

# THIRD-WORLD MILITARY EXPENDITURE AND ARMS PRODUCTION

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FOREWORD BY ROBERT L. WEST

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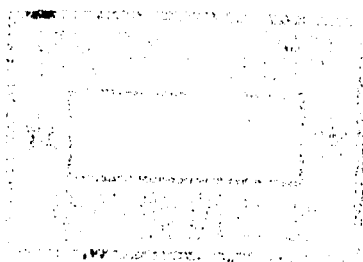
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# **Part I**

## **Comparative Analysis**





# 1 Impact of Indigenous Arms Production on Third-World Military Expenditures

## INTRODUCTION

In discussing the role which economic factors can play in affecting our understanding of the growth in third-world armaments, it is useful to begin by surveying several of the major theoretical explanations of this phenomenon. First, a fundamental distinction can be made between exogenous and endogenous models of military expenditures. The exogenous category includes those approaches which see national military expenditure patterns as essentially responses to external stimuli, in particular the actions of rival nations (but possibly also those of alliance partners). The endogenous category includes those approaches which see military expenditure patterns resulting largely from changing domestic considerations.<sup>1</sup>

The popular and intuitively appealing metaphor of the 'arms race' assumes the dominance of exogenous causes and it is this approach which has received the greatest attention in the literature. Nearly all arms race models trace their origin to the pioneering work of Lewis Richardson.<sup>2</sup> The well-known reaction equations developed by Richardson describe competitive armament acquisition in terms of the simultaneous linear differential equations, each equation depicting the rate of change of one nation's level of armaments as a positive function of the level of the rival nation's armaments and a negative function of its own.

The view of the state as a rational optimizer can be extended to include an explanation for the resource allocation behaviour of nations participating in military alliances. If two or more nations confront what is perceived to be a common external threat, then the production of security by one nation can be consumed jointly by the others with no reduction in the amount consumed by the producers. Military security then has all the characteristics of an international public good.

If security preferences are revealed, then given resource endowment and production technologies, it is conceptually possible to construct reaction equations, not unlike those of Richardson's arms race models to indicate how participants in an alliance will vary their own military expenditures in response to changes in the expenditures of other members. And as in the case of the Richardson model it is possible to use such equations to investigate the nature of equilibrium and stability in alliance military expenditures.

While the Richardson and alliance models may provide useful descriptive devices, it strains credulity unreasonably to attribute their behavioural foundations to the optimizing behaviour of advanced industrial states, let alone third-world governments, most of which are neither seriously threatened by their neighbours nor belong to former military alliances. This is not to suggest that provision for security should not be made with the explicit goals of maximizing welfare or producing security at minimum cost; indeed prescriptive advice in these directions is a desirable by-product of this mode of analysis. But it is expecting too much for the state to have the information and processing capacity to pursue grand optimizing strategies.<sup>3</sup>

Furthermore the idea of the state as rational optimizer requires an acceptance of the unreal and uncomfortable notion of the organic nature of the state. Specifically it ignores the political and economic interests of those who participate in the military resource allocation process and those who are affected by it. And it ignores the constraints which the availability (or lack) of economic resources can place on planned expansions in military expenditures.

Interestingly enough, despite the conceptual problems outlined above, almost all of the quantitative analysis of the impact of military expenditure on third-world economic growth has in fact taken such expenditures as exogenously given.<sup>4</sup> This is particularly true since the traditional neoclassical approach – which views the role of the state as balancing the welfare benefits of extra security derived from military expenditure with its exporting cost in terms of forgone civilian output – appears particularly difficult to apply, if not largely irrelevant to the majority of developing countries.<sup>5</sup>

Neoclassical economic theory assumes that the state, whose decisions determine the level of military expenditures, is politically neutral and that its view of the need for security is based on serving the interests of the entire society.<sup>6</sup> However, in developing countries the concept of state security typically includes the need for repression

of domestic opposition groups, as well as the need for protection against possible external aggression.<sup>7</sup>

In particular, in developing countries where the military have themselves taken power, it can hardly be assumed that the state is neutral. Even in developing countries with civilian governments, the state apparatus is typically in the hands of a ruling social elite. Consequently a more satisfactory approach to analyzing the forces influencing the level of third-world military expenditures must be related to the need for military force to maintain the ruling elites in power.<sup>8</sup> Logically the ability of the ruling elites to keep themselves in power should be a function of the economic resources at the disposal of the state. From this viewpoint the primary influence on the level of military expenditure would be the degree of threat to dominant elites from domestic opposition groups.

We may take as a working hypothesis, therefore, the notion that the optimal shock of military assets (and hence security) in third-world countries is largely a function of perceived or imagined threats to the ruling class. In the mathematical sense the optimal level of military expenditures is exogenous with the actual level of military expenditures undertaken to bridge the gap between existing levels of security and those deemed optimal. The speed of adjustment between actual and optimal levels of sectors, which determines the annual level of military expenditures, can in turn be taken as a function of the economic resources at the disposal of the elites and the economic constraints under which they must operate.

Clearly, consistent cross-sectional data on the threat to dominant elites from domestic opposition groups is not available, although several notable studies have developed comprehensive time series data for individual countries. In the absence of satisfactory indices concerning the imagined levels and means of threat to elite rule, it is assumed below that elites are capable of mobilizing additional resources for their survival as the degree of threat increases, but that overall economic conditions will delineate the boundaries within which this mobilization can take place.<sup>9</sup>

In this context it is important to distinguish between expenditure on armaments and defence expenditure in total. For most developing countries, the largest proportion of defence expenditure is spent not on armaments, but on personnel costs, and a further substantial proportion goes on operations and maintenance. While it may be true that external factors influence the amount of actual weaponry purchased, their effect is less obvious in the case of personnel. Of course

large powers might encourage smaller countries to expand their military capability in order to act as a proxy for the presence of the large power in the area. However, it seems too simple to generalize that external factors are responsible for the escalation of defence expenditures, as opposed to armament, in LDCs.<sup>10</sup>

## ECONOMIC FACTORS

A number of economic factors are likely to contain the level of military expenditures in any individual country. First, the level of gross domestic product would seem to be a relevant factor, since in a general way national income delineates the overall ability of a country to maintain a particular volume of military expenditures.<sup>11</sup>

Second, the balance of payments deficit is also relevant since, again in a general way, it delineates the volume of external resources that may be used to finance arms imports. A related factor is the size of the external public debt, some of which has undoubtedly gone to financing past military expenditures. At any point in time additional debt can be used to finance further arms imports. On the other hand, for some countries the outstanding debt may, through reducing their credit worthiness, serve as a constraint to further arms imports.

Third, the military burden (defined as military expenditures per capita or military expenditures as a share of GDP) may also influence the overall amount of military expenditures. While the size of the military burden undoubtedly reflects the need for internal security, it will most likely also reflect the degree of external threat perceived by the government.

Fourth, population was included in the regression equation on the presumption that some military expenditure will be undertaken to reduce open unemployment. Obviously a country's population sets certain limits on the size of the armed forces and therefore military expenditure.

Finally a further factor frequently mentioned in the literature is the influence of a domestic arms industry which, by a close alliance with political and bureaucratic interests, can develop effective persuasive power to influence decision makers to agree to additional military expenditures.<sup>12</sup> Clearly, governments in those countries possessing an arms industry can, by placing and cancelling orders for equipment, use the arms industry as a direct tool in implementing their domestic economic stabilization efforts.

Unfortunately we do not have a consistent measure of the size of indigenous arms industries across countries. In order to integrate this important factor in the analysis, countries were examined separately, depending on whether or not they produced an indigenous arms industry capable of producing at least the major weapons system.<sup>13</sup>

## DETERMINANTS OF MILITARY EXPENDITURES

The introduction to this paper posed the question why, if military expenditures in fact retard growth, developing countries increase such expenditures? Clearly, knowledge as to the impact of military expenditures on economic growth will aid our understanding of the mechanisms tending to constrain the overall level of military expenditures. As a preliminary examination along the lines of Frederiksen and Looney,<sup>14</sup> showed growth (GDPGB) for 1970–81 in the arms and non-arms producing countries was hypothesized to be a function of the rate of growth in investment (GDIGB) from 1970–81, the average inflow of foreign resources as a per cent of GDP between 1970 and 1981 (RBB) and the average military burden (MEB) between 1970 and 1981. In addition, the rate of inflation (INFB) in 1970–81 was included to control for any influence price movements may have had on the overall expansion of the economy.<sup>15</sup>

The results were as follows:

### *Non-arms producers*

$$\text{GDPGB} = 0.94\text{GDIGB} - 0.181\text{INFB} - 0.57\text{MEP} - 0.07\text{RBB}$$

$$(7.13) \quad (-1.90) \quad (-4.47) \quad (0.64)$$

$$r^2 = 0.628 \quad F = 17.33 \quad DF = 45$$

### *Arms producers*

$$\text{GDPGB} = 0.72\text{GDIGB} - 0.31\text{INFB} + 0.32\text{MEP} - 0.38\text{RBB}$$

$$(3.66) \quad (-1.69) \quad (2.89) \quad (2.46)$$

$$r^2 = 0.125 \quad F = 9.91 \quad DF = 19$$

This indicates that the military burden (MEP) had a strong negative impact on growth in the non-arms producing group and a statistically significant and positive impact on growth in the producing countries.

These results seem to show that governments in arms producing countries will not be as constrained in increasing military expenditures as their counterparts in the non-arms producing countries. All

things being equal we would, therefore, expect less of a link to exist between overall military expenditures and GDP for the producing countries than for the non-producers. The same also applies to the current account balance. Not only are the producing countries by definition less dependent on imports of arms to maintain a given level of military expenditures but, given the overall positive impact of military expenditures on growth, these countries' fiscal policy will not be particularly constrained; that is, given a level of desired security increases, a domestic military expenditure can be used to offset the deflationary impact of increased current account deficits at the same time as arms imports are being reduced by shifting from foreign to domestic arms acquisitions. The reverse can take place during periods of inflation and/or balance of payments surpluses.

## EMPIRICAL RESULTS

To test these hypotheses a simple model based on the discussion in the previous section was constructed, whereby military expenditures in 1981 were assumed to be a function of gross domestic product (GDPB) in 1981, the balance of payments current account (CAB) 1981 and the external public debt (PDA) 1970, (PDB) 1981. In addition, the effect on total military expenditures of the military burden (MEP and MEY) was tested, as was the impact of the overall population (POP).

The results (Table 1.1) for the total sample of countries show that a high degree (86.8 per cent) of the variance in total military expenditures was explained by three variables – the gross domestic product (GDPB), the current account (CAB), and the external public debt in 1970; that is, the higher GDP, the longer a current account surplus (or lower deficit) and the higher public external debt in 1970, the larger the overall level of military expenditures. For non-producers (Table 1.2), GDP appears to be highly significant, as is the current account surplus (CAB), but when either public external debt in 1970 (PDA) or public external debt in 1981 (PDB) is added to the regression equation, GDP is no longer statistically significant. For the non-producers, 97 per cent of the fluctuations in military expenditures can be explained by two variables – the current account surplus (or slight deficit) and public external debt.

The fact that military expenditures are so closely linked to the current account balance (and not GDP) indicates that for the non-

Table 1.1 Determinants of total military expenditures, total country sample (standardized coefficients)

Equation	Independent variables							Statistics		
	GDPB	CAB	PDA	PDB	MEP	MEY	POP	r <sup>2</sup>	F	DF
(1) ME =	0.56 (5.85)							0.313	34.20	76
(2)	0.43 (7.45)	0.78 (16.07)	0.16 (2.73)					0.868	133.36	64
(3)	0.51 (6.64)	0.75 (13.53)		0.03 (0.40)				0.851	121.84	67
(4)	0.50 (11.32)	0.58 (9.97)			0.24 (4.00)			0.878	156.95	68
(5)	0.55 (13.43)	0.69 (16.25)				0.20 (4.79)		0.888	172.22	68
(6)	0.47 (9.53)	0.71 (16.77)	0.12 (2.40)			0.22 (5.28)		0.909	151.09	64
(7)	0.51 (9.35)	0.74 (15.53)					0.07 (1.22)	0.852	124.97	68

Note: See text for definition of symbols. *DF* = degrees of freedom; (#) = *t* statistics; *r*<sup>2</sup> = coefficient of determination.; *F* = *F* statistic.



Table 1.2 Determinants of total military expenditures, non-arms producers (standardized coefficients)

Equation	Independent variables							Statistics		
	GDPB	CAB	PDA	PDB	MEP	MEY	POP	r <sup>2</sup>	F	DF
(1) ME =	0.93 (19.00)							0.878	361.31	51
(2)	0.35 (5.09)	0.64 (9.29)						0.962	519.26	43
(3)	0.04 (0.34)	0.96 (7.81)	0.16 (2.99)					0.972	429.64	40
(4)	0.05 (0.51)	0.94 (8.10)		0.16 (2.99)				0.969	416.34	43
(5)	0.05 (0.51)	0.86 (7.63)		0.15 (3.24)	0.10 (2.48)			0.973	354.12	43
(6)	0.06 (0.54)	0.91 (8.80)	0.15 (3.22)			0.10 (4.06)		0.981	461.15	40
(7)	0.33 (4.34)	0.67 (9.02)					0.02 (0.75)	0.962	342.71	43

Note: See text for definition of symbols; r<sup>2</sup> = coefficient of determination. F = F statistic. DF = degrees of freedom. (#) = t statistic.