulatively over a period of time. The Asia-Pacific region gives credence to this point. For example, in the Asia-Pacific region, in the 1980s, the aggregate economic performance data were low, yet in the 1990s the region consistently has recorded some impressive growth rates in all measurable economic growth indicators, regardless the 1998-1999 period of economic downturn in Asia.

The primary base of economic activities in post-

colonial Sub-Saharan Africa was the mining of natural resources and agriculture. Mining and extraction of minerals increased as the mainstay of foreign reserve, as wealth production through agriculture gradually declined. Industries' contribution to growth of gross domestic product (IGDP) has steadily declined from an average of 7.4 percent of the GDP in 1970 to -1.1 percent in 1993 (World Bank 1994, 30, 38).

In Sub-Saharan Africa, economic and political influence continues to be concentrated in the elite class in the same manner in which the elite population of the colonial era controlled the political and economic structures (Callaghy 1988, Hyden 1986). There has been considerable interest in the development literature concerning the search for alternative explanations of the patterns of development in the region. Sub-Saharan Africa is a region with multifaceted development problems. The magnitude of the crisis of development is evinced in all measurable indicators of economic development and growth. For example, from 1981 to 1991, the gross national product per capita (GNP/Capita) of the region declined by -45.3 percent, from an all-time high of $770 to $530, at a time when other regions were registering phenomenal growth

(Table 3.3 and Figures 3.3 and 2.4).

Table 3.3: GNP/Capita for Developing Regions*

Region	1981 $	1986 $	1991 $	Rate '81-'91(%)
Sub-Saharan Africa	700	530	530	-45.30
South Asia	430	510	720	18.20
East Asia and Pacific	430	510	720	40.30
Latin America/Caribbean	2280	1840	2470	7.70

*Data Source: World Bank, World Tables 1992 and 1995 (all in U.S. Dollar).

Figure 3.3: Gross National Product/Capita for Developing Economies

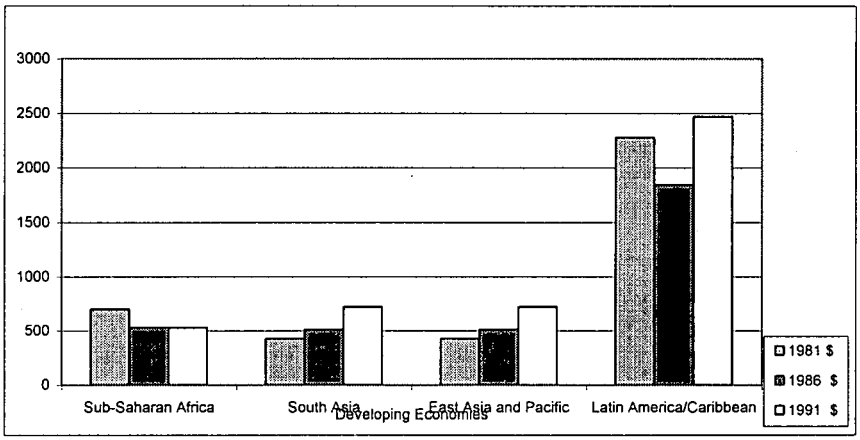
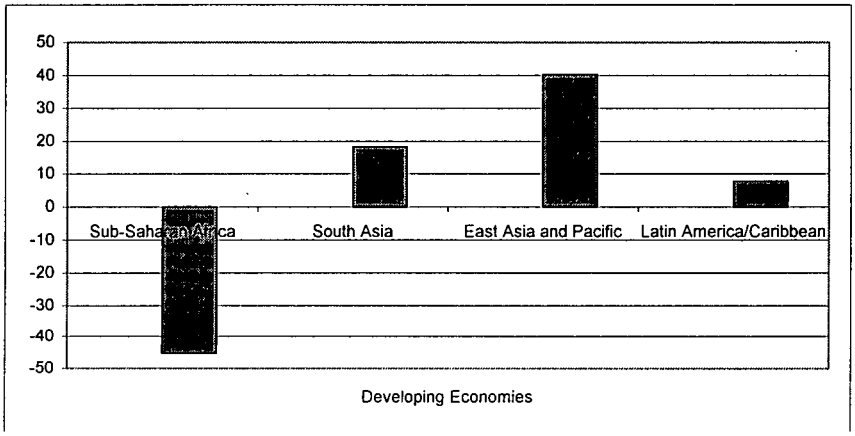


Figure 3.4: Growth Rate of GNP 1981-1991 (%)



During the same period, gross national income per capita (GNI/Capita) fell -23.4 percent (Table 3.4 and Figures 3.5 and 3.6), and private consumption per capita (PC/capita) declined -24.2 percent. As shown in Table 3.5, Figures 3.7 and 3.8, gross domestic investment (GDI) per capita declined -112.5 percent, from $170 in 1981 to a meager $80 in 1991 (World Bank 1995, 2-81). The rate of economic development activities of Sub-Saharan Africa, measured as the rate of GDP/capita growth compared to the rate of economic development activities in other developing regions, is shown in Table 3.6 and Figures 3.9 and 3.10. Aside from Latin America and the Caribbean countries, where the GDI/capita registered the sharpest aggregate decline, Sub-Saharan Africa's performance declined precipitously from 1981 to 1991. On the average, income levels in Sub-Saharan African countries were substantially lower from 1981 to 1991. In a comprehensive survey of development issues and trends in Third World economies, Meier and Rauch note similar trends. While East Asian countries registered phenomenal growth in GNP per capita from 1965-90, of more than 5%, Sub-Saharan Africa countries had a meager growth rate of less than .30%, and lagged substantially behind Latin America and Caribbean with nearly 2% (Meier and Rauch 2000, 37).

Table 3.4: Gross National Income(GNI)/Capita for Developing Economies*

Region	1981 $	1986 $	1991 $	Rate '81-'91(%)
Sub-Saharan Africa	580	500	470	-23.40
South Asia	260	300	340	23.50
East Asia and Pacific	290	390	500	42.00
Latin America/Caribbean	1920	1770	1770	-8.80

*Data Source: World Bank, World Tables 1992 and 1995 (all in U.S. Dollar).

Figure 3.5: GNI/Capita for Developing Economies 1981-9191

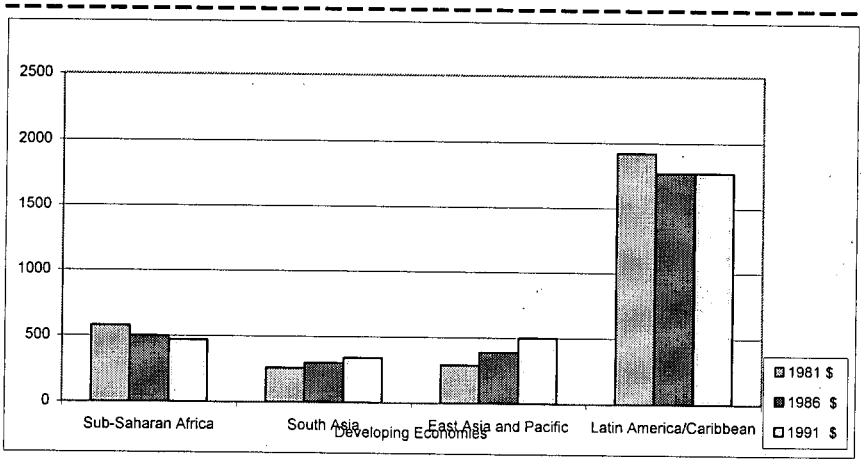


Figure 3.6: Growth Rate of GNI 1981-1991 (%)

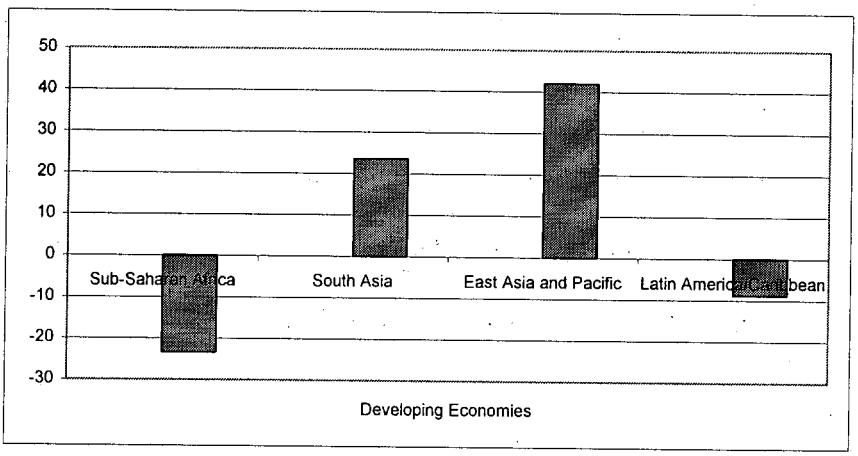


Table 3.5: Gross Domestic Investment/Capita for Developing Economies*

Region	1981 $	1986 $	1991 $	Rate '81-'91(%)
Sub-Saharan Africa	170	100	80	112.50
South Asia	70	70	70	0.00
East Asia and Pacific	80	120	180	55.60
Latin America/Caribbean	520	380	360	-160.00

*Data Source: World Bank, World Tables 1992 and 1995 (all in U.S. Dollar).

Figure 3.7: GDI/Capita for Developing Economies 1981-9191

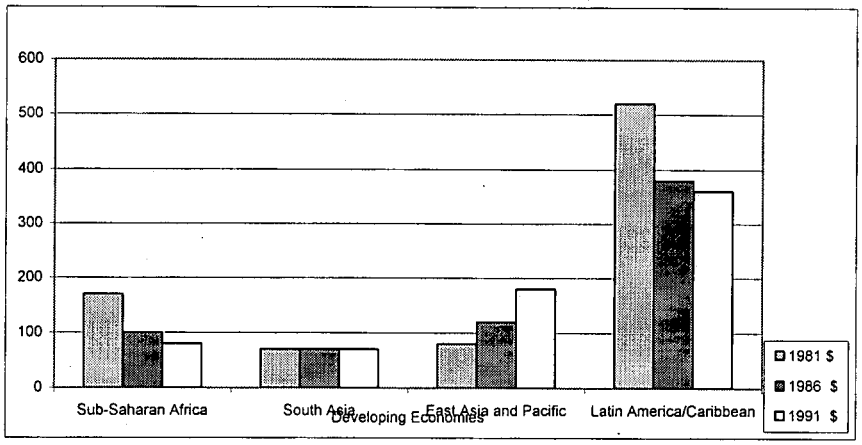


Figure 3.8: Growth Rate of GDI/Capita 1981-1991 (%)

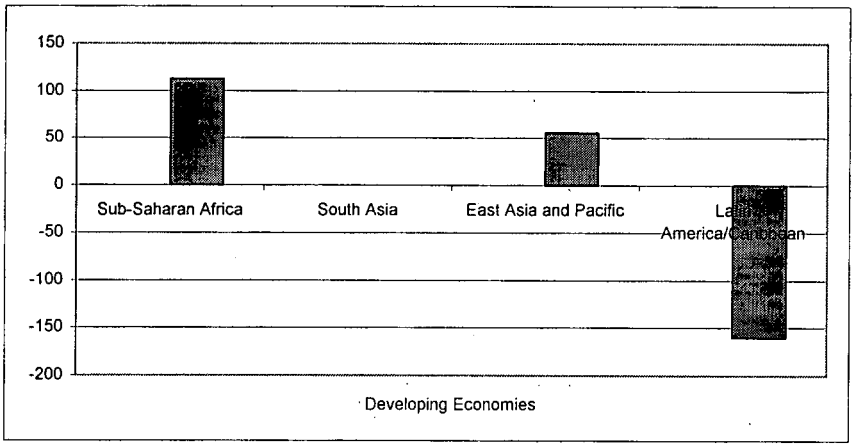


Table 3.6: Gross Domestic Product (GDP)/Capita for Developing Economies*

Region	1981 $	1986 $	1991 $	Rate '81-'91(%)
Sub-Saharan Africa	410	340	330	-24.20
South Asia	180	210	240	25.00
East Asia and Pacific	180	210	290	37.90
Latin America/Caribbean	1240	1190	1210	-2.50

*Data Source: World Bank, World Tables 1992 and 1995 (all in U.S. Dollar).

Figure 3.9: GDP/Capita for Developing Economies 1981-9191

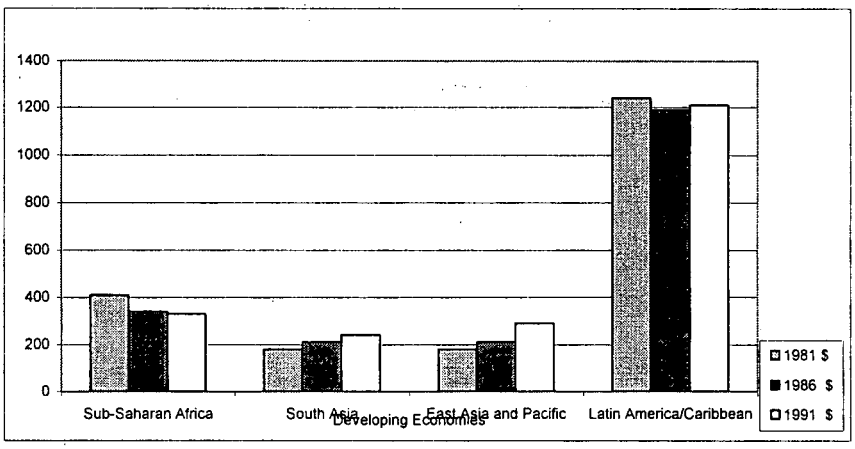
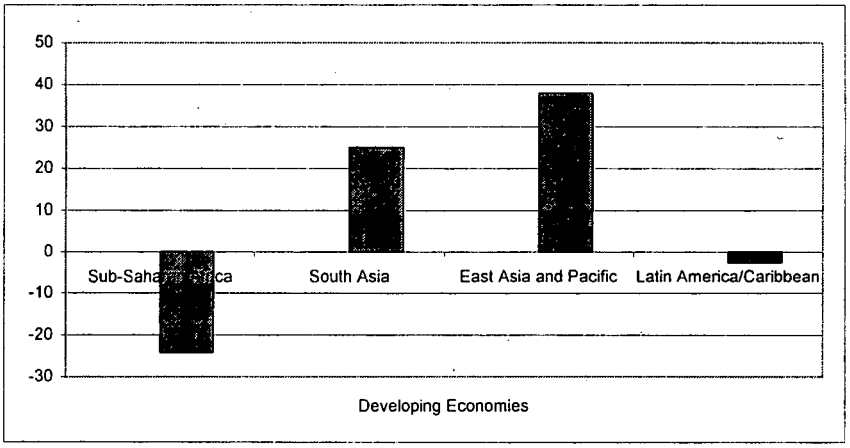


Figure 3.10: Growth Rate of GDP/Capita 1981-1991 (%)



A corpus of studies in development literature attempts to explain the dismal trends in Sub-Saharan African's socioeconomic and political scene. For present purposes, the conceptual framework for studying socioeconomic trends in the development literature can be grouped into three contending paradigms; namely, a) the colonialism legacy, b) the neoclassical political economy, and c) the dependency approach. Taken exclusively, none of these approaches explains the low rate of development and the dismal economic performance that are shown in Sub-Saharan Africa's economic development indicators. With the exception of neopolitical economy, the colonialism and dependency approaches depict Sub-Saharan African countries as victims of international interests and exploitation.

The Dominant Explanatory Models of Governance and Economic Development in Sub-Saharan Africa

In this study, I employ the colonial legacy model as the starting point to review the various approaches that have been used in the development and comparative politics literature to explain underdevelopment in Sub-Saharan Africa.

The Colonial Legacy Approach

The colonial legacy approach attributes the cause of the crisis of governance and lack of sustainable economic

development in Sub-Saharan Africa to decades of colonization and economic exploitation (Crawford 1988, Rodney 1974).

Crawford (1988) argues that there are a number of statehood attributes, the absence of which reduces polities to merely a subdivision of an independent state. The characteristics of statehood, Crawford notes, are territoriality, sovereignty and a sense of nationality that stems from the concept of indivisibility and unity of citizens and that the state, although an abstract concept, "is much more than the simple sum of its institutions of governance" (Crawford 1988, 29-31). Crawford argues that statehood evolved differently in Sub-Saharan Africa; hence, African countries lacked the attributes of statehood and the bonding that is characteristic of a state in the real sense of statehood. Therefore, the former colonies, even after independence, were simply the dependent appendages of the European colonial states. Territorially, the nations were capriciously and arbitrarily partitioned, with little consideration to the cultural and linguistic tapestries of the frontiers (1988, 32-33). Because self-governance was not fathomed at the national level, the colonial masters made no plans to rectify the ill-partitioned colonies and their territorial

implications for the various cultural and linguistic nationalities that were arbitrarily brought into the colonies. Consequently, the colonies were not prepared to train national leaders who could transcend regional and tribal linguistic biases for the national interest.

For Crawford, the crises of modern Sub-Sahara -- the crises of governance and development -- are inextricably linked to colonialism. Only by taking a retrospective look at the political and economic performance of the region can one begin fully to understand the legacies of colonialism in Sub-Saharan Africa. Although researchers agree on the effects of natural perils (drought, soil depletion and infertility), the intractability of resource endowment and population growth, the proponents of colonial-legacy argue that these factors are secondary to the legacies of colonial rule (Crawford 1988,28).

Rodney (1974) offers the harshest indictment of colonialism for the ravaged economy of Sub-Saharan Africa. He argues that the advent of colonialism interrupted Sub-Saharan Africa's natural course of development already in progress. By shifting developmental emphasis away from the established forms of government, industry and services to the forms of economic practices and structures that served the interests of the colonialists, colonialism

destroyed the growth of indigenous technology, such as the work of blacksmiths, carpenters, architects, and artisans. In Rodney's assessment, modern Sub-Saharan Africa's lack of sustainable development at a period when other less-developed regions were recording phenomenal levels of growth is the residual of the exploitative relationship that continued between the countries of Sub-Saharan Africa and their former European colonists, even decades after independence.

Ake's account of the development policies of the colonial states in a number of Sub-Saharan African countries reinforces the view that colonization detoured the course of development in Africa in the exclusive interest of the colonial states. For example, cocoa was introduced as a cash crop in Ghana after colonization for the singular purpose of meeting the cocoa demand in Western Europe. Consequently, the Ghanaian economy became a monocultural crop economy (Ake, 1996,2), depriving other sectors of Ghana's economy the incentive to develop. Prior to 1918, coffee was Kenya's most profitable cash crop. As Ake notes, the Coffee Plantation Registration Ordinance of 1918 reversed the course of coffee production in Kenya. The ordinance banded African countries from

producing coffee in an attempt to prevent African farmers from competing with European coffee farmers (1996,2).

A major criticism of the colonial-legacy approach is that it is intentionally reticent in addressing the role of Sub-Saharan Africa in adopting the structural and economic policies that had repeatedly failed in country after country. The colonial-legacy approach blames colonization for all the ills of Sub-Saharan Africa -- economic stagnation, political turmoil and dilapidated infrastructures. It indemnifies post-colonial indigenous national leaders and absolves them from any responsibility for their own errors in pursuing policies that continued to produce economic exploitation and political decay.

Neoclassical Political Economy Approach

Disenchantment with the colonial legacy's failure to address satisfactorily the intractable crisis of governance and development in the Third World countries led to the emergence of neoclassical political economy in the 1970s as a school of thought in development literature. Once a euphemism for Marxian analysis of polities and economic systems, political economy has become a generally accepted approach to analyzing the ramifications of government policies and how such policies

affect economic performance. Traditionally, the classical political economy approach to economic development assigns a dominant role to the states in the development of post-independence Africa. The state was expected to assume an indispensable role in determining what sectors of the economy should be allowed to develop and to what extent. The neoclassical political economy brought about a paradigmatic shift away from the classical view that government should guide all facets of development to the view that government's involvement in monetary, market and agricultural policies should be restrained and minimal. According to the neoclassical political economic theorists, the state can and ought to have a role in the development process, but such a role, they argue, should be limited to instituting policies that are conducive to political stability and economic security. For the neoclassical theorists, the prima facie niche for governments in economic development is to ensure that property rights are impartially enforced, including the formulation of policies that do not penalize the accumulation of private wealth. Socially, the state can intervene in a limited sense to insure that social goods (i.e., communication and transportation infrastructures,

capital investment in educational systems) are accessible to the masses (Lofchie 1994, 178). Meier and Rauch identify past policies, especially those that contribute to biases and discourage make forces; pro-urban policy bias of import substitution at the expense of sustained agriculture policies; and financial repression policies that are based on non-financial criteria contribute to the poor record of economic development in Sub-Saharan Africa (2000, 65). Clearly, responsibility for the relative degradation and stagnation of the economies of the region rests with Sub-Saharan African leaders. Much of the countries in the region gained independence from colonial rule in the 1960s, yet as Meier and Rauch show, 35 years after independence, (1965-90) governments still implement and reinforce policies that perpetuate economic failures (2000, 66-7).

Dependency Approach to Economic Development

The dependency approach to economic development had its origin in Latin America and gained acceptance and following in comparative politics and development literature in the late 1960s to early 1970s. Unconvinced by classical development and modernization models' explanations of the patterns of development in the Third

World countries, Latin American scholars advanced the dependency model as an alternative model to the classical theory, which was the leading model in comparative development literature. The problem of development, according to the classical theorists, is internal to the Third World countries. Lack of development does not result from patterns of socioeconomic relationships with the international capitalist system. The dependency approach takes a contrarian view to the question of development. The central hypothesis of the dependency approach is that the causes of the patterns of development and economic performance that are characteristic of the Third World countries are not inherent in the internal structures of the underdeveloped countries. Rather, the determinants of underdevelopment are said to have their pedigree in decades of economic exploitation of the Third World countries by the global accumulation of resources by the Western dominant capitalist nations (Chew and Denemark 1996).

For the dependentistas (as they are referred to in the literature), underdevelopment in Latin America, Asia and Africa is the direct result of the exploitative structure of international commerce and the monopolistic

practices of the dominant European countries in expropriating wealth from their dependent peripheral nations (Cardoso 1977, Frank 1967). Cardoso (now the president of Brazil), one of the foremost scholars in the dependency approach, expounds three aspects of dependency that peripheral nations could experience as they pass from a state of colonialism to one of dependency:

> a)"creation of states in answer to the interest of local property-owning classes; b) these [the newly created states] however, have their structural situation defined within the larger framework of the international capitalist system and are thus connected and subordinated to the conquering bourgeoisies of the western world and to those classes which succeed them; in this way alliances are established within the country, even though in contradictory form, to unify external interests with those of the local dominant groups; and c) as a consequence, the local dominated classes suffer a kind of double exploitation. (1977, 13)

In essence, in a state of dependency, the interests of the imperialist are engendered in the social, economic and political fabric of the peripheral nation. Consequently, the state of dependency is perpetuated as the Western capitalist countries continue to exploit the Third World countries for the economic enrichment of the interdependent core. According to the dependentistas, the problems of underdevelopment in the Third World countries

proceed from decades of imperious economic policies, designed with the primary aim of subordinating these countries to the industrialized nations of European for trade and capital flow and accumulation (Cardoso 1973, 1977, Frank 1969). Smith notes that the thrust of the argument often advanced by the dependentistas is that the problem of underdevelopment is the product of the development agendas of the industrialized countries (Smith 1991, 121).

By the mid-1980s, the dependency model would come under scrutiny for its myopic, and often unidimensional view of the dynamics of development. Like the colonial-legacy approach to development, the dependency model attempts to explain political and economic systems of the Third World countries solely on the basis of external factors. The model fails to account for the crucial role that the peripheral nations played in setting their own economic policies, as well as failing to explain the complexities of economics and class relationships. The confluence of internal factors that may have contributed to the dismal economic performance in the Sub-Saharan countries, such as the lack of coherent national economic policies and leadership, is not examined.

Ake observes that the debate concerning the state of development, whether political or economic growth, is vacuous and occurs in a state of complete lack of understanding of the nature of African development problems, coupled with the rush to find solutions to problems that no one really understands. He notes that, if well-being is the "supreme" end of development, then democracy is the only institution by which the goal of development can be achieved. Unlike the colonial-legacy and dependency scholars who attribute the problem of development to exploitative policies, Ake argues that democracy is the necessary condition for development. The state of development is attained when political leadership exhibits the rudimentary qualities of democracy, which are the principle of "accountability, predictability, the rule of law, and competition" (Ake 1996, 128).

For example, the much-written-about phenomenal economic growth of the newly industrialized countries (NIC) of East Asia, namely, Thailand, Taiwan, South Korea and Singapore, did not result from a mix of authoritarianism and democracy, as has been noted in news accounts. Rather, the economic success by the NIC can be attributed to the leadership of indigenous political

leaders who are disciplined and also skillful in articulating the national project of development. The leaders of the NIC achieved accountability by taking their obligations to the nation seriously and in doing so they achieved predictability in national goals and policies (Ake 1996, 128). Conversely, in Sub-Saharan Africa personalization of governance is prevalent as national leaders are inclined to assume absolute power and become the fulcrum political influence and power. More often than not, the governing elite promotes patron-client relationships based on familial and ethnic loyalties (Meier and Rauch 2000, 67). Therefore, in Sub-Saharan Africa, personalization of power often means the subversion of sound decision making process and marginalization of the intelligentsia for the policy preferences of the political leadership. The result is often economic policies that perpetuate underdevelopment and lack of sustainable growth.

Clearly, after three decades of political independence and self-governance, the failure to attain political and economic development in Sub-Saharan Africa can no longer be sufficiently explained in terms of colonialism and dependency. The focus in this chapter has

been to examine the political and economic trends in post-independence Sub-Saharan Africa. The empirical evidence shows that the overall economic performance of Sub-Saharan Africa is meager and that the rate of economic growth in the region lags seriously behind the rate of development recorded in other developing regions. But as noted earlier, poor economic performance should not be taken to mean zero economic growth, especially when the indicators of economic development are measured using a pooled time series model. Thus, the aim of this study is to measure economic development and how it is causally related to political turmoil, defined in this study as riots, political assassination, guerrilla warfare, general strikes, government crisis and antigovernment demonstrations.

I have also reviewed the literature on economic performance of the Third World countries with emphasis on Sub-Saharan Africa. In the following section, I discuss the population and urbanization trends that are notable in Sub-Saharan Africa and the implications for the political and economic well-being of the region. I have noted elsewhere in this study that "urbanization" is the proxy variable that is used to measure social dislocation.

Population Growth and Urbanization in Sub-Saharan Africa

Various population studies indicate that Sub-Saharan Africa is one of the fastest growing regions in the world (Cook 1997, Hance 1970, World Bank 1993a). The enormity of the growth trend is attributed to the region's high fertility rate and the continuing improvements in public health and life expectancy. Because "real" population is a function of birth, death, immigration and emigration, gains in birth rate and subtle improvements in disease management and life expectancy would invariably result in "real" gains in population. High fertility rates, high birth rates, low death rates and high immigration lead to a net increase in total population, while high emigration from rural to urban areas adds to the net population increase in cities, which in turn leads to urbanization.

According to a 1993 World Bank population report, the average rate of population growth per annum for all regions, projected to the year 2000, is 1.6 percent (World Bank 1993a). Data for Sub-Saharan African countries for the same period show an annual growth rate of 2.85 percent for the region. As shown in Table 3.7, the annual growth rate of Sub-Saharan African countries is 2.5 percent

better, with the exception of Mauritius, with 1.1 percent, and Guinea Bissau with a 2.0 percent growth rate. With the exception of Guinea Bissau, Lesotho, Zimbabwe and Mauritius, the countries of Sub-Saharan Africa are expected to double their 1991 populations by the year 2025.

Table 3.8 shows that the rates of birth per 1,000 population in 1970 and 1991 are correspondingly higher than death rates for the same period. The global average birth rate in 1991 was 26 per 1,000 (World Bank 1993a, 291), while the average birth rate for Sub-Saharan African countries was 43.6 per 1,000. Each Sub-Saharan African country registered an average birth rate that is greater than 30 per 1,000. As with birth rate, mortality rate is high in the region, with an average of 14.8 per 1,000 compared to the 9 per 1000 for all regions of the world. However, the net effect of mortality on the population of the region can be somewhat misleading. When net population increases (birth minus death) and improved public health and life expectancy are taken into account, Sub-Saharan African countries seem to be adding more rapidly to their population base than they are removing by decrement. If the current trends continue, Sub-Saharan

Africa countries will find it increasingly difficult to meet the basic social needs of their citizens or to create jobs for the new entrants into the labor market. The high rate of growth means that the region's economies and social services must outpace population growth rate for current living standard to be maintained, not improved.

Urbanization is a direct result of economic activities in cities and population pressure in villages. Population emigration to cities is caused by rising hopes for employment in industries and improved quality of life among rural population. Data from Work Bank studies, such as the data presented in Table 3.8, show that urban population as a percentage of total population grew substantially during the 1990s. Judging from the rate of urban population growth, Sub-Saharan African countries are quickly becoming more urbanized, even when chances of employment in the industries and urban areas are decreasing (see Table 3.9).

The impact of urbanization for government should not be underestimated. Urbanization results in increased pressure on the national budget, as outlays must be increased to provide additional social goods (i.e., transportation, schools, hospitals and increased food

production). As the diverse needs of the urban dwellers compete for scarce government resources, some aspects of

Table 3.7: Sub-Saharan Africa Population Trend

	Pop. in Million			Average Annual Growth		
Countries	1991	2000	2025	1970-80	1980-91	1991-00*
Benin	5	6	11	2.7	3.2	2.9
Burkina Faso	9	12	23	2.1	2.6	3.0
C. Afr. Rep.	3	4	7	2.2	2.7	2.5
Ghana	15	20	36	2.2	3.2	3.2
Guinea Bissau	1	1	2	4.7	1.8	2.0
Ivory Coast	12	17	32	4.1	3.8	3.3
Kenya	25	34	73	3.8	3.8	3.5
Lesotho	2	2	2	2.3	2.8	2.4
Madagascar	12	15	26	2.6	3.0	2.8
Malawi	9	12	24	3.1	3.3	3.1
Mali	9	12	24	3.1	3.3	3.1
Mauritania	2	3	5	2.4	2.6	3.1
Niger	8	11	24	2.9	3.3	3.5
Nigeria	99	128	217	2.9	3.3	2.9
Senegal	8	10	18	2.9	3.0	2.8
Togo	4	5	9	2.6	3.4	3.1
Zambia	8	11	21	3.0	3.6	3.0
Zimbabwe	10	12	18	2.9	3.4	2.3
Cameroon	12	16	29	3.0	2.8	3.1
Congo	2	3	6	3.8	3.4	3.4
Botswana	1	2	3	3.8	3.5	2.8
Mauritius	1	1	1	1.5	1.0	1.1
Gabon	1	2	3	4.7	3.5	2.9

*1991-00 is projected.
Average annual growth = 2.85.
N = 23.
Source: World Bank 1993a, 228, 229.
Note: Data were not available for Cape Verde, Sao Tome and Principe, Gambia and Zaire.

public needs are bound to be unmet. In turn, a feeling of abandonment could lead to government resentment and

heightened awareness of corruption and nepotism and, consequently, to political turmoil.

It is possible that the trend in urbanization noted here will be interrupted in light of the devastation that the AIDS pandemic is causing in Sub-Saharan Africa. If the current trend in AIDS infection continues, the future of the region's labor market will be bleak as AIDS-related death increases and life expectancy decreases. Lack of time series data on AIDS in Sub-Saharan Africa, during the period of this study, hindered my desire to examine the effect of the disease on the population and the economies of the region.

In this chapter, I have examined the political, economic and population trends in Sub-Saharan Africa and provided some historical background on the performance of the region. I examined some key indicators of economic development and growth and also provided an overview of the competing approaches that have been employed in the literature to explain the causes of underdevelopment and political turmoil. In chapter 4, I discuss the dependent and independent variables and the approach used in generating the indices of political turmoil and economic development. I pose the research questions and specify

the underlying hypotheses for the study, concluding the chapter with an examination of the statistical procedures and the analytical models used in the study.

Table 3.8: Fertility and Death Rate/1000 Population in Sub-Saharan Africa

	Birth/1000 Population		Death/1000 Population		Tot Fertility Rate		
Countries	1970	1991	1970	1991	1970	1991	2000
Benin	50	45	22	15	6.9	6.3	5.2
Burkina Faso	48	47	25	18	6.4	6.5	6.3
Burundi	46	46	24	17	6.8	6.8	6.6
C. Afr Rep.	37	42	22	17	4.9	5.8	5.3
Ghana	46	45	16	13	6.7	6.2	5.1
Guinea-Bissau	41	45	27	25	5.9	6.0	6.0
Ivory Coast	51	46	20	14	7.4	6.6	5.8
Kenya	53	45	18	11	8.0	6.5	5.5
Lesotho	43	35	20	11	5.7	5.1	4.5
Madagascar	46	43	20	14	6.6	6.2	5.2
Malawi	56	53	24	21	7.8	7.6	7.4
Mali	51	5	26	19	6.5	7.0	7.0
Mauritania	47	49	25	19	6.5	6.8	6.8
Niger	50	52	28	19	7.2	7.4	7.3
Nigeria	51	44	21	14	6.9	5.9	5.0
Senegal	47	43	22	16	6.5	6.1	6.3
Togo	50	48	20	14	6.5	6.6	5.5
Zambia	49	47	19	15	6.7	6.5	6.1
Zimbabwe	53	36	16	8	7.7	4.7	3.4
Cameroon	43	42	18	12	5.8	5.8	5.3
Congo	43	49	16	16	5.9	6.6	6.3
Botswana	53	36	17	6	6.9	4.8	3.1
Mauritius	29	17	7	6	3.6	2.0	1.8
Gabon	31	42	21	15	4.2	5.8	6.1
Avg for Region	46.4	41.8	20.6	14.8	6.4	6.1	5.5

Source: World Bank 1993a, 290-91.
Data were not available for Cape Verde, San Tome & Principe, Gambia and Zaire.

Table 3.9: Rate of Urbanization in Sub-Saharan African Countries

	Urban Population as a % of Tot. Pop		Tot Fertility Rate	
Countries	1970-1980	1991	1970-1980	1980-1991
Benin	18	38	8.4	5.1
Burkina Faso	6	9	4.3	5.2
Burundi	2	6	5.7	5.7
Central African Repub.	30	48	4.5	4.8
Ghana	29	33	2.7	4.1
Guinea-Bissau	15	20	5.8	3.7
Ivory Coast	27	41	7.5	4.7
Kenya	10	24	8.5	7.8
Lesotho	9	21	7.1	7.0
Madagascar	14	25	5.3	6.2
Malawi	6	12	7.5	6.0
Mali	14	20	4.1	3.8
Mauritania	14	48	10.4	7.3
Niger	9	20	7.5	7.4
Nigeria	20	36	6.1	5.8
Senegal	33	39	3.4	4.0
Togo	13	26	6.4	6.6
Zambia	30	51	5.9	6.0
Zimbabwe	17	28	5.6	5.8
Cameroon	20	42	7.6	5.6
Congo	33	41	4.0	4.7
Botswana	8	29	10.0	10.0
Mauritius	42	41	1.7	0.5
Gabon	26	47	8.3	6.0
Avg for Region	18.5	31.0	6.2	5.6

Source: World Bank 1993a, 298.
Data were not available for Cape Verde, San Tome & Principe, Gambia and Zaire. Put simply, Sub-Saharan Africa became more urbanized in the 1990s.

CHAPTER 4

DEFINITIONS, MEASUREMENT, HYPOTHESES AND THE ANALYTICAL MODEL

This study examines the question of correlation and causality among economic development, social dislocation and political turmoil in 24 Sub-Saharan African countries from 1970 to 1995 (see Appendix A for the list of countries and their abbreviations). The hypotheses to be tested derive from the thesis that economic development causes political turmoil. The central question that this study seeks to answer is the question of the relation between economic development and political turmoil, and the effect of social dislocation as an intervening variable in the development-turmoil hypothesis. Second, the prevailing theoretical perspective in the literature is to view political turmoil as a product of modernization, political mobilization and lag in development of political institutions, referred to as institutionalization (Huntington, 1968). When economic

development is introduced into the model of development and political turmoil, it is often treated as an intervening variable. Rarely has economic development been empirically examined as an exogenous determinant of political turmoil. This study attempts to further our understanding of how economic variables interact with political behavior. It fills the current gap in the literature in the area of the application of advanced methodologies in studying political turmoil. It is possible that the hypothesized linkage between political turmoil (i.e., instability) and economic development entails a feedback relationship. This means that economic development and political turmoil mutually affect each other, rather than the prevailing view in the literature, which posits a unidirectional relationship. Alternatively, it is possible that the hypothesized relationship does not exist.

The decision to select the countries and the period chosen for this study was guided primarily by the availability of data for the dependent variable and the independent variables. The data used to develop the index of political turmoil were obtained from Cross-National Time-Series Data Archives, 1995: Binghampton, NY: Center

for Social Analysis, State University of New York at Binghampton. An in-depth discussion of the data-transformation procedure and a description of the protocol for the design of the index of political turmoil are presented in Appendix D, "Generating Index of Political Turmoil."

The data for economic development and social dislocation were compiled from the World Bank's World Tables, 1989-90 and 1995 (World Bank, 1009, 1995b). The data are annual panel data, which are amenable to cross-sectional pooled time-series analysis. The initial list of countries was comprised of 39 Sub-Saharan African countries. The list was reduced to 24 countries due to missing data for some of the countries in the initial list. In selecting the 24 countries, those with four or more missing entries in one or more variables were dropped from the study.

The second factor that I consider in selecting the countries is the homogeneity of the countries at the level of social dislocation and economic development. For example, these countries do not seem to differ significantly from one another in economic development. The indices of economic well-being for the region show that SSA countries are characteristically homogenous. As

shown in Table 4.1, z scores for industries' contribution to gross domestic product range from -3.04 to 2.57. A great majority of the countries, 18, had a z score of plus or minus one standard deviation. The similarities of these countries should not overshadow the need to study them with a pooled time series model.

Table 4.1: Industries' Contribution to Gross National Product (DGDI)

Countries	Average	Z score	Ranking
Burundi	199.02	2.57	1
Ivory Coast	57.14	1.62	2
Zaire	39.82	1.50	3
Burkina Faso	33.49	1.46	4
Gambia	-31.50	1.03	5
Zambia	-35.72	1.00	6
Congo	-38.74	0.98	7
Cameroon	-55.40	0.87	8
Madagascar	-62.95	0.82	9
Senegal	-79.54	0.71	10
Central Afr. Repub.	-107.01	0.53	11
Lesotho	-108.61	0.52	12
Mauritania	-112.54	0.49	13
Kenya	-140.59	0.30	14
Malawi	-143.35	0.28	15
Niger	-151.92	0.23	16
Mali	-170.76	0.10	17
Nigeria	-173.40	0.08	18
Mauritius	-176.96	0.06	19
Ghana	-189.55	-0.02	20
Benin	-196.28	-0.07	21
Togo	-196.60	-0.07	22
Guinea-Bissau	-199.27	-0.09	23
Botswana	-642.06	-3.04	24

Average = -185.90; N = 24.

Source: World Bank 1990, 1995a. The data were compiled by the author.

Table 4.2: Pooled Scores for Economic Development and Social Dislocation from 1970 - 1995

	Economic Development		Social Dislocation	
Countries	Average	Z score	Average	Z score
Benin	0.073	0.32	26.34	0.00
Botswana	0.107	0.47	18.08	-0.71
Burkina Faso	0.161	0.71	12.52	-1.19
Burundi	0.108	0.48	4.90	-1.84
Cameroon	0.221	0.98	33.88	0.65
Cent. Afr. Rep.	0.288	1.28	35.67	0.80
Congo	0.095	0.42	45.04	1.61
Gambia	-0.096	-0.43	19.80	-0.56
Ghana	-0.105	-0.47	32.19	0.51
Guinea-Bissau	-0.117	-0.52	18.02	-0.71
Ivory-Coast	-0.033	-0.15	36.42	0.87
Kenya	0.094	0.42	18.62	-0.66
Lesotho	0.220	0.98	15.36	-0.94
Madagascar	-0.056	-0.25	20.18	-0.53
Malawi	0.012	0.05	9.87	-1.42
Mali	0.092	0.41	20.27	-0.52
Mauritania	0.037	0.16	34.40	0.70
Mauritius	0.341	1.51	41.80	1.33
Niger	-0.114	-0.50	13.60	-1.09
Nigeria	-0.397	-1.76	29.64	0.29
Senegal	0.085	0.38	37.30	0.95
Togo	0.039	0.17	23.57	-0.24
Zaire	-0.434	-1.92	45.04	1.61
Zambia	-0.622	-2.76	39.12	1.10
Average	0.000	0.00	26.32	0.00
Std Deviation	0.226	1.00	11.62	1.00

Source: Prepared by the author.

The similarity of the countries is not compromised when we consider the independent variables over a period of 25 years, as shown in Table 4.2. Specifically, the z scores for economic development are within minus one and plus one standard deviation from the mean, with the exception of Central African Republic (1.28), Mauritius

(1.51), Nigeria (-1.76), Zaire (-1.92) and Zambia (-2.76). The social dislocation data also lend credence to the homogenous nature of the region, as most of the countries scored within one standard deviation from the mean. However, there is a greater variability in the social dislocation variable compared to the economic development variable.

The practice of selecting countries with similar characteristics is consistent with the most similar systems approach to the aggregation of unit of analysis in comparative inquiry. As Przeworski and Teune (1970) note in their seminal work, The Logic of Comparative Social Inquiry, most similar systems design is based upon the "belief that systems as similar as possible with respect to as many features as possible constitute the optimal samples for comparative inquiry" (Przeworski and Teune 1970, 32).

In addition, the data reported in the Table 4.2 indicate that these countries will have little variability with respect to the variables of interest. When systems are most similar, as is the case in the countries of Sub-Saharan Africa, the possibility of confounding effects of the relationship between variables is expected to be reduced (Przeworski and Teune, 1970).

Table 4.3: Growth Rate and Political Instability in Sub-Saharan African for Selected Years

Variable	1980	1985	1989	1995
Growth Rate (%)	2.54	3.89	3.40	2.42
Political Instability	0.0381	-0.651	0.2907	-0.0406

Source: Gyimah-Brempong and Traynor, 1996.

The Research Questions

This study attempts to answer the following questions:

1. Does an increase in economic development (ED) lead to an increase in political turmoil (PT) -- [ED↗=PT↗]?

2. Does an increase in economic development lead to an increase in social dislocation (SD) -- [ED↗=SD↗]?

3. Does an increase in social dislocation lead to an increase in political turmoil -- [SD↗=PT↗]?

4. If there is a simultaneous relationship between the independent variables (economic development and social dislocation) and the dependent variable (political turmoil), then I ask, what is the strength of the relationship?

5. Does economic development induce political turmoil? I hypothesize that economic development has a destabilizing effect on polities. Symbolically, this question is represented as follows:

$$ED \Rightarrow PT$$

6. Does economic development result from political turmoil? This question is one of reverse causality. It challenges the assumption that economic development is the exogenous variable. Therefore, this hypothesis implies a reverse causal linkage. This hypothesis is depicted as:

$$ED \Leftarrow PT$$

7. Is the causal relationship between economic development and political turmoil bidirectional? Hagen suggests that economic development does not occur first and then cause social and political change (Hagen 1966). Rather, he argues that economic development and political turmoil are mutually dependent. It may be that periods of economic development lag periods of unconventional political behavior and political unrest. Riots, general strikes, protest demonstration or armed attacks can pressure the political leadership to embark on economic development projects that could subsequently lead to improvement in the quality of life for the average citizen. While the reverse causation argument may be counterintuitive, it is worth examining. Hoselitz and Weiner have noted that political turmoil could possibly lead to economic development (Hoselitz and Weiner 1961, 174). This is also an important dimension of the development-turmoil thesis that is explored in this study. Symbolically, this relationship is depicted as:

$$ED \Leftarrow\!\!-\!\!-\!\!\Rightarrow PT$$

8. Is it possible that the suggested bidirectional causal relationship between economic development and political turmoil does not exist? This study attempts to answer this question. The hypothesized relationship is diagrammatically shown as:

$$ED \Leftarrow\!\!=\!\!//\!\!=\!\!\Rightarrow PT$$

9. Does economic development cause social dislocation, which in turn causes political turmoil? This question examines the hypothesized intervening effect of social dislocation upon political turmoil. Social dislocation is measured as urban population (SD), which is the difference between total population and rural population and is consistent with the World Bank's definition. The variability of SD is used. The hypothesized relationship between economic development, urban population and political turmoil in a causal form is shown as:

$$ED \Rightarrow SD \Rightarrow PT$$

10. Does social dislocation (SD) cause political turmoil? Symbolically, the above relationship would look like the following:

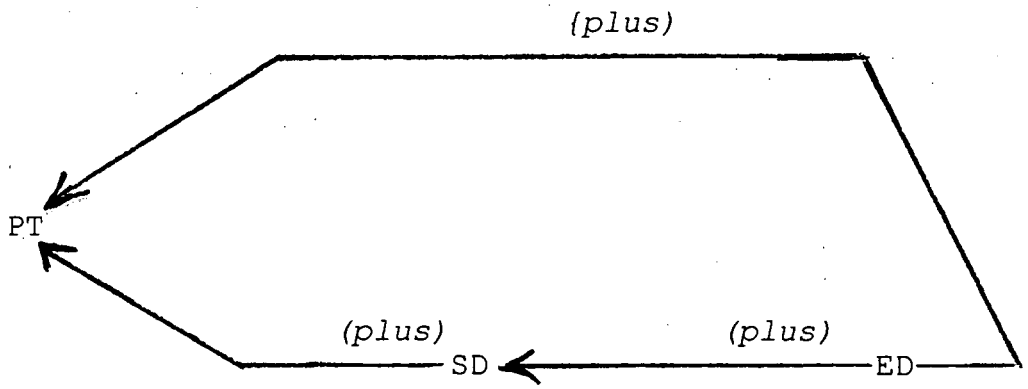
$$SD \Rightarrow PT$$

These 10 questions form the foundation of this

research and the basis for the research hypotheses. The first four questions explore the direction and the strength of the relationship, while the remaining questions explore the question of causality.

The hypothesized model of relationship among economic development, social dislocation and political turmoil is presented in Figure 4.1 below.

Figure 4.1: Hypothesized Relationship Among Economic Development, Social Dislocation and Political Turmoil



Source: Prepared by the author

Following are two structural equations derived from the models and will be used to test the research hypotheses derived from the model.

$$PT = B_0 + B_1 ED + B_2 SD + E \; ; \qquad (4.1)$$

where PT is the level of political turmoil; B is constant;

ED is the rate of economic development; SD is the rate of social dislocation and E is the error term. In the second equation, SD is regressed on ED. The complete equations, which include the country and time effects, are presented in chapter 5 below.

$$SD_{JT} = C_0 + C_1 ED_{JT} + E_{JT} . \qquad (4.2)$$

The Research Hypotheses

The following hypotheses are tested in this study:

Hypothesis 1: Countries with a high rate of economic development will register high level of political turmoil.

Hypothesis 2: Countries that have experienced higher rates of economic development will register higher levels of social dislocation.

Hypothesis 3: Countries that exhibit high rates of social dislocation (SD) will exhibit high levels of political turmoil (PT).

Hypothesis 4: Countries with high rates of economic development(ED) will have high levels of social dislocation (SD) and, consequently, high levels of political

turmoil (PT).

Individually, Hypotheses 1 through 4 are designed to test how the dependent and independent variables interact. Hypothesis 4 directly tests the theory that economic development leads to political turmoil via social dislocation (SD). In sum, Hypotheses 1 through 4 cumulatively build to the model of economic development, social dislocation and political turmoil and test the relationship between economic development and political turmoil. This brings us to Hypotheses 5 and 6, designed to test the direction and the magnitude of the relationship, respectively:

> Hypothesis 5: The direction of the relationship between economic development and social development, for each country, will be consistent with the results of the pooled cross-sectional time-series analyses.
>
> Hypothesis 6: The relative strength of the relationship among economic development, social dislocation and political turmoil remains the same from one country to another.

Next, I investigate the causal relationship between economic development (ED) and political turmoil (PT) and

social dislocation (SD) and political turmoil. As stated earlier, the relationship may be found to be bidirectional. The next three hypotheses explore the question of causality:

Hypothesis 7: Economic development causes political turmoil [ED ⇒ PT].

Hypothesis 8: Social dislocation is Granger-caused by economic development [SD ← ED].

Hypothesis 9: Political turmoil is Granger-caused by social dislocation [PT ← SD].

The above hypotheses are examined using the concept of Granger causality (a discussion of Granger causality is presented in the section on methodology).

Measuring the Dependent Variable

The dependent variable is "political turmoil." There is general agreement in the literature that political turmoil refers to situations, actions or patterns of political behavior that threaten to topple or change the political system through the exertion of unconventional behavior. It is a state of polity that results from the exertion of demand from citizens through nonconventional political expression. Often, the distinctions that scholars make in defining unconventional political behavior are subtle and based upon the availability of

data.

In this study, the terms "political turmoil" and "unconventional political behavior" are used interchangeably. Political turmoil encompasses destabilizing political events such as politically-related deaths. The action portrayed by these events must be directed against the state or against other social groups with the objective of influencing the polity (Taylor and Jodice, 1983, 19). These events must be outside normal political process in order to be characterized as unconventional political behavior.

The dependent variable is operationalized as a weighted index of politically unstable events per annum from Banks's political event data obtained from the Cross-National Time-Series Data Archives User's Manual 1995 (Binghampton, New York: Center for Social Analysis, State University of New York at Binghampton). The index of political turmoil is constructed from six of Banks's eight variables of manifest political violence. The variables used to construct the index include antigovernment demonstrations (ANTIGD), assassinations (ASSI), government crisis (GVCRISIS), general strikes (GSTRIKES), guerrilla warfare (GWAR) and riots (RIOTS). These variables are commonly used to construct an index of political

instability in political science literature (see Taylor and Jodice 1983). Elite-dominated types of political violent behaviors (such as coups and purges) are excluded, because these are considered "extraconstitutional or forced changes in the top government elite" (Banks 1971, xv). I exclude revolution from the original list of variables because revolution is an extreme form of political violence. It is highly organized (Gurr 1970,10) and often involves political elites, and it includes elite forms of organized political violence such as civil war, coups, mutinies and plots to overthrow government.

These variables are transformed to obtain the index of political turmoil using principal components analysis. Indeed, the application of principal component analysis in transforming political event data is not a novel approach to political science. The approach is used by Yough and Sigelman (1976) to transform political instability variables into an index of "collective protest" (consisting of riots, protest demonstrations, antigovernment demonstrations, and general strikes), "internal war" (made up of assassinations, guerrilla warfare, armed and attacks), and "power transfers" (comprising of revolution and coups). Appendix B provides a description of the variables that make up the index of

political turmoil. Appendix C shows the research data. In Appendix D, I describe the steps employed to generate the index of political turmoil (PT). The same procedure was followed in creating the economic development variable (ED).

Measuring the Independent Variables

The independent variables are economic development and social dislocation.

Economic development

Economic development (ED) is variously defined in the literature. In this study, it is defined as the percent change (rates) rather than the level of change and consists of the percent change in gross national product per capita (PGNP), private consumption per capita (PPC), industries' contribution to gross domestic product per capita (PGDI) and exchange rate (PXR). These four variables (PGNP, PPC, PGDI, PXR) were then combined using principal component analysis to create a measure of economic development. Note that percent change was obtained as follows:

$$PXR_{IT} = LOG(XR_{IT}) - LOG(XR_{IT}(-1)) \qquad (4.3)$$

where, for example using exchange rate, PXR is percent

change for country *I* at time *T* and XR is exchange rate. Using Benin as an example, in Eviews it is written as *PXRBENI = log(XRBENI)- log(XRBENI(-1))*. There is no one "best" approach to measuring change or growth rate. Therefore, the approach that one adopts should be a function of situation; the characteristics of data; and the purpose of one's research (Van Meter 1974, 135). In this study, theory suggests that we should use relative changes in the rate of economic development to express the development-turmoil thesis. The dependent variable is best measured as level of political turmoil because the development-begets-turmoil thesis suggests that it is the "level" of change that produces political stress in the polity. These variables are coded for a period of 25 years in the 24 countries of Sub-Sahara.

Social Dislocation

Social dislocation as operationalized in this study does not mean a loss of social status. I use social dislocation here to describe a condition that results when the rate of urbanization outpaces the rate of general population growth. If most Sub-Saharan African countries have social structures that are fundamentally rooted in the nuclear family, as has been noted in the literature, then urban population as a percentage of the general

population would constitute a form of social dislocation. Urbanization results from population emigration from rural to metropolitan areas, as citizens migrate in search of better employment in factories, industries or government. Therefore, rural to urban migration and urbanization can be attributed to the concentration of industrial growth in cities.

The Olsonian definition of social dislocation has been adopted in this study. Simply put, Olson (1963) posits that social dislocation derives from the loosening of traditional ties associated with class, caste, village and family that bind citizens to the traditional social order. It is the resultant reallocation of resources, influence and power from the nuclear and extended family units to the urban areas and centers of industry and commerce, with the resultant change in the economy that leads to social dislocation. Here, social dislocation is measured as urban population as percentage of total population. One may argue that death and birth rates can affect urban population and so can they affect non-urban population. Hence, death and birth rates can possibly have a zero-sum effect on urban and total population.

As noted earlier, economic development induces rural population migration from rural to urban in search of

better employment opportunities and an improved standard of living. This in turn causes a high rate of urbanization and the social complications associated with rapid urbanization. The dependent and independent variables and their indices are listed in Appendix B.

Sample, Treatment of Missing Observations and the Data Transformation

Twenty-four (24) independent countries of Sub-Saharan African make up the sample for this study. The study covers a period of 26 years, from 1970 to 1995. Availability of time series data on the dependent variable, political turmoil, was the key factor in selecting the countries that are included in the study and the period for the study.

The initial sample consisted of 39 countries for which there are data on the dependent variable through 1995. However, some countries (Mozambique, Sudan, Ethiopia, Comoros, Equatorial Guinea, Namibia, Chad, Sierra Leone, Seychelles, Somalia, Swaziland, Tanzania, Gabon, Zimbabwe, and Uganda) do not have complete data on the independent variables (see Table 4.4). These countries are dropped from the study. Mozambique, for example, in Table 4.4, has missing data for GNP per capita from 1970 to 1979, and has missing data on industries' contribution to gross domestic product (GDI) from 1970 to

1979. Chad is dropped from the study for missing data for private consumption from 1970-1982, and Rwanda is excluded for lack of data for industries' contribution to gross domestic product (GDI).

Countries with missing data in four or fewer time series points, in any of the independent variables, are included in the study. In those instances, the missing observations are fitted with data generated by regressing the known values of the variable on time and substituting the missing observation by the fitted values of the regression (see Pindyck and Rubinfeld, 1976). There is no consensus about how best to address the problem of missing variables. But Pindyck and Rubinfeld note that the procedure one employs to minimize the problem "depends upon the nature of each particular regression model and the related data" (1976, 194). As is the case in this study, where the approach employed is a time series model, and the missing data are serial (i.e, the missing data occur in a consecutive cluster of time period), Pindyck and Rubinfeld recommend "regressing the known values of the dependent variable, X, on time and substituting the missing observations by the fitted values of the regression" (Pindyck and Rubinfeld 1976, 197). For example, Zaire has missing observations for GDI from 1991

Table 4.4: Countries with Missing Data[1]

Country	GNP/Capital	Yrs	PC	Yrs	GDI	Yes
Mozambique	1970-1979	9	1970-1979	9		
Sudan	1986-1993	7				
Ethiopia	1973-1982	10				
Comoros	1970-1979	10				
Eq. Guinea	1970-1987	18				
Namibia	1970-1979	9				
Chad			1970-1982	12		
Sierra Leone			1970-1977	8		
Seychelles			1970-1977	8		
Somalia			1970-1993	23		
Swaziland			1970-1993	23		
Tanzania			1970-1993	23		
Gabon			1970-1982	13		
Zimbabwe			1971-1975	5		
Rwanda					1970-1976	7

[1]These countries are dropped from the sample because they had more than 4 missing observations in one or more economic development variables.

to 1993. To determine the values for the missing years, I regress the known values of GDI on time (the serial number of the year in which the missing observation occurred). The coefficient of time, "t," resulting from the regression, was multiplied by the appropriate serial number for the year, and the product was added to "C," the coefficient of constant. For example, I determined the GDI for 1991, for Zaire, by creating the parameters of time 1 (1970) through 26 (1995) and coded the known observations in *EVIEWS*. I then regressed the known values

on time and multiplied the coefficient of time, t, by the year 21 (which represents the year 1991) and added the result to the coefficient of the constant.

It is worthy of mention that the assumption of linear trend does not compromise the analysis, because 1) the growth rate of most time-series variables tends to be fairly predictable, and 2) as Pindyck and Rubinfeld observe, the procedure offers "a more general approach to the systematic missing observations problem which also yields consistent parameter estimates" (Pindyck and Rubinfeld 1976, 197-8).

Transforming the Dependent and Independent Variables

Often, when measuring a concept such as political turmoil, it is important to know whether the variables used to create the index that represents the variable of interest are correlated, especially when the variables are assumed to interact. The method of data transformation that one adopts depends on the objective that one wants to achieve with implementation of a data-transformation technique. If one is interested in the underlying commonalities of the variables of interest or in extracting the key component of the variables of interest, as I am in this study, then factor analysis can be an effective technique. In using factor analysis, the

analyst should assume that there are relations among the variables under examination and that the relations stem from some general causal factors (Schilderinck 1970, Weisberg 1984, Norusis 1994). Hence, in factor analysis, the variables are transformed "in order to make a mutual comparison possible" (Schilderinck 1970,3). Only those factors that received the most loading effects from the variables are used.

The use of data transformation technique is prevalent in disciplines such as sociology, psychology and biological sciences, but the technique has also become common in econometric and political science research. Schilderinck (1970) has shown that factor analysis can be successfully applied to political research regardless of the level of development attained in the countries or regions of interest (1970, 33-49). Other political scientists who have used the principal component approach to transform political variables are Hibbs (1973) and Yough and Sigelman (1976).

Commenting on the effectiveness of factor analysis as a data-reduction technique, Kirkpatrick (1974) notes that it is the most parsimonious approach:

> Although factor analysis performs a variety of functions for the political scientist, the most important is parsimony. When dealing with numerous and complex 'real world' data, the

> technique enables the parsimonious reduction of masses of data into manageable, and hopefully, theoretically meaningful form (1974, 238).

The factor analysis technique that I use in this study is known as the principal component extraction technique. It has been described in the literature as the most robust data-reduction technique for extracting the sufficient number of independent components that account for the most variance in the variables (Kirkpatrick 1974, 239-40). Also, this technique "eliminates the arbitrariness of the choice of weights and allows the weights to be determined by the data" (Gyimah-Brempong and Traynor 1996, 703). This is particularly important, given that political instability variables are likely to be highly correlated.

In this study, I use the principal component approach to transform antigovernment demonstrations, assassinations, government crisis, general strike, guerrilla warfare and riots into a single index of political turmoil, and repeat the analysis to create an index of economic development. I code these variables in pooled time-series format using *SPSS* procedures. A total of 600 observations were coded ((N(24)x(T(26)), where N is the number of countries, and T the number of time points. Using the SPSS data reduction procedure, I collapse the

variables into one factor and extract the principal components for the six variables. The aim in applying this procedure is to produce one primary component factor that is representative of the variables.

Once the data-reduction routine is complete, I use the SPSS transformation procedure to compute the absolute values of the principal component factor to obtain the political turmoil index. The number of components that one combines in order to produce a single index depends upon the value of the eigenvalues and the percent of variances accounted for by the factors. In determining the validity of the eigenvalues, it is recommended that only those factors with eigenvalues that are equal to or greater than 1 be combined to produce an index (Jolliffe 1986, 95-103, Norusis 1994, 54, Weisberg 1984,349-50). In this study, as shown in Table 4.4 (e.g, political turmoil), the factor components and the variances are quite robust. Factors 1 and 2 are 3.37231 and 1.30963. Taken together, the two factors explain 78 percent of the variance. Yet, other analysts maintain that only those components with latent roots that are equal to or greater than 1 can be used. But Dunteman shows that it is acceptable to use as many components as are necessary to adequately represent all the variables in the percent of

variance explained (Dunteman 1989, 38-40). The Dunteman approach was implemented in this study.

The scree plot in Figure 4.2 depicts the total variances associated with each factor. The plot shows a distinct gradual trailing off of the eigenvalues from factors 1 and 2, with values that are greater than 1, to factors 3 through 6. This indicates that the model is well-behaved. The shape of the scree plot confirms that components 1 and 2 can be used in the model specification (see Cureton and D'Agostino 1983, 159-61). Further, to ensure that the variables are amenable to factor analysis, I implement a test of sampling adequacy, using the Kaiser-Meyer-Olkin (KMO) procedure. According to Norusis, the closer the KMO value is to 1.0, the more appropriate is the factor analysis approach to data transformation:

> Small values for the KMO measure [such as .4] indicate that a factor analysis of the variables may not be a good idea, since correlations between pairs of variables cannot be explained by the other variables (Norusis 1994, 52).

As shown in Table 4.5, value of the KMO statistics in the test data is .77, which indicates sampling adequacy and also shows that a factor analysis of the six variables of political turmoil is highly appropriate. The intercorrelation coefficients of the variables reported in Table 4.5 indicates the existence of multicollinearity --

the violation of the assumption that no independent variable is a linear function of another. There is sufficient correlation between antigovernment and riots; and assassinations and general strikes, government crisis and guerrilla warfare. However, this problem of multicollinearity is corrected by the principal component-transformation procedure described above. A step-by-step explanation of how the principal component analysis is implemented for the dependent and independent variables is shown in Appendix D. The routine is implemented using Statistical Package for Social Sciences (SPSS) software.

The Statistical Procedures

The three statistical procedures used in this study are pooled cross-sectional time-series and seemingly unrelated regression analyses, and Granger-causality test. The problems associated with each and the solutions to those problems are also discussed in this chapter.

Pooled Cross-Sectional Time Series Analysis

The data for this study are annual observations, collected over a period of 26 years on 24 Sub-Sahara African countries, from 1970 to 1995 (see Appendix A for the list of countries). Pooled data is a collection of observations made over a period of time and across units. A major opportunity arises in conjunction with the gains

in degrees of freedom, when pooling is appropriate. For example, while there are 25 time series for a single country, a pooled regression of observations from all the

Table 4.5: Principal Components Factor Loading Matrix

Factor Loading Matrix (1):

Variables	Factor 1	Factor 2
Gstrikes	.83629	-.16235
ASSI	.81395	-.30285
GVCRISIS	.79152	-.34472
GWAR	.73787	-.33014
RIOTS	.63430	.70748
ANTIGD	.66115	.68060

(1) Principal Component extracted 2 factors

Total Variance of Principal Components Explained (2):

Variables	Communality	Factor	Eigenvalue	%Variance	Cum%
ANTIGD	.90033	1	3.37231	56.2	56.2
ASSI	.75423	2	1.30962	21.8	78.0
GSRIKES	.72574				
GVCRISIS	.74533				
GWAR	.65345				
RIOTS	.90286				

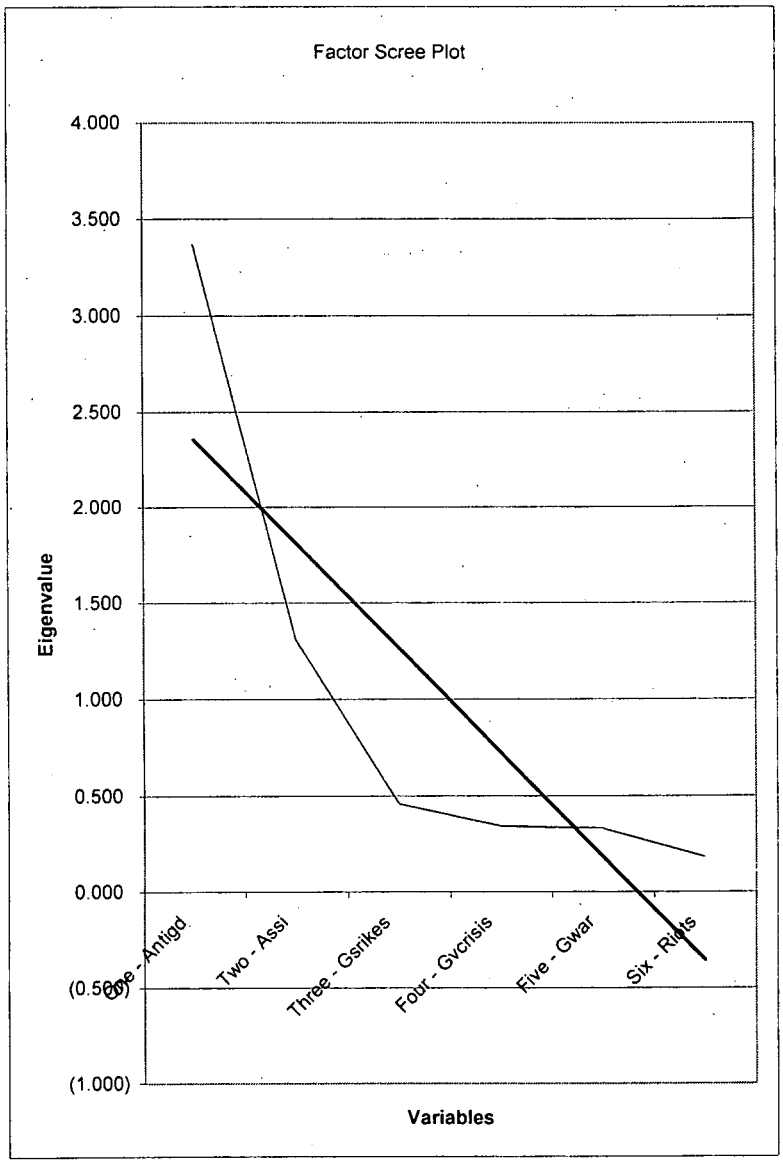
(2) Factors 1 and 2 (ANTIGD and ASSI) taken together explain 78% of the variance.

Intercorrelation Matrix

	ANTIGD	ASSI	GSRIKES	GVCRISIS	GWAR	RIOTS
ANTIGD	1.000					
ASSI	.314	1.00				
GSRIKES	.421	.659	1.000			
GVCRISIS	.317	.673	.644	1.000		
GWAR	.267	.591	.564	.576	1.000	
RIOTS	.808	.320	.383	.248	.261	1.000

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy = .77.
Significance = .0000.

Figure 4.2: Factor Scree Plot of Principal Components for Political Turmoil in Sub-Saharan Africa



24 countries and time periods would yield estimates based on both units and time -- (N(C)x N(T))=624 panel observations (i.e., 24 cross sections [countries] multiplied by 26 time-series). Because cross-sectional variation is substantially greater than time-series variation, pooled estimates result from a wider space of variance than are estimates generated solely from time series (Stimson 1985, 933). Although pooling offers some advantages over separate regressions, a decision must be made about how to pool the data before the development of pooled estimates. What method the analyst uses to build a pooled model depends on the underlying assumptions. The decision is a function of the characteristics of the data used in this study. There are four general classification of methods, although the dominant literature recommends "starting from the simplest model first (e.g., ordinary least squares) if only to retain a benchmark of the magnitude and direction of the estimates" (Sayrs 1989, 33; see also Greene (1993).

Ordinary Least Squares

Ordinary Least Squares (OLS) is generally applied if it is possible to assume that (a) the intercepts are fixed and equal for all countries or cross-sections; (b) the coefficients of the independent variables are fixed and

equal for all cross-sections; (c) there is absence of autocorrelation and heteroscedasticity in the residuals; and (d) there is no cross-correlation among the residuals of the cross-sections. Serial correlation, also known as autocorrelation, implies that the error term from one time period depends, in some systematic way, on error terms from earlier time periods (Ostrom 1990). Heteroscedasticity, on the other hand, violates the classical regression assumption that the error terms are drawn from a distribution that has a constant variance (homoscedasticity).

Basically, for OLS to yield the best linear unbiased estimates (BLUE), it is necessary to assume "that all the error processes are independent of each other" (Beck and Katz 1995, 636). When this condition is met, OLS is the optimal model. Otherwise, OLS could yield spurious results, which could merely be a statistical artifact (Beck and Katz 1995, 636). Serial correlation and heteroscedasticity do not cause bias in the coefficient estimates. However, since both influence the variances of the estimated coefficients, the tests of significance that one applies will be based on the wrong covariance matrix. Neither the t nor the F statistics can be reliable in the presence of autocorrelation or heteroscedasticity.

However, when these assumptions are not met, the use of ordinary least squares yields inefficient results.

OLS may be inappropriate for the type of analysis examined in this study. Stimson has discussed in greater detail the complications associated with OLS when analyzing pooled data. OLS ignores the pooled structure of the data as it treats events at one particular time "as independent of all others, not as part of a set of related observations" (Stimson 1985, 918). Also, variability of unit sizes can complicate the analysis and induce heteroscedasticity (the resultant condition when the assumption of homogeneity on Y is violated). Even when the data are standardized, OLS procedure can still yield spurious estimates. Finally, if the assumption of homogeneity (i.e., the assumption that all units have a common intercept) is violated, then the robustness of the least squared estimator (LSE) as a reliable predictor of the units' behavior will be compromised (Stimson 1985, 919). In turn, inflated levels of heteroscedasticity and autocorrelation can result. Thus, Beck and Katz observe that the temporal (time) and spatial (unit) properties of time series render OLS problematic (1995, 634).

I now discuss alternative approaches one can implement in order to obviate the problems associate with

OLS when the analysis involves pooled across section and time-series data.

The Covariance Model

Another method used in this study to estimate a pooled model is the covariance model. Also known as the least squares dummy variable (LSDV), the covariance approach allows the analyst to use dummy variables to control for the significant variation within and between units, and or time points, which are often the sources of OLS bias (Stimson 1985, 921). In using LSDV, it is assumed that each cross-section and time period has a different intercept, one for each cross-sectional unit and for each time period. For this study, the LSDV approach requires the addition of 25 dummies to distinguish the 26 annual observations and 23 dummies to distinguish the 24 countries. There are two disadvantages to this approach. First, this approach can use a substantial number of degrees of freedom (Stimson 1985, 922). Second, the use of the dummy variables is an acknowledgment by the researcher that one can, a priori, identify which variables affect the equation at both temporal and spatial points. That is, we are adjusting for important missing information by using dummies.

Because including dummy variables shows a lack of

knowledge about the data-generating process, one can describe this lack of knowledge by examining the error terms of the equation (Pindyck and Rubinfeld, 1981). If one assumes that the intercept terms in the LSDV model are not a set of fixed parameters, but are two random variables (i.e., one related to a time-series variable and the other to a cross-section variable), then one can save degrees of freedom. For this reason LSDV can be quite inefficient. Thus, the search for an alternative model has led to the use of the *error components model,* discussed next.

Error Components Model

This approach is derived from the LSDV model by making the following assumptions: a) that the average effect of the random time-series and cross-section is captured in the intercept term and that deviations from this mean can be attributed to the cross-section components and time-series components; b) that the intercept terms in the LSDV are normally distributed. Therefore, the main difference among the OLS, LSDV and error components methods is in how the intercept terms are handled. If the intercepts do not change or vary systematically (LSDV assumption) or randomly (error components assumption), then the OLS approach is suitable.

Hence, Pindyck and Rubinfeld note that "since the estimation described will give unbiased and consistent parameter estimates, the central issue associated with pooling is one of efficiency" (1981, 257). The error components model is intended to offer the best unbiased estimator (i.e., the estimator with the least variance). Thus, Stimson notes that it "can be seen as a compromise between OLS, which is biased in the presence of fixed effects, and LSDV, which is inefficient" (1985, 922-25).

However, one must be cognizant of the fact that the error components model has its share of estimation problems. The model's effectiveness can be hampered by the problem of homoscedasticity. Secondly, it implies that the contemporaneous correlation between the error terms of two cross-sectional units are the same for every pair of counties and that the correlation between the error terms of a given country is constant over time and is also the same for every country. This presumption of constant contemporaneous error term at space and time dimensions is especially at odds with the supposition that a) the correlation declines as the disturbances become further apart in time, and b) it can be different for different countries (see Kmenta, 1971). Thirdly, the procedure is not directly applicable if there is a lagged

dependent variable in the model (Pindyck and Rubinfeld 1981).

Since the primary concern of this paper is with inference on the slope coefficients (i.e., the nature of the impact of variable "X" on "Y" and not with forecasting), the use of fixed-effects model is preferred to a random model (see Judge et al. 1988). Consequently, it is preferable to use a procedure that accounts for heteroscedasticity and both autocorrelation and contemporaneous correlation among the disturbances. Such a model is the *time-series autoregressive model*, discussed next.

Full Autoregressive Model

The third method is the full autoregressive model, also known as the Parks-Kmenta method. Kmenta (1971) presents a number of estimation models that make explicit assumptions about error terms. The most general of these models assumes that there is significant correlation among disturbances, both contemporaneously (across countries) and serially (within countries over time). The procedure is generalized least squares estimator that accounts for both forms of error correlation. This method consists of four procedures: a) computing consistent estimates of autocorrelation coefficients within each cross-section

using OLS; b) transforming the data by using a Cochrane-Orcutt procedure; c) applying OLS to the transformed data to compute consistent estimates of cross-sectional error variances and covariances across countries; d) using the estimated variance covariance matrix to perform a standard GLS estimation. See also Judge et al. (1985, 485-90). Despite the advantages of the full autoregressive approach, Beck and Katz (1995) point out that it is inapplicable when N (number of units) is greater than T (number of time periods).[2]

Which estimation technique is more appropriate? To answer this question, it is important to apply a sequence of tests. Pindyck and Rubinfeld note that "the choice of whether to pool using ordinary least squares or to sacrifice degrees of freedom by using ordinary least squares with dummy variables is one which can be made on the basis of statistical testing" (1981, 255).

To test for autocorrelation, I use the Breusch-Godfrey test, and to test for heteroskedasticity, I use the Crockett-Basset method. See Maddala (1977) and Greene (1993) for extended discussion of these tests.

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[2] I am grateful to Professor Harold Clarke, who directed me to Beck and Katz's 1995 American Political Science Review article and its implications for full autoregressive models.

Seemingly Unrelated Regression

Seemingly unrelated regression (SUR) method, also known as the multivariate method, allows one to assess the strength of the relationship between two or more variables at unit level. For example, if Q, R and S are variables of interest and if we have shown that there is a relationship between these variables in a pooled cross-sectional time-series analysis, then we want to examine the strength of the relationship in each country (unit level). In this study, I use SUR to examine the magnitude of the relationship between economic development and political turmoil as the independent variables, and political turmoil. See Quantitative Micro Software (1994) for extended discussion of the SUR method.

Granger Causality Tests

Granger (1969) suggests a notion of causality that is applicable in longitudinal analysis. The application of Granger's idea of causation is commonly used in economics, but less so in political science. The usefulness of implementing Granger causality in the study of political relationship is underscored by its recent application in political science, especially in the subfield of political economy (Freeman 1983). By implementing Granger causality in this study, the objective is not to supplant well-

established theoretically-based approaches to conducting political inquiry, but to use it as an alternative model to the extent that it allows me to perform certain tests that time-series models are incapable of performing, such as the test of causal priority. Freeman has evaluated the usefulness of causal modeling in the Granger sense and concluded that, when employed in this manner, the Granger-causality test enhances our understanding of political events and relationships (Freeman 1983, 355).

The concept of causality in the Granger sense is based on the assumptions that: (a) the future cannot cause the past (i.e., the past and the present cause the future); and (b) detection of causality is only possible between two stochastic variables (Granger 1969). Granger proposes that for a pair of linear covariance stationary time series X and Y, where X causes Y, if the past values of X can be used to predict Y more correctly than by simply using the past values of Y. The Granger-causality tests are applied to time-series data over the period 1970-1995 for the 24 countries that make up the sample for this study. The purpose of the Granger-causality test is to determine the direction of causality.

The first step in the test for Granger-causality is to take the dependent time series as a function of lagged

versions of itself. The variable is initially run against its lagged version, as in equation:

$$PT_t = \alpha_0 + \alpha_1 PT_{t-1} . \quad (4.4)$$

Next, the variable is regressed against two lagged aversions as:

$$PT_t = \alpha_0 + \alpha_1 PT_{t-1} + \alpha_2 PT_{t-2} . \quad (4.5)$$

The choice is made between these two equations, depending on some criterion. The criterion used in this study is based on the R-squared technique. As I progress from the first equation (4.4) to the second equation (4.5), I ask, does the second equation add new information to the first? Next, if the second equation improves the result of the first equation, then another lag is added to the second equation, as in equation (4.6):

$$PT_t = \alpha_0 + \alpha_1 PT_{t-1} + \alpha_2 PT_{t-2} + \alpha_3 PT_{t-3} . \quad (4.6)$$

The equation with the highest R-squared is considered the equation with the optimum lag length. In this study, these tests are run for lags of up to three periods. That allows the result to be an equation including from one to three lagged versions of the series.

It is often considered to be better to detrend each series before doing the foregoing. In this case, this is done by taking the first difference of each series. If PT_t is the original series, let $Z_t = PT_t - PT_{t-1}$.

The second step in the Granger-causality test is to take the equation estimated earlier for each of the time series and add the lagged version of the series for which the causality is in question. If this adds information, the question is next asked: Is the coefficient significant? If it is, then is it Granger-causal? Suppose that the equation for the original series was as in equation (1) with one lag. The new estimate is as in equation (4.7):

$$PT_t = \alpha_0 + \alpha_1 PT_{t-1} + \beta_1 ED_{t-1} . \qquad (4.7)$$

If there is no information added by the term $\beta_1 ED_{t-1}$, it is an indication that there is no causality from ED to PT. If the coefficient β_1 is not significant, the causality will not be considered significant (Judge et al., 1988, pp. 767-70).

The lag-lead relation between Y and X may be found by a simple test of causality. In this respect the Granger (1969) causality test is performed. To test for causality

and its direction between PT and ED in the Granger sense, the following equations are specified:

$$X_t = A_1 + \sum_{i=1}^{n} B_i X_{t-i} + \sum_{j=1}^{n} C_j Y_{t-j} + E_t \qquad (4.8)$$

$$Y_t = A_2 + \sum_{i=1}^{k} P_i X_{t-i} + \sum_{j=1}^{s} Q_j Y_{t-j} + F_t \qquad (4.9)$$

where X = PT and Y = ED, i and j are the time lags, B, C, P, Q are the coefficients and E_t and F_t are serially independent random vectors with zero mean and finite covariance matrix. The causality tests to be performed can be represented simply in terms of the following hypotheses. The hypothesis that there is no causal flow from X to Y and from Y to X is equivalent to:

$$\sum_{j=1}^{m} C_j = 0 \; and \; \sum_{i=1}^{k} P_i = 0 \qquad (4.10)$$

The alternative hypotheses in this respect are: (a) There is unidirectional causality from Y to X, when:

$$\sum_{j=1}^{m} C_j \neq 0 \; and \; \sum_{i=1}^{k} P_i = 0 \qquad (4.11)$$

(b) There is unidirectional causality from X to Y, when:

$$\sum_{j=1}^{m} C_j = 0 \text{ and } \sum_{i=1}^{k} P_i \neq 0 \qquad (4.12)$$

(C) There is mutual causality or feedback, when:

$$\sum_{j=1}^{m} C_j \neq 0 \text{ and } \sum_{i=1}^{k} P_i \neq 0 \qquad (4.13)$$

(iii) Granger-causality tests involve testing the significance of C's and P's conditional on the chosen lag lengths, n, m, k and s. The optimum lag-lengths can be chosen by using the lag period that produces the highest R-squared.

The estimation of Granger causality is a two-step procedure. For example, to determine if there is causality link from economic development (ED) to political turmoil (PT), ED is first estimated as a function of past values of ED (called the restricted equation) and then estimated as a function of its past values and past values of PT (called the unrestricted equation). The two autoregressive equations are expressed as follows:

$$\Delta X_t = A_1 + \sum_{i=1}^{n} B_i X_{t-i} + \mu_{1t} \quad (\textit{Restricted}) \qquad (4.14)$$

$$\Delta X_t = A_{11} + \sum_{i=1}^{n} B_i X_{t-i} + \sum_{i=1}^{m} C_j \Delta y_{t-j} + \mu_{2t} \quad (\textit{Unrestricted}) \qquad (4.15)$$

respectively.

There is causality, in the sense of Granger, where n and m are the number of lags of ED and PT from PT to ED if the inclusion of the past values of PT significantly improved the prediction of ED.

To implement the Granger test, one calculates the following F-statistic under a null hypothesis that all the coefficients of the lagged values of the independent variables are jointly insignificant:

$$F = \frac{(RSS_{UR} - RSS_R)/(K_{UR} - K_R)}{(1 - RSS_{UR})/(N-K_{UR})}; \qquad (4.16)$$

where RSS_{UR} is the R-squared for the unrestricted model; RRS_R model is the R-squared for the restricted model; K_{UR} is the number of linearly independent parameters, including constant, in the unrestricted model; and K_R is the number of linearly independent parameters, including constant, in the restricted model. N is the sample size; $RSS_{UR} - RSS_R$ is the percent of total variance explained by the variables or variables dropped out of the unrestricted model; and $1-RRS_{UR}$ is the percent of total variance that is not explained by the unrestricted model. A detailed discussion of how to calculate the F-test is presented in

Hanke and Reitsch (1981).

In this chapter, I have discussed the underlying hypotheses, the statistical procedures, and the analytical models chosen for this study. In chapter 5, I test the research hypotheses, interpret and present the findings.

CHAPTER 5

DATA ANALYSIS AND PRESENTATION OF RESULTS

In this chapter I test empirically the thesis that economic development, independently or in conjunction with social dislocation, causes political turmoil in Sub-Saharan Africa. How to achieve economic growth while controlling for political turmoil has been a focus of comparative politics and development literature in less-developed regions, including Sub-Saharan Africa. The prevailing view in the comparative development literature is that economic development leads to political stability. According to this view, the cure for political crises in developing countries is to provide them with the resources needed to improve the standard of living for their citizens. This school of thought formed the basis for the foreign policy doctrine that many of the developed industrialized Western countries adopted when dealing with the developing nations of Africa, Latin America and Asia (Arendt 1963; Gurr 1968, 1971). But the years of infusing economic aid into developing nations have failed to induce political stability. Thus, there is now the view that

economic development induces political turmoil in developing countries. In this study, I refer to this latter theoretical perspective as the counterintuitive approach to the study of the relationship between economic development and political turmoil, because it contradicts the traditional view in the literature.

According to the development-begets-political turmoil theorists, as the economy grows and the standard of living improves for the masses, more citizens become less preoccupied with the immediate task of subsistence living and will be more inclined to pay attention to the affairs of the governing regime, which, in turn, will lead to an increase in political awareness and participation. Ultimately, with this new-found leisure that has accrued to them from economic growth, the citizens tend to exert demands on the political system by means of political participation. Rummel argues that increases in education and communication enhance the probability of conflict (Rummel 1977, 21), and Olson (1963) argues that rapid economic development produces new demands on the political system which, in turn, leads to political destabilization. I have reviewed the literature that propounds these arguments in detail in chapter 2. I now analyze the Sub-Saharan Africa data and present the findings of these

analyses.

To this end, I implement two statistical models. First, I employ pooled cross-sectional time-series analysis to investigate the relationship between economic development and political turmoil over 25 years (1971 - 1995) across 24 Sub-Saharan African countries. The analysis yields a total of 600 observations. Basically, there are five pooled cross-sectional time-series models that one can use, but the full-autoregressive model, specifically, the Parks-Kmenta model, is used in this analysis. The other four models are the ordinary least squares (OLS), least squares with dummy variables (LSDV), error components and seemingly unrelated regression (SUR) models. These models are fully discussed in chapter 4. Although these models are amenable to pooled cross-sectional time-series data, the Parks-Kmenta method is especially useful because it corrects for both autocorrelation and heteroscedasticity, which, as I observe in chapter 4, are problems endemic to pooled cross-sectional time-series analysis. The analyses are performed in two sequences, using OLS and the Parks-Kmenta procedure. First, I examine the relationship between economic development and political turmoil (hereafter referred to as the economic development-political turmoil

model). The equation for the model is depicted in equation (5.1),

$$PT_{JT} = B_0 + B_1 ED_{JT} + B_2 SD_{JT} + \varepsilon_{JT} ; \qquad (5.1)$$

where PT_{JT} is the level of political turmoil in country J at time T; B is constant; ED is the rate of economic development; SD is the level of social dislocation; and ε is the error term. Next, I repeat the analysis, using social dislocation as an endogenous variable, and regressed it on ED, as shown in equation (5.2):

$$SD_{JT} = C_0 + C_1 ED_{JT} + \varepsilon_{JT} . \qquad (5.2)$$

Equation (5.2) expresses social dislocation as the intervening variable for the main model; hence, it is regressed on economic development.

The second analysis that I perform is designed to test for Granger-causality. I discuss the Granger-causality test and how it is performed in this study in chapter 4. The intent of the Granger-causality test is to determine whether economic development and social dislocation Granger-cause political turmoil. The questions are, Does SD Granger-cause PT? Does ED Granger-cause PT? And Does ED Granger-cause UP? An F-test is

performed, using the restricted and unrestricted models of political turmoil at different lag lengths. Political turmoil is regressed on economic development and social displacement.

Results of Pooled Cross-Sectional Time-Series Analyses

In this section, I present and interpret the results of the pooled cross-sectional time-series analyses for the 24 Sub-Saharan African countries. An OLS regression model is used as the starting point for the analysis and presentation of the findings and as a reference point to compare the results of the OLS model with those of the Parks-Kmenta model. The OLS results for the full model are presented in Table 5.1. The model specification is equation (5.1), shown above.

As Table 5.1 shows, the regression coefficient for economic development (ED) is -0.0159, and the t-ratio for the coefficient is -2.107. This coefficient suggests that economic development is associated with a decrease in political turmoil (PT), as the coefficient is preceded by a negative sign. This result confirms the classical theorists' view of the relationship between economic development and political turmoil, which posits that economic development begets political stability. The coefficient is statistically significant at ($p < .05$),

which indicates that I must reject the null hypothesis that the true coefficient of economic development is zero. The coefficient for social dislocation, conversely, is 0.0020, with a t-ratio of 3.239. The coefficient is preceded by a positive sign; the presence of a positive sign indicates that an increase in social dislocation does lead to an increase in political turmoil in Sub-Saharan Africa. The p-value of 0.001 indicates that the result is statistically significant. However, the Durbin-Watson statistic from this model is only 1.39, which indicates the possible presence of first-order autocorrelation (see Bahmani-Oskooee 1987, 611), a problem that, if not corrected, can bias the statistical inferences that can be drawn from the empirical analysis. A Durbin-Watson test statistic that is close to 2.0 indicates that the null hypothesis of first-order autocorrelation in the error terms can be rejected (Charemza and Deadman 1992, 42).

Next, I examine social dislocation as the intervening variable for the main model by regressing social dislocation on economic development. This aspect of the analysis explores the relationship between social dislocation and economic development, with an interest in ascertaining whether an increase in economic development

Table 5.1: OLS Result for Sub-Saharan Countries

Political Turmoil (PT) as Dependent Variable

	B	Std Error	T-ratio	Probability
Constant	0.3999	0.0176	22.757	0.000
Economic Development	-0.0159	0.0076	-2.107	0.036
Social Dislocation	0.0020	0.0006	3.239	0.001

$R^2 = 0.03$
Durbin-Watson = 1.39
Observations = 600

leads to an increase in social dislocation. The model for the intervening model is shown in equation (5.2) above. The OLS results are presented in Table 5.2.

The coefficient for economic development is -1.1399, and the t-ratio is -2.234; it is statistically significant at ($p < .05$). The negative sign preceding the coefficient of economic development in this result suggests that economic development is associated with a decrease in social dislocation.

When interpreting the results of the OLS model, one must do so cautiously, given that OLS results for pooled data generally suffer from heteroscedasticity, autocorrelation and contemporaneous correlation. When these problems are present in the data, the Parks-Kmenta model is preferable, because it corrects for heteroscedasticity, autocorrelation and contemporaneous

Table 5.2: OLS Result for Sub-Saharan African Countries

Social Dislocation (SD) as Dependent Variable

	B	Std Error	T-ratio	Probability
Constant	26.3177	0.5099	51.611	0.000
Economic Development	-1.1399	0.5103	-2.234	0.057

R^2 = 0.008
Durbin-Watson = 0.023
Observations = 600

correlation -- problems associated with pooled cross-sectional time-series data. It is the most robust method when one is modeling for country and time effects simultaneously. Unlike the estimation procedures that rely on the OLS approach, the Parks-Kmenta approach allows for implementation of a number of procedures that are effective in correcting for the problems associated with pooled cross-sectional time-series data.

The results for the 24 Sub-Saharan African countries, using the Parks-Kmenta method, are shown in Table 5.3. The results indicate that an increase in economic development (B = -0.0077, Std Error = 0.0006, t = -12.416, p < .001) is associated with a decrease in political turmoil, since the coefficient for economic development is preceded by a negative sign. The coefficient is statistically significant. Also statistically significant

is social dislocation (B = 0.0017, Std Error = 0.0001, t = 12.808, $p < .001$).

What do these findings tell about the implications of economic development and social dislocation for developing nations? Clearly, the empirical evidence does not support the notion that economic development begets political turmoil. Rather, the evidence lends credence to the classical theorists' view that political stability accrues from economic growth and development. Also, one can infer from the results that an increase in social dislocation (urban population as a ratio of total population) does lead to an increase in political turmoil. Population growth, not economic growth or development, is associated with political turmoil in Sub-Saharan Africa. As the concentration of population in urban centers increases, so does the level of political demand exerted on the government to deliver public goods. When these demands are not fulfilled, the result is an increased probability of political turmoil and chaos. This is an important finding and one that should be given serious consideration as governments of less-developed nations address their population, city and urban planning and allocation of resources issues for development projects. Increases in urbanization and the resultant social dislocation, coupled

with a lack of economic development, can be a serious threat to the ability of the less-developed countries to sustain political stability and foster conventional political participation.

Table 5.3: Parks-Kmenta Model Result for Sub-Saharan Countries

Political Turmoil (PT) as Dependent Variable

	B	Std Error	T-ratio	Probability
Constant	0.3877	0.0027	144.717	0.0001
Economic Development	-0.0077	0.0006	-12.416	0.0001
Social Dislocation	0.0017	0.0001	12.808	0.0001
R^2 = 0.34				
Observations = 600				

Having established the relationship among economic development, social displacement and political turmoil, and having shown that a linkage exists between social displacement and economic development, the focus of the analysis is now shifted to the examination of the relationship between social displacement and economic development. This aspect of the analysis examines the direct impact of economic development on social dislocation -- does economic development lead to social dislocation? The results, shown in Table 5.4, indicate that a positive relationship exists between economic

development and social dislocation, as signified by a positive economic development coefficient. The coefficient for economic development (B = 0.0010, Std Error = 0.00003, t = 33.371 (p < 0.001) is statistically significant.

Table 5.4: Parks-Kmenta Model Result for Sub-Saharan Countries

Social Dislocation (SD) as Dependent Variable

	B	Std Error	T-ratio	Probability
Constant	20.6536	0.00670	3072.376	0.0001
Economic Development	0.0010	0.00003	33.371	0.0001
R^2 = 0.65				
Observations = 600				

What do the results of the pooled time-series analyses reveal about the relationship among political turmoil, economic development and social dislocation as presented in the research hypotheses?

In Hypothesis 1, I state that countries that register high rates of economic development will register a high level of political turmoil. As the results of the OLS and Parks-Kmenta models show, this hypothesis cannot be confirmed. The association between economic development and political turmoil is a negative one--an increase in one leads to a decrease in the other. This finding is

consistent with the classic economic-political development theory. Hypothesis 2, which state that social dislocation or greater population pressure in urban centers tends to have a strong positive relationship with economic growth, is confirmed, because an increase in social dislocation is associated with an increase in political turmoil. Hypothesis 3, which state that countries that experience higher rates of economic development will register higher levels of social dislocation, also is confirmed, as shown in the results presented in Table 5.4. In sum, although the proposition that economic development stimulates political turmoil in developing nations is not supported by the empirical data, what the analyses do show is that urbanization (the measure of social dislocation used in this study) tends to be positively related to political turmoil.

Hypothesis 4 states that countries that have high rates of economic development will exhibit high levels of social dislocation and, consequently, high levels of political turmoil. This hypothesis is confirmed. The Parks-Kmenta analysis indicates that economic development has a positive indirect effect on political turmoil through its effects on social dislocation. Population shifts from rural to urban centers, due to changes in the

economic base--that is, from agriculture and traditional cottage industries to a manufacturing and industry-based economy--tend to produce disgruntled citizens who "are naturally susceptible to the temptations of revolutionary agitation" (Olson 1963). This aspect of the Olsonian theory is supported by empirical evidence.

Seemingly Unrelated Regression Results

Having established the general nature of the relationship among the exogenous variable, political turmoil, and the endogenous variables, economic development and social dislocation, I want to assess the strength of the relationships in each country. The seemingly unrelated regression (SUR) approach allows me to perform the analysis.

An advantage of SUR over pooling is that, while pooling provides aggregate results about the overall relationship between economic development and political turmoil, SUR allows the analysis of the nature of the relationship in each country. For this, I performed individual country analyses of the strength of the relationship between economic development and social dislocation as the independent variables, and political turmoil, using the seemingly unrelated regression (SUR) method. First, I ran the analysis without any lags on

economic development and social dislocation. From this initial analysis, I found that Botswana exhibits the characteristics of an outlier, as its chi-square statistic is extraordinarily high. I dropped Botswana and repeated the analysis with 23 countries, implementing one lag on economic development for some selected countries. To determine the strength of the relationship, I impose equality constraint on economic development and social dislocation.

The SUR analyses provide some interesting results. For the vast majority (21 of 24) of the countries, I find economic development to be negatively related to political turmoil. This result confirms the classical theory argument that economic development does lead to political turmoil and is consistent with the results of the pooled analyses, which indicate that economic development does not move in tandem with political turmoil. In most of the countries, economic development seems to be having a negative effect on the polity. Therefore, for the most part, Hypothesis 5, which states that the relationship between economic development and political turmoil (at the unit level) is similar to the result of the pooled analyses, is confirmed. However, Hypothesis 6, which states that the strength of the relationship is the same,

is not confirmed. When we impose equality of constraint, the t-statistics from the SUR analyses vary widely from 41.4972 in Lesotho to 0.7589 in Mali. Although, in the vast majority of the countries the t-statistics are significant at less than $p < .01$, as shown in Table 5.5, they are not of the same strength.

Table 5.5: Results of Seemingly Unrelated Regression Test for the Strength of Relationship and Equality of Constraint

Political Turmoil (PT) as Dependent Variable

Countries	Variables	Beta	Std Error	T-ratio	Prob
Benin					
	Const.	0.29665	0.65674	4.5170	0.0001
	ED	-0.02691	0.00268	-10.0402	0.0001
	SD	0.00506	0.00212	2.3811	0.0173
Burkina Faso					
	Const.	0.25294	0.03555	7.1150	0.0001
	ED	-0.01325	0.00292	-4.5416	0.0001
	SD	0.01556	0.00182	8.5318	0.0001
Burundi					
	Const.	0.22729	0.14662	1.5503	0.1211
	ED	-0.05569	0.00660	-8.4377	0.0001
	SD	0.05255	0.02777	1.8925	0.0584
C. African Rep.					
	Const.	0.63090	0.34454	1.8311	0.0671
	ED	-0.05564	0.00505	-11.0098	0.0001
	SD	-0.00533	0.00956	-0.5576	0.5771
Cameroon					
	Const.	0.03973	0.09008	0.4411	0.6592
	ED	-0.05445	0.00140	-38.9936	0.0001
	SD	0.01200	0.00248	-4.8411	0.0001
Congo					
	Const.	0.21655	0.27430	0.7895	0.4298
	ED	0.01684	0.00658	2.5587	0.0105
	SD	0.00586	0.00846	0.6929	0.4884
Ghana					
	Const.	0.17723	0.15878	1.1162	0.2644
	ED	-0.01691	0.00170	-9.9472	0.0001
	SD	0.01080	0.00869	1.2422	0.2142
Guinea-Bissau					
	Const.	0.39022	0.03823	10.2074	0.0001
	ED	-0.01104	0.00886	-12.4657	0.0001
	SD	-0.00092	0.00188	-0.4889	0.6249

Table 5.5: Continued

Political Turmoil (PT) as Dependent Variable

Countries	Variables	Beta	Std Error	T-ratio	Prob
Gambia					
	Const.	-0.24676	0.27015	-0.9134	0.3610
	ED	-0.06098	0.00456	-13.3736	0.0001
	SD	0.01899	0.00728	2.6078	0.0091
Ivory Coast					
	Const.	0.49088	0.14910	3.2922	0.0010
	ED	-0.10796	0.02076	-5.2018	0.0001
	SD	0.00187	0.00745	-0.2512	0.8017
Kenya					
	Const.	0.22214	0.10162	2.1861	0.0288
	ED	-0.01288	0.00316	-4.0747	0.0001
	SD	0.01454	0.00619	2.3512	0.0187
Lesotho					
	Const.	0.29817	0.09745	3.0598	0.0022
	ED	-0.12454	0.00300	-41.4972	0.0001
	SD	0.00969	0.00945	1.0255	0.3051
Malawi					
	Const.	0.36233	0.18181	1.9929	0.0463
	ED	-0.02977	0.01947	-1.5292	0.1262
	SD	0.00455	0.00870	0.5229	0.6011
Mali					
	Const.	0.31076	0.24505	1.2682	0.2047
	ED	-0.00454	0.00598	-0.7589	0.4479
	SD	0.01269	0.01173	1.0825	0.2790
Madagascar					
	Const.	0.44566	0.04832	9.2229	0.0001
	ED	-0.00519	0.00097	-5.3631	0.0001
	SD	-0.00053	0.00121	-0.4353	0.6633
Mauritania					
	Const.	0.21182	0.58852	0.3599	0.7189
	ED	-0.01791	0.00770	-2.3274	0.0199
	SD	0.00499	0.01408	0.3547	0.7228
Mauritius					
	Const.	0.14305	0.06373	2.2446	0.0248
	ED	-0.01360	0.00473	-2.8745	0.0040
	SD	0.02007	0.00420	4.7806	0.0001
Niger					
	Const.	0.17429	0.23295	0.7482	0.4543
	ED	-0.04885	0.00265	-18.4169	0.0001
	SD	0.01544	0.00761	2.0285	0.0425
Nigeria					
	Const.	-0.51411	0.33330	-1.5425	0.1229
	ED	-0.06143	0.01024	-6.0001	0.0001
	SD	0.02610	0.00886	2.9473	0.0032
Senegal					
	Const.	0.06637	0.09328	0.7114	0.4768
	ED	-0.06987	0.00425	-16.4348	0.0001
	SD	0.01668	0.00355	4.6955	0.0001

Table 5.5: Continued

Political Turmoil (PT) as Dependent Variable

Countries	Variables	Beta	Std Error	T-ratio	Prob
Togo					
	Const.	-0.39378	0.14662	-2.6858	0.0072
	ED	-0.01537	0.00537	-2.8598	0.0042
	SD	0.02073	0.00313	6.6148	0,0001
Zaire					
	Const.	0.02769	0.22960	0.1206	0.9040
	ED	-0.00377	0.00590	-0.6390	0.5228
	SD	0.00994	0.00576	1.7264	0.0843
Zambia					
	Const.	0.22759	0.19468	1.1691	0.2424
	ED	-0.04460	0.00346	-12.8758	0.0001
	SD	0.00484	0.00420	1.1534	0.2487

Degrees of Freedom = 22.

As to the relationship between social dislocation and political turmoil, I had shown that it has a positive relationship with political turmoil (see the results of the pooled regression analysis). But when I impose equality of constraint, the strength of the relationship is spotty at best. The question is, Does social dislocation have the same positive effect on political turmoil at the single-country level as it does in the pooled analyses? The result shows a degradation of the relationship, which means that the strength of the relationship is not consistently exhibited from one country to another. Hence, Hypothesis 6, which states that the strength of the relationship between social dislocation (SD) and political turmoil (PT) is the same,

cannot be confirmed.

In this section, I have analyzed the Sub-Saharan Africa data and presented the results of the pooled cross-sectional time series analyses, using two techniques -- OLS and Parks-Kmenta. The analyses show a negative relationship between economic development and political turmoil. I find a relationship between economic development and social dislocation and social dislocation and political turmoil. However, when I implement equality of constraint, at the country-by-country level, using SUR, I find that economic development and political turmoil are negatively related and that the relationship is quite strong in the vast majority of Sub-Saharan African countries. This result further substantiates the classical theorists' argument. However, the strength of the relationship between economic development and political turmoil varies.

Granger-Causality Tests

I now turn to Granger-causality testing by addressing the question of causal relationships between economic development (ED) and political turmoil(PT), ED and social dislocation (SD) and SD and PT. This section is devoted to answering the questions Does economic development Granger-cause political turmoil? Does economic development

Granger-cause social dislocation? Does social dislocation Granger-cause political turmoil? An in-depth discussion of how the Granger test of causality is implemented in this study has been offered earlier (see chapter 4). Therefore, I turn to the presentation of the Granger-causality tests for Sub-Saharan Africa (SSA).

In Hypothesis 7, I state that economic development Granger-causes political turmoil. Equations (5.3) and (5.4) represent the restricted and the unrestricted models, respectively, for PT and ED, at three lagged periods.

$$PT_t = \alpha_0 + \alpha_1 PT_{t-1} + \alpha_2 PT_{t-2} + \alpha_3 PT_{t-3} . \quad (5.3)$$

$$PT_t = \alpha_0 + \alpha_1 PT_{t-1} + \alpha_2 PT_{t-2} + \alpha_3 PT_{t-3} + \beta_1 ED_{t-1} + \beta_2 ED_{t-2} + \beta_3 ED_{t-3}. \quad (5.4)$$

To perform the test of Granger-causality, I calculate the F-statistic for both models, as shown in equation (5.5), where RSS_{UR} is the variance of the parameters of the unrestricted model explained by past values of itself; RSS_R is the variance of the parameters of the restricted model explained by past values of itself; K_{UR} and K_R are the numbers of parameters in the unrestricted and restricted models, respectively; and N is the sample size.

$$F = \frac{(RSS_{UR} - RSS_R)/(K_{UR} - K_R)}{(1 - RSS_{UR})/(N-K_{UR})} \qquad (5.5)$$

In Table 5.6, I present the result of the Granger-causality test of causal ordering from economic development to political turmoil at three lags. The calculated F-statistic is only .54. The result is not statistically significant, given that the critical values of the F-statistic at 5 percent and 10 percent are 2.60 and 2.08, respectively. The conclusion drawn from this result is that economic development does not Granger-cause political turmoil. Thus, Hypothesis 7 must be rejected, and the null hypothesis that there is no such causal ordering must be accepted. However, at two and one lagged periods, the results are statistically significant. The result at two lagged periods, shown in Table 5.7, is significant at 10 percent. At lag one, shown in Table 5.8, the F-statistic is 6.77 and is statistically significant at the .05 level.

I now examine the causal ordering from ED to SD stated in Hypothesis 8. Both SD and ED are implemented at three lag periods. The causal ordering from ED to SD is shown in equation (5.6) below.

$$SD_t = \alpha_0 + \alpha_1 SD_{t-1} + \alpha_2 SD_{t-2} + \alpha_3 SD_{t-3} + \beta_1 ED_{t-1} + \beta_2 ED_{t-2} + \beta_3 ED_{t-3}. \qquad (5.6)$$

Table 5.6: Does Economic Development Granger-Cause Political Turmoil? At Three Lags

	PT Restricted Model	PT<----ED Unrestricted Model
R-Squared	0.130251	0.127495
DF(including constant)	4	7
Lag Periods	3	3

DF = 3 (7-4)
F-statistic = .54; Critical value (p=.05) = 2.60, at .10 = 2.08).
N = 528.

Table 5.7: Does Economic Development Granger-Cause Political Turmoil? At Two Lags

	PT Restricted Model	PT<----ED Unrestricted Model
R-Squared	0.127272	0.136116
DF(including constant)	3	5
Lag Periods	2	2

DF = 2 (5-3)
F-statistic = 2.79; Critical (p =.05) = 3.00, at .10 = 2.30).
N = 552.

Table 5.8: Does Economic Development Granger-Cause Political Turmoil? At One Lag

	PT Restricted Model	PT<----ED Unrestricted Model
R-Squared	0.105480	0.127495
DF(including constant)	2	3
Lag Periods	1	1

DF = 1 (3-2)
F-statistic = 6.77; Critical (p =.05) = 3.84, at .10 = 2.71.
N = 576.

The result of the three-lag period is presented in Table 5.9. The calculated F-statistic is 5.79, while the critical value of the F-statistic is 2.60, which indicates that the result is statistically significant at .05. Thus, the null hypothesis that there is no causal relationship from economic development to social dislocation is rejected. The results for lag periods 2 and 1 are shown in Tables 5.10 and 5.11, respectively. The F-statistics are statistically significant and confirm the hypothesis that economic development Granger-causes social dislocation.

In Hypothesis 9, I state that political turmoil is Granger-caused by social dislocation. The results reported in Table 5.12 lend credence to the social dislocation-political turmoil hypothesis, thus confirming Hypothesis 9 at .10 (at lag 3). The results obtained at lags 2 and 1 are shown in Tables 5.13 and 5.14 and are not statistically significant at shorter lag lengths.

The conclusion that can be drawn from these results is that urbanization does appear to have some causal effects on political climate in Sub-Saharan Africa. However, evidence of a causal relationship is weak, given that, at lag 3, it is statistically significant at 10 percent, but not significant at lag periods 2 and 1, as

the results in Tables 5.13 and 5.14 show.

Table 5.9: Does Economic Development Granger-Cause Social Dislocation? At Three Lags

	SD Restricted Model	SD <----ED Unrestricted Model
R-Squared	0.997922	0.997989
D.F.(including constant)	4	7
Lag Periods	3	3

DF = 3 (7-4)
F-statistic = 5.79; Critical (p =.05) = 2.60, at .10 = 2.08.
N = 521.

Table 5.10: Does Economic Development Granger-Cause Social Dislocation? At Two Lags

	SD Restricted Model	SD <----ED Unrestricted Model
R-Squared	0.997651	0.997568
D.F.(including constant)	3	5
Lag Periods	2	2

DF = 2 (5-3)
F-statistic = 8.88; Critical at (p=.05) = 3.00, at .10 = 4.61.
N = 552.

Table 5.11: Does Economic Development Granger-Cause Social Dislocation? At One Lag

	SD Restricted Model	SD <----ED Unrestricted Model
R-Squared	0.997377	0.997303
D.F.(including constant)	2	3
Lag Periods	1	1

DF = 1 (3-2)
F-statistic = 15.72; Critical at (p=.05) = 3.84, at .10 = 2.71.
N = 576.

Table 5.12: Does Social Dislocation Granger-Cause Political Turmoil? At Three Lags

	PT Restricted Model	PT <----SD Unrestricted Model
R-Squared	0.130251	0.140748
D.F.(including constant)	4	7
Lag Periods	3	3

DF = 3 (7-4)
F-statistic = 2.22; Critical at (p=.05) = 2.60, at .10 = 2.08.
N = 521.

Table 5.13: Does Social Dislocation Granger-Cause Economic Development? At Two Lags

	PT Restricted Model	PT <----SD Unrestricted Model
R-Squared	0.127272	0.133210
D.F.(including constant)	3	5
Lag Periods	2	2

DF = 2 (5-3)
F-statistic = 1.96; Critical at (p=.05) = 3.00, at .10 = 2.30.
N = 552.

Table 5.14: Does Social Dislocation Granger-Cause Political Turmoil? At One Lag

	PT Restricted Model	PT <----SD Unrestricted Model
R-Squared	0.105480	0.114523
D.F.(including constant)	2	3
Lag Periods	1	1

DF = 1 (3-2)
F-statistic = .09; Critical at (p=.05) = 3.84, at .10 = 2.71.
N = 600.

Conclusion

In this chapter I have presented the results of the pooled cross-sectional time-series analyses and Granger-causality tests. The pooled cross-sectional time-series analyses show significant relationships among economic development, social dislocation and political turmoil, and between economic development and social dislocation. The analyses indicate that the direct effects of economic development on political turmoil are negative. Thus, the classical economic development theory's argument that an increase in economic development leads to a decrease in political turmoil is found to hold true in Sub-Saharan Africa. Even at the country-by-country level, a test of the strength of the relationship between economic development and political turmoil confirms that there is a strong negative relationship between the two variables.

The Granger-causality tests were conducted to shed additional light on the flow of causality among the variables of interest. At lag periods 1 and 2, I find a causal ordering leading from economic development to political turmoil (at lag 1 $p < .05$; lag 2 $p < .10$), but none at lag period 3. The results of the Granger-causality tests point to a causal relationship from economic development to social dislocation and from social

dislocation to political turmoil. Figure 5 represents the revised model. The revised multivariate relationship flowchart indicates that economic development indirectly causes political turmoil through the effects of social dislocation.

In the concluding chapter, I summarize the major arguments and empirical findings of this study and discuss its implications and limitations. I also discuss future research opportunities.

Figure 5: Relationship Among Economic Development, Social Dislocation and Political Turmoil at Lag Three

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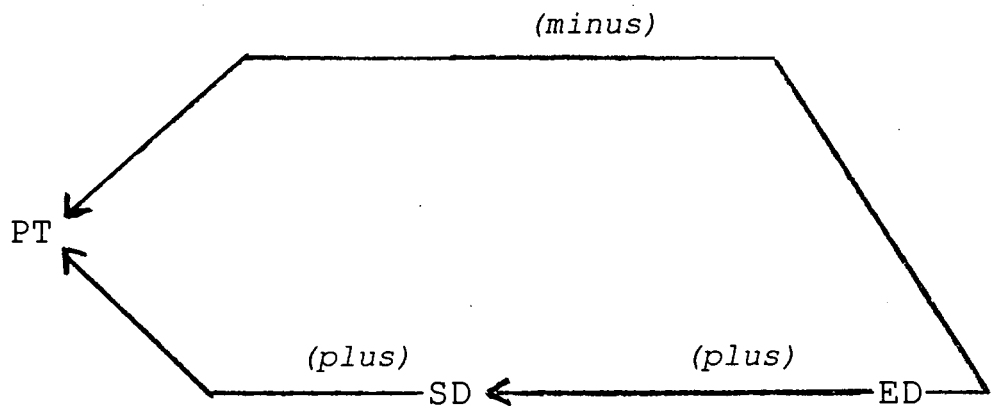


Source: Prepared by the author.

Chapter 6

CONTRIBUTIONS, CONCLUSIONS AND OPPORTUNITIES FOR FUTURE STUDY

In this chapter I summarize the major arguments and findings, discuss the contributions and limitations, and offer some thoughts about opportunities for future research.

The Major Arguments

Comparative politics, like many subfields in political science, has had numerous controversies and debates on issues concerning theory, methods and the implications of its literature for policy making. The question concerning economic development, political turmoil and quality of life in developing countries of Africa, Southeast Asia and Latin America/Carribean has been an area of comparative politics that long has been mired in theoretical and methodological controversy. The motivation for this study stemmed from the desire to understand how economic development impacts nations, with an emphasis on the developing regions of Sub-Saharan Africa. Hence, I ask, Does economic development lead to political turmoil in developing countries? Does the level

of political turmoil change during periods of economic development and growth, and, if there is a relationship, what is the nature of it? Is there a causal relationship between the two, and what is the nature of the causal linkage? What are the implications of social dislocation for political turmoil? These questions came from my review of the pertinent literature, the contending theories and the core arguments concerning the implications of economic development for developing polities and its relationship to political turmoil.

Those whom I have called the classical theorists argue that economic development leads to political stability. Accordingly, they maintain that the solution to the crisis of governance, involving problems of recurrent coups d'etat, riots, protests, demonstrations, political assassinations and strikes in developing nations, is enhanced economic development. In many countries, especially those in Sub-Saharan Africa, the focus of the economic development programs of the industrialized countries historically has been on the disbursement of economic aid and subsidies.

Contrary to the classical theory, there is the countervailing view that holds that economic development produces political violence and instability in developing

countries. This view is presented in the work of Hoselitz and Weiner (1961), Olson (1963), Rummel (1971), and Feierabend and Feierabend (1966, 1972). Basically, these theorists state that countries that attain high levels of economic growth tend to be the least stable, while those that register the lowest levels of economic growth tend to exhibit stability. For example, in his seminal work "Rapid Growth as a Destabilizing Force," Olson argues that countries that are undergoing economic transformation from traditional economies, such as agriculture and cottage industries, to mass production of goods and services and modern business institutions, tend to have more political instability. Arguably, increases in political turmoil are caused by the stress of economic transition as modes of production are modernized and not necessarily by economic development per se. I do not accept this view, because it is tautological and seems to argue that counting the number of industries and modern businesses that existed in Sub-Saharan Africa during the period of this study is more important than assessing the rate of growth that resulted from the modernization of the modes of production. Aggregate economic data, such as have been used in this study to describe economic development and growth, reveal more about the effectiveness of the development policies

of nations than a knowledge of the number of industries and modern business can reveal about the state of development in any nation.

Findings and Policy Implications

Regarding the question concerning the relationship between economic development and political turmoil, my multivariate analyses indicate that the direct relationship between the two variables is negative. Thus, the results of the pooled cross-sectional time-series analysis clearly do not lend support to the Olsonian argument that economic development tends to lead to political instability and turmoil. Economic development has a significant negative direct effect on political turmoil. This finding buttresses the classical theorists' argument that political stability can be induced in developing nations through economic development. However, this study did find that, when social dislocation (measured as a high rate of urban population) is taken into account as an intervening variable, there is an indirect positive relationship between economic development and political turmoil.

A seemingly unrelated regression (SUR) analysis was performed to corroborate the results of the pooled analysis. Concerning the direct relationship between

economic development and political turmoil, I find negative relationships in virtually every country. Again, increases in economic development do not produce an increase in political turmoil. This finding confirms the pooled regression result discussed above.

A second point that should be made here concerns the strength of the relationship between economic development and political turmoil in various countries. When I impose an equality of constraint on the model in the SUR analyses, the goodness of fit decreases significantly. This finding indicates that the magnitude of the relationship varies from one country to the next. Again, however, economic development has a countervailing effect because it raises political turmoil through its effect on social dislocation. When economic development increases, social dislocation increases and political turmoil increases. Figure 6.1 depicts these direct and indirect effects of economic development on political turmoil.

Third, regarding the relationship between social dislocation and political turmoil, there are several countries where the relationship is positive. But, once more, the strength of the relationship varies. Overall, the relationship between social dislocation and political turmoil is less robust than that involving economic

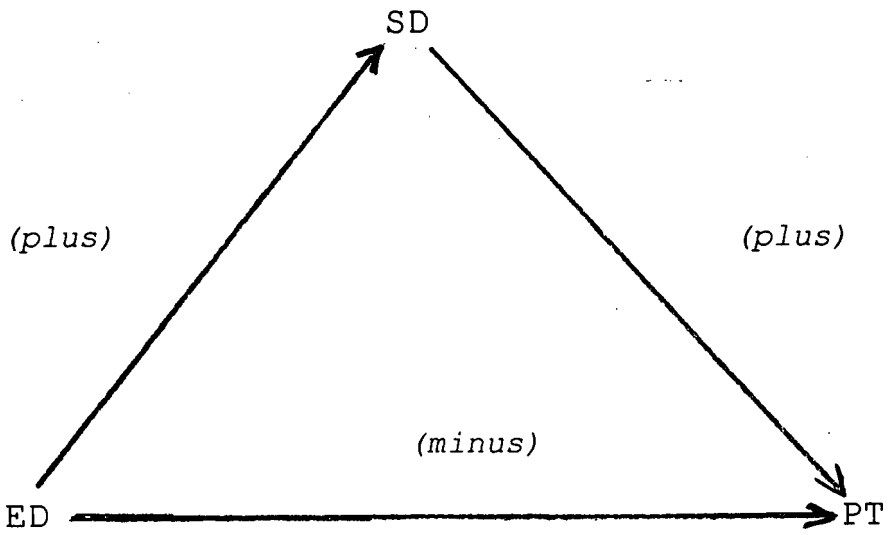
development.

The implications of these findings for public policy making are significant. If economic development leads to population growth in big cities, then political turmoil can result. This would suggest that governments that pursue economic development policies should put in place policies that alleviate stress in urban areas. Such development policies are being pursued by the U.S. Congress. Through the leadership of the Clinton administration, the U.S. Congress recently passed a bill designed to stimulate economic development in Africa through commerce and investment in the countries of Sub-Saharan Africa.

This study also provides empirical evidence that suggests that public policies designed to invigorate the economies of developing nations can be effective tools for cultivating conventional forms of political participation and hastening democratization in the regions. However, policy makers should pay attention to the problem of urbanization as the developing countries develop their economic infrastructures. It is migration to urban centers and the resulting disintegration of social bonds--villages' and clans' social commitments and family ties, which are built on solidarity and mutual trust--that lead

to political turmoil.

Figure 6.1: Direct versus Indirect Effect of the Relationship Among Economic Development, Social Dislocation and Political Turmoil



Source: Prepared by the author.

The question that those who aspire to build civil societies must ask is, How can we alleviate social dislocation? Better yet, how can we ameliorate the negative effects of economic development while accentuating the positive effects? This is an important question and one whose answer may lie in the social capital (SC) theorists' argument and the work of political sociologists regarding the relationship between strong socialization structures and associations and political

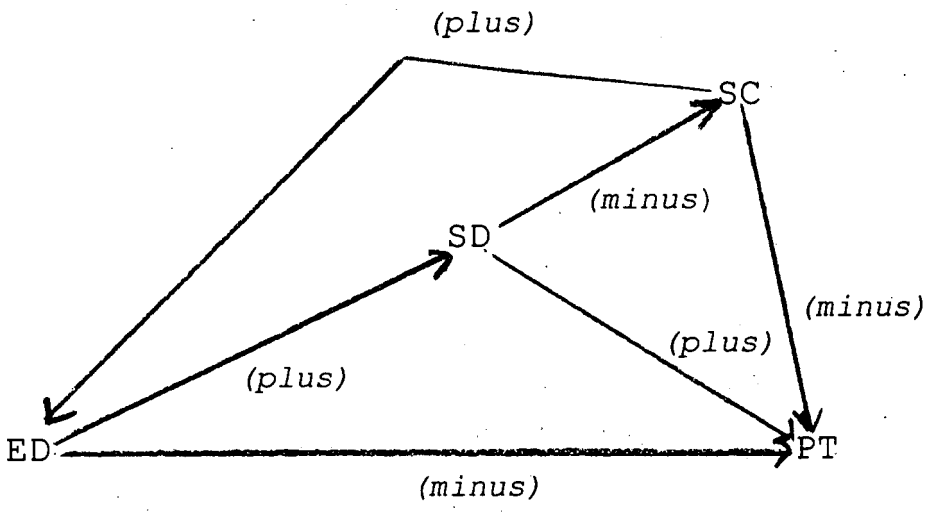
stability. The social capital theorists' and political sociologists' basic thesis is that "prospects for stable democratic government [political stability] depend on ... social and economic transformation" (Putnam 1993, 83). To ensure that economic development does not lead to political turmoil via social dislocation, I conjecture that policy makers must seek to minimize the disconnection with social classes that results from the increase in urbanization by modernizing in a way that does not lead to diminution of existing social networks built on social capital.

Putnam defines social capital as elements of social organizations that can enhance the efficiency of any society, such as trust, norms and networks (Putnam 1993, 167). Figure 6.2 is a modified model of relationships among the variables of interest. This modified model includes the social capital theorists' thesis and shows how the negative consequences of social dislocation can be alleviated, while political turmoil is decreased through enhanced social capital.

This study implements a useful methodology for investigating the theoretical questions it posed. Prior to this study, classical theory's argument regarding economic development and political turmoil had not been

tested rigorously using sophisticated, yet parsimonious, methodologies now available to political scientists. I employ pooled cross-sectional time-series analyses to the question of relationship between economic development and political turmoil and implement equality of constraint to

Figure 6.2: Correcting the Negative Effects of Economic Development on Political Turmoil and the Social Capital Implication



Source: Prepared by the author.

determine the strength of the relationship in each country. Additionally, I implement the Granger-causality test to answer the question of causality. Regarding the latter, I find that, while there is a causal relationship between economic development and political turmoil in the Granger-sense, the causal linkage is indeed weak. At lag

3, the linkage does not exist. However, there is a strong causal ordering from economic development to social dislocation and from social dislocation to political turmoil. This finding prompted the revision of the hypothesized model in Figure 4.1 to the actual model shown in Figure 6.2.

Limitations of This Study: Some Caveats

This study is not without some limitations. Such limitations exist in the areas of data availability and methodology. First, the problem of missing data in Sub-Saharan Africa presents challenges for research in the region. Data for many political, economic and social variables have not always been consistently collected or reported for the countries of Sub-Saharan Africa. Consequently, one is forced to limit one's study to those countries with meaningful data, or, alternatively, to develop proxy variables to measure the phenomena of interest. This problem was encountered here.

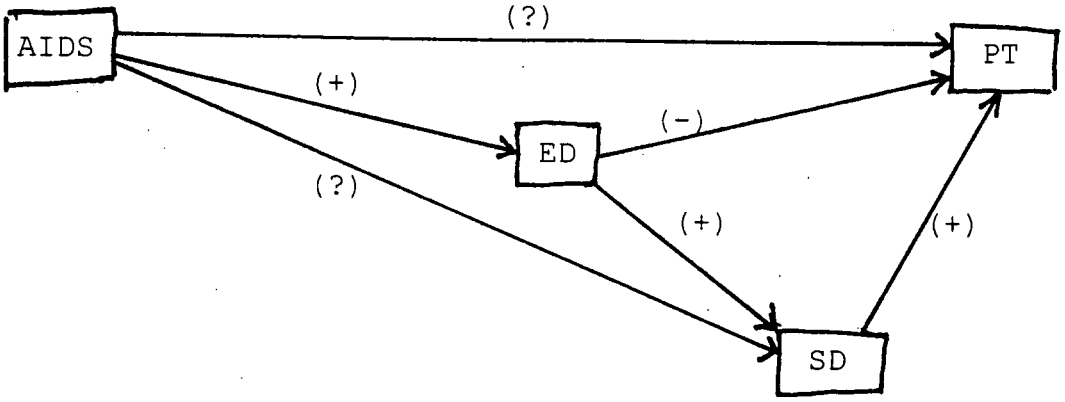
I initially intended for this study to consist of 39 countries. But due to lack of data for the dependent variable, 15 countries were dropped from the sample, limiting the sample to 24 countries. Although the 24 countries for which I have data are broadly representative of the countries that make up the region, it remains true

that nearly 40 percent of the countries of the region could not be included in the study due to missing data.

Also, I had intended to explore the impact of the Acquired Immune Deficiency Syndrom (AIDS) epidemic on the economy of Sub-Saharan Africa. Unfortunately, lack of time-series data during the period of this study prohibited the study of the impact of this significant public health problem. A cursory review of various data sources (World Tables, IMF, etc.) to examine the trend of the AIDS epidemic, a disease with highly significant implications for population and economic trends in the region, shows that data are virtually nonexistent and sparse at best. Suppose AIDS has a direct relationship to economic development--would it have any effect on the results of this study? Because economic development is an exogenous variable, the effect of AIDS does not matter. If the relationship exists, it is one of omitted variable. AIDS is, therefore, orthogonal to political instability, as illustrated in Figure 6.3. Omitting AIDS in the model simply leads to an omitted variable bias. This could not have been addressed in this study because of the lack of data and the poor quality of data on the disease, since AIDS is a recent public health crisis. The following equation is derived from the model.

The following equation is derived from the model.

Figure 6.3: The Theoretical Direct Effect of AIDS on Political Turmoil



Source: Prepared by the author.

$$PT_t = \beta_0 + \beta_1 ED_{t-i} + \beta_2 SD_{t-i} + \beta_3 AIDS_{t-i} + E_t.$$

Anther limitation encountered in this study concerns methodology. The most-similar systems design (Przeworski and Teune 1970, 32) rather than the most-different systems approach was used. The most-similar system design tends to produce results that are limited to comparable systems only. While this design may limit the generalizability of the results to Sub-Saharan Africa, it is a robust approach

number of possible control variables. As shown in chapter 4, Sub-Sahara African countries are homogenous in all important respects.

In light of these limitations, I offer a number of avenues for future research in the section that follows.

Avenues for Future Research

One of the areas in which this study can be improved is by the performing of longitudinal analyses over shorter time periods (e.g., focusing on three to four countries and studying those countries in detail for a period of four to five years). This would allow us to begin to assess the impact of AIDS as a public health issue on the political and economic development of developing countries of Sub-Saharan Africa. Given the recency of the AIDS issue, a pooled cross-sectional time-series analyses approach would continue to encounter the problem of lack of data. Until such a time when the disease reaches a maturation stage in the region, we would not have enough data in a pooled cross-sectional time-series setting to assess its implications for political stability of Sub-Saharan Africa.

Another way in which the field of political science can be further enhanced through this study is by extending this work beyond the question of causality to explore the

the question of weak exogeneity. I had intended to extend the study by performing the weak exogeneity test of the variables in each model. The test of weak exogeneity would have allowed me to assess the explanatory power of the conditional model. When a variable is weakly exogenous, the marginal model can be ignored, because the conditional model, solely, is complete for the purpose of statistical inference (see Hendry 1995), in addition to testing for Granger-causality. That is, the marginal distribution of conditional variables contains no relevant information and carries no significance in the analysis, since no information can be gained from estimating an equation for the independent variable of interest (see Hausman 1978, and Johnston and Dinardo 1997). In essence, it may be that Y is not Granger-caused. It may be that X affects Y without a lag. If that is the case, then X could be weakly exogenous. The test of weak exogeneity was not implemented due to difficulties in transforming the data and obtaining the residuals from pooled time-series data. This would allow for a better understanding of the actual impact of the independent variables.

Finally, I would like to use the methodology implemented in this study to explore political turmoil in other developing regions, such as Latin America/Carribean

and Southeast Asia. By so doing, it could be determined whether the results noted in this study are unique to Sub-Saharan African countries or whether they can be generalized to other developing regions of the world.

APPENDIX A

LIST OF COUNTRIES

Country	Abbreviation
Benin	Beni
Burkina Faso	Bfs
Botswana	Bsw
Burundi	Buru
Central African Republic	Car
Cameroon	Cmr
Congo	Cngo
Ghana	Ghn
Guinea-Bissau	Ginb
Gambia	Gmb
Ivory Coast	Ivor
Kenya	Knya
Lesotho	Leso
Malawi	Mala
Mali	Mali
Madagascar	Mdg
Mauritania	Mrit
Mauritius	Mrus
Niger	Nig
Nigeria	Nigr
Senegal	Sngl
Togo	Togo
Zaire	Zair
Zambia	Zamb

APPENDIX B

DESCRIPTION OF THE RESEARCH DATA

Abbreviation		Description
Obs	=	Observations. The study contains 25 time points for each of the 24 units (countries) studied, for a total of 600 panel observations ($(N_{24})(T_{25})=600$).
Ccode	=	Country code.
Year	=	Year represents time points.
PT	=	Index of political turmoil constructed from annual unconventional political events. Banks's political violence file is the source of the data for political turmoil. The data consist of political assassinations, general strikes, guerrilla warfare, riots, anti-government demonstrations and government crisis. I construct the index of political turmoil using the principal component approach.
ED	=	Means economic development. It consists of the log of gross national product (PGNP) per capita; private

consumption (PPC) per capital; industries' contribution to gross domestic product(PGDI); and exchange rate (PXR).

SD = Means social dislocation, and measured as the ratio of urban population to total population. This is level data.

APPENDIX C

POLITICAL TURMOIL, ECONOMIC DEVELOPMENT AND SOCIAL DISLOCATION DATA

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
1	BENI	1971	0.36581	-0.85005	19.50000	0.068993
2	BENI	1972	0.36581	0.73346	20.90000	0.069335
3	BENI	1973	0.36581	1.54996	18.60000	-0.116588
4	BENI	1974	0.36581	0.95931	19.50000	0.047253
5	BENI	1975	0.36581	-0.72782	20.40000	0.045120
6	BENI	1976	0.36581	-0.04991	21.30000	0.043172
7	BENI	1977	0.36581	0.94306	22.20000	0.041385
8	BENI	1978	0.36581	-0.17720	23.10000	0.039740
9	BENI	1979	0.36581	0.94571	24.00000	0.038221
10	BENI	1980	0.36581	0.62979	24.90000	0.036814
11	BENI	1981	0.36581	0.54387	25.30000	0.015937
12	BENI	1982	0.36581	-0.78914	25.70000	0.015687
13	BENI	1983	0.36581	-1.87594	26.10000	0.015444
14	BENI	1984	0.36581	-0.03080	26.50000	0.015209
15	BENI	1985	0.36581	0.06613	26.90000	0.014982
16	BENI	1986	0.36581	-1.00945	27.30000	0.014760
17	BENI	1987	0.36581	0.58694	27.70000	0.014546
18	BENI	1988	0.36581	0.90031	28.20000	0.017890
19	BENI	1989	0.92831	0.05523	28.60000	0.014085
20	BENI	1990	0.75339	-1.04252	29.00000	0.013889
21	BENI	1991	0.36581	0.22963	29.50000	0.017094
22	BENI	1992	0.36581	0.03681	29.90000	0.013468
23	BENI	1993	0.91454	0.06312	30.40000	0.016584
24	BENI	1994	0.36581	0.18647	41.00000	0.299129
25	BENI	1995	0.36581	-0.05702	42.00000	0.024098
26	BFS	1971	0.36581	-0.13259	5.80000	0.017392
27	BFS	1972	0.36581	-0.74889	5.90000	0.017094
28	BFS	1973	0.36581	2.50153	6.10000	0.033336
29	BFS	1974	0.55255	-0.13994	6.20000	0.016261
30	BFS	1975	0.36581	1.34696	6.30000	0.016000
31	BFS	1976	0.36581	0.14602	6.70000	0.061558
32	BFS	1977	0.36581	-0.36318	7.20000	0.071973

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
33	BFS	1978	0.36581	0.66674	7.60000	0.054067
34	BFS	1979	0.36581	0.66347	8.10000	0.063716
35	BFS	1980	0.36581	0.76622	8.50000	0.048202
36	BFS	1981	0.36581	-0.28256	9.10000	0.068208
37	BFS	1982	0.36581	-0.09747	9.70000	0.063851
38	BFS	1983	0.55255	-0.91153	10.20000	0.050262
39	BFS	1984	0.36581	-0.95136	10.80000	0.057158
40	BFS	1985	0.36581	-0.06422	11.40000	0.054067
41	BFS	1986	0.36581	0.43645	12.70000	0.107989
42	BFS	1987	0.36581	0.94019	14.00000	0.097455
43	BFS	1988	0.36581	0.18331	15.30000	0.088795
44	BFS	1989	0.55255	0.21383	16.60000	0.081550
45	BFS	1990	0.36581	-0.31857	17.90000	0.075398
46	BFS	1991	0.87974	-0.24535	19.80000	0.100881
47	BFS	1992	0.36581	0.45193	21.60000	0.087011
48	BFS	1993	0.36581	-0.40152	23.50000	0.084307
49	BFS	1994	0.79279	0.35972	25.00000	0.061875
50	BFS	1995	0.87974	0.00831	27.00000	0.076961
51	BSW	1971	0.36581	-3.31914	9.10000	0.080043
52	BSW	1972	0.36581	0.99447	9.80000	0.074108
53	BSW	1973	0.36581	1.75749	10.60000	0.078472
54	BSW	1974	0.36581	1.49403	11.30000	0.063949
55	BSW	1975	0.36581	-0.43617	12.00000	0.060104
56	BSW	1976	0.36581	1.87516	12.60000	0.048790
57	BSW	1977	0.36581	-1.10688	13.20000	0.046520
58	BSW	1978	0.36581	2.67742	13.90000	0.051672
59	BSW	1979	0.36581	-0.59710	14.50000	0.042260
60	BSW	1980	0.36581	1.64237	15.10000	0.040546
61	BSW	1981	0.36581	1.12377	15.80000	0.045315
62	BSW	1982	0.36581	-0.57354	16.60000	0.049393
63	BSW	1983	0.36581	0.74730	17.30000	0.041304
64	BSW	1984	0.36581	-1.12713	18.10000	0.045205

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
65	BSW	1985	0.36581	-0.86798	18.80000	0.037945
66	BSW	1986	0.36581	-0.60109	19.70000	0.046762
67	BSW	1987	0.36581	0.77276	20.50000	0.039806
68	BSW	1988	0.36581	0.91360	21.40000	0.042966
69	BSW	1989	0.63949	-0.04763	22.20000	0.036701
70	BSW	1990	0.36581	-2.79984	23.10000	0.039740
71	BSW	1991	0.36581	0.95599	24.10000	0.042379
72	BSW	1992	0.63949	0.11855	25.10000	0.040656
73	BSW	1993	0.36581	-0.79624	26.10000	0.039067
74	BSW	1994	0.36581	-0.12991	30.00000	0.139262
75	BSW	1995	0.58322	-0.00168	31.00000	0.032790
76	BURU	1971	0.36581	2.09379	2.60000	0.080043
77	BURU	1972	0.99987	-1.79741	2.70000	0.037740
78	BURU	1973	0.77120	0.18631	2.90000	0.071459
79	BURU	1974	0.36581	0.49220	3.00000	0.033902
80	BURU	1975	0.36581	0.40207	3.20000	0.064539
81	BURU	1976	0.36581	0.53655	3.40000	0.060625
82	BURU	1977	0.36581	0.85446	3.60000	0.057158
83	BURU	1978	0.36581	-0.25854	3.90000	0.080043
84	BURU	1979	0.36581	0.35315	4.10000	0.050010
85	BURU	1980	0.36581	0.78769	4.30000	0.047628
86	BURU	1981	0.36581	0.33404	4.50000	0.045462
87	BURU	1982	0.36581	-0.11652	4.70000	0.043485
88	BURU	1983	0.36581	-0.61973	4.80000	0.021053
89	BURU	1984	0.36581	-0.56794	5.00000	0.040822
90	BURU	1985	0.36581	0.76361	5.20000	0.039221
91	BURU	1986	0.36581	0.01875	5.40000	0.037740
92	BURU	1987	0.36581	-0.05695	5.60000	0.036368
93	BURU	1988	0.36581	-0.06982	5.90000	0.052186
94	BURU	1989	0.36581	-0.84590	6.10000	0.033336
95	BURU	1990	0.36581	0.02529	6.30000	0.032261
96	BURU	1991	0.36581	0.07144	6.50000	0.031253

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
97	BURU	1992	0.36581	-0.64880	6.80000	0.045120
98	BURU	1993	0.99991	-0.91135	7.00000	0.028988
99	BURU	1994	0.99992	1.70770	7.00000	0.000000
100	BURU	1995	1.00000	-0.02810	8.00000	0.133531
101	CAR	1971	0.36581	-0.35448	31.20000	0.025975
102	CAR	1972	0.36581	0.86977	31.90000	0.022188
103	CAR	1973	0.36581	3.93848	32.30000	0.012461
104	CAR	1974	0.36581	0.87000	33.00000	0.021440
105	CAR	1975	0.36581	0.23983	33.70000	0.020990
106	CAR	1976	0.36581	0.52682	34.00000	0.008863
107	CAR	1977	0.36581	1.13923	34.30000	0.008785
108	CAR	1978	0.36581	0.39909	34.50000	0.005814
109	CAR	1979	0.75339	-0.25260	34.80000	0.008658
110	CAR	1980	0.36581	0.44935	35.10000	0.008584
111	CAR	1981	0.79734	-0.88685	35.30000	0.005682
112	CAR	1982	0.36581	0.33789	35.60000	0.008463
113	CAR	1983	0.36581	-1.33347	35.80000	0.005602
114	CAR	1984	0.36581	-0.00439	36.10000	0.008345
115	CAR	1985	0.36581	-0.02306	36.30000	0.005525
116	CAR	1986	0.36581	0.73380	36.50000	0.005495
117	CAR	1987	0.36581	0.17899	36.80000	0.008186
118	CAR	1988	0.36581	0.61358	37.00000	0.005420
119	CAR	1989	0.36581	-0.04317	37.30000	0.008075
120	CAR	1990	0.36581	-0.23260	37.50000	0.005348
121	CAR	1991	0.36581	-0.59031	37.90000	0.010610
122	CAR	1992	0.36581	-0.37097	38.20000	0.007884
123	CAR	1993	0.90168	-0.59306	38.60000	0.010417
124	CAR	1994	0.36581	1.56489	39.00000	0.010309
125	CAR	1995	0.36581	0.01980	39.00000	0.000000
126	CMR	1971	0.36581	0.36266	21.60000	0.062072
127	CMR	1972	0.36581	-0.64117	22.90000	0.058444
128	CMR	1973	0.36581	1.29680	24.30000	0.059339

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
129	CMR	1974	0.36581	1.13250	25.60000	0.052116
130	CMR	1975	0.36581	0.85013	26.90000	0.049534
131	CMR	1976	0.36581	-0.24160	27.80000	0.032910
132	CMR	1977	0.36581	1.05938	28.70000	0.031861
133	CMR	1978	0.36581	0.95830	29.60000	0.030877
134	CMR	1979	0.36581	1.46564	30.50000	0.029952
135	CMR	1980	0.36581	1.16782	31.40000	0.029081
136	CMR	1981	0.36581	0.86728	32.30000	0.028259
137	CMR	1982	0.36581	-0.95163	33.10000	0.024466
138	CMR	1983	0.36581	-0.19278	34.00000	0.026827
139	CMR	1984	0.36581	-0.99183	34.80000	0.023257
140	CMR	1985	0.36581	-0.27801	35.70000	0.025533
141	CMR	1986	0.36581	1.03422	36.60000	0.024898
142	CMR	1987	0.36581	-1.17800	37.50000	0.024293
143	CMR	1988	0.36581	-0.23269	38.50000	0.026317
144	CMR	1989	0.36581	-0.02972	39.40000	0.023108
145	CMR	1990	0.63949	-1.14795	40.30000	0.022586
146	CMR	1991	0.99453	-0.70663	41.20000	0.022087
147	CMR	1992	0.92831	-0.07821	42.10000	0.021609
148	CMR	1993	0.36581	-1.34267	43.10000	0.023475
149	CMR	1994	0.68212	3.33353	44.00000	0.020667
150	CMR	1995	0.36581	0.00045	45.00000	0.022473
151	CNGO	1971	0.36581	-0.59576	33.00000	0.006079
152	CNGO	1972	0.36581	0.28128	33.20000	0.006042
153	CNGO	1973	0.36581	-0.16800	34.00000	0.023811
154	CNGO	1974	0.36581	0.74326	34.40000	0.011696
155	CNGO	1975	0.36581	0.43153	34.80000	0.011561
156	CNGO	1976	0.36581	0.25225	36.00000	0.033902
157	CNGO	1977	0.96124	-0.98950	37.30000	0.035474
158	CNGO	1978	0.36581	0.63978	38.50000	0.031665
159	CNGO	1979	0.55255	-0.17010	39.80000	0.033209
160	CNGO	1980	0.36581	1.77251	41.00000	0.029705

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
161	CNGO	1981	0.36581	0.91701	42.30000	0.031215
162	CNGO	1982	0.36581	2.06001	43.60000	0.030270
163	CNGO	1983	0.36581	-1.13840	44.90000	0.029381
164	CNGO	1984	0.36581	-0.35292	46.20000	0.028542
165	CNGO	1985	0.36581	-0.28591	47.50000	0.027750
166	CNGO	1986	0.36581	-0.87988	48.70000	0.024949
167	CNGO	1987	0.36581	0.21204	49.90000	0.024342
168	CNGO	1988	0.36581	-0.28764	51.10000	0.023763
169	CNGO	1989	0.36581	-0.09657	52.30000	0.023212
170	CNGO	1990	0.36581	-0.41141	53.50000	0.022685
171	CNGO	1991	0.36581	-0.13245	54.60000	0.020352
172	CNGO	1992	0.81864	-0.16729	55.60000	0.018149
173	CNGO	1993	0.36581	-1.45975	56.70000	0.019591
174	CNGO	1994	0.99719	2.22742	58.00000	0.022669
175	CNGO	1995	0.36581	-0.01540	59.00000	0.017094
176	GHN	1971	0.36581	0.13601	29.20000	0.006873
177	GHN	1972	0.36581	-0.93412	29.30000	0.003419
178	GHN	1973	0.36581	0.95288	29.70000	0.013560
179	GHN	1974	0.36581	0.40925	29.90000	0.006711
180	GHN	1975	0.36581	-1.30159	30.10000	0.006667
181	GHN	1976	0.36581	-0.57500	30.30000	0.006623
182	GHN	1977	0.36581	0.43132	30.50000	0.006579
183	GHN	1978	0.79279	0.60191	30.80000	0.009788
184	GHN	1979	0.36581	-0.29479	31.00000	0.006473
185	GHN	1980	0.36581	0.83182	31.20000	0.006431
186	GHN	1981	0.58322	-1.06614	31.40000	0.006390
187	GHN	1982	0.36581	-1.61897	31.60000	0.006349
188	GHN	1983	0.36581	-0.27938	31.90000	0.009449
189	GHN	1984	0.36581	0.76319	32.10000	0.006250
190	GHN	1985	0.36581	0.23870	32.30000	0.006211
191	GHN	1986	0.36581	0.25024	32.60000	0.009245
192	GHN	1987	0.36581	0.14477	33.00000	0.012195

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
193	GHN	1988	0.36581	0.08296	33.30000	0.009050
194	GHN	1989	0.36581	-0.51920	33.70000	0.011940
195	GHN	1990	0.36581	-0.17876	34.00000	0.008863
196	GHN	1991	0.36581	-0.02585	34.50000	0.014599
197	GHN	1992	0.36581	0.04195	34.90000	0.011528
198	GHN	1993	0.36581	-0.35015	35.40000	0.014225
199	GHN	1994	0.36581	-0.22547	36.00000	0.016807
200	GHN	1995	0.63949	-0.13432	36.00000	0.000000
201	GINB	1971	0.50000	-0.28930	15.30000	0.013158
202	GINB	1972	0.50000	0.69667	15.40000	0.006515
203	GINB	1973	0.50000	0.82958	15.60000	0.012903
204	GINB	1974	0.00001	0.50304	15.70000	0.006390
205	GINB	1975	0.36581	-0.60800	15.90000	0.012658
206	GINB	1976	0.36581	-1.81492	16.10000	0.012500
207	GINB	1977	0.36581	-0.32486	16.30000	0.012346
208	GINB	1978	0.36581	0.54860	16.40000	0.006116
209	GINB	1979	0.36581	-1.25232	16.60000	0.012121
210	GINB	1980	0.36581	-2.05010	16.80000	0.011976
211	GINB	1981	0.36581	1.89643	17.10000	0.017700
212	GINB	1982	0.36581	0.76833	17.30000	0.011628
213	GINB	1983	0.36581	-0.55696	17.60000	0.017192
214	GINB	1984	0.36581	0.48108	17.80000	0.011300
215	GINB	1985	0.36581	-0.36173	18.10000	0.016713
216	GINB	1986	0.36581	-0.66407	18.50000	0.021859
217	GINB	1987	0.36581	-0.29050	18.80000	0.016086
218	GINB	1988	0.40877	0.33975	19.20000	0.021053
219	GINB	1989	0.36581	0.60054	19.50000	0.015504
220	GINB	1990	0.36581	0.14463	19.90000	0.020305
221	GINB	1991	0.36581	-0.57015	20.40000	0.024815
222	GINB	1992	0.63949	0.48679	20.80000	0.019418
223	GINB	1993	0.36581	-1.36224	21.30000	0.023754
224	GINB	1994	0.36581	0.07117	22.00000	0.032335

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
225	GINB	1995	0.36581	-0.15363	22.00000	0.000000
226	GMB	1971	0.36581	1.39501	15.30000	0.019803
227	GMB	1972	0.36581	-0.75982	15.60000	0.019418
228	GMB	1973	0.36581	-1.70908	16.00000	0.025318
229	GMB	1974	0.36581	1.38555	16.30000	0.018576
230	GMB	1975	0.36581	-0.89882	16.60000	0.018238
231	GMB	1976	0.36581	1.16066	16.90000	0.017911
232	GMB	1977	0.36581	0.11621	17.20000	0.017596
233	GMB	1978	0.36581	1.36336	17.60000	0.022990
234	GMB	1979	0.36581	-0.44641	17.90000	0.016902
235	GMB	1980	0.36581	0.15124	18.20000	0.016621
236	GMB	1981	0.55255	-2.10139	18.60000	0.021740
237	GMB	1982	0.36581	-0.48731	19.00000	0.021277
238	GMB	1983	0.36581	-2.12961	19.40000	0.020834
239	GMB	1984	0.36581	0.34034	19.80000	0.020409
240	GMB	1985	0.36581	0.54284	20.20000	0.020001
241	GMB	1986	0.36581	-1.10639	20.70000	0.024451
242	GMB	1987	0.36581	-0.19715	21.20000	0.023867
243	GMB	1988	0.36581	0.81430	21.60000	0.018692
244	GMB	1989	0.36581	-0.08771	22.10000	0.022884
245	GMB	1990	0.36581	0.08745	22.60000	0.022372
246	GMB	1991	0.36581	0.50192	23.20000	0.026202
247	GMB	1992	0.36581	2.27308	23.80000	0.025533
248	GMB	1993	0.36581	-0.30223	24.30000	0.020791
249	GMB	1994	0.36581	-2.14524	25.00000	0.028399
250	GMB	1995	0.36581	-0.15423	26.00000	0.039221
251	IVOR	1971	0.36581	0.07906	28.30000	0.032319
252	IVOR	1972	0.36581	-0.20578	29.30000	0.034726
253	IVOR	1973	0.36581	0.28414	30.20000	0.030254
254	IVOR	1974	0.36581	0.98193	31.20000	0.032576
255	IVOR	1975	0.36581	1.20766	32.10000	0.028438
256	IVOR	1976	0.36581	0.53740	32.60000	0.015456

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
257	IVOR	1977	0.36581	0.42194	33.20000	0.018238
258	IVOR	1978	0.36581	1.29367	33.70000	0.014948
259	IVOR	1979	0.36581	0.29741	34.30000	0.017648
260	IVOR	1980	0.36581	-0.53349	34.80000	0.014472
261	IVOR	1981	0.36581	-0.44557	35.40000	0.017094
262	IVOR	1982	0.63949	-2.02415	35.90000	0.014025
263	IVOR	1983	0.36581	-0.83764	36.50000	0.016575
264	IVOR	1984	0.36581	-0.56535	37.00000	0.013606
265	IVOR	1985	0.36581	0.65525	37.60000	0.016086
266	IVOR	1986	0.36581	-0.43588	38.20000	0.015831
267	IVOR	1987	0.36581	0.19386	38.70000	0.013004
268	IVOR	1988	0.36581	0.06995	39.30000	0.015385
269	IVOR	1989	0.36581	-0.57862	39.80000	0.012642
270	IVOR	1990	0.99991	-1.26585	40.40000	0.014963
271	IVOR	1991	0.36581	-0.83444	41.00000	0.014742
272	IVOR	1992	0.94633	0.01351	41.70000	0.016929
273	IVOR	1993	0.36581	-0.55639	42.30000	0.014286
274	IVOR	1994	0.36581	1.63067	43.00000	0.016413
275	IVOR	1995	0.98666	-0.20539	44.00000	0.022990
276	KNYA	1971	0.36581	2.80316	10.80000	0.047402
277	KNYA	1972	0.36581	1.16948	11.30000	0.045257
278	KNYA	1973	0.36581	-1.45880	11.90000	0.051736
279	KNYA	1974	0.36581	0.56138	12.40000	0.041158
280	KNYA	1975	0.92274	0.15302	12.90000	0.039531
281	KNYA	1976	0.81864	-0.51841	13.50000	0.045462
282	KNYA	1977	0.36581	0.45406	14.20000	0.050552
283	KNYA	1978	0.36581	0.78635	14.80000	0.041385
284	KNYA	1979	0.36581	0.59746	15.50000	0.046213
285	KNYA	1980	0.36581	0.26843	16.10000	0.037979
286	KNYA	1981	0.36581	-0.51600	16.80000	0.042560
287	KNYA	1982	0.97371	-0.57857	17.50000	0.040822
288	KNYA	1983	0.55255	-0.98434	18.30000	0.044700

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
289	KNYA	1984	0.36581	-0.35097	19.00000	0.037538
290	KNYA	1985	0.36581	-0.56474	19.70000	0.036180
291	KNYA	1986	0.36581	0.71481	20.50000	0.039806
292	KNYA	1987	0.58322	0.48952	21.30000	0.038282
293	KNYA	1988	0.36581	0.40202	22.00000	0.032335
294	KNYA	1989	0.36581	-0.07483	22.80000	0.035718
295	KNYA	1990	0.99972	-0.37003	23.60000	0.034486
296	KNYA	1991	0.99929	-0.51047	24.40000	0.033336
297	KNYA	1992	0.97812	-0.56301	25.20000	0.032261
298	KNYA	1993	0.36581	-0.91102	26.10000	0.035091
299	KNYA	1994	0.36581	1.42721	27.00000	0.033902
300	KNYA	1995	0.36581	-0.07631	28.00000	0.036368
301	LESO	1971	0.36581	-0.10300	9.00000	0.045462
302	LESO	1972	0.36581	0.93338	9.50000	0.054067
303	LESO	1973	0.36581	2.03672	9.90000	0.041243
304	LESO	1974	0.36581	0.92626	10.40000	0.049271
305	LESO	1975	0.36581	0.28329	10.80000	0.037740
306	LESO	1976	0.36581	1.25507	11.30000	0.045257
307	LESO	1977	0.36581	0.88958	11.80000	0.043297
308	LESO	1978	0.36581	-0.20264	12.30000	0.041500
309	LESO	1979	0.36581	0.43147	12.80000	0.039846
310	LESO	1980	0.36581	-0.05491	13.30000	0.038319
311	LESO	1981	0.57523	-0.88225	13.90000	0.044125
312	LESO	1982	0.84286	1.83661	14.40000	0.035339
313	LESO	1983	0.57523	-3.63857	15.00000	0.040822
314	LESO	1984	0.36581	2.87961	15.50000	0.032790
315	LESO	1985	0.36581	-1.72047	16.10000	0.037979
316	LESO	1986	0.36581	-1.75354	16.80000	0.042560
317	LESO	1987	0.36581	1.11901	17.40000	0.035091
318	LESO	1988	0.36581	1.25140	18.10000	0.039442
319	LESO	1989	0.36581	0.85489	18.70000	0.032612
320	LESO	1990	0.55255	-1.69671	19.40000	0.036750

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
321	LESO	1991	0.36581	-0.01823	20.10000	0.035447
322	LESO	1992	0.36581	-0.14297	20.90000	0.039029
323	LESO	1993	0.36581	1.22612	21.60000	0.032944
324	LESO	1994	0.99972	-0.19693	22.00000	0.018349
325	LESO	1995	0.58322	-0.00245	23.00000	0.044452
326	MALA	1971	0.36581	1.81386	6.30000	0.048790
327	MALA	1972	0.36581	-0.16445	6.70000	0.061558
328	MALA	1973	0.36581	0.02757	7.00000	0.043803
329	MALA	1974	0.36581	0.44055	7.40000	0.055570
330	MALA	1975	0.36581	0.69498	7.70000	0.039740
331	MALA	1976	0.36581	-0.65414	8.00000	0.038221
332	MALA	1977	0.36581	0.06012	8.30000	0.036814
333	MALA	1978	0.36581	0.49598	8.50000	0.023811
334	MALA	1979	0.36581	0.33385	8.80000	0.034686
335	MALA	1980	0.36581	0.06524	9.10000	0.033523
336	MALA	1981	0.36581	-0.56618	9.40000	0.032435
337	MALA	1982	0.36581	-0.36127	9.60000	0.021053
338	MALA	1983	0.68212	-0.53826	9.90000	0.030772
339	MALA	1984	0.36581	0.09504	10.10000	0.020001
340	MALA	1985	0.36581	-0.18874	10.40000	0.029270
341	MALA	1986	0.36581	-0.93980	10.70000	0.028438
342	MALA	1987	0.36581	-0.40767	11.00000	0.027652
343	MALA	1988	0.36581	0.53462	11.20000	0.018019
344	MALA	1989	0.36581	-0.10027	11.50000	0.026433
345	MALA	1990	0.36581	0.34563	11.80000	0.025752
346	MALA	1991	0.36581	0.20650	12.10000	0.025106
347	MALA	1992	0.94633	-0.83409	12.50000	0.032523
348	MALA	1993	0.36581	-0.22717	12.80000	0.023717
349	MALA	1994	0.36581	0.27188	13.00000	0.015504
350	MALA	1995	0.36581	-0.11331	13.00000	0.000000
351	MALI	1971	0.36581	-0.71908	14.70000	0.027588
352	MALI	1972	0.36581	1.37719	15.10000	0.026847

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
353	MALI	1973	0.36581	-0.10359	15.40000	0.019673
354	MALI	1974	0.36581	0.50539	15.80000	0.025642
355	MALI	1975	0.36581	1.23722	16.20000	0.025001
356	MALI	1976	0.36581	0.72006	16.70000	0.030397
357	MALI	1977	0.36581	0.45733	17.10000	0.023670
358	MALI	1978	0.36581	-0.15146	17.60000	0.028820
359	MALI	1979	0.63949	0.71461	18.00000	0.022473
360	MALI	1980	0.94633	0.46487	18.50000	0.027399
361	MALI	1981	0.58322	-0.06543	19.00000	0.026668
362	MALI	1982	0.36581	-0.99349	19.50000	0.025975
363	MALI	1983	0.36581	-1.40034	20.00000	0.025318
364	MALI	1984	0.36581	-1.33152	20.50000	0.024693
365	MALI	1985	0.36581	0.13694	21.00000	0.024098
366	MALI	1986	0.36581	0.74213	21.60000	0.028171
367	MALI	1987	0.36581	0.27164	22.10000	0.022884
368	MALI	1988	0.36581	0.56656	22.70000	0.026787
369	MALI	1989	0.36581	0.27324	23.20000	0.021787
370	MALI	1990	0.36581	-0.13233	23.80000	0.025533
371	MALI	1991	0.77735	-0.75705	24.40000	0.024898
372	MALI	1992	0.36581	0.66209	25.10000	0.028285
373	MALI	1993	0.94633	-0.51944	25.70000	0.023623
374	MALI	1994	0.36581	0.39731	26.00000	0.011606
375	MALI	1995	0.36581	-0.04629	27.00000	0.037740
376	MDG	1971	0.58322	1.05889	14.50000	0.027974
377	MDG	1972	1.00000	-0.25714	14.90000	0.027213
378	MDG	1973	0.81864	3.16540	15.30000	0.026492
379	MDG	1974	0.36581	0.52397	15.70000	0.025808
380	MDG	1975	0.36581	0.42068	16.10000	0.025159
381	MDG	1976	0.36581	-0.83637	16.50000	0.024541
382	MDG	1977	0.36581	0.07408	17.00000	0.029853
383	MDG	1978	0.58322	-0.13483	17.40000	0.023257
384	MDG	1979	0.36581	1.30739	17.90000	0.028331

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
385	MDG	1980	0.36581	0.10361	18.30000	0.022100
386	MDG	1981	0.99998	-1.71235	18.80000	0.026956
387	MDG	1982	0.99790	-0.39492	19.30000	0.026248
388	MDG	1983	0.36581	-0.36537	19.90000	0.030615
389	MDG	1984	0.58322	-0.61231	20.40000	0.024815
390	MDG	1985	0.36581	-0.58727	20.90000	0.024214
391	MDG	1986	0.36581	-0.29102	21.50000	0.028304
392	MDG	1987	0.36581	-0.59169	22.10000	0.027525
393	MDG	1988	0.36581	-0.69318	22.60000	0.022372
394	MDG	1989	0.36581	-0.86240	23.20000	0.026202
395	MDG	1990	0.36581	0.18874	23.80000	0.025533
396	MDG	1991	1.00000	-0.69644	24.50000	0.028988
397	MDG	1992	0.99058	-0.20086	25.10000	0.024195
398	MDG	1993	0.55255	0.07533	25.80000	0.027507
399	MDG	1994	0.55255	0.28180	26.00000	0.007722
400	MDG	1995	0.85478	-0.35632	27.00000	0.037740
401	MRIT	1971	0.36581	-0.44935	15.00000	0.090654
402	MRIT	1972	0.36581	0.64136	16.30000	0.083115
403	MRIT	1973	0.36581	-0.16585	17.70000	0.082400
404	MRIT	1974	0.36581	2.38512	19.00000	0.070874
405	MRIT	1975	0.36581	-1.00934	20.30000	0.066182
406	MRIT	1976	0.57523	1.15227	22.00000	0.080422
407	MRIT	1977	0.57523	-1.34966	23.80000	0.078643
408	MRIT	1978	0.57523	-0.10851	25.50000	0.068993
409	MRIT	1979	0.57523	0.75383	27.30000	0.068208
410	MRIT	1980	0.36581	-0.48762	29.00000	0.060409
411	MRIT	1981	0.36581	0.33273	30.80000	0.060219
412	MRIT	1982	0.36581	-0.04873	32.70000	0.059860
413	MRIT	1983	0.36581	0.50550	34.50000	0.053584
414	MRIT	1984	0.36581	-0.12892	36.40000	0.053609
415	MRIT	1985	0.36581	-1.43269	38.20000	0.048267
416	MRIT	1986	0.36581	0.60368	39.90000	0.043541

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
417	MRIT	1987	0.36581	-0.38683	41.60000	0.041724
418	MRIT	1988	0.36581	0.25557	43.40000	0.042359
419	MRIT	1989	0.77735	0.71473	45.10000	0.038423
420	MRIT	1990	0.36581	-0.96053	46.80000	0.037001
421	MRIT	1991	0.36581	0.30715	48.20000	0.029476
422	MRIT	1992	0.36581	-0.05474	49.60000	0.028632
423	MRIT	1993	0.36581	-0.77125	51.00000	0.027835
424	MRIT	1994	0.36581	0.68245	52.00000	0.019418
425	MRIT	1995	0.58322	-0.05179	54.00000	0.037740
426	MRUS	1971	0.36581	0.11875	42.30000	0.007117
427	MRUS	1972	0.36581	0.48634	42.60000	0.007067
428	MRUS	1973	0.36581	0.73370	42.80000	0.004684
429	MRUS	1974	0.36581	2.69265	43.10000	0.006985
430	MRUS	1975	0.36581	0.31833	43.40000	0.006936
431	MRUS	1976	0.36581	1.24612	43.20000	-0.004619
432	MRUS	1977	0.36581	-0.06170	43.00000	-0.004640
433	MRUS	1978	0.63949	0.35798	42.80000	-0.004662
434	MRUS	1979	0.79279	0.45682	42.60000	-0.004684
435	MRUS	1980	0.36581	-0.79459	42.40000	-0.004706
436	MRUS	1981	0.36581	0.29544	42.20000	-0.004728
437	MRUS	1982	0.36581	-0.55915	42.00000	-0.004751
438	MRUS	1983	0.36581	-0.68110	41.80000	-0.004773
439	MRUS	1984	0.36581	0.09728	41.60000	-0.004796
440	MRUS	1985	0.36581	0.32977	41.40000	-0.004819
441	MRUS	1986	0.55255	0.73586	41.20000	-0.004843
442	MRUS	1987	0.36581	1.33152	41.00000	-0.004866
443	MRUS	1988	0.36581	0.70923	40.90000	-0.002442
444	MRUS	1989	0.36581	0.24625	40.70000	-0.004902
445	MRUS	1990	0.36581	0.40501	40.50000	-0.004926
446	MRUS	1991	0.36581	0.03095	40.50000	0.000000
447	MRUS	1992	0.63949	0.56204	40.50000	0.000000
448	MRUS	1993	0.36581	0.15682	40.60000	0.002466

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
449	MRUS	1994	0.36581	-0.78462	41.00000	0.009804
450	MRUS	1995	0.36581	0.08990	41.00000	0.000000
451	NIG	1971	0.36581	0.79594	8.90000	0.045985
452	NIG	1972	0.36581	-1.09591	9.30000	0.043963
453	NIG	1973	0.36581	-1.81981	9.80000	0.052368
454	NIG	1974	0.36581	2.39874	10.20000	0.040005
455	NIG	1975	0.36581	-1.28558	10.60000	0.038466
456	NIG	1976	0.36581	-0.51598	11.00000	0.037041
457	NIG	1977	0.36581	0.50709	11.40000	0.035718
458	NIG	1978	0.36581	0.70216	11.70000	0.025975
459	NIG	1979	0.36581	1.81874	12.10000	0.033617
460	NIG	1980	0.36581	0.68372	12.50000	0.032523
461	NIG	1981	0.36581	-0.52899	12.80000	0.023717
462	NIG	1982	0.36581	-0.82945	13.00000	0.015504
463	NIG	1983	0.36581	-1.27271	13.30000	0.022815
464	NIG	1984	0.36581	-1.31795	13.50000	0.014926
465	NIG	1985	0.36581	-0.53783	13.80000	0.021979
466	NIG	1986	0.36581	0.70440	14.10000	0.021506
467	NIG	1987	0.36581	-0.09712	14.40000	0.021053
468	NIG	1988	0.36581	0.22974	14.60000	0.013793
469	NIG	1989	0.36581	-0.73950	14.90000	0.020340
470	NIG	1990	0.81864	0.13270	15.20000	0.019934
471	NIG	1991	0.79279	-0.27869	15.60000	0.025975
472	NIG	1992	0.36581	-0.63788	15.90000	0.019048
473	NIG	1993	0.36581	-0.53262	16.30000	0.024846
474	NIG	1994	0.81864	0.85592	22.00000	0.299877
475	NIG	1995	0.36581	-0.18274	23.00000	0.044452
476	NIGR	1971	0.36581	0.55751	20.70000	0.034401
477	NIGR	1972	0.99946	-0.09812	21.40000	0.033257
478	NIGR	1973	0.36581	-5.11213	22.00000	0.027652
479	NIGR	1974	0.81864	2.69417	22.70000	0.031322
480	NIGR	1975	0.36581	-1.21122	23.40000	0.030371

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
481	NIGR	1976	0.68212	2.17606	24.10000	0.029476
482	NIGR	1977	0.36581	-0.28819	24.90000	0.032656
483	NIGR	1978	0.81864	0.23590	25.60000	0.027725
484	NIGR	1979	0.36581	0.86298	26.40000	0.030772
485	NIGR	1980	0.36581	0.13157	27.10000	0.026170
486	NIGR	1981	0.55255	-0.07160	27.90000	0.029093
487	NIGR	1982	0.75339	-0.67651	28.70000	0.028270
488	NIGR	1983	0.36581	-2.05282	29.50000	0.027493
489	NIGR	1984	0.90598	-0.35485	30.30000	0.026757
490	NIGR	1985	0.36581	0.42037	31.10000	0.026060
491	NIGR	1986	0.36581	-2.78368	31.90000	0.025398
492	NIGR	1987	0.36581	-1.93369	32.70000	0.024769
493	NIGR	1988	0.91454	-0.39093	33.60000	0.027151
494	NIGR	1989	0.92831	-0.61683	34.40000	0.023530
495	NIGR	1990	0.58322	-0.33440	35.20000	0.022990
496	NIGR	1991	0.96922	-0.35904	36.00000	0.022473
497	NIGR	1992	0.90598	-0.15206	36.80000	0.021979
498	NIGR	1993	1.00000	-1.21872	37.70000	0.024162
499	NIGR	1994	1.00000	1.18236	38.00000	0.007926
500	NIGR	1995	0.63949	-0.52837	39.00000	0.025975
501	SNGL	1971	0.36581	-0.47758	33.60000	0.005970
502	SNGL	1972	0.36581	0.10517	33.70000	0.002972
503	SNGL	1973	0.36581	0.98892	33.90000	0.005917
504	SNGL	1974	0.36581	0.74515	34.00000	0.002946
505	SNGL	1975	0.36581	0.76842	34.20000	0.005865
506	SNGL	1976	0.36581	0.46980	34.50000	0.008734
507	SNGL	1977	0.36581	-0.30253	34.90000	0.011528
508	SNGL	1978	0.36581	-0.84038	35.20000	0.008559
509	SNGL	1979	0.36581	1.04064	35.60000	0.011300
510	SNGL	1980	0.36581	0.29005	35.90000	0.008392
511	SNGL	1981	0.36581	-0.61874	36.30000	0.011080
512	SNGL	1982	0.36581	0.34230	36.70000	0.010959

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
513	SNGL	1983	0.63949	-1.08038	37.10000	0.010840
514	SNGL	1984	0.36581	-1.03644	37.50000	0.010724
515	SNGL	1985	0.36581	0.25274	37.90000	0.010610
516	SNGL	1986	0.36581	0.40793	38.30000	0.010499
517	SNGL	1987	0.36581	0.96212	38.70000	0.010390
518	SNGL	1988	0.58322	0.76207	39.00000	0.007722
519	SNGL	1989	0.98474	-0.46727	39.40000	0.010204
520	SNGL	1990	0.36581	0.06964	39.80000	0.010101
521	SNGL	1991	0.36581	-0.27306	40.30000	0.012485
522	SNGL	1992	0.36581	0.35109	40.80000	0.012331
523	SNGL	1993	0.99017	-0.67454	41.30000	0.012180
524	SNGL	1994	0.81864	0.34993	42.00000	0.016807
525	SNGL	1995	0.36581	-0.02135	42.00000	0.000000
526	TOGO	1971	0.36581	-0.08169	13.60000	0.037458
527	TOGO	1972	0.36581	0.43347	14.20000	0.043172
528	TOGO	1973	0.36581	0.22524	15.00000	0.054808
529	TOGO	1974	0.36581	1.23685	15.70000	0.045611
530	TOGO	1975	0.36581	-0.56613	16.30000	0.037504
531	TOGO	1976	0.36581	0.85959	17.60000	0.076734
532	TOGO	1977	0.36581	0.16981	18.90000	0.071263
533	TOGO	1978	0.36581	-0.10662	20.30000	0.071459
534	TOGO	1979	0.36581	-0.12385	21.60000	0.062072
535	TOGO	1980	0.36581	1.56630	22.90000	0.058444
536	TOGO	1981	0.36581	-1.30749	23.60000	0.030110
537	TOGO	1982	0.36581	-0.33909	24.30000	0.029230
538	TOGO	1983	0.36581	-1.61231	25.10000	0.032391
539	TOGO	1984	0.36581	-0.06910	25.80000	0.027507
540	TOGO	1985	0.36581	0.68229	26.50000	0.026770
541	TOGO	1986	0.36581	-0.09069	26.90000	0.014982
542	TOGO	1987	0.36581	0.43323	27.30000	0.014760
543	TOGO	1988	0.36581	1.20039	27.70000	0.014546
544	TOGO	1989	0.36581	-0.37006	28.10000	0.014337

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
545	TOGO	1990	0.98666	-0.32763	28.50000	0.014135
546	TOGO	1991	1.00000	-0.10839	29.00000	0.017392
547	TOGO	1992	0.99999	-1.34906	29.40000	0.013699
548	TOGO	1993	0.81864	-1.63412	29.90000	0.016864
549	TOGO	1994	0.36581	2.32733	30.00000	0.003339
550	TOGO	1995	0.36581	-0.06882	31.00000	0.032790
551	ZAIR	1971	0.58322	-0.48454	33.00000	0.006079
552	ZAIR	1972	0.36581	-0.26522	33.20000	0.006042
553	ZAIR	1973	0.36581	0.23930	34.00000	0.023811
554	ZAIR	1974	0.36581	0.44116	34.40000	0.011696
555	ZAIR	1975	0.68212	-0.60849	34.80000	0.011561
556	ZAIR	1976	0.36581	-0.65467	36.00000	0.033902
557	ZAIR	1977	0.57523	0.00976	37.30000	0.035474
558	ZAIR	1978	0.36581	-0.32131	38.50000	0.031665
559	ZAIR	1979	0.36581	0.42580	39.80000	0.033209
560	ZAIR	1980	0.36581	0.06998	41.00000	0.029705
561	ZAIR	1981	0.36581	-0.57609	42.30000	0.031215
562	ZAIR	1982	0.36581	-0.86840	43.60000	0.030270
563	ZAIR	1983	0.36581	-0.50033	44.90000	0.029381
564	ZAIR	1984	0.36581	-0.79895	46.20000	0.028542
565	ZAIR	1985	0.36581	-1.74930	47.50000	0.027750
566	ZAIR	1986	0.36581	0.24629	48.70000	0.024949
567	ZAIR	1987	0.36581	-0.05240	49.90000	0.024342
568	ZAIR	1988	0.57523	-0.29665	51.10000	0.023763
569	ZAIR	1989	0.99970	-0.62633	52.30000	0.023212
570	ZAIR	1990	0.63949	-0.44589	53.50000	0.022685
571	ZAIR	1991	1.00000	-0.56055	54.60000	0.020352
572	ZAIR	1992	1.00000	-0.60860	55.60000	0.018149
573	ZAIR	1993	0.82861	-0.98836	56.70000	0.019591
574	ZAIR	1994	0.91701	-0.75880	58.00000	0.022669
575	ZAIR	1995	0.99644	-1.11523	59.00000	0.017094
576	ZAMB	1971	0.36581	-0.42224	31.10000	0.029366

OBS	CCode	Year	PT	ED	Urbanization (SD)	SDL
577	ZAMB	1972	0.36581	0.24138	32.00000	0.028528
578	ZAMB	1973	0.36581	-5.68450	33.00000	0.030772
579	ZAMB	1974	0.36581	1.12304	33.90000	0.026907
580	ZAMB	1975	0.36581	-0.80578	34.80000	0.026202
581	ZAMB	1976	0.36581	-0.07355	35.80000	0.028331
582	ZAMB	1977	0.36581	-1.21107	36.80000	0.027550
583	ZAMB	1978	0.36581	0.27979	37.80000	0.026811
584	ZAMB	1979	0.36581	0.71466	38.80000	0.026111
585	ZAMB	1980	0.36581	0.65228	39.80000	0.025447
586	ZAMB	1981	0.36581	0.52263	40.00000	0.005013
587	ZAMB	1982	0.36581	-2.38000	40.20000	0.004988
588	ZAMB	1983	0.36581	-0.16662	40.50000	0.007435
589	ZAMB	1984	0.58322	-0.82454	40.70000	0.004926
590	ZAMB	1985	0.36581	-0.39604	40.90000	0.004902
591	ZAMB	1986	0.77735	-1.84982	41.10000	0.004878
592	ZAMB	1987	0.36581	2.01041	41.30000	0.004854
593	ZAMB	1988	0.36581	0.80311	41.60000	0.007238
594	ZAMB	1989	0.36581	-0.20097	41.80000	0.004796
595	ZAMB	1990	0.81864	-0.54140	42.00000	0.004773
596	ZAMB	1991	0.36581	-3.56321	42.00000	0.000000
597	ZAMB	1992	0.63949	1.71474	42.00000	0.000000
598	ZAMB	1993	0.36581	-1.59418	42.10000	0.002378
599	ZAMB	1994	0.36581	-2.45124	43.00000	0.021152
600	ZAMB	1995	0.36581	-1.44320	45.00000	0.045462

APPENDIX D

PROTOCOL FOR PRINCIPAL COMPONENT ANALYSIS TRANSFORMATION OF POLITICAL TURMOIL AND ECONOMIC DEVELOPMENT DATA

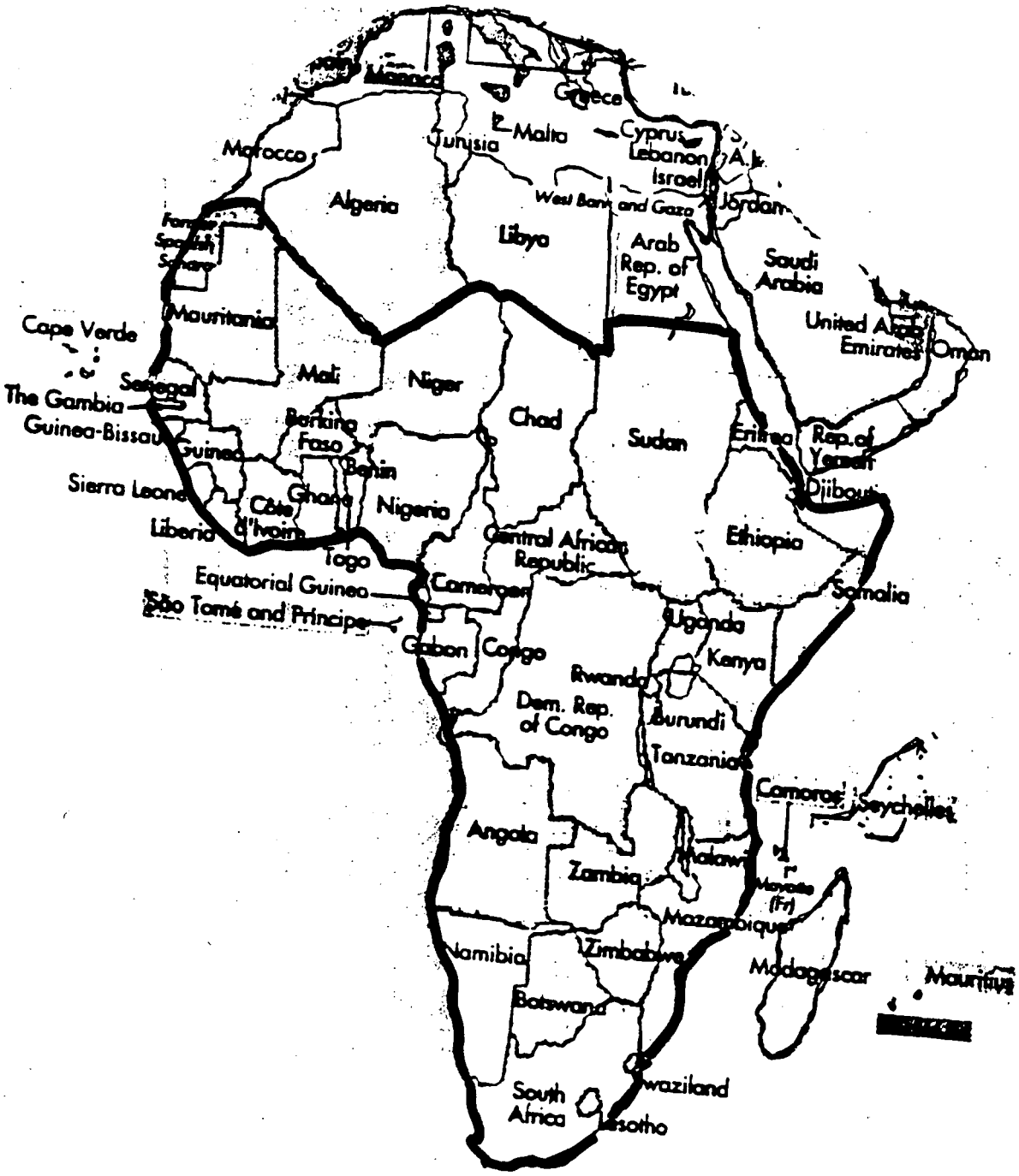
I used the SPSS data transformation procedure to generate the principal components for the indices of political turmoil (PT) and economic development (ED). The routine is executed from the "Statistics," "Data Reduction," and "Factor" sub-menus of the SPSS software as follows:

	Menu		Select
1.	Rotation	=	none
2.	Options	=	"missing variables" replace with mean
3.	Extraction	=	Principal Component "Analyze" correlation matrix "Display" unrotated factor solution and Scree plot "Extract" - Eigenvalues over 1. "Maximum Iteration for convergence" is 25
4.	Scores	=	Select "Save as variables" "Method" - Regression Select "Display factor coefficient and "save variable."
5.	Descriptive	=	"Statistics" - Initial Solution "Correlation Matrix" - Select the following: - Coefficients - Significant levels - Determinant - KMO & Bartlett's test of sphericity

Source: Prepared by author.

APPENDIX E

MAP OF SUB-SAHARAN AFRICA



Source: World Bank 1997.

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