The Role of Military Expenditures in the African Economic Crisis

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The period 1970-1982 in Africa was marked by poor economic performance, and also by accelerated military expenditures. In seeking to determine whether these two phenomena were linked, this analysis finds that although generalizations concerning the Third World in this regard are futile, for many African countries the defense build-up of the 1970s and early '80s was a major factor in their economic demise.

INTRODUCTION

The poor economic performance in Africa during the 1970s and '80s has spawned a rather vigorous debate[1] over where to lay the blame for the region's economic crisis. The major contributors to this debate have tended to structure their arguments around the issue of whether the principal cause of the poor performance was outside the control of governments in Africa (the poor state of the world economy and associated declines in commodity prices, drought, and so on) or whether it was due to adverse selection policies on key issues by government (acceleration in military expenditures, discrimination against agriculture in pricing, and the attempt to maintain balance of payments equilibrium by reliance on direct controls).

With respect to military expenditures, allocations to defense, despite lagging economic growth, rose rapidly in the early 1970s, reaching a peak in 1976-77 when they were approximately double their 1970 level (in constant prices).[2] The rise was sharpest in North Africa, owing in part to its proximity to the Middle East. Yet there were also smaller rises in sub-Saharan Africa, whose military spending increased by more than one-half in the first five years of the decade.

The effects of military spending on economic performance—and in particular whether increased spending in the 1960s and '70s bears any responsibility for the economic crisis that has beset the region—are extremely difficult to determine.[3] Superficial reading of the evidence (Table 1) would seem to suggest that military expenditures have, if anything, risen faster in the middle-income and higher-growth economies and that they have risen more slowly or have declined in poorer, low-growth economies. However, this may merely be because, in many of the former, the factors that account for nonmilitary growth—including rapid rises in earnings from the international economy by oil and other mineral producers—have also generated higher military spending, whereas in the lowest-growth economies military spending has fallen because of rapid inflation and shrinking government revenues.[4]

My purpose here is to shed more light on the effect of military expenditures during their period of acceleration (1970-1982) on economic performance in Africa. The specific purpose of the empirical work below is to determine whether military expenditures[5] during this period can be directly linked to poor socioeconomic performance in the region and, if so, in what situations this was most likely to have occurred.

TABLE 1

Trends in Military Expenditures and Economic Growth in Africa During the 1970s

Income per capita and growth
Middle income countries

Military expend.	High growth	Low growth
Rapid increase	Morocco Mauritius Tunisia Algeria	Libya Mauritania Zimbabwe South Africa Gabon
Moderate increase	Egypt Ivory Coast Cameroon Congo	Zambia Liberia Senegal
Decline		Nigeria

Income per capita and growth
Low-income countries

Military expend.	High growth	Low growth
Rapid increase	Kenya Tanzania Malawi	Libya Ethiopia Benin
Moderate increase	Rwanda Mali	UpperVolta Togo Burundi Somalia Niger Sierra Leone
Decline	Central African Republic	

Source: R. Luckham, "Militarization in Africa," in SIPRI, *World Armaments and Disarmament, 1985* (Philadelphia: Taylor & Francis, 1985), p. 298.

MILITARY EXPENDITURES AND ECONOMIC PERFORMANCE

Contrary to the conventional wisdom[6] associated with the guns vs. butter analogies, recent empirical research on Third World economies suggests that under certain circumstances increased levels of defense expenditures can enhance economic growth. First, Benoit,[7] Faini, Annez, and Taylor,[8] and Looney,[9] among others, have shown that defense spending may stimulate growth by increasing aggregate demand. The additional demand generated by higher defense spending leads to increased utilization of capital stock, lower resource costs, and higher labor employment. The mechanism here is straightforward: higher defense spending leads to increased utilization of capital stock, lower resource costs, and higher labor employment. The increased utilization of capital stock may lead in turn to an increase in the profit rate. Increased profits may, then, lead to higher investment, which, in turn, will generate both short-run multiplier effects as well as higher long-term rates of economic growth. In this case, defense spending appears to be causally prior to economic growth.[10]

Another variant of this mechanism operates through the security aspect of defense expenditures. As Koler[11] has recently shown, a well-equipped and well-trained army in the African context can induce additional investment and (ultimately) growth through its security-enhancing effects.

Second, the work of Deger[12] suggests that defense spending may aid economic development through a spin-off effect. In the LDCs, the military is undoubtedly one of the most modern institutions and thus may help in creating a socioeconomic structure conducive to growth. The military may aid in enhancing growth through engaging in R&D, providing technical skills and educational training, and creating productive infrastructure.

Finally, several studies[13] have found that by disaggregating developing countries into categories such as resource rich and resource poor or foreign exchange constrained and unconstrained, it is possible to identify a number of positive economic impacts associated with defense expenditures. On the other hand, resource-constrained, foreign exchange poor nations tend to have a negative impact on growth. Although during periods of

austerity high opportunity costs might indicate that defense cuts could be appropriate, for this group of countries it is usually development projects that are reduced. The reasons are very simple: military expenditures are current outlays (not including arms bought on credit) whereas development projects are future growths, and there is a natural tendency to try to maintain the status quo. As a result, military budgets in resource-constrained countries are often not significantly reduced during periods of austerity.[14]

Perhaps offsetting this effect is Weed's finding that increased military participation rates increase overall economic growth.[15] Clearly Africa, given its very low levels of human capital formation, should be one of the most receptive areas for this link between military expenditure, military participation, human capital formation, and hence economic growth. It is also clear, however, that those African countries facing strong external or internal threats will be forced to allocate a relatively large proportion of their military resources to equipment and imported arms and supplies[16] and will not be in a particularly good position to fully use the military as a medium for increasing human capital.

In sum, two conflicting forces may be at work in Africa. On the one hand, countries with low internal and external threat are in a position, if they have the resources, to utilize the military in a manner that is quite likely to improve growth. On the other hand, countries with high external or internal threats to security may be forced to divert resources from productive areas into equipment and related expenditure unlikely to improve overall growth. The relative magnitudes of these opposing forces will undoubtedly determine the impact military expenditures have on the economy. These observations are the basis for a model of military expenditure and economic development elaborated in the next section.

THREAT PERCEPTION, RESOURCE CONSTRAINTS, AND LEGITIMACY

One approach to explaining the linkage between military expenditures and economic performance is to examine the role of the

state in the African context. Although the state takes many forms in Africa,[17] in almost all cases it has great power and autonomy because of its central role in providing security and instituting and managing the process of economic and social development. The functions that the state performs in the poor, weak, and badly integrated countries of Africa are particularly critical. The state must meet the growing demand for certain public goods (security, infrastructure, education, and the like) and for certain kinds of large-scale organization and central guidance.[18]

Furthermore, in many of the African countries the state faces a substantial resource gap. Maintaining an equilibrium between rising demands and available resources is becoming increasingly difficult. The absence of resources sharply narrows the range of elite choices and makes repression and higher military spending more likely, but it also has an impact on the legitimacy of the state.[19] Legitimacy relates to whether citizens are loyal and willingly support state policies—whether they accept the authority of the state and believe existing institutions are in some sense appropriate. In general, illegitimate governments must use much of the resources they dispose of to stay in power and to secure compliance; conversely, legitimate governments can expend more available resources on productive public goods.[20]

Along these lines, Rothstein has constructed a framework whereby the relationship between effectiveness and legitimacy is an important element in explaining the level of military expenditure.[21] Operationally, both variables, effectiveness and legitimacy, are difficult to estimate and require some degree of subjective judgment by analysts. The same is also true for the degree of threat (external or internal) perceived by ruling elites. After consulting with various authorities, Rothstein constructed a matrix capable of classifying developing countries on the basis of government legitimacy and degree of threat.[22]

An examination of Rothstein's group of African countries[23] indicates an even simpler classification. In general, those African countries that experience low legitimacy also tend to experience a high level of threat. On the other hand, those countries experiencing medium to high levels of legitimacy tend to experience low levels of threat. Although there are several exceptions to this general pattern, it was felt that in part Rothstein's classification scheme approaches a tautology: if legitimacy is dependent on

performance, then those countries with some resource availability (performance) may also be legitimate.[24]

To avoid this problem a simple two-group sample was developed. This classification scheme follows Rothstein, but focuses on countries of similar military orientation—developmental and repressive; i.e., conflict countries were defined as countries of low governmental effectiveness and nonconflict countries were defined as having medium to high levels of government effectiveness and/or low threat.

On this basis, the countries classified as nonconflict were: Cameroon, Senegal, Togo, Tunisia, Morocco, Rwanda, Malawi, Benin, Algeria, Libya, Ivory Coast, Congo, Sierra Leone, Tanzania, South Africa, Zimbabwe, and Kenya. Those classified as conflict were: Nigeria, Sudan, Somalia, Niger, Upper Volta, Liberia, Mauritania, Chad, Madagascar, Uganda, Ethiopia, Central African Republic, Angola, Mozambique, Zaire, and Guinea.

An examination of socioeconomic and military differences between the two groups tends to verify (Table 2) the general picture sketched above, i.e., the nonconflict countries have consistently superior socioeconomic performance. These patterns are nearly constant across a wide variety of indices.

In contrast, the conflict countries have a higher military burden (measured as a share of GNP). However, the nonconflict countries have higher total and per capita military expenditures.

The external sectors of conflict and nonconflict states also vary considerably. Although the conflict states had somewhat better export performance in the 1960s, their ability to import was way below that of the nonconflict countries over the 1970-1982 period.

In part, the superior import performance of the nonconflict states was due to their relative ability to borrow externally. Both measures of external public debt—the total volume and the servicing of the debt—indicate the relative ability of the nonconflict countries to attract external loans (Table 2). In short, the conflict and nonconflict countries are characterized by considerable differences across a wide variety of indices.

If the conceptualized framework developed above is correct, we should expect to find a generally favorable association between military expenditures and the quality of life, economic activity, and resources for development in the nonconflict states, with the reverse occurring for the conflict countries in Africa.

TABLE 2

Socioeconomic Comparisons of African Regimes (means)

Variables	Regime type Conflict	Nonconf.
Economic variables		
Per capita income, 1982	332.1	1,148.6
Marginal savings rate, 1970-81	-1.7	10.3
Capital output ratio, 1970-82	-1.8	1.6
Share of investment in GDP, 1982	17.3	24.9
Growth of GDP, 1970-82	1.9	4.2
% public consumption in GDP, 1982	17.5	17.7
% public expenditures in GDP, 1981	21.1	28.8
% public revenues in GDP, 1981	15.9	22.5
% private consumption in GDP, 1982	81.6	71.3
Growth in investment, 1970-82	1.7	6.7
Growth in public consumption, 1970-82	3.6	7.6
Socioeconomic variables		
% of population with safe water, 1980	22.1	41.0
Protein supply per capita, 1980	53.6	172.0
Calorie supply per capita, 1980	2,103.9	2,220.7
Life expectancy, 1980	44.5	52.8
Infant mortality rate, 1980	138.6	134.3
Population per physician, 1980	27,731.9	14,192.1
Public health expend. per cap., 1980	4.2	18.9
Literacy rate, 1980	25.3	44.4
% women in university enrollment, 1980	20.6	21.7
% school-age population per teacher, 1980	30.2	47.9
School-age population per teacher, 1980	182.8	91.3
Exports-imports-public external debt		
Growth in exports, 1970-82	-1.3	-1.1
Growth in imports, 1960-70	10.0	8.9
Growth in imports, 1970-82	0.1	3.3
Growth in imports, 1960-70	5.6	5.9
Public external debt, 1970	149.6	260.2
Public external debt, 1982	1,675.5	2,316.1
Debt service as % of GDP, 1982	2.6	4.1
Debt service as % of exports, 1970	4.9	5.8
Debt service as % of exports, 1982	8.5	15.8
Military variables		
Total military expenditures, 1981	260.4	372.5
Military expenditures, $ GNP, 1981	3.9	3.4
Military expenditures per capita, 1980	14.1	23.0
Military expend. per soldier, 1980	7,002.4	1,284.9

Sources: R. L. Sivard, *World Military and Social Expenditures*, 1983 (Washington: World Priorities, 1983); World Bank, *World Development Report*, 1984 (New York: Oxford University Press, 1984).

Note that this conceptual framework extends the previous work of Looney and Frederiksen[25] through explicitly incorporating the motives for defense expenditure and regime type with their simple dichotomy between resource/foreign-exchange-abundant and scarce economies. In the African context of general resource scarcity, it is apparent that the correct dichotomy is between those countries able to free up some resources for development and those that are unable. Whether a country makes resources available for development is largely a function of legitimacy.

EMPIRICAL RESULTS

The main quality of life measures[26] were derived from a maximum likelihood factor analysis[27] of fourteen standard socioeconomic indices. The results (Table 3) of the factor analysis for the total sample of African countries indicate that four main trends exist in the data; i.e, that the fourteen socioeconomic measures of development represent four major independent developmental phenomena. The first phenomenon, Factor 1, represents the general development of human capital, and Factor 2 depicts the level of public expenditure per capita; Factor 3 nutritional levels, and Factor 4 educational levels among women.

Interestingly enough, when factor analysis was performed on the conflict and nonconflict countries, marked differences in the factor patterns were discovered (Tables 4, 5). The conflict states followed more or less the same factor pattern as the sample as a whole. However, for the nonconflict countries the factor depicting public expenditure per capita (Factor 1) accounted for the largest proportion of the sample variance. Nutrition accounted for the next higher proportion of variance, followed by general human capital and a fourth factor depicting the number of professionals (physicians and teachers) per capita.

The next step in the analysis was to determine through regression analysis the general impact of military expenditures on the four general measures of the quality of life derived above. To improve the specification of the regressions, per capita income (GNPPER) was introduced as a control variable. Military expenditures were introduced as the military burden—the share of military expenditures in GNP (MILX).

The results[28] (Table 6) for the general development of human capital indicate a negative relationship between the military burden and human capital development. On the other hand, a positive and statistically significant relationship existed between human capital development and the military burden in the nonconflict states. No statistically significant relationship was found in the case of the conflict states, however.

Although the total sample of countries experienced a highly significant correlation between the military burden and public expenditures per capita on health and education, the nonconflict states also experienced positive and highly significant links between the military burden and other types of public expenditure (health and education) per capita.

TABLE 3

Oblique Factor Rotation:
Dimensions of African Quality of Life
(standardized regression coefficients)

Socioeconomic variables	Factor 1	Factor 2	Factor 3	Factor 4
Infant mortality rate	0.90*	0.19	-0.29	0.14
School-age population per teacher	0.76*	0.00	0.18	-0.29
Population per hospital bed	0.68*	-0.05	0.20	-0.20
Population per physician	0.57*	0.05	0.00	-0.51
Life expectancy	-0.61*	0.02	0.34	0.11
% school-age population in school	-0.71*	0.31	-0.09	0.03
Literacy rate	-0.94*	0.05	0.00	-0.26
Per capita income	0.02	1.01*	0.04	-0.05
Public health expenditure per capita	-0.03	0.99*	0.02	-0.07
Public educational expenditure per capita	-0.02	0.95*	0.05	-0.01
Protein supply per capita	0.27	0.11	0.82*	0.16
% population with safe water	-0.23	0.08	0.73*	0.07
% women in total university enrollment	0.02	-0.01	0.23	0.62*

* Indicates high correlation with respective factor.

TABLE 4

Oblique Factor Rotation: Dimensions of Quality of Life in African Conflict States (standardized regression coefficients)

Socioeconomic variables	Factor 1	Factor 2	Factor 3	Factor 4
Infant mortality rate	0.99*	0.35	-0.20	-0.13
School-age population per teacher	0.63*	-0.33	0.11	-0.04
Population per hospital bed	0.61*	-0.06	0.18	-0.10
Population per physician	0.57*	-0.45	-0.26	-0.06
% school-age population in school	-0.48*	0.31	-0.23	0.26
Life expectancy	-0.63*	0.37	0.00	-0.29
Literacy rate	-0.92*	-0.11	-0.18	-0.12
Public educational expenditure per capita	0.11	1.01	*0.00	0.00
Per capita income	0.13	0.82*	-0.07	0.20
Calories per capita	-0.23	0.57*	0.44	0.14
% population with safe water	-0.07	0.08	0.86*	-0.04
Protein supply per capita	0.30	-0.06	0.78*	0.06
% women in total university enrollment	0.07	0.13	0.10	0.79*
Public health expenditure per capita	-0.02	0.37	-0.21	0.58*

* Indicates high correlation with respective factor.

TABLE 5

Oblique Factor Rotation: Dimensions of Quality of Life in African Nonconflict States (standardized regression coefficients)

Socioeconomic variables	Factor 1	Factor 2	Factor 3	Factor 4
Per capita income	0.96*	0.03	0.05	0.00
Public health expenditure per capita	0.94*	0.00	0.10	-0.02
Public educational expenditure per capita	0.91*	0.04	0.01	-0.10
% women in total university enrollment	-0.11	0.89*	-0.08	-0.12
Protein supply per capita	0.25	0.89*	-0.07	0.23
% population with safe water	0.09	0.74*	0.28	0.06
Life expectancy	-0.10	0.59*	0.23	-0.37
Calories per capita	-0.55	0.57*	-0.19	-0.05
Literacy rate	0.02	-0.09	0.97*	0.07
% school-age population in school	0.33	-0.07	0.57*	-0.23
Infant mortality rate	0.24	-0.26	-0.61*	0.29
Population per hospital bed	-0.19*	-0.01	-0.86*	-0.47
Population per physician	-0.07	0.00	0.16	0.94*
School-age population per teacher	-0.14*	0.10	-0.18	0.82*

* Indicates high correlation with respective factor.

To test this hypothesis, the share of defense in the central government budget was regressed on the share going to each of the other major socioeconomic budgetary categories. Again, several control variables were introduced to improve the regression specifications.[29] These included:[30] (a) per capita income (GNPPER); (b) the share of public consumption in GDP (PCB), and the share of public external debt in GDP (DEBT). Only the most statistically significant results for GNPPER, PCB, or DEBT are shown here.

In general, the results (Tables 7, 8, and 9) indicate that:

1. The nonconflict states experience a number of positive linkages between defense and socioeconomic expenditures—public services, education, health, social security, roads and other transport. In each case, defense showed a high degree of statistical significance.

2. The only statistically significant negative trade-off in the nonconflict countries associated with defense was expenditures on agriculture. For the conflict countries, in sharp contrast, only one socioeconomic allocation, housing, had a positive and significant association with defense.

3. Increased defense allocations in the conflict countries tended to reduce public services, economic services, and roads. Other categories such as education, health, other social, agriculture, and other economic purposes had a negative trade-off relationship with defense, but were not statistically significant.

4. Again, the total sample of countries (Table 7) tends to reflect the patterns found in nonconflict countries rather than in the conflict states.

In short, the results obtained in the analysis of budgetary trade-offs are quite consistent with the quality of life findings and perhaps provide insights as to the way in which increased defense expenditures tend to improve the general quality of life in nonconflict countries and reduce it in the case of the conflict states. This conclusion must, however, be moderated in light of the finding that the agricultural sector in both the conflict and nonconflict states may have suffered as a result of increased allocations to defense. The food and agriculture sector is the mainstay of most African economies, as evidenced by its generation of employment (67 percent in 1981), its percentage of national output (40 to 60 percent of GDPs), and its contribution to total export earnings.[31] Agriculture provides livelihood and security for a large majority of Africa's 537 million people. Although the contribution of this sector varies from one country to another, for the bulk of them agriculture remains the single most important generator of overall economic growth and sustained further development.

TABLE 6

Impact of Military Expenditures on the African Quality of Life (standardized estimates)

Human capital factor

Total country sample
Human capital = -0.31 GNPPER - 0.44 MILX
(-2.05) (-2.84)
r2 = 0.330; F = 6.88; df = 30

Nonconflict states
Human capital = 0.15 GNPPER + 0.52 MILX
(0.48) (2.42)
r2 = 0.288; F = 3.04; df = 17

Conflict states
Human capital = -0.55 GNPPER + 0.13 MILX
(-1.52) (0.36)
r2 = 0.224; F = 1.43; df = 12

Public expenditure per capita factor

Total country sample
Public expenditure = 0.02 GNPPER + 0.87 MILX
(0.62) (9.36)
r2 = 0.764; F = 45.23; df = 30

Nonconflict states
Public expenditure = 0.02 GNPPER + 0.87 MILX
(0.21) (6.97)
r2 = 0.763; F = 24.25; df = 17

Conflict states
Public expenditure = 0.56 GNPPER + 0.25 MILX
(2.10) (0.94)
r2 = 0.559; F = 6.36; df = 12

(Cont'd.)

TABLE 6 (Cont'd.)

Nutrition factor

Total country sample
Nutrition = 0.21 GNPPER + 0.53 MILX
(1.38) (3.44)
r2 = 0.348; F = 7.50; df = 30

Nonconflict states
Nutrition = 0.02 GNPPER + 0.87 MILX
(0.17) (6.97)
r2 = 0.763; F = 24.26; df = 17

Conflict states
Nutrition = -0.14 GNPPER + 0.28 MILX
(-0.35) (0.12)
r2 = 0.051; F = 0.27; df = 12

Opportunities for women, professionals per capita factor

Total country sample
Opportunities, professionals = -0.31 GNPPER + 0.40 MILX
(1.96) (2.54)
r2 = 0.293; F = 5.78; df = 30

Nonconflict states
Opportunities, professionals = -0.44 GNPPER - 0.49 MILX
(-2.27) (-2.49)
r2 = 0.429; F = 5.62; df = 17

Conflict states
Opportunities, professionals = 0.14 GNPPER + 0.77 MILX
(0.40) (0.28)
r2 = 0.156; F = 0.93; df = 12

Notes: GNPPER = Gross national product per capita, 1981; MILX = share of military expenditure in gross national product. r2 = coefficient of determination; F = F statistic; ( ) t statistic; df = degrees of freedom.

TABLE 7

Africa: Defense-Budgetary Trade-offs, Total Sample (standardized coefficients)

Budgetary item	Independent variables			Statistics		
	GNPPER	PCB DEBT*	DEFENSE	r2	F	df
Public services						
General services	-0.13 (-1.01)		0.87 (6.79)	0.736	22.34	30
Education		-0.28 (-1.87)	0.71 (4.69)	0.689	15.35	30
Health		-0.27 (-2.11)	0.78 (6.14)	0.783	25.31	30
Social security	0.26 (2.11)		0.78 (6.26)	0.759	25.26	30
Housing		-0.49* (-2.18)	-0.18 (-0.79)	0.233	2.44	30
Other social		-0.30 (-1.29)	0.37 (1.58)	0.216	2.67	30
Economic services						
Total economic		-0.39* (-1.87)	-0.50 (-2.34)	0.319	3.74	30
Agriculture	-0.36 (-1.85)		-0.47 (-2.38)	0.411	5.57	30
Roads		-0.15* (-0.95)	0.73 (4.61)	0.611	12.51	30
Other transport	-0.36 (-3.36)		0.76 (7.06)	0.844	37.85	30
Other economic	-0.19 (-0.82)		-0.53 (-2.27)	0.273	2.62	30

Notes: GNPPER = per capita GNP, PCB = the share of public consumption in gross domestic product; DEBT = the share of public external debt in GDP. Both the budgetary item and DEFENSE are measured as shares of the total central government budget. * indicates DEBT was the control variable.

TABLE 8

Africa: Defense-Budgetary Trade-offs, Nonconflict States (standardized coefficients)

Budgetary item	Independent variables			Statistics		
	GNPPER	PCB DEBT*	DEFENSE	r2	F	df
Public services						
General services		0.20*	1.04			
		(1.22)	(6.33)	0.862	16.59	17
Education		-0.39	0.62			
		(-2.62)	(4.20)	0.903	42.00	17
Health		-0.38	0.65			
		(-2.71)	(4.61)	0.915	48.61	17
Social security	0.27		0.85			
	(2.28)		(7.15)	0.875	31.68	17
Housing	-0.01		-0.13			
	(-0.03)		(-0.38)	0.017	0.08	17
Other social	-0.11		0.47			
	(-0.39)		(1.78)	0.218	2.85	17
Economic services						
Total economic	-0.26		-0.30			
	(-0.86)		(-1.11)	0.542	3.16	17
Agriculture		-0.47*	-0.83			
		(-1.65)	(-2.90)	0.484	4.23	17
Roads	-0.28		1.03			
	(-1.85)		(5.77)	0.834	13.41	17
Other transport	-0.07		0.90			
	(-0.44)		(5.90)	0.796	17.55	17
Other economic	0.24		-0.55			
	(0.88)		(-1.99)	0.322	2.14	17

Notes: GNPPER = per capita GNP, PCB = the share of public consumption in gross domestic product; DEBT = the share of public external debt in GDP. Both the budgetary item and DEFENSE are measured as shares of the total central government budget. * indicates DEBT was the control variable.

TABLE 9

Africa: Defense-Budgetary Trade-offs, Conflict States (standardized coefficients)

Budgetary item	Independent variables			Statistics		
	GNPPER	PCB DEBT*	DEFENSE	r2	F	df
Public services						
General services		1.14	-0.73			
		(5.03)	(-2.62)	0.970	34.20	12
Education		0.80	-1.07			
		(3.20)	(-4.61)	0.990	36.17	12
Health		0.78	-0.76			
		(-2.71)	(-2.66)	0.615	18.61	12
Social security		0.52*	0.18			
		(1.11)	(1.42)	0.501	4.01	12
Housing		-1.25	0.98			
		(-2.71)	(2.10)	0.788	6.71	12
Other social	0.72		-0.56			
	(2.36)		(-1.83)	0.643	4.71	12
Economic services						
Total economic	0.76		-0.80			
	(4.96)		(-5.21)	0.912	20.69	12
Agriculture	-0.54		-0.68			
	(-1.74)		(-2.49)	0.750	4.89	12
Roads	0.79		-0.57			
	(2.90)		(-2.11)	0.723	5.22	12
Other transport	0.71		-0.39			
	(2.37)		(-1.22)	0.761	5.19	12
Other economic	0.41		-0.64			
	(1.08)		(-2.76)	0.553	4.66	12

Notes: GNPPER = per capita GNP, PCB = the share of public consumption in gross domestic product; DEBT = the share of public external debt in GDP. Both the budgetary item and DEFENSE are measured as shares of the total central government budget. * indicates DEBT was the control variable.

Yet, despite this predominant role, food and agriculture output has been in decline since the 1960s. Chronic food insecurity, mounting food import bills, serious dietary deficiencies, and stagnating agricultural exports plague the continent. The causes of the decline of Africa's agricultural sector are numerous and include:[32] (1) urban-biased development that has turned the terms of trade against the agricultural sector, (2) export-oriented strategies, (3) technological dependence, (4) scarcity of trained manpower, and (5) a largely unknown resource base.

Given the likely strength of these factors in contributing to the sector's decline, increased defense expenditures (and the associated reduction in public sector allocations to the agricultural sector) may only contribute marginally to the sector's demise. Clearly, more research will be needed before it will be possible to assess the relative contribution of defense expenditures to the stagnation of Africa's agricultural sector. Some insights can be obtained, however, from an examination of the differential macroeconomic impact of defense expenditures in the conflict and nonconflict states; that is, it may be that defense expenditures in nonconflict states interact on key economic variables to offset somewhat their negative impact on the agricultural sector.

For example, it is rather unlikely that the conflict states would be able, due to hesitancy on the part of the suppliers or capital markets to provide funds, to supplement their domestic resources by fairly large volumes of external loans to finance military expenditures. Instead, military expenditures in these countries would have to come from bidding resources away from other activities. The nonconflict countries, on the other hand, might, through use of external funds due to their higher credit-worthiness, be able to expand military expenditures without diverting a large volume of resources away from other activities.

To test this hypothesis, military expenditures were regressed on gross domestic product (GDPB), the public external debt (PDB), and debt service payments (DSGB). The results were:

Nonconflict states:

(1) ME = -0.02 GDPB + 1.26 PDB - 0.39 DSGB
(-0.32) (12.19) (-4.90)
r2 = 0.963; F = 132.40; df = 17

Conflict states:

(2) ME = 1.00 GDPB - 0.02 PDB - 0.01 DSGB
(11.32) (-0.30) (-0.24)
r2 = 0.970; F = 87.08; df = 12

Where ME = total military expenditures, 1981; GDPB = gross domestic product, 1981; PDB = total external public debt, 1981; DSGB = public external debt service as a percentage of GDP 1981.

The contrast between the two groups is striking. Clearly, the nonconflict states have relied largely on external public debt to facilitate their military expenditures. The negative sign on the debt service term may indicate that debt servicing to maintain credit-worthiness is given a high priority by these countries and that any conflicts between making debt service payments and military expenditures are resolved in favor of debt servicing. The conflict countries, on the other hand, have not been able to draw extensively on foreign resources to facilitate their military buildups. As the budgetary analysis indicated, they have been forced to live largely within their domestic resources, with added defense expenditures apparently coming at the expense of other allocations.

Another area in which we should find substantial differences between the conflict and nonconflict states lies in the factors that determine arms imports. We should expect less of a pressing need among the nonconflict countries to spend scarce foreign exchange on arms imports—undoubtedly this group of countries is in a position to postpone new acquisitions during periods of foreign exchange scarcity, whereas the conflict countries may feel such a pressing need (real or imagined) for new weapons that orders are placed quite independently of the overall state of the economy. To test this proposition, arms imports were regressed on the level of gross foreign exchange reserves of the country (reflecting ability to finance imports) and total military expenditures (reflecting need for new weapons). The results were as follows:

Conflict states:

(3) AI = 1.01 GIRB + 0.10 PDB - 0.17 ME
(23.61) (0.83) (-1.34)
r2 = 0.976; F = 204.11; df = 12

Nonconflict states:

(4) AI = -0.94 GIRB + 0.12 PDB + 1.71 ME
(-1.44) (0.62) (2.55)
r2 = 0.833; F = 13.33; df = 17

Where AI = arms imports, 1981; GIRB = gross international reserves, 1981; PDB = public external debt, 1981; ME = total military expenditures, 1981.

Again, sharp contrasts exist between the nonconflict and conflict states of Africa. Arms imports in the nonconflict states are largely related to overall foreign exchange reserves (there is almost a one-to-one pattern). Presumably, for these countries during periods of foreign exchange scarcity, arms imports are correspondingly reduced and vice versa. This interpretation is quite consistent with the insignificance of military expenditure (ME) affecting this group's level of arms imports. Again, because of the apparent luxury these countries have in postponing arms imports until economic conditions are favorable, large amounts of scarce foreign exchange are not diverted from productive uses to finance arms imports.

The conflict countries' arms imports, on the other hand, are not related to their ability to pay for them. Instead, they apparently reflect immediate military need as reflected by their positive and statistically significant association with total military expenditures. Again, military build-ups in these countries do not appear to be related to good economic conditions with the result that sacrifices are likely to be inflicted to finance stepped-up levels of defense expenditures.

If this interpretation is correct, we would also expect the overall determinants of external public debt to vary considerably between conflict and nonconflict countries with the nonconflict countries likely to be more credit-worthy and have more flexibility in financing military expenditures with external debt if necessary to minimize strains on the domestic economy. The model tested assumed public external debt to be directly related to the resources of the country (GDPB) (a need for finance), the level of gross domestic reserves (GIRB) (another reflection of the need for external finance—the higher the level of resources the less the need for additional external funds), military expenditures (ME),

and exports (MTEA) (a measure of credit-worthiness). The results were:

Nonconflict states:

(5) PDB = 0.03 GDPB - 1.89 GIRB + 0.68 ME + 2.00 MTEA
(0.31) (-4.10) (2.52) (3.99)
r2 = 0.954; F = 67.40; df = 17

Conflict states:

(6) PDB = 3.20 GDPB + 0.52 GIRB - 0.05 ME - 2.98 MTEA
(1.57) (0.37) (-0.03) (-1.36)
r2 = 0.644; F = 2.71; df = 12

Where PDB = public external debt, 1981; GDPB = gross domestic product, 1981; ME = average military expenditure, 1970-1981; MTEA = average level of exports, 1970-1981.

The nonconflict countries, therefore, have borrowed externally to augment local resources in expanding military expenditures. They have borrowed against relatively good export performance, and have used added gross domestic resources to reduce their debt burden. The conflict countries, on the other hand, show no statistically significant pattern. They have not been able to improve their credit-worthiness through improved export performance nor has their external public debt been managed to reflect changes in the foreign reserves. Again, since these countries have apparently not used external resources to finance a large amount of their military expenditures, these allocations have undoubtedly come at the expense of other domestic socioeconomic allocations.

Along these same lines, we would expect to find the impact of military expenditures on such macro-aggregates as investment to vary considerably between conflict and nonconflict countries. The model tested links the rate of investment to the savings rate, resource inflows (the resource balance), public external debt, and the military burden. The results are:

Nonconflict states:

(7) GDIB = 0.63 MS - 0.36 RBB + 0.35 MEY + 0.68 PDPB
(3.47) (-2.20) (2.04) . (1.68)
r2 = 0.695; F = 7.41; df = 17

Conflict states:

(8) GDIB = 0.53 MS - 0.39 RBB + 0.19 MEY + 0.51 PDPB
(1.85) (-1.28) (0.69) (1.71)
r2 = 0.69; F = 2.79; df =12

Where GDIB = share of investment in GDP, 1981; MS = average marginal savings rate, 1970-1981; MEY = military expenditure share in GNP, 1981; RRB = resource balance share in GDP, 1981; PDPB = public external debt as percentage of GDP, 1981.

While not negative, the military burden has not stimulated investment in the conflict countries. On the other hand, increases in the military burden are statistically significant and positively linked with increases in the share of resources allocated to investment. This pattern may have developed as a result of either positive spin-offs associated with military expenditures in the conflict countries or the tendency of military expenditures to augment (as shown in the factor-quality of life analysis) the amount of supporting resources, thus increasing the overall profitability of investment.

A proxy for the profitability of investment is the capital output ratio. Here the capital output ratio is defined as the rate of growth in investment (1970-1981) divided by the growth in GDP (1970-1981). The capital output ratio is assumed to be linked to public external debt (reflecting technology imports) and the overall growth in the economy (presumably high growth rates causing bottlenecks that reduce the productivity of capital). The results are:

Nonconflict states:

(9) ICOR = 0.48 PDB - 0.41 PDPB - 0.48 MEP - 0.52 GDPGB
(1.03) (-1.74) (-2.07) (-2.10)
r2 = 0.391; F = 2.09; df = 17

Conflict states:

(10) ICOR - 0.71 PDB - 0.65 PDPB + 0.82 MEP + 0.42 GDPGB
(-3.57) (-3.17) (3.79) (2.16)
r2 = 0.816; F = 6.67; df = 12

Where ICOR = rate of growth in investment, 1970-1981, divided by the rate of growth in GDP, 1970-1981; PDB = external public debt, 1981; PDPB = public external debt as a share of GDP, 1981; MEP = average military expenditure per capita, 1970-1981; GDPGB = growth in real GDP, 1970-1981.

Again, military expenditures impact in divergent ways in the two groups of countries. In the nonconflict countries they tend to increase the productivity of capital (reduce the capital output ratio), whereas in the conflict countries additional military expenditures have tended to reduce the productivity of capital (increase the capital output ratio).

Of related interest is the fact that higher growth rates in the nonconflict countries have tended to increase the productivity of investment (perhaps through fuller capacity utilization). Conflict countries have experienced reductions in the productivity of investment at higher growth rates, indicating perhaps the presence of bottlenecks created by too great a strain on local resources.

CONCLUSION

The empirical results presented demonstrate the futility of attempting to generalize about the costs of military expenditures in the Third World. Clearly, the old guns vs. butter type of analysis is not universally valid. In fact, this dichotomy may be extremely misleading for a fairly large group of countries. On the other hand, it is quite apparent that for many of the African countries, the defense build-up in the 1970s and early 1980s was a major cause of their economic demise.

NOTES

1. The debate is summarized and empirically tested in D. Wheeler, "Sources of Stagnation in Sub-Saharan Africa," *World Development* (1984): 1-23. See also S. Lewis, "Development Problems in Mineral Rich Countries," in M. Syrquin, L. Taylor, and L. E. Westphal, eds., *Economic Structure and Performance: Essays in*

Honor of Hollis B. Chenery (New York: Academic Press, 1984); D. F. Gordon and J. Parker, "The World Bank and Its Critics: The Case of Sub-Saharan Africa," Center on Economic Development, *Discussion Paper No. 108*, University of Michigan, Ann Arbor; C. Allison and R. Green, eds., "Sub-Saharan Africa: Getting the Facts Straight," *JDS Bulletin* (July 1985).

2. This discussion is based on R. Luckham, "Militarization in Africa," in Stockholm International Peace Research Institute, *World Armaments and Disarmament: SIPRI Yearbook, 1985* (Philadelphia: Taylor & Frances, 1985), pp. 295-328.

3. Along these lines, various facets of the military's role in the African economies are given in B. Arlinghaus, *Military Development in Africa: The Political and Economic Risks of Arms Transfers* (Boulder, Col.: Westview Press, 1984).

4. Luckham, "Militarization," p. 298.

5. For an excellent recent analysis of the causes of African defense expenditures, see E. Dommen and A. Maizels, "The Military Burden in Developing Countries," *Journal of Modern African Studies* (1988): 377-401.

6. Largely espoused by Nicole Ball. See her *Security and Economy in the Third World* (Princeton: Princeton University Press, 1988).

7. E. Benoit, *Defense and Economic Growth in Developing Countries* (Lexington, Mass.: Lexington Books, 1973), p. 3.

8. R. Faini, P. Annez, and L. Taylor, "Defense Spending, Economic Structure and Growth: Evidence Among Countries and Over Time," *Economic Development and Cultural Change* (1986): 487-498.

9. R. E. Looney, "Military Keynesianism in the Third World: An Assessment of Non-Military Motivations for Arms Production," *Journal of Political and Military Sociology* (Spring 1989): 43-64.

10. A similar mechanism is suggested in R. E. Looney, "Impact of Arms Production on Income Distribution and Growth in the Third World," *Economic Development and Cultural Change* (October 1989): 145-154.

11. D. F. Kohler, "The Effects of Defense and Security on Capital Formation in Africa: An Empirical Investigation," *Rand Note* (Santa Monica, Calif.: Rand Corporation, September 1988).

12. S. Deger, "Economic Development and Defense Expenditure," *Economic Development and Cultural Change* (1986): 179-196.

13. Cf. P. C. Frederiksen and R. E. Looney, "Defense Expenditure and Economic Growth in Developing Countries," *Journal of Economic Development* (1982): 113-125; P. C. Frederiksen and R. E. Looney, "Defense Expenditures and Economic Growth in Developing Countries," *Armed Forces and Society* (Summer 1983): 633-646; R. E. Looney and P. C. Frederiksen, "Defense Expenditures, External Public Debt and Growth in Developing Countries," *Journal of Peace Research* (December 1986): 329-338; R. E. Looney, "Impact of Arms Production on Income Distribution and Growth," *Economic Development and Cultural Change* (October 1989): 145-154; R. E. Looney, "Military Keynesianism in the Third World: An Assessment of Non-Military Motives for Arms Production," *Journal of Political Military Sociology* (Spring 1989): 43-64.

14. R. E. Looney, "Austerity and Military Expenditures in Developing Countries: The Case of Venezuela," *Socio-Economic Planning Sciences* (1986): 161-164; R. E. Looney and P. C. Frederiksen, "Consequences of Military Rule in Argentina," *Comparative Political Studies* (April 1987): 34-46; R. E. Looney and P. C. Frederiksen, "The Future Demand for Military Expenditures in Argentina," *Arms Control* (September 1986): 197-204.

15. E. Weede, "Rent Seeking, Military Participation and Economic Per-

formance in LDCs," op. cit., and E. Weede, "Military Participation Ratios, Human Capital Formation and Economic Growth: A Cross-National Analysis," *Journal of Political and Military Sociology* (1983): 17.

16. G. Harris, "The Determinants of Defense Expenditures in the ASEAN Region," *Journal of Peace Research* (March 1986): 41-50.

17. See the excellent classification of African economic regimes in N. Chazan, "Ideology, Policy, and the Crisis of Poverty: The African Case," *Jerusalem Journal of International Relations* 10, 4 (December 1988): 1-30.

18. R. Sandbrook, *The Politics of Africa's Economic Stagnation* (Cambridge: Cambridge University Press, 1985). Also on the role of the state see R. Sandbrook, "Is Socialism Possible in Africa?" *Journal of Commonwealth and Comparative Politics* (1981): 197-207.

19. Cf. R. Jackson and C. Rosberg, "Why Africa's New States Persist: The Empirical and the Juridical in Statehood," *World Politics* (October 1982): 1-24. The issue of legitimacy is dealt with in detail in B. Neuberger, *National Self-Determination in Postcolonial Africa* (Boulder, Col.: Lynne Rienner, 1986); and D. Ronen, ed., *Democracy and Pluralism in Africa* (Boulder, Col.: Lynne Rienner, 1986).

20. Cf. R. Rothstein, "The 'Security Dilemma' and the 'Poverty Trap' in the Third World," *Jerusalem Journal of International Relations 8, 4* (December 1986): 1-38.

21. Ibid.

22. Ibid., Table 1, p. 20.

23. Ibid., Table 1, p. 20.

24. I wish to thank an anonymous referee for noting this point.

25. See note 13.

26. The data are for 1980 and were taken from R. L. Sivard, *World Military and Social Expenditures, 1983* (Washington, D. C.: World Priorities, 1983).

27. This approach overcomes the difficulties involved in artificially creating a "quality of life" index. See, e.g., D. A. Larson and W. T. Wildford, "The Physical Quality of Life Index: A Useful Social Indicator?" *World Development* (1979): 581-584. The factor analysis generates several separate indices with no attempt made to combine these with an artificial weighing system. An excellent description of the use of factor analysis for this type of problem is given in S. Abizadeh and A. Basilevsly, "Socio-Economic Classification of Countries: A Maximum Likelihood Factor Analysis Technique," paper presented at the Atlantic Economic Conference, Philadelphia, July 1984.

28. r2 = the coefficient of determination; F = the F statistic; df = degrees of freedom. The t values for the independent variables are given in parentheses under their estimated coefficients.

29. A method developed in J. Vener, "Budgetary Tradeoffs Between Education and Defense in Latin America: A Research Note," *Journal of Developing Areas* (October 1983): 77-92. See also R. E. Looney, "Military Expenditures in Latin America: Patterns of Budgetary Tradeoff," *Journal of Economic Development* (July 1986): 69-104.

30. Data are from the World Bank, *World Development Report* (New York: Oxford University Press), various issues.

31. Ibid., various issues.

32. E. P. Pallangyo and L. A. Odero-Ogwel, "The Persistence of the Food and Agriculture Crisis in Africa," in A. Adedeji and T. M. Shaw, *Economic Crisis in Africa: African Perspectives on Development Problems and Potentials* (Boulder, Col.: Lynne Rienner, 1985), pp. 170-171.