Non Elite Political Instability and Economic Growth: Evidence from Sub-Saharan Africa

Kwabena Gyimah-Brempong** and Amma S. Dapaah***

This paper uses a simultaneous equation model and data from Sub-Saharan Africa to investigate the effects of non elite political instability on economic growth in LDCs. We find that non elite political instability has negative and significant impacts on economic growth in Sub-Saharan Africa. Non elite political instability decreases economic growth directly by decreasing the productivity of resources and indirectly through decreased savings and investment. These negative effects are independent of the effects elite political instability has on growth and robust to different model specifications. Our results suggest that researchers should measure political instability more broadly than the elite political instability that has been used in previous research and that development policy should focus on building broader participatory governments that ensure broader political stability instead of focusing on government stability.

I. Introduction

This paper uses a simultaneous equation model and time-series cross-national data from Sub-Saharan Africa(SSA) to investigate the effects of non elite political instability(NEPI) on economic growth. Two groups of studies have been used to investigate the effects of political instability (PI) on economic performance. The first group employs single equation models, treats PI as exogenous, and finds PI to have negative impact on economic performance. The second group treats PI as

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** Department of Economics University of South Florida, Tampa, FL 33620
*** Ghana Institute of Management and Public Administration, Greenhill, P.O.Box 50 Achimota GIANA.
1 For example, A. K. Fosu, "Political Instability and Economic Growth: Evidence from
endogenous and while they find that PI negatively affect economic performance, they disagree on the effects of economic performance on PI. While economists use PI to explain economic performance, political scientists use economic performance to explain PI.

These studies suffer a weakness: they measure PI as “elite” political instability (EPI) or executive change. However, other forms of PI can negatively impact economic growth. Indeed, it may be argued that these forms of PI may have more deleterious effects on economic growth since they are likely to affect the stability of the political system, hence confidence in the economy, than EPI. Failure to account for these types of PI implies that previous studies may have mis-measured the PI variable. This mismeasurement could result in biased coefficient estimates and the conclusions based on such estimates.


4. See for Alesina et al, and Gyimah-Brempong and Traynor (n. 2 above).
erroneous, at best.

Morrison and Stevenson define political instability as a situation in which the institutionalized pattern of political authority breaks down and is replaced by political violence. While we agree that political instability implies a breakdown of the authority and effectiveness of the current — political structure, it need not be accompanied by violence. We define political instability as situations, activities, or patterns of political behavior that threaten to, or actually undermine the stability of the political system or government. The key attribute of political instability, as used here, is that it generates uncertainties about the stability of the political system and/or government and thus undermine its effectiveness. In this framework, political instability need not involve a change in government or take a violent form.

Sanders provides three dimensions of political instability—elite, communal, and mass. Elite political instability involves the struggle for executive control and is characterized by frequent attempts to topple the incumbent government through non constitutional channels or the frequency of government collapse. As used here, EPI refers to executive instability as opposed to instability of the political system. This concept of political instability is what has been used by earlier researchers and we follow them and measure EPI as a weighted index of successful coups, attempted coups, plots, and purges.

Communal instability is characterized by situations in which communal groups, usually organized along ethnic and religious lines, use political violence to change established political relationships. Events associated with communal political instability include secession movements, civil wars, guerrilla warfare, rebellions, and ethnic violence. Like communal political instability, mass political instability involves the use of political violence to achieve the objectives of the movement. Events that characterize mass political instability include riots, revolutions, politically motivated strikes, and political assassinations.

7. We note that this political assassination is not necessarily directed at the executive in power.
To be characterized as mass political instability, these events must be politically motivated. In this paper, we combine communal and mass political instability and refer to the sum as "non elite" political instability for lack of a better terminology. NEPI is therefore an index summarizing a large number of social protests and political violence.

The difference between EPI and NEPI is that the former is related to instability of the executive while the latter concept is more related to instability of the political system. There can be executive instability without instability of the political system. An example of this is when there is a palace coup which replaces one governing elite with another without changing the political structure or philosophy. On the other hand, there can be instability of the political system without a change in government as in cases where there is a secession movement or there is a constant agitation for change from a repressive regime. Mobutu's Zaire and Mengestu's Ethiopia are examples of unstable political systems with a stable executive power. We note that NEPI is likely to be more widespread over both population and geographical area, longer lasting, and more violent than EPI.

Since EPI excludes other manifestation of political instability that may affect economic growth in LDCs, using it as the only measure of PI to investigate the effects of PI on economic performance may produce biased estimates if NEPI has significant effects on performance in LDCs. It is therefore necessary to investigate the effects of NEPI on economic performance in LDCs. If NEPI has a significant effect on economic performance, then it may be necessary to use a broader measure of PI that includes both EPI and NEPI to investigate the effects of PI on economic performance in LDCs. While we argue that NEPI has a negative impact on economic performance, we are unable to assess its magnitude relative to that of EPI on economic performance. We therefore make no attempt to measure the relative magnitudes of EPI and NEPI on economic performance.

Our approach to investigating the relationship between NEPI and economic growth is as follows: We develop and estimate a growth model in which we measure political instability as NEPI. We then compare the results with those of a model that measures political instability as EPI. Finally, we estimate a model that uses a broad
measure of PI that include both NEPI and EPI events and compare the results to those based on NEPI. The rest of the paper is organized as follows: We present a four equation growth model that endogenized investment, savings, and political instability in section II. Section III discusses the data used to estimate the model while section IV presents the statistical results. Section V summarizes and concludes the paper.

II. Model

We use an augmented production function framework to investigate the effects of NEPI on economic growth in SSA. Following Feder, Krueger and Ram, we write the growth equation as a function of the growth rates of capital, labor, and exports. As argued by Barro, Fosu and others, economic growth is directly influenced by productivity losses created by PI, and is included as an additional explanatory variable. We also include real per capita income, \( y \), to test the convergence hypothesis. The growth equation we estimate is given as follows:

\[
g = a_0 + a_1k + a_2I + a_3x + a_4FRNCH + a_5l + a_6y + e \tag{1}
\]

where \( g, I \) and \( x \) are the growth rates of real GDP, labor, and exports respectively, \( k \) is investment/GDP ratio, FRNCH is economic and cultural cooperation with France, \( e \) is a stochastic error term, and all other variables are as defined above. Most former French colonies in SSA

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9. See Barro (n. 1 above), Fosu (n. 1 above), and the references in n. 1 and 2 above.

10. See Barro (n. 1 above).

11. To avoid repetition, we use PI as a generic term to refer to all measures of political instability in developing the model. We will refer to specific measures of political instability when discussing the results.
have economic, cultural, and technical cooperation with France. FRNCH is included to account for the possible growth impact of this cooperation. The coefficient of FRNCH cannot be signed a priori. Since \( k, l, \) and \( x \) are normal inputs, we expect them to be positively correlated with economic growth. The coefficient of \( y \) is expected to be negative if the convergence hypothesis is true. In general, PI is likely to directly disrupt the production process in the current and subsequent periods. The coefficient of PI is therefore expected to be negative.

Poor economic performance increases the clamor to change the incumbent government or political system. In developed countries where there are established institutional processes for changing governments, this dissatisfaction manifests itself through the election of a new government. In SSA where such institutional structures are not well established, frustration with poor economic performance manifests itself in politically unstable events such as strikes, riots, and secessionist movements. Theoretical and empirical studies by political scientists support this proposition.\(^{12}\)

Following the political science literature, we see PI as a function of economic growth, the strength of the military's role in civil society (MIL), the legislative selection process (LGSL), the type of head of state, level of income \( (y) \), and the extent of fractionalization in the polity (FRA). Formally, the PI equation is given as:

\[
\text{PI} = \beta_0 + \beta_1 g + \beta_2 \text{MIL} + \beta_3 \text{FRA} + \beta_4 \text{PRES} + \beta_5 \text{GEN} + \beta_6 \text{LGSL} + \beta_7 \text{PI}_{t-1} + \beta_8 y + \mu_i
\]  

where PRES and GEN represent constitutionally elected and military heads of state respectively, \( \mu_i \) is a stochastic error term and all other variables are as defined above. We have include a lagged value of PI to test the hypothesis that countries that experience political instability develop an intertemporal "culture of political instability".\(^{13}\) The more democratic and open the legislative selection process is and the stronger economic growth, the lower the incidence of PI, all things equal. We

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12. See Londregan and Poole (n. 2 above) and the references in n 3 above.
13. Londregan and Poole (n. 2 above)
therefore expect the coefficients of $g$, and LGSL to be negative in the PI equation. The political science literature suggests that the military tends to intervene in politics when it has a strong, high profile role in society. The literature also argue that party fractionalization increases political instability in LDCs. The coefficients of MIL and FRA are therefore expected to be positive in the PI equation. The coefficients of PRES and GEN cannot be signed a priori since their signs will depend upon how they affect PI relative to that of a monarchy. If the hypothesis that countries experiencing political instability develop a culture of political instability is correct, we expect $\beta_l$ to be positive.

PI can affect economic growth in two ways: directly by reducing the productivities of existing resources, and indirectly by reducing the availability (or growth) of inputs, such as capital. Investment in capital requires long term planning and guarantees of property rights. Drastic and frequent changes in laws governing property rights and profit repatriation, as well as increased uncertainty that accompany political instability make this long term planning impossible. This implies that investment is, in part, determined by PI. We write our investment function as:

$$k = \gamma_0 + \gamma_2 g + \gamma_3 PI + \gamma_4 RDS + \gamma_5 s + \gamma_6 MIL + \gamma_7 PI_{t-1} + \varepsilon$$

(3)

where $m$ is the imports/GDP ratio, RDS is the real foreign debt service/GDP ratio, $s$ is the domestic savings/GDP ratio, $\varepsilon$ is a stochastic error, and all other variables are as defined above. We include $PI_{t-1}$ to account for the possibility that PI has an inter-temporal effects on investment. We expect the coefficients of $s$ and $g$ to be positive in this equation, while the coefficient of PI and its one period lag are expected to be negative. In SSA where almost all investment goods are imported, investment is constrained by import capacity, hence the coefficient of $m$ is expected to be positive. High foreign debt constrains investment, therefore the coefficient of RES is expected to be negative. The coefficient of MIL in this equation cannot be signed a priori.
Earlier research postulates that national savings rate is a function of growth rate, interest rate, income, and export growth. We follow these researchers and make savings a function of these variables. PI can negatively affect the savings rate in several ways. First, it creates an uncertain atmosphere within which to save and this uncertainty increases the riskiness and hence the cost of savings. Second, PI decreases economic growth, and since economic growth has a positive impact on savings, saving is decreased through this channel. Finally, PI decreases savings by decreasing investment opportunities as Maddison has argued. McKinnon and Shaw argue that real interest rate have a positive impact on the saving rate in LDCs. However, the effects of interest on saving is not theoretically clear since a change in interest rate has an income effect (which depresses savings) and a substitution effect (which increases savings). The effect of interest rate on savings is therefore an empirical question. Since data on real interest rates in SSA is lacking and nominal interest rates are controlled by governments and hence do not transmit market impulses to savers, we follow Ma and use the rate of inflation as the opportunity cost on not saving. The savings function we estimate is specified as:


17. See McKinnon (n. 14 above) and Shaw (n. 14 above).

18. G. Ma, "Macroeconomic Disequilibrium, Structural Change, and the Household Savings
\[ s = \delta_0 + \delta_1 g + \delta_2 y + \delta_3 p + \delta_4 PI + \delta_5 PI_{t-1} + \xi \] (4)

where \( s \) is the savings rate, \( \dot{p} \) is the rate of inflation, \( \xi \) is a stochastic error term and all other variables are defined above. We expect the coefficients of \( g, y, \) and \( x \), to be positive while the coefficients of \( PI \) and \( PI_{t-1} \) are expected to be negative. \( \dot{p} \) cannot be signed \textit{a priori}.

From the arguments above, the total effect of \( PI \) on economic growth in the current period (\( dg/dPI \)), is the sum of the direct and indirect effects which is given as:

\[ dg/dPI = [a_2 + a_1(\gamma_2 + \gamma_3\delta_5)](1 - a_1(\gamma + \gamma_3\delta_1)^{-1}) \]

We note that \( PI \) is an endogenous variable hence the expression for the current period should not be interpreted as the effect of an \textit{exogenous} change \( PI \) on growth but rather as the total relationship between instability and economic growth regardless of the source of the change in \( PI \). We calculate this total effects in order to compare it with estimates when one treats \( PI \) as exogenous.

III. Data

The endogenous variables in our model are \( g, PI(NEPI,EPI), s \) and \( k \). \( PI \) is multidimensional and it encompasses a multitude of events. These events have varying degrees of seriousness and they occur with different degrees of frequency in different countries at different times. For example, there may be more coups d’etat in one country than another but there could be more political assassinations in the second country than the first in any particular time period. Therefore, we measure \( PI \) as a weighted index of these politically unstable events in any particular year. Variables used in the construction of this index are: successful and attempted coups d’etat, guerrilla warfare, secession and Money Demand in China," Journal of Development Economics, 41, 1993, 115–135.
movements, political assassinations, revolutions, riots, major government crisis, large scale anti-government demonstrations, politically motivated strikes, constitutional changes, and plot, and major government crisis while events used to construct the _NEPI_ index are: political assassinations, strikes, secession movements, guerrilla warfare, riots, revolutions, open civil wars, and large scale anti-government demonstrations. Instead of arbitrarily assigning weights to these events to construct the _PI_ index as is the practice in the literature, we use the first principal components of these events as our measure of _PI_. This approach eliminates the arbitrariness of the choice of weights and allows the weights to be determined by the data. Our approach to constructing the _PI_ index is similar to those of Gupta and Alesina _et al._

We measure _g_ as the annual growth rate of real GDP in a country, while we follow Ram and others and measure _k_ as the investment/GDP ratio. _y_ is per capita real GDP in 1980 US$. _x_ is measured as the annual growth rate of real export earning, while FRNCH is a dummy variable that equals 1 if a country has cooperation with France, zero otherwise. It is difficult to quantify the role the military plays in society. However, as the political science literature suggests, the extent of military involvement in civilian societies can be captured by the amount of resources the military commands in society. We follow this approach and measure _MIL_ as the number of military personnel per thousand in the population. To capture a nation's import

19. The principal components methodology creates a composite variable which has the highest correlation with individual politically unstable events. This is accomplished by choosing the vector of weights _b_ which maximizes the variance of _b'x_ subject to _b'b = 1_ and _x_ is the vector politically unstable events. See W. R. Dillon and M. Goldstein, _Multivariate Analysis: Methods and Applications_, (New York: John Wiley & Sons, 1984) for an introduction to the principal components methodology.


21. See Ram (n. 8 above).

22. It is possible to use defense burden (defense expenditure / GDP ratio) as a measure of MIL. However, we use MIL to obviate the problems of measuring of defense expenditure in LDCs. For a discussion of the problems involved in measuring defense spending in LDCs, see Nicole Bell, _Third World Security Expenditures: A Statistical Compendium_, (Stockholm: National Defense Research Institute, 1984).
and savings ability, we measure \( m \) and \( s \) as the import/\( GDP \) and savings/\( GDP \) ratios respectively. \( RDS \) is measured as the ratio of external debt service to \( GDP \).

\( FRA \) is party fractionalization index as defined by Ras.\(^{23} \) It is measured as \( 1 - \sum_{i=1}^{m}(t_i)^2 \), where \( t_i \) is the proportion of members of the legislature associated with the \( i \)th political party. \( LGSL \) is a scale variable that equals 0 if no legislature exists, 1 if the nation has a non-elected legislature, and 2 if the legislature is elected either directly or indirectly. \( PRES \) is a dichotomous variable that equals 1 for a constitutionally elected head of state, zero otherwise while \( GEN \) is a state imposed by the military, zero otherwise. The excluded category is monarchy.

Data for the calculation of the socio-political variables (\( PI, EPI, NEPI, PRES, FRA, GEN, FRNCH, LGSL \)) were obtained from the data tapes of Arthur S. Banks, *Cross-National Time-series Data Archives*, 1993, Center for Social Analysis, State University of New York at Binghamton, Binghamton, New York, while the data for calculating all the economic variables (\( g, x, l, k, m \), \( RDS, s, y \)) were obtained from the World Bank *STARS* Data Tapes *African Economic Indicators*, 1992.

Data for \( MIL \) were obtained from Arms Control and Disarmament Agency (ACDA), *World Military Expenditures and Arms Transfers*, (Washington, DC: ACDA, various years). The data were annual observations for the 1975-1990 period for thirty eight SSA countries.\(^{24} \) Because of missing observations for some of the variables for some countries, we had a total of 465 usable observations. Summary statistics of the data are presented in table 1. As the standard errors indicate, there is a wide variation in the values of the variables across countries and through time, with the data showing relatively high levels

\(^{23} \) D. Rae, "A Note on the Fractionalization of Some European Party Systems", *Comparative Political Studies*, 1, October, 1968, 413–418.

\(^{24} \) The countries in our sample are: Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Ethiopia, Gabon, Gambia, Guinea, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, Sudan, Swaziland, Tanzania, Togo, Uganda, Zaire, Zambia, and Zimbabwe.
of political instability as well as low average rate of economic growth during the sample period.

IV. Results

The operating hypothesis is that $NEPI(EPI, PI)$ is endogenous in the model. Nonetheless, we used a Hausman exogeneity test to test the hypothesis that NEPI is exogenous in the system. The calculated F statistic is 26.925. We reject the null hypothesis of exogeneity of NEPI and treat it as endogenous in the system. Given that the data is time-series cross-national data, it is possible for the coefficients to differ across countries and through time. We used a covariance test to test the hypothesis of homogeneity of coefficients. The calculated F statistic to test the homogeneity of coefficients across countries is 0.98. Therefore, we do not reject the null hypothesis of homogeneity of coefficients and proceed to estimate coefficients that are homeogenous across countries.

All equations in the system are overidentified by both rank and order conditions so we used the Two Stage Least Squares (TSLS) procedure to estimate the model. Coefficient estimates using NEPI to measure PI are presented in table 2. Column 2 presents the estimates for the savings equation, column 3, the growth rate equation, column 4, the investment equation, while column 5 presents the estimates for the NEPI equation. The model goodness-of-fit statistics are relatively strong, considering the large cross national component in our sample. In all equations, we reject the null hypothesis that variation in the dependent variables cannot be explained by variation in all right hand side variables at $\alpha = .01$ as indicated by the equation F-statistics.

In the $g$ equation, $k$, $x$, and $l$ have positive and significant

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25. See C. Hsio, Analysis of Panel Data, (New York : Cambridge University Press, 1989) for a summary of such tests. In conducting this test, we assumed that the coefficients are constant through time(on account of the relatively short period of our sample) but both intercept and slope coefficients could vary across countries.

26. The $g$ equation was identified relative to the other equations by $MIL$, $PI_{1,1}$, $m$; the $PI$ equation was identified by $s$, $x$, and $RDS$; the $k$ equation was identified by $y$, $FRA$, and $p$ while $PI$ equation was identified relative to the other equations by $k$ GEN, and $l$. 

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coefficients as expected. The coefficient of FRNCH is negative but statistically insignificant. The coefficient of NEPI is negative and significant, thus validating the convergence hypothesis. The coefficient of NEPI is negative as expected, and significantly different from zero at \( \alpha = .05 \). The negative coefficient of NEPI implies that non elite political instability has a directly negative impact on economic growth in SSA after controlling for other factors variables—a result that is consistent with the findings of previous research. We note that the coefficients of all the "traditional" growth variables are unaffected by the inclusion of NEPI in the growth equation.

In the \( k \) equation, the coefficients of \( g, m, \) and \( s \) are positive as expected, and are significantly different from zero at \( \alpha = .01 \). The coefficient of RDS is negative and significant, indicating that heavy external debt burden decreases investment. The coefficient of NEPI is negative and statistically significant at \( \alpha = .05 \). The coefficient of NEPI\(_{-1}\) is negative and significant \( \alpha = .01 \). An increase in NEPI decreases the investment/GDP ratio in the current period and additionally one year later. The negative coefficient of NEPI indicates that non elite political instability has a deleterious effect on investment besides its direct negative impact on economic growth. This negative effect on investment provides another channel through which NEPI impacts economic growth. The coefficient of MIL is positive and significantly different from zero at \( \alpha = .01 \).

Looking at the estimates for the NEPI equation, \( g \) has a negative coefficient which is significantly different from zero at \( \alpha = .01 \). This implies that, all things equal, good economic performance decreases NEPI in SSA—a result that is consistent with the political science literature. The coefficient of LGSL is negative and significant at .05. significance level. FRA and MIL have significantly positive coefficients. The coefficients of GEN and PRES are negative and statistically significant indicating that relative to a monarchy, an elected or military head of state provides political stability. These estimates indicate that large resource allocation to the military and fractionalization of the polity increase non elite political instability in SSA. On the other hand, an open legislature
selection and fast economic growth increase political stability. The relatively large positive and highly significant coefficient of $\text{NEPI}_{t-1}$ indicates that African nations tend to get into a "culture of political instability" once they experience political instability in any period. These results are in accord with the political science literature.

The coefficients of $g$, $x$, $y$, and $\dot{p}$ are all positive and significantly different from zero at $\alpha = .05$ or better in the $s$ equation. These estimates are in accord with expectation and consistent with the results of previous research. The positive and significant coefficient of $\dot{p}$ is inconsistent with the McKinnon-Shaw hypothesis since it indicates that the income effect dominates the substitution effect. The coefficients of NEPI and its one period lag are both negative and statistically significant at $\alpha = .01$. These coefficient estimates indicate the NEPI negatively affects the savings rate contemporaneously as well as with a lag. The effects of NEPI on the savings rate suggests another indirect channel through which $PI$ affects economic growth in LDCs.

Our estimates indicate that NEPI negatively affects economic growth in two ways—directly through a reduction in the productivity of existing inputs and indirectly through its impact on reduced savings and investment. Using the statistically significant estimates to calculate the total effects of NEPI on growth, the total contemporaneous effect is $-6.457$. The total effect consists of a direct effect of $-5.368$ and an indirect effect of $-1.089$. While the indirect effect is small in magnitude, it is statistically significant. The calculated temporal effect of NEPI on economic growth is $-1.679$. This effect is also statistically significant. We note that the lag effect of NEPI on economic growth works exclusively through two indirect channels—savings and investment. These estimated total effects of NEPI on economic growth suggest that elimination of NEPI could increase the average annual growth rate in SSA, a development that would significantly improve the

27. The positive coefficient of $\dot{p}$ does not imply that an inflationary policy will increase the savings rate. Note that we used $\dot{p}$ here only to proxy the opportunity cost of not saving.

28. We note that the magnitudes of these estimates are not as important to us as their signs.
lives of many in this part of the developing world. As argued above, we
calculate this total effect in order to compare it with the direct effect and
to show that disregarding the indirect channels may lead to biased
estimates. Our calculations show that total effect NEPI has on growth
far exceed the direct effects.

We have estimated a model that treats NEPI and \( k \) as exogenous
in a growth model in order to compare the coefficient of NEPI with
the total growth effects NEPI in our model. The results of this
estimation are presented in table 3. The estimated coefficient of NEPI
in the "reduced form" equation is \(-.4578\), an estimate that is 40% less in
absolute value than the total effect of NEPI calculated from our
model. The conclusion we draw from this exercise is that not taking
account of the endogeneity of NEPI when investigating the effects it
has on economic growth could result in the usual simultaneous equation
bias.

The estimated effects of NEPI on economic growth are similar to
those obtained by research that measures political instability as EPI.
To compare our results with such studies, we estimate the model using
EPI as the measure of political instability. Estimates of the model
using EPI as the measure of PI are presented in table 4. All
coefficients in the model are of the expected signs and are generally
statistically significant. In the \( g \) equation, the coefficient of EPI is
negative and significant at \( \alpha = .05 \) indicating that EPI has a directly
negative effect on economic growth in SSA. However, the coefficient
of EPI, although negative, is insignificant in all other equations
indicating that EPI has no significant indirect effect on economic
growth in the current period. With the exception of the \( k \) equation, the
coefficient of EPI\(_{t-1}\) is insignificant in all other equations in the system.
An interesting and surprising result is that EPI\(_{t-1}\) is not a significant
predictor of EPI. The total effect of EPI on economic growth in the
current period is \(-.548\), an estimate that is significantly (in the
statistical sense) less than the total current effect NEPI has on
economic growth. EPI, unlike NEPI, has no statistically significant
temporal effect on growth. The conclusion we draw from the estimates in table 4 is that EPI has no indirect effect on economic growth in the current period. It also shows that EPI has no statistically significant temporal effect on economic growth—an indication that EPI may not indicate all the effects political instability has on economic growth in SSA.

Our estimates indicate that both NEPI and EPI have significantly negative effects on economic growth in SSA. It is possible that these results were obtained because these measures of PI act as proxy for each other when entered separately in the model. To further investigate the separate impact NEPI has on economic growth and the mechanisms through which it works, we re-estimated the model using both EPI and NEPI as explanatory variables in the same equations. In these equations, NEPI and EPI enter separately as regressors. However, in the PI equation, we use a broader index that includes NEPI and EPI events as the regressand. We therefore used OLS to estimate these equations, hence the coefficients are not strictly comparable to those in tables 2 and 4. The estimates are presented in table 5. All coefficients in table 4 have the expected signs and most of them are statistically significant at conventional levels. In particular, the coefficients of EPI and NEPI are negative and marginally significant in the $g$ equation, indicating that both EPI and NEPI have directly negative impacts on economic growth. While the coefficient of NEPI is negative and significant in both the $s$ and $k$ equations, the coefficient of EPI is not, implying that EPI has no effect on savings and investment in the current period while NEPI does. The coefficient of NEPI$_{t-1}$ is negative and statistically significant in the $s$ and $k$ equations, while it is positive and significant in the PI equation as expected. On the other hand, the coefficient of EPI$_{t-1}$ is significant in only the $k$ equation suggesting that all the indirect impact PI has on economic growth may be attributable to NEPI and not EPI. The insignificant coefficients of EPI$_{t-1}$ in all but the $k$ equation also suggests that the temporal effects PI has on economic growth is
attributable to only NEPI. The estimates also show that past NEPI but not past EPI is the major predictor of PI. Apart from the insignificance of EPI in these equations, all coefficient estimates are similar to their counterparts in table 2.29

Why does NEPI have significant indirect effects on growth through decreased savings and investment while EPI does not? Both savings and investment require time to plan and implement, hence they are likely to be influenced by the expectations of the stability or lack thereof of the political system and hence the economic system. They are likely to treat executive instability as random noise since it does not affect the long term business environment of the country, but they will react to changes in political stability. Our results suggest that savers and investors in SSA discount executive instability in making their decisions to save and invest while taking instability of the political system into consideration. One can point to capital flight from and the long term economic stagnation of Zaire, a country with a stable executive (only one dictator since 1960) but a very unstable political system, as an example of how NEPI affects economic growth. In the final analysis, stability of the political system is more important than executive stability in generating the necessary confidence for long term economic growth.

The conclusions from our results is that non elite political instability has statistically significant negative direct and indirect effects on economic growth that are independent of elite political instability. Moreover, we find that all the indirect effects PI has on growth in both the current and later periods are accounted for by non elite political instability. The implication of our results is that failure to account for non elite political instability implies that the effects of PI on economic growth will be seriously underestimated. Second, the exclusion of NEPI implies that researchers cannot identify the indirect channels through which PI affects economic growth. Finally, since NEPI is a

29. We also estimated regressions with EPI\(_{t-1}\) and NEPI\(_{t-1}\) as regressors in the NEPI and EPI equations respectively (results are not presented but available upon request). We find that while EPI\(_{t-1}\) was not a predictor of itself or NEPI, NEPI\(_{t-1}\) is a good predictor of both NEPI and EPI.
significant predictor of future political instability, excluding it from the measurement of PI results in underprediction of future political instability and its effects on economic growth. The policy implication is that a fixation on elite instability will lead to serious misjudgment about the incidence of political instability, and the consequent effects on economic growth in LDCs.

How robust are our results that NEPI has significantly negative direct and indirect effects on economic growth in SSA? We conduct some sensitivity analyses to check the robustness of our results. It may be argued that the calculation of savings from national income accounts makes it an identity and therefore not estimable. The first sensitivity analysis we conducted, therefore, was to re-estimate the model treating $s$ as an identity. The results are presented in table 6. All coefficients in the model have the expected signs, mostly statistically significant, and are similar in magnitude to those in table 2 above. In particular, the coefficient of NEPI is negative and statistically significant in the $g$ and $k$ equations while that of NEPI$_{t-1}$ is negative and significant in the $k$ equation. The coefficient of NEPI$_{t-1}$ is positive and significant in the NEPI equation as in table 2.

The second sensitivity analysis we conducted was to divide the sample into two per capita income subsample—greater than, and less than or equal to $500.00—and estimated the model for both subsamples. In both subsamples, NEPI had negative and significant effects (directly and indirectly) on growth. The third sensitivity test we conducted was to exclude the $k$ equation from the model and replace $k$ by $s$ in the growth rate equation. This specification did not qualitatively affect our results that NEPI has both direct and indirect negative impacts on economic growth in SSA. Finally, we excluded $y$ and FRNCH from the growth equation and estimated the four equation model. Again, our result were not qualitatively affected. These estimates show that our results are not sensitive to model specification.

In view of results that non-elite political instability has a

30. Coefficient estimates for these estimates and other sensitivity analyses are not presented here for space consideration. They are, however, available upon request.
deleterious effect on economic growth in SSA as elite political instability, it may be more appropriate to construct a more comprehensive PI index that combines both elite and non elite political events. We constructed such an index and used it to estimate the model.\textsuperscript{31} The results are presented in table 7. The estimates show that all the coefficients are of the expected signs and similar to those in table 5. The coefficient of PI in the $g$ equation is negative, statistically significant and similar in magnitude to the estimate in table 2. The coefficients of PI and PI\textsubscript{t-1} are negative and significant in both the $k$ and $s$ equations indicating that like NEPI but unlike EPI, PI has direct and indirect effects on economic growth. The total effect of PI on economic growth in the current period is -.6089. This consists of a direct effect of -.4959 and indirect effect of -.1127. The intertemporal effect of PI on growth works indirectly through reduced savings and investment, a finding that was absent when we used EPI to measure political instability. The coefficient of PI\textsubscript{t-1} in the PI equation is positive and significant, indicating that it is a good predictor of PI. This result was absent in the EPI estimates in table 6 above. In general, the broad measure of PI provides a better explanation of the mechanisms through which PI affects economic growth than does EPI. The broader measure of PI is therefore to be preferred over the narrower EPI.

Our results that non elite political instability has a deleterious effects on economic growth are similar to those of researchers who find that elite political instability has a negative effect on economic growth in LDCs.\textsuperscript{32} However, there is another sense in which our results differ from those of earlier researchers. We show that non elite political instability has a deleterious effect on economic growth that is unrelated to any effect that elite political instability has on growth. In this regard, our results complement the results of earlier research and points to the need to use a broader measure of PI to investigate the link

\textsuperscript{31} We note that Alesina et al, 1992 and Gyimah-Brempong and Traynor, 1996, use such a broad index in their studies.

\textsuperscript{32} See n. 1 and 2 above.
between PI and economic growth in LDCs. Our results are also consistent with the findings in the political science literature which indicate that economic growth reduces elite political instability.33

V. Conclusion

This paper used a simultaneous equations model and cross-national time-series data to investigate the effects of non elite political instability on economic growth in Sub-Saharan Africa. We find that non elite political instability has a negative and statistically significant impact on economic growth in Sub-Saharan Africa. Non elite political instability effects economic growth directly through its impact on the productivities of existing resources and indirectly through a reduction in capital formation. We also find that the relationship between non elite political instability and economic growth is bi-directional - non elite political instability has a negative impact on economic growth and economic growth has a negative effect on non elite political instability. The results are similar to those obtained by research that investigate the relationship between elite political instability and economic growth in LDCs. However, there are some qualitative differences between our results and those of researchers who measure PI as elite PI. We find that NEPI provides the indirect mechanism through which PI affects economic growth; excluding this measure of political instability from the PI index implies that researchers cannot account for the indirect channels through which PI affects economic growth.

The results of our study have both policy and research implications. The research implication is that a broader measure of PI that accounts for both elite and non elite politically unstable events should be used to investigate the effects of political instability on economic performance in LDCs. Our findings also imply that policy makers in Sub-Saharan Africa should consider the impact of policy changes on the broader measure of political stability, rather than a narrow focus on elite political instability, when formulating and implementing economic policy.

33. See the references in notes 1, 2, and 3 above.
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* Absolute value of ‘t’ statistics in parentheses.
Table 3  OLS Estimates of Growth Rates in Subsaharan Africa

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### Table 4 Model Estimates: Elite PI

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* Absolute value of t-statistics in parentheses.
### Table 5: Model Estimates: Inclusion of EPI and NEPI

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* Absolute value of 't' statistics in parentheses.
Table 6 Model Estimates: Alternative Specification

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* Absolute value of 't' statistics in parentheses.
Table 7  Model Estimates: Broad Measure of PI

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* Absolute value of 't' statistics in parentheses.
References


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