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Arms Imports and Third World Growth in the 1980s

Robert E. Looney and Peter C. Frederiksen

During the 1980s both defense spending and arms imports declined in many developing countries (DCs), especially in the Middle East and to a lesser degree in South Asia and Northern Africa[1]. In large part, the reductions in defense allocations resulted from growing fiscal problems which forced governments to reorder their spending priorities. It is apparent for the developing world as a whole that countries are indeed examining the potential benefits of reduced defense allocations. Depending on the relative impact of defense spending, the concomitant resource reallocation may significantly affect the economic performance of these countries. This paper examines whether future "peace dividends" are likely to stimulate or to retard third world economic growth. To do this, we examine whether (a) military spending and arms imports helped or hindered growth in the 1980s, (b) military spending/arms imports were associated with changes in external debt, and (c) military expenditures impacted uniformly between groups of countries. We hypothesize that DCs will exhibit large variations in how defense spending has impacted economic performance. In turn these variations, it is believed, reflect the underlying health of the individual country, i.e., its ability to absorb the potential adverse effects associated with changes in defense spending patterns.

Literature Survey

Much has been written recently on the causes and consequences of militarization in the DCs. While much of the early work was anecdotal and biased toward the standard "guns vs. butter" analogies, a rapidly

growing literature has attempted to identify the impact of defense spending on various aspects of economic development and growth. Many of the studies assumed that since defense consumes large quantities of technical and managerial manpower, there will be a significant opportunity cost to defense spending. Unfortunately, no consensus on the effect of defense on the economy has yet emerged.[2] Even recent studies have failed to quell the debate. For example, Biswas and Ram (1986) recently concluded that "military expenditures neither help nor hurt economic growth in LDCs to any significant amount."

Another recent interest has focused on causality. While most of the early studies assumed causation from defense to growth, Joerding (1986) and LaCivita and Frederiksen (1991) have shown that, as expected, causality and the lag length (from the independent to the dependent variables) differ among countries.

The economic effect of planned cuts in defense has not been limited to DCs. In a 1992 article, Roth (1992) examined how the planned cuts in United States' defense spending and the growing budget deficits will affect employment in the U.S. Among his generalizations, Roth felt that (a) the US economy could easily absorb the displaced workers (active-duty, DoD civilians, and defense industry workers), (b) outlays will not fall as fast as authorizations and will thus act as a modified stabilizer, and (c) the state of the U.S. economy will have a significant impact on the severity of worker dislocation.

Another avenue of research has been to use sub-groups of DCs and examine the impact of defense spending within each group. This type of research argues that by creating a stable economic environment, added defense expenditures may actually stimulate higher rates of investment, technological process, technology transfer and hence overall growth. Frederiksen and Looney's (1983) study based on Benoit's (1978) work grouped countries based on a broad range of economic variables to reflect resource availability. Later studies, which enlarged the sample, used later data, or grouped countries using other criteria (such as savings and investment or foreign exchange availability, import elasticity, and investment productivity) found that for the relatively richer group there was a positive effect from defense on growth but in the constrained group there were statistically insignificant results between defense and growth.[3]

Dividing DCs according to producers and non-producers of at least one major weapon system indicated that producers experienced positive economic impacts from military expenditures while non-producers experienced declines in growth and investment.[4] Broadly similar

results were obtained by grouping according to regime type[5] or the legitimacy of government.[6]

Recently, analysis has branched into more complex issues and studies have used both time series and simultaneous models estimated by two and three stage least squares regression techniques. These studies have attempted to incorporate the demand for military expenditures as well as their impacts to determine feedbacks from one to the other. The results[7] tend to confirm the results which were obtained by the more naive models discussed above.

In short, the research so far demonstrates a somewhat consistent pattern whereby certain groups of DCs -- usually the more successful, the more stable, or who are producing arms -- seem to derive some positive impacts from military spending. For the other group, on the other hand, it seems that defense spending has little impact on the economy.

A major limitation to the studies cited above is that they are very aggregative and any generalizations to a specific country is hazardous at best. One exception is Lebovic and Ishaq's (1987) study of defense spending in the Middle East. Using a pooled time-series, cross-sectional analysis on various groupings of Middle Eastern states, they found that higher military spending tended to suppress economic growth in the non-oil states during the 1973-1984 period.

Babin (1989) incorporated the time variable since some relationships which might exist over the long-run disappear in the short-run or vice versa. As Babin concludes, one cannot assume that defense spending will have an immediate, or even short-term, effect on national economic performance. Along these lines, Kick and Sharda's (1986) analysis indicated that an increase in the military manpower ratio has a positive effect on infrastructure and social welfare but that the impact occurs with a long (12 year) lag. Militarization, whether measured in expenditures or size of the military, contributes to economic development.

In summary, although there is no broad consensus as to impact (positive, negative, or none) or causality (defense to growth, growth to defense, or feedback), there is some agreement as to the channels in which defense expenditures transmit impacts to the general economy.[8] These include:

Resource Allocation Effects. Increases in military expenditures divert or re-allocate resources away from domestic civilian investment, public expenditures on government capital investment and current account expenditures on non-military inputs.

Resource Mobilization Effects. Increases in military

expenditures can influence domestic savings through the following linkages: reduced social services, additional taxes, an increase in the social discount rate, and inflation.

Spin-off Effects. Military expenditure may impact economic growth through spin-off effects on human capital (from military training, education and modernization) and on investment productivity through technology transfers).

Aggregate Demand Effects. If underutilized productive capacity exists, an increase in aggregate demand from military expenditures can result in increased output and a rise in capacity utilization and profit rates, in turn inducing an increase in investment rates.

Debt Accumulation Effect. This effect is the impact on current performance of debt accumulation from past imports of military goods and services.

Methodology and Results

Given the conflicting nature of the impacts of these factors, we do still not know whether, a priori, military expenditures promote or hinder economic growth. The net outcome is likely to differ across countries and through time. This paper examines the relationship between defense (and particularly arms imports) and growth during the 1980s.

Factor Analysis

As a first step, we factor analyzed[9] a set of twenty-five economic variables[10] to get a broad overview of the relationship between defense expenditures, arms imports, debt, and economic performance for the 1980s. The results, which appear as Table 12.1, indicate five main trends/factors[11] in the data:

Factor 1: Debt/Arms Imports. The main trend in the data was represented by the high correlation between the arms imports share of total imports and the ratio of total external debt to exports. Several structural variables, the resource balance and the share of savings in GDP (1989) were also included in this factor. The resource balance roughly corresponds to the current account in the balance of payments.

Factor 2: Growth. Many of the overall measures of macroeconomic growth in the 1980s were highly correlated. High growth was also strongly correlated with the share of national resources devoted to investment.

TABLE 12.1
Military Expenditure, Growth, External Debt Variables and Factor Loadings with Eigen Values > 2

		FACTOR				
VARIABLE		Debt Arms Imports	Growth	Public Spending Debt	Military Spending	Debt Service
Debt/Exports	89	0.888*	-0.190	0.011	0.063	0.167
Res Bal/GDP	89	-0.803*	-0.266	0.052	0.034	0.173
Savings/GDP	89	-0.798*	0.193	-0.013	0.277	0.064
Arms Imp	80-79	0.775*	0.008	0.056	0.395	0.063
Arms Imp	72-89	0.771*	0.032	0.138	0.412	0.038
GDP Growth	80-89	0.038	0.899*	-0.026	0.246	-0.063
Imp Growth	80-89	-0.078	0.862*	0.080	0.059	-0.065
Priv Cons	80-89	0.041	0.790*	0.162	0.049	0.157
Invest Growth	80-89	0.052	0.757*	-0.336	0.040	-0.231
Invest/GDP	89	-0.287	0.547*	-0.078	0.363	-0.106
Govt Cons	80-89	0.186	0.540*	-0.227	0.110	-0.219
Govt Exp/GNP	80-89	-0.158	0.060	0.847*	0.004	-0.063
Govt Exp/GDP	72-79	-0.010	-0.001	0.831*	0.251	-0.079
Debt/GDP	80	0.383	-0.069	0.687*	0.128	0.267
Debt/GDP	89	0.489	-0.316	0.629*	0.065	0.210
Exports/GDP	89	-0.469	0.050	0.620*	-0.128	-0.232
Govt Cons/GDP	89	0.134	-0.029	0.556*	-0.261	-0.221
Av Milex/GE	72-79	0.082	0.299	-0.087	0.865*	-0.049
Av Milex/GE	80-89	0.075	0.057	-0.287	0.818*	-0.073
Milex/GNP	80-89	0.077	0.162	0.379	0.802*	-0.046
Milex/GNP	72-79	0.121	0.219	0.336	0.787*	-0.036
Interest/Exp	80	-0.212	-0.012	-0.025	-0.021	0.900*
Debt Serv/Exp	80	-0.199	-0.044	0.006	0.060	0.877*
Debt Serv/Exp	89	0.436	0.085	0.084	0.108	0.737*
Interest/Exp	89	0.076	-0.155	-0.089	-0.097	0.710*
Eigen Values		**5.470**	**5.140**	**3.464**	**3.299**	**2.138**

*denotes factor loadings over 0.50.

Source: Authors' calculations based on oblique factor rotation.

Factor 3: Public Spending/Debt. This factor depicts the close relationship between government expenditures and the overall external debt burden. Included in this factor is the share of exports in GDP, which may indicate that countries with a high share of resources allocated to exports are relatively credit worthy.

Factor 4: Military Expenditures. This factor primarily depicts the % of the central government budget allocated to military spending and the "military burden", (the % of GDP allocated to the military). Interestingly, arms imports as a share of total imports is only weakly correlated with these variables.

Factor 5: Debt Service. This factor is comprised of four measures of debt servicing -- interest payments and total debt service as a share of exports in 1980 and 1989.

The factor scores for the 62 countries in the sample appear as Table 12.2. Since the individual country scores have a mean of zero, they provide an index of the relative country ranking. As anticipated, the Middle East countries have by far the highest defense burdens, while many of the Latin American countries score relatively highly in terms of their debt service burden. The economic successes of the East Asian countries is apparent by the Factor 2 scores.

The next step was to determine the relationship between growth and defense for the sample set in the 1980s. Specifically did the net impact of military expenditures (a) produce a positive or neutral effect in countries facing few relative resource constraints and (b) produce a negative impact on growth in those countries which were relatively resource constrained.

To group the countries, we used the Factor 2 score: countries with a factor score less than zero were classified as low growth (and presumably resource constrained) and countries with factor scores greater than zero were considered high growth (and presumably relatively resource unconstrained).

The mean values of the 25 economic and defense expenditure variables (used in the factor analysis) appear as Table 12.3. Both groups had relatively similar defense burdens, although the share of the central budget allocated to defense was considerably lower in the high growth group during the 1980s (11.4% versus 15.6%). In contrast, the high growth group had considerably lower shares of their total imports accounted for by arms imports in both the 1970s and 1980s. As expected, income growth was much greater in the high growth group; perhaps of greater significance was that this group maintained

TABLE 12.2
Factor Loadings for Individual Countries

	FACTOR				
COUNTRY	Debt Arms Imports	Growth	Public Spend-ing Debt	Military Spending	Debt Service
Tanzania	2.10	0.05	0.01	-0.13	0.05
Somalia	5.63	-0.49	0.17	0.88	-0.26
Malawi	0.61	0.28	0.49	-0.85	0.85
Burundi	1.31	0.84	-0.76	-0.42	-0.29
Madagascar	0.93	-0.82	-0.80	-0.24	1.32
Nigeria	-0.70	-2.72	-0.57	0.59	-0.84
Zaire	0.12	-0.10	-0.20	-0.09	0.00
Mali	1.02	0.98	-0.42	-0.20	-0.69
Niger	0.31	-1.32	-0.65	-0.98	0.21
Upper Volta	0.75	0.60	-1.49	-0.26	-1.38
Rwanda	0.63	0.38	-1.31	-0.64	-1.14
India	0.50	1.06	-1.14	0.40	-0.29
China	-0.91	2.15	-0.78	2.03	-1.32
Haiti	0.13	-1.24	-1.04	-0.48	-1.35
Kenya	0.11	0.61	0.29	-0.53	0.45
Pakistan	0.67	1.21	-0.42	1.13	-0.13
CAR	0.61	-0.23	-0.35	-0.92	-1.32
Ghana	0.33	0.16	-0.86	-1.18	0.07
Togo	0.16	0.21	1.20	-0.74	-0.41
Zambia	0.25	-1.11	1.44	0.87	0.00
Sri Lanka	0.07	0.84	0.27	-0.97	-0.60
Indonesia	-0.69	0.75	-0.63	0.18	0.00
Mauritania	0.44	-0.50	2.35	1.18	0.32
Bolivia	0.26	-1.10	-0.34	0.25	1.60
Egypt	1.13	0.68	2.40	3.68	0.06
Senegal	0.16	0.29	0.15	-0.69	0.45
Zimbabwe	-0.27	-0.39	0.36	0.48	-1.53
Philippines	-0.36	-0.34	-0.63	-0.09	1.12
Ivory Coast	0.00	-0.43	1.35	-1.12	1.18
Dominican Rep	-0.42	0.27	-0.78	-0.46	-0.23
Morocco	0.16	0.60	0.46	0.72	1.10
Papua New Guinea	0.04	0.37	1.03	-1.44	-0.61
Honduras	0.20	-0.03	-0.10	-0.44	-0.17
Guatemala	0.05	-1.59	-1.67	-0.15	-1.17
Congo	0.11	-0.15	2.37	-0.06	-0.06
Cameroon	-0.06	0.07	-0.72	-0.57	-0.44

TABLE 12.2 (Contd.)
Factor Loadings for Individual Countries

COUNTRY	FACTOR				
	Debt Arms Imports	Growth	Public Spending Debt	Military Spending	Debt Service
Peru	-0.22	-1.14	-0.57	1.81	0.80
Ecuador	-0.03	-0.46	-0.52	0.58	1.37
Paraguay	-0.34	0.01	-1.12	-0.07	-0.42
El Salvador	0.32	-0.57	-1.31	0.33	-1.19
Colombia	-0.42	0.31	-1.09	-0.54	0.77
Thailand	-0.73	1.74	-0.51	0.38	-0.28
Jamaica	-0.48	0.10	1.42	-1.11	0.00
Tunisia	-0.40	0.29	1.04	-0.58	-0.59
Turkey	-0.11	1.24	-0.22	0.62	1.33
Panama	-0.22	-1.30	1.81	-0.91	-1.16
Chile	-0.76	-0.18	0.18	0.58	1.30
Costa Rica	-0.18	0.72	0.38	-1.34	0.58
Mauritius	-0.60	2.03	0.59	-1.83	-1.09
Mexico	-0.48	-0.29	-0.61	-1.00	2.54
Argentina	-0.12	-1.41	-0.35	0.64	1.74
Malaysia	-1.39	0.72	1.07	0.24	-1.26
Algeria	-0.18	0.26	0.25	-0.04	1.08
Venezuela	-1.05	-0.50	0.13	-0.30	0.94
Brazil	-0.68	0.65	-0.64	-0.71	2.77
Hungary	-1.06	-0.17	1.25	0.92	-0.11
Uruguay	-0.61	-0.97	-0.30	-0.14	0.10
Yugoslavia	-1.80	-0.98	-1.72	3.03	-0.62
Gabon	-0.97	-0.61	1.48	-0.23	-0.92
Trinidad	-1.17	-2.57	0.51	-0.45	-1.73
Portugal	-0.68	1.06	0.65	0.01	-0.28

Source: Derived from analysis in Table 12.1

relatively high rates of investment growth during both periods while in the low growth group the rate of capital formation fell from 4.5% in the 1970s to -4.4% in the 1980s. These growth patterns were also reflected, albeit to a lesser extent, in exports, government consumption, and private sector consumption.

In terms of the relative size of the public sector, the low growth group had a higher ratio of government expenditures to GNP in the

TABLE 12.3
Mean Values, 25 Economic and Defense Variables, High and Low Growth Country Groups

Variable		Growth Group		
		Low	High	Total
Military Expenditures:		Percent(%)		
% Central Budget	72-79	12.5	12.9	12.7
% Central Budget	80-89	15.6	11.4	13.4
% GNP	72-79	2.9	2.6	2.8
% GNP	80-89	3.0	2.8	2.9
Arms/Total Imports	72-79	4.9	2.5	3.6
Arms/Total Imports	80-89	4.5	3.1	3.8
Growth In:				
GDP	80-89	0.9	3.7	2.4
Investment	80-89	- 4.4	3.0	- 0.5
Govt Consumpt	80-89	0.1	3.8	2.1
Imports	80-89	- 4.0	1.9	- 0.9
Private Consumpt	80-89	1.2	3.4	2.4
Composition of Expenditures:				
Govt Exp/GNP	72-79	23.9	21.8	22.4
Govt Exp/GNP	80-89	21.4	26.6	24.2
Govt Consmt/GDP	89	12.0	12.8	12.5
Investment/GDP	89	15.4	23.4	19.7
Savings/GDP	89	13.3	18.9	16.3
Exports/GDP	89	24.2	26.5	25.4
Resource Bal/GDP	89	- 2.0	- 4.6	- 3.4
External Debt:				
Total Debt/Exp	89	433.8	240.9	331.2
Total Debt/GNP	80	51.2	41.2	45.9
Total Debt/GNP	89	101.4	62.2	80.6
Debt Service/Exp	80	23.0	19.6	21.2
Debt Service/Exp	89	24.7	26.0	25.4
Interest/Exp	80	11.7	10.0	10.8
Interest/Exp	89	11.8	10.8	11.3

Source: Based on Factor 2 Score in Table 12.2. Military variables from United States Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers* (Washington, D.C.: US Arms Control and Disarmament Agency, various issues). All other data from World Bank, *World Development Report* (New York: Oxford University Press, various issues).

1970s than the high growth countries (23.9% versus 21.8%) but this fell to 21.4% in the 1980s, while increasing to 26.6% for the high growth group. As might be imagined, the high growth group were able to allocate a relatively large part of their resources to investment, and while they had a higher savings rate the differences were not as great as those associated with investment.

Several diverse patterns characterize the indebtedness of the two groups of countries. The low growth countries have considerably higher debt burdens, both in terms of the total debt/GNP ratio and total external debt to export ratio. In addition, these gaps widened during the 1980s. However, the debt service ratios do not reflect this pattern, with the high growth countries having the highest ratio of debt service to exports in 1989. These patterns suggest that much of the debt in the low growth group is concessional and/or of a longer term nature.

Other than their rate of macro-aggregate growth, the two groups seem to have their greatest differences with respect to their pattern of debt -- especially the ratios of debt to exports and GNP.

Discriminant Analysis

To assess the extent to which the pattern of debt differentiates high from low growth countries, a discriminant analysis[12] was performed using the set of variables used in the factor analysis. Countries were initially classified as 0 or 1 based on their factor 2 score, and the discriminant analysis (using a stepwise selection process) determined the extent to which our set of economic/military variables could correctly classify high and low growth countries.

The results of the analysis[13] indicated that GDP growth in the 1980s was the most significant variable differentiating the two groups. However, the only other statistically significant growth variable was the rate of growth of exports -- the seventh and last variable entered in the stepwise procedure. The next most important variable was the share of defense expenditures in the central government budget, followed by the share of investment in GDP, and the resource balance share of GDP. Arms imports as a % of total imports in 1972-79 was the fifth most important discriminating variable, followed by the two export variables. Interestingly, none of the debt variables were statistically significant in differentiating the high growth from low growth countries.

Our profile of high and low growth countries is therefore largely based on relative resource constraints -- especially differences in the proportion of resources allocated to investment (domestic resource

constraint), and the rate of growth in exports (the external resource constraint). In addition the high growth countries devote considerably less of their central government budgets to defense and allocate a much lower share of their imports to armaments. On the basis of the seven significant discriminating variables, every country except Mexico were classified correctly and the probabilities of correct placement into the respective group were usually associated with high levels of confidence. The resulting discriminant scores provide a ranking of countries in terms of relative resource constraints (with countries the least resource constrained having the highest negative discriminant score).

Regression Results

Our next step was to determine the impact of defense expenditures on growth in the two groups of countries (as defined in terms of discriminant scores). To do this, a simple Benoit-type growth model of the form:

Growth = f(Invest., Resource Flow, Military Exp., Arms Imports)

was estimated using linear regression analysis. In this model, growth is seen largely as a function of investment and foreign resource flows. Military expenditures and arms imports are added to the regression equation to assess their impact on overall economic growth. The growth variable (GDPG) is the growth of GDP from 1980-89, and the investment variable (GDIG) is the rate of growth of gross capital formation. The resource flow, military expenditures, and arms imports variables (DEBT, MILEX, and ARMSIMP, respectively) are the factor 3,4 and 1 scores for each country. Operationally, these factor scores provide good proxy measures since little multicollinearity exists between the factors.

The results of the regression analysis appear as Table 12.4. Initially, we estimated the model for the entire sample (Eq. 1). The results suggest that both debt and military expenditures contributed to overall economic expansion. On the other hand, arms imports do not appear to have any impact on growth during the 1980s.

To see if these patterns were similar for the sub-groups of countries, two additional sets of regressions were performed. The first set (Table 12.4, Eqs. 2-8) gradually eliminated the relatively resource constrained/low growth countries from the sample set. The results indicate that, as in the case of the total sample, investment, debt and military expenditures were all statistically significant in contributing

ABLE 12.4
egression Results

EQUATION	Independent Variables -- t-statistics GDIG	DEBT	MILEX	ARMSIMP	df[a]	$R^{2,b}$	F[c]
1. Full Sample	7.62**	3.16**	2.52*	-0.87	49	.56	17.7
iminating Resource Constrained Countries							
scriminant Score:							
2. < 2.5	5.89**	2.10*	3.72**	-1.51	43	.58	17.2
3. < 1.5	5.01**	1.61	4.36**	-2.20*	37	.63	18.7
4. < 1.0	4.57**	-0.01	5.26**	-2.44*	31	.67	18.8
5. < 0.5	2.83**	-0.74	5.61**	-2.47*	28	.67	17.6
6. < 0.0	3.02**	0.68	5.35**	-2.32*	27	.68	17.4
7. < -0.5	1.80	-1.82	5.33**	-2.51*	20	.72	16.2
8. < -1.0	1.97	-0.68	5.44**	-2.06	13	.72	12.0
iminating Resource Unconstrained Countries							
scriminant Score:							
9. > -2.5	6.21**	3.26**	1.52	0.08	45	.45	10.9
10. > -2.0	5.81**	3.43**	1.80	0.08	41	.45	10.3
11. > -1.5	5.33**	3.18**	1.68	0.18	35	.46	9.2
12. > -1.0	4.74**	3.16**	1.40	0.05	31	.39	6.7

LE 12.4 (Contd.)
ression Results

QUATION	Independent Variables -- t-statistics GDIG	DEBT	MILEX	ARMSIMP	df[a]	$R^{2,b}$	F[c]
riminant Score:							
3. > -0.5	4.06**	3.03**	1.18	0.54	24	.39	5.5
4. > 0.0	2.97**	3.54**	1.14	0.87	17	.42	4.9
5. > 0.5	2.80**	3.50**	0.85	0.83	16	.43	4.7

degrees of freedom
adjusted
F-statistic
indicates that the coefficient (not reported) was statistically different from zero at the 99% level of confidence
ndicates that the coefficient was statistically different from zero at the 95% level of confidence.

ce: Authors' calculations.

to overall expansion. However, as more and more of the low growth countries were eliminated, the debt variable ceased to have a significant impact on growth. In addition, as the proportion of high growth/resource unconstrained countries increased, the military expenditure term became increasingly important in contributing to economic growth. The arms import variable tended to impact negatively on growth, although the effect was fairly weak and statistically significant for only five of the seven regressions.

The second set of regressions (Eqs. 9-15) sequentially eliminated the high-growth countries and a different pattern emerged. For the resource constrained countries, investment and debt played an important role in economic growth. In contrast to the relatively richer countries, neither defense expenditures or arms imports were statistically significant in explaining the overall rate of economic growth in the 1980s.

The relationship of arms imports to overall growth is an interesting one. The results found here are somewhat counter-intuitive. On the one hand, our results indicate that arms imports retard growth in the relatively richer countries (who allocate a much lower proportion of total imports to armaments). On the other hand, arms imports appear to have a neutral effect for the resource constrained countries. While somewhat beyond the scope of this paper, part of the explanation may be attributed to the original factor analysis where arms imports were highly correlated with the share of the debt burden (debt to total exports ratio). This pattern suggests that the resource constrained countries finance much of their arms imports through increases in external debt. As such, these funds may simply augment or add to foreign exchange holdings -- foreign exchange otherwise unavailable and consequently of low opportunity cost.

Conclusions

Conventional wisdom suggests that large outlays on defense divert scarce resources away from directly productive investment ("guns versus butter") and human capital formation (education and health). While this view might make intuitive sense, it does not necessarily follow that increased military expenditures will actually reduce overall economic growth in developing countries as a whole. The counter-argument for DCs suggests that defense expenditures may in fact be an economic stimulus. Military expenditures finance heavy industry (armaments), the acquisition of advanced technologies

military establishment may also attract investment and thus enhance the country's foreign exchange position. The results which we have obtained in this paper are consistent with this dual view of defense expenditures. The findings are also consistent with earlier studies for the periods prior to 1980. Roughly the same picture has carried over into the 1980s: the more abundantly resource endowed countries appear to have derived positive net benefits to growth from increased defense expenditures. For the relatively poorer group of nations, military spending has no significant impact -- either positive or negative.

For those who advocate cutting defense spending to increase economic growth, such a policy might not always be successful. As Richards and Waterbury (1990) note:

"We may estimate, counterfactually, the returns on alternative uses of the monies devoted to defense, but practically nowhere in the world is there any assurance that reduced defense budgets would result in increased outlay on say, social welfare or infrastructure. Defense outlays are laden with the symbols and sentiments of national pride and survival. People seem prepared to accept disproportionate public investment in defense. They and their leaders find less justification in using equivalent resources to reduce adult illiteracy or line irrigation ditches."

Notes

1. United States Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers 1990* (Washington, D.C., U.S. Arms Control and Disarmament Agency, 1991), Figures 2 and 6.

2. For an excellent review, see Steve Chan, "The Impact of Defense Spending on Economic Performance: A Survey of Evidence and Problems," *Orbis*, Vol. 29, No.3, Summer 1985, pp. 403-34; see also Saadat Deger and Robert West, "Introduction: Defense Expenditure, National Security and Economic Development in the Third World," in Saadat Deger and Robert West, eds., *Defense, Security and Development* (London: Francis Pinter, 1987), pp. 1-16.

3. See Frederiksen and Looney (1982, 1985), and Looney and Frederiksen (1986).

4. Following the classification of Neuman (1984), and Looney and Frederiksen (1987).

5. See, for example, Looney (1988).

6. See Looney (1990).

7. See, for example, Looney (1989).

8. The following draws on West (1991).

9. For a general overview of this technique and interpretation of results, see Rummel (1970).

10. Economic variables are from the World Bank, *World Development Report, 1991* (New York: Oxford University Press, 1991). Defense Expenditures were derived from: United States Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers, 1990* (Washington: U. S. Arms Control and Disarmament Agency, 1991) and *World Military Expenditures and Arms Transfers 1972-1982* (Washington: U. S. Arms Control and Disarmament Agency, 1984). The variables (%) include (in order of listing in Table 12.1): (1) total external debt/exports, 1989; (2) resource balance/GDP, 1989; (3) savings/GDP, 1989; average arms imports/total imports, (4) for 1980-1989 and (5) 1972-1979; (6) average annual rate of GDP growth, 1980-1989; (7) the average annual rate of growth of imports, 1980-1989; (8) the average annual rate of growth in private consumption, 1980-1989; (9) the average annual rate of growth in gross capital formation, 1980-1989; (10) investment/GDP, 1989; (11) the average annual rate of growth in government consumption, 1980-1989; average government expenditures/GNP, (12) for 1980-1989 and (13) 1972-1979; total external debt/GDP, (14) for 1980 and (15) for 1989; (16) exports/GDP, 1989; (17) government consumption/GDP, 1989; military spending/ central government budget, (18) for 1972-1979 and (19) for 1980-1989; average military expenditure/ GNP (20) for 1980-89 and (21) for 1972-1979; (22) interest payments on the external debt/exports, 1980; debt service payments/exports (23) for 1980 and (24) for 1989; (25) interest payments/exports, 1989.

11. Selected on the basis on having Eigen values greater than 2.0. See Rummel (1970).

12. Based on variables used in factor analysis. See *SPSS, SPSS/PC + Advanced Statistics 4.0* (Chicago: SPSS Inc., 1990) for a description of the discriminant program and its interpretation.

13. The statistically significant variables (Wilks' Lambda in parentheses) which formed the discriminant function (in order of importance) were: [1] GDP growth 1980-89 (0.569); [2] military expenditures as % of central government budget 1980-89 (0.467); [3] investment/GDP, 1989 (0.400); [4] resource balance/GDP, 1989 (0.340); [5] arms imports/total imports, 1972-1979 (0.297); [6] exports/GDP, 1989 (0.285); [7] export growth 1980-89 (0.271).

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