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Determinants of Military Spending in Developing African Countries

Abstract

All countries make trade-offs between social spending and military spending, and developing countries are not exempt from this predicament. Resources are particularly scarce in these countries, so every decision is made with the understanding that money is tight. Since the end of the Cold War, United States policy makers have been trying to stabilize these regions to promote peace and development. Ironically, however, military weapons are still readily available to these developing countries through the major industrial powers (United States, Russia, China, etc.). If the United States and other developed countries are serious about promoting peace and development in underdeveloped regions, then it is vital to know why excessive amounts of money are spent on the military every year in those countries.

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All countries make trade-offs between social spending and military spending, and developing countries are not exempt from this predicament. Resources are particularly scarce in these countries, so every decision is made with the understanding that money is tight. Since the end of the Cold War, United States policy makers have been trying to stabilize these regions to promote peace and development. Ironically, however, military weapons are still readily available to these developing countries through the major industrial powers (United States, Russia, China, etc.). If the United States and other developed countries are serious about promoting peace and development in underdeveloped regions, then it is vital to know why excessive amounts of money are spent on the military every year in those countries.

If it is true that aid received by underdeveloped countries makes the procurement of military equipment easier, then it is also possible to eliminate or reduce those factors that contribute to excessive military spending. This in turn could lead towards regional stability and accelerate development of the nations.

A large portion of the available research dealing with Third World military expenditure revolves around the study of Emile Benoit (1973). Benoit's study, based on forty-four developing countries from 1950-65 and 1960-65, showed that as military spending increased, economic growth increased. This conclusion was reinforced in 1981 by Charles Wolf who found that certain conditions are necessary for military expenditures to have a positive effect on economic growth (Looney 1990).

Saadet Deger, however, concludes that "this reasoning is flawed" (Deger 1986). Deger reasons that increased military expenditure decreases growth rates because it reduces the capital available for investment (Deger 1986). Benoit's conclusions are also rejected by Dommen and Maizels (1988) because "the armed forces are relatively unproductive—in the sense of contributing to capital formation." While not totally rejecting Benoit's study, Brauer (1991), concludes military investment "might exert only a 'muffled' effect on the economy as a whole." In any case, it is clear that no consensus exists among researchers. This study examines military spending in order to discover an association, if one is present, between the variables that may explain excessive spending on the military budget.

McKinlay looked at budgets of Third World countries in his study to see whether there were identifiable variables that predicted spending patterns. This study contradicts Looney's earlier presumptions about employing eco-

conomic models. Looney stated that non-economic models are case studies, or focused on the arms-race, but “this case-by-case approach has tended to emphasize idiosyncratic factors and obscure the systematic incentives and constraints that influence all countries similarly” (Looney 1994). In his study, McKinlay concluded that budget size predicts military expenditure in a positive direction, and the GDP (Gross Domestic Product) is “the single best predictor of military expenditure.” Overall, however, budgets do not reveal much in terms of spending patterns (McKinlay 1989). McKinlay’s study, while failing in some respects, shows the importance of the GDP in spending patterns of Third World countries, thereby showing the importance of economic variables. It is unlikely, however, that non-economic factors are unimportant. For example, international relations most likely play a role in the prediction of military expenditures in Third World countries. Clearly, this is an important non-economic factor. Thus, this study contains both economic and non-economic factors.

Researchers divide the potential variables they study into two broad categories when looking for determinants of spending patterns in developing countries: “exogenous” and “endogenous” (Looney 1988). Exogenous variables are those which originate outside of a given country, for example, external factors such as security threats, foreign assistance, and private investment. Endogenous variables relate to domestic concerns including social domestic programs. Looney (1994) suggests that, “Most analysts consider military expenditure to be determined by exogenous factors, that is, regional conflicts and arms-races, super-power alliances, and the like.” With no Cold War to drive the arms markets, this study will investigate whether or not Looney’s conclusion still holds true. It is important to look at both endogenous and exogenous factors when searching for common spending habits, but that does not mean that these variables are mutually exclusive. For this reason, this study includes both exogenous and endogenous factors as independent variables. By doing so it will be possible to identify which type of variable is more powerful in predicting military expenditure in developing countries.

The Variables: Modernization

This study, following the model of Robert Looney, measures twelve independent variables. Those variables are further divided into more individualized groups. Specifically, three sub-groups of variables are tested: modernization, economic development, and demographics.

I hypothesize that as a country becomes more modernized, it increases its military spending. This is likely for several reasons. The first reason deals with the tax base. Governments collect more taxes in the more modern countries because of greater employment and business transactions. Also, as a country becomes more developed, other countries are more likely to loan money to that country due to the increased probability that the loan will be repaid.

Modernization is difficult to grasp because it is a concept, not a tangible characteristic. The first measure in this category is the percentage of a country's population living in urban areas. I suggest that as this population rises, military spending will increase. Urban centers tend to provide industry, creating employment for people. The bigger the portion of the population employed in industry, the greater the tax base. Also, as people begin to move towards centers of population, there will be fewer costly development projects in rural areas. This will save the government funds they can then spend elsewhere.

The next measure in this group will be the average number of children per woman. I hypothesize that a lower number of children per woman indicates a more modern society which, in turn, predicts an increase in military spending. Here I assume that a woman with a large number of children (seven or more) most likely does not work outside of the home, and therefore contributes little to the national economy in terms of taxes. Also, I presuppose that a large number of children per woman indicates that a government must divert some resources to child care programs such as immunization clinics and education, thus eliminating some of the funds that countries could spend on the military.

The next variable measured is the ratio of physicians to the general population of the country. It seems reasonable that a greater number of physicians per segment of the population represents a more modern society. I hypothesize that as the ratio of physician to population increases, military expenditures increase. The physicians perform taxable services, and therefore contribute to a country's economic growth. Also, as the number of physicians increases, it is likely that more of them will be privatized, thereby eliminating a need for the government to subsidize health clinics. This should free up money for tanks and guns.

Finally, within this category, the literacy rate will be measured. Here, I hypothesize that the higher the level of literacy in these countries, the higher the level of modernization. A high literacy rate represents a large pool of educated workers capable of contributing to the tax base of the country by working in light industrial jobs. This would mean a country could benefit in the long run by increased resources devoted towards the military.

Economic Development

The next set of variables that will be tested will measure economic factors in developing countries. To begin with, I hypothesize a positive relationship between military expenditure and economic growth. To test this relationship, I will examine the growth of the GNP of the countries for a twelve-year period against the change in military expenditures for the same period.

The next economic measure is the per capita GNP level. I hypothesize that a large per capita GNP indicates a productive population in terms of con-

tributing to the growth of the country's economy. Therefore, more resources are available to divert to military spending. As productivity increases, the available tax base increases. Also, a productive population is less likely to receive welfare-type aid from the government, which will allow savings on social programs.

Next, I will test what role, if any, foreign investment plays in shaping military spending patterns in developing countries. To begin, I hypothesize that as foreign developmental aid to a particular country increases, the level of military spending will decrease. As developed countries give aid to promote growth and stability, they will often put restrictions on their aid packages, inhibiting the recipient from spending too much on items like the military which threaten stability. Also, I assume that developmental aid will prompt developing countries to devote large amounts of domestic resources to completing development programs, thereby eliminating some capital that could go to military applications.

This study also tests private investment. My hypothesis is that as the private investment increases, the level of military spending will decrease. This follows from the rationale that if a person is going to invest in a country, that person would want the most stable country possible in which to invest. I argue that as developing countries spend more and more on military procurement, they appear less stable, and therefore lose their attractiveness for investors.

Demographics

My final variables are simply measures of demographic characteristics. I will test both the size and the total population of a country to determine if there is anything inherent in the make-up of a country that affects developing patterns of military spending. I hypothesize that as the land size of a country increases, the need to protect its borders will increase. This means more men and guns are needed for an adequate defense. As size increases, military expenditure will also increase. Examples reinforce this reasoning. Traditionally, smaller states (Switzerland, Luxemburg, etc.), of the developed world see little need for armament, as they know they are easy targets for bigger neighbors. This mentality could spill over into the developing world, and those countries will focus on social programs leaving little for military spending.

Test Countries

Thirty-two developing African countries are used as subjects in this study. This selection yields control and generalizability. First, these countries share a common history in the sense of being colonies of European nations and winning or gaining freedom through long struggles. This is one example of an historical commonality that results from using all African countries.

These countries also represent differences that will aid in the generalization of the results to the region as a whole. The countries in the study have many different characteristics which help make the findings more than just case study results. Differences in terms of climate, language, landscape, and culture help legitimize the results of the study in a way that would not be possible if only identical countries were examined.

Results

For the purpose of this study, standard multivariate regression will be employed to examine the variables in the test countries. Individually, some of the factors measured showed no statistical significance to the amount of military expenditures for these developing countries in Africa. In fact, of the thirteen variables tested, only four showed bivariate statistical significance on the level of military spending in 1994: children per woman, private investment, population, and total area (see Table 1). This does not imply that nothing other than those variables predicts military spending levels, but merely that of the variables I tested, only those four had individual significance.

Notably absent from these significant variables are GNP, percentage of the population living in an urban setting, and economic growth history. The fact that GNP is not significant is worth mentioning because it appears to discount McKinlay's conclusions, at least in the context of these test countries. The growth of the economy was also not statistically significant, which again, supports Looney's assertion that economic models are not useful in predicting military expenditures in developing countries.

Table 1
**Results of Bivariate Correlations using Military Spending (1994) as
Dependent Variable**

	Child	Urban	Doctor	GNP	Growth	Invest	Aid	Pop.	Area
Sig. F	.00	.20	.30	.69	.28	.00	.56	.04	.01
Beta	-.59	.23	-.19	-.08	.22	.03	.11	.37	.44

While few of the variables were statistically significant alone, several of them became important when placed with other variables from their groupings (see Table 2). The "modernization group" showed significance as a whole even though only one variable in the grouping showed individual significance. However, the R^2 value only represented 37 percent of the variance amongst the countries. This finding seems to indicate that something is missing in this category which might help explain more variance. Finally, this group is surprising, as the relationship overall seems to be a negative one, which was the opposite of what I predicted.

Table 2
Multivariate Regression in Modernization Model

	Beta	T	R²	Adj. R²	F value	Sig. F
Model			.372	.305	5.545	.0041
Urban	-.178	-.946				
Children	-.683	-3.697				
Physician	-.043	-.226				

The two investment variables, foreign and development, also showed significance when simultaneously tested (see Table 3). These variables produced an R² of 43 percent, which explains more variance than the modernization group, but still falls well under 60 percent. It is also important to note that a positive relationship exists, which is in contrast to what I suggested might happen. I had hypothesized that the level of military spending would decrease in order to attract investment and aid. The results of these 32 African countries demonstrates otherwise.

Table 3
Multivariate Regression in Economic Model

	Beta	T	R²	Adj. R²	F Value	Sig. F
Model			.432	.366	6.489	.008
Develop	.280	1.533				
Invest	.590	3.234				

The final category, country demographics, proves statistically significant as well. This leads me to conclude that there may exist an inherent need to arm as the size and population of a country rises (see Table 4). This group explains only 24 percent of the variance, however. Again, this seems to indicate that there is something missing.

Table 4
Multivariate Regression in Demographic Model

	Beta	T	R²	Adj. R²	F Value	Sig. F
Model			.241	.189	4.628	.018
Area	.346	1.978				
Population	.240	1.377				

Conclusion

The United States, when possible, should encourage appropriate military expenditures in developing countries and reward it with aid. This study demonstrates a positive relationship between the amount of aid received by developing countries and their military purchasing. This should not be allowed to happen in countries, such as the African ones examined here, where a relatively small percentage of the population has access to fresh water within one day's walking distance. In countries where children receive minimal education at best, and HIV/AIDS has infected almost a quarter of the population, money should not be wasted on needless arms just so developed countries can purge their arsenals.

There were some variables, however, which significantly affected military spending that cannot be handled politically through refined policies. This study demonstrates that the size of territory and population in a country play significant roles in determining levels of military spending. These variables cannot be manipulated to minimize excessive spending. Beyond that, the study shows other significant relationships, but fails to produce tight conclusions as the standard errors of the various models are very large. In light of the loose findings, there are several possibilities regarding how the study could be modified to yield more significant results.

Dr. Robert Leh suggested three changes in the model, which might produce more conclusive results. The first adjustment would be to divide Africa into different regions such as Sahara and sub-Saharan and compare the results across the different regions. The next adjustment would be to separate those countries with domestic arms manufacturing capabilities from those that merely import arms. The rationale for this adjustment comes from the fact that since arms are produced when it is cheaper than importing, countries are able to spend less but get more in terms of military equipment. The final adjustment would be that the countries should be divided into groups of economic development. This allows comparisons to be made both across equals, and at different stages of development.

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