

# Military Expenditures in Latin America: Patterns of Budgetary Tradeoffs

Robert E. Looney\*

## I. Introduction

The economic climate in the 1970s was particularly unstable not only because of oil price changes but also because of wide-ranging fluctuations in commodity prices and induced changes in patterns of world demand. One of the consequences of this relative economic stagnation has been an increasing difficulty for governments to finance their customary budgets.

As debt service costs have risen and revenue has levelled off or declined, governments have been forced to re-evaluate programs in an effort to curtail government spending.

The purpose of this paper is to examine empirically the extent, direction and form of budgetary tradeoffs between defense and other social-economic programs in Venezuela and several of the other major Latin American countries. An attempt will be made to answer several specific questions:

1. Is there a significant relationship between defense and social-economic expenditures over time?;
2. Does defense spending cut spending in other social-economic programs in Venezuela and other major Latin American country? ;
3. Are there any common elements among countries with similar

\* Associate Professor of National Security Affairs, Naval Postgraduate School, Monterey, California.

1969, B.M. Russett concuded that each dollar increase in defense spending resulted in a subtraction of "forty-two cents from personal consumption spending, twenty-nine cents from fixed capital formation, ten cents from exports, five cents from federal government civilian programs and thirteen cents from state and local government activities."

Unfortunately, Russett's analysis is distorted by the data of the World War II years, in which percentage allocations to defense were two to three times larger than in other years. In a re-analysis of the data, Hollenhorst and Ault divided the 1939-1968 series into three wars plus peacetime. The majority of the significant tradeoff relationships occur in the World II period. Other significant tradeoffs vary across the four periods and in several instances negative relationships become positive. The authors conclude regarding Russett's question "Who Pays for Defense?" that:

in an "intense" war period (World War II) probably everyone pays. In peacetime, however, and in the "lesser" wars of the recent past (Korea, Vietnam) the consumer pays nearly the entire bill, while the proportion of GNP consisting of state-local government expenditures and some types of fixed investment expenditures have, at times, increased along with increases in defense spending.

Russett, himself, in a more detailed analysis which omits the World War II period found a substantial reduction in the number of significant substitution relationships.

For a variety of reasons, the U.S. is relatively a typical in both the pattern and content of its defense spending. While this in no way reduces the importance of the concern over possible negative tradeoffs with other program expenditures, it does make the U.S. case inappropriate as a model for cross-national hypothesis testing (Hayes).

Smith found from his analysis of a set of OECD time series that there was a negative association between military expenditures and investment and that this result was robust whether the data were treated as time series, cross section, or pooled, and for a variety of assumptions about stochastic structure. Frederick Pryor performed an analysis similar to the Russett research using data from twelve countries in East and Western Europe, plus the U.S. and Canada. In cross section analysis of the fourteen countries in

methodologies and examined a wide range of variables for the purpose of evaluating the performance of military and civilian governments in Latin America (Nordlinger, Schmitter, Weaver). Of the many hypothesis advanced and tested, one of the more interesting has been the respective roles of military and civilian regimes in the arms race vs. their promotion of socio-economic well-being. Although approaches for examining a defense/social welfare tradeoff or a pro-defense vs. pro-economic development stance among regime types have varied, political scientists during the last several decades have generally treated regime type as the independent variable and various macropublic policy indicators as dependent variables. Similar methodologies have been employed by historians. Sociologists, in what is becoming a rapidly growing body of literature, have addressed various issues pertaining to the sociology of the military in developing countries, although most of their attention has been confined to regions outside of Latin America (Pluta).

Eric Nordlinger summarizes the "prevailing interpretation":

The likely consequences of military rule are economic growth, the modernization of economic and social structures and a more equitable distribution of scarce economic values and opportunities. As sponsors of these types of change, soldiers in mufti are depicted as progressive forces whose politicization is to be commended if not recommended, rather than being condemned as usurpation of civilian authority.

Nordlinger, himself, disagrees with this interpretation, arguing that "except under conditions (for example, particularly low levels of economic development and political mobilization) soldiers in mufti are not agents of modernization" but rather act in pursuance of their military corporate interests and protect "a particular type of political stability" and middle class interests and identities.

Schmitter finds conflicting hypotheses in the literature on the impact of military intervention: (1) the military is dedicated to the preservation of order and maintenance of the social status quo: (2) the military is dedicated to national development goals including "important increments in the role of public authority in areas such as investment health and education, income redistribution and industrial management," (3) the military is only one of several groups competing for hegemony over the

the military, in effect, to reduce the likelihood of armed revolt and/or opposition to civilian-initiated reform programs (Pluta).

In another study of civilian and military regimes in Latin America, Dickson found that: (1) military regimes appear to have been more fiscally conservative than civilian ones and (2) civilian regimes appear to have been more developmentally-oriented than military ones. In justification, military regimes were inclined to spend less and run lower deficits, even though they spend more on the military. They showed a lower rate of increase in the cost of living and maintained a stronger international liquidity position for the Central Bank. Civilian regimes, for their part, spent more, did more for education and effected higher savings and investment rates, although the military had an edge in electrical production.

In contrast, in her analysis of budgetary allocations to defense and a variety of socioeconomic programs in Brazil between 1950 and 1967, Hayes concluded that military spending did not necessarily yield negative consequences for social and economic investments. She found that "substitutions between military allocations and allocations to other sectors do occur frequently, but that the burden of these substitutions is distributed across all categories at one time or another." Further she judged that "substitutions are not severe." Overall defense spending "accompanied substantial increases in spending for infrastructure development and aspects of this associated with greater Central Government activity." She did find, on the other hand, that increased defense spending has some negative effects on social spending but that this "was mild because social investment was not a major priority of any of the regimes examined." Nevertheless, Hayes reported a correlation of  $-0.23$  between defense and social development (education, health, welfare) expenditures, measured as percentages of the total public budget. In addition, a  $-0.23$  correlation was registered between spending on military personnel and social development expenditures. Although "theoretical generalizations cannot be made and hypotheses cannot be accepted or rejected on the basis of evidence from a single case," Hayes's research seems to indicate a mildly negative trade-off between defense and education expenditures.

In yet another study, Ames and Goff using a pooled cross-state time series data set (18 countries, 1948-1968), concluded

were given including the positive spin-off benefits associated with indigenous military production and the role of budgetary stabilization in producing countries. The work below attempts to extend this analysis — i.e., have the producing countries systematically different budgetary tradeoffs than the non-producing countries and, if so, what are the implications for predicting likely defense expenditures in the future.

More specifically, when public policy demands exceed the available public resources, budgetary tradeoffs are bound to occur between and among different policy areas; one policy area may gain at the expense of other policy areas in the allocation of scarce resources. Budgetary tradeoff patterns range on a continuum between two extremes. It may be that increases in defense spending come at the expense of, say, health spending or education spending; that is, as defense spending increases, spending on education or health may actually decrease producing a negative tradeoff. This result is sometimes referred to as a substitution effect. Positive tradeoff occurs if defense spending increases are matched by real increases in health or education spending. For any particular Latin American country, the actual tradeoff will certainly fall somewhere between these two extremes. Of course, it is always possible that defense spending bears no relationship, negative or positive, to education spending, producing a pattern in the middle of the tradeoff continuum — no tradeoff.

### III. The Methodology

Two basic methodological concerns relating to tradeoff analysis have been discussed at some length in previous studies. The first relates to the type of data format or design that is most appropriate to a proper assessment of tradeoff hypothesis. Which design should be used — a cross sectional or time series design? The second concern refers to the definition and measurement of the expenditure variables. The present analysis rests upon a time series design wherein expenditure terms are based on ratios, i.e., defense and other budgetary expenditures as a percentage of total public expenditures.

Several of the tradeoff studies summarized above utilized a longitudinal or time series design but without accounting for some

- (2) social security-welfare,
- (3) housing, and
- (4) other purposes.

Positive tradeoffs between defense and other government expenditures:

- (1) economic services.

#### Brazil (Table 2)

Negative tradeoffs between defense and other government expenditures:

- (1) housing, and
- (2) other community services.

Positive tradeoffs between defense and other government expenditures:

none.

#### Argentina (Table 3)

Negative tradeoffs between defense and other government expenditures:

- (1) public services, and
- (2) education

Positive tradeoffs between defense and other government expenditures:

- (1) other purposes.

#### Chile (Table 4)

Negative tradeoffs between defense and other government expenditures:

- (1) public services;
- (2) education,
- (3) social security, and
- (4) other purposes.

Positive tradeoffs between defense and other government expenditures:

- (1) health,
- (2) housing, and
- (3) economic services.

#### Ecuador (Table 5)

Negative tradeoffs between defense and other government expenditures:

**Table 1**  
**VENEZUELA: DEFENSE EXPENDITURE-BUDGETARY TRADEOFFS 1972-1983**

Equation	Budget Categories						Control Variables			Statistics		
	Public Services	Education	Health	Social Security	Other Community Services	Government Expenditure Per GDP	Other Purposes	Government Expenditure Per Capita	RHO	r <sup>2</sup>	F	DW
(1)	-1.28 (-3.36)					-0.07 (-3.47)			-0.36 (-1.31)	0.613	6.33	1.74
(2)	-0.78 (-1.43)					-0.05 (-2.14)			0.05 (0.19)	0.375	2.40	1.79
(3)		-0.21 (-1.62)					-0.09 (-5.23)		-0.34 (-1.81)	0.956	88.30	1.22
(4)				-0.60 (-2.33)				-0.01 (-2.33)	-0.09 (-0.28)	0.497	3.96	2.85
(5)					-1.94 (-2.19)		0.03 (-2.12)		-0.07 (0.22)	0.378	2.43	1.93
(6)						0.10 (0.83)			0.93 (8.51)	0.086	0.37	1.11
(7)								0.01 (2.44)	-0.30 (-1.03)	0.458	3.39	2.25
(8)							-1.78 (-2.04)	-0.03 (-1.01)	-0.22 (-0.76)	0.423	2.94	2.22

Notes: \* Estimations made using Cochrane-Orcutt two stage iteration process for serial correlation; see text for definition of symbols.

( ) = t statistic

F = F statistic

DW = Durbin-Watson statistic

L = Variable lagged one year

Data from International Monetary Fund, *Government Finance Statistics Yearbook*, various issues; International Monetary Fund, *International Financial Statistics Yearbook*, 1984.

**Table 3**  
**ARGENTINA: DEFENSE EXPENDITURE-BUDGETARY TRADEOFFS 1972-1982**

Equation	Budget Categories							Control Variables						
	Public Services	Education	Health	Social Security Welfare	Housing	Other Community Services	Economic Services	Other Purposes	Gov't Expenditures Per GDP	GDP	RHO	r <sup>2</sup>	F	DW
(1)	-0.03 (-2.27)								-0.04 (-3.19)		0.51 (1.77)	0.720	7.73	2.32
(2)		0.08 (-4.35)							-0.03 (-1.47)		0.08 (0.24)	0.766	9.86	1.80
(3)			0.01 (-1.94)							0.03 (-1.44)	0.22 (0.75)	0.429	2.25	1.96
(4)				-0.01 (-1.46)					-0.03 (-1.44)		0.85 (4.91)	0.265	1.08	1.37
(5)					-0.08 (-1.05)					-0.08 (-2.00)	0.495 (1.80)	0.375	1.80	1.84
(6)						0.018 (1.39)			-0.04 (0.31)		0.37 (1.22)	0.264	1.07	1.63
(7)							-0.03 (-0.35)		-0.07 (-0.75)		0.38 (1.25)	0.087	0.28	1.54
(8)											-0.58 (-2.26)	0.809	12.71	2.49

Notes: Estimations are made using Cochrane-Orcutt two stage iteration procedure for serial correlation correction:

( ) = t statistic

F = F statistic

DW = Durbin-Watson statistic

L = Variable lagged one year

Military Data from Stockholm International Peace Research Institute, *World Armament and Disarmament*; SIPRI Yearbook, 1984; other data from International Monetary Fund, *Government Finance Statistics Yearbook*, various issues; International Monetary Fund, *International Financial Statistics Yearbook*, 1984.



**Table 5**  
**ECUADOR: DEFENSE EXPENDITURE-BUDGETARY TRADEOFFS 1973-1982**

	Budget Categories					Control Variables					Statistics			
	Education	Public Services	Education	Social Security Welfare	Economic Services	Other Purposes	Health	Government Expenditure Per Capita	Government Expenditure	GDP	RHO	r <sup>2</sup>	F	DW
(1)		-0.12 (-0.50)						-0.02 (-1.62)			0.05 (0.14)	0.404	2.03	2.25
(2)			-0.004 (-0.09)								0.06 (0.19)	0.245	0.97	1.53
(3)				-0.06 (-3.26)					-0.07 (-1.94)		0.55 (1.98)	0.640	5.34	1.82
(4)					-0.24 (-3.79)				-0.01 (-19.20)		-0.35 (-1.14)	0.986	226.96	2.58
(5)						-1.05 (-1.88)			-0.09 (-0.70)		0.32 (1.03)	0.398	1.98	1.09
(6)							-0.11 (-2.81)	-0.03 (-3.00)			0.26 (0.82)	0.634	5.20	2.05

Notes: Estimations are made using Cochrane-Orcutt two stage iteration procedure for serial correlation correction:

( ) = t statistic

F = F statistic

DW = Durbin-Watson statistic

L = Variable lagged one year

Data from International Monetary Fund, *Government Finance Statistics Yearbook*, various issues; International Monetary Fund, *International Financial Statistics Yearbook*, 1984.

Table 7  
MEXICO: DEFENSE EXPENDITURE-BUDGETARY TRADEOFFS 1973-1982

	Budget Categories					Control Variables			Statistics					
	Education	Public Services	Education	Health	Social Security Welfare	Economic Services	Other Purposes	GDP Per Capita	GDP	Government Expenditure	Government Expenditure Per Capita	R <sup>2</sup>	F	DW
(1)		-0.014 (-1.46)										0.25 (0.80)	0.263	1.07 1.98
(2)		-0.041 (-4.56)								0.01 (5.44)		-0.41 (-1.37)	0.834	15.16 1.59
(3)			0.014 (1.93)									0.47 (1.61)	0.754	9.22 2.05
(4)												-0.09 (-4.11)	0.977	130.74 2.07
(5)						0.011 (2.04)						0.09 (1.40)	0.466	2.62 1.53
(6)												-0.12 (-0.37)	0.491	2.89 2.26

Notes: Estimations are made using Cochrane-Orcutt two stage iteration procedure for serial correlation correction:

( ) = t statistic

F = F statistic

DW = Durbin-Watson statistic

L = Variable lagged one year

Military Data from Stockholm International Peace Research Institute, *World Armament and Disarmament, SIPRI Yearbook, 1984*; other data from International Monetary Fund, *Government Finance Statistics Yearbook*, various issues; International Monetary Fund, *International Financial Statistics Yearbook, 1984*.

**Table 9**  
**BOLIVA: DEFENSE EXPENDITURE-BUDGETARY TRADEOFFS 1973-1982**

	Budget Categories						Control Variables						
	Public Equation	Services Education	Health	Social Security Welfare	Other Community Housing Services	Economic Services	Other Purposes	Government Expenditures Per Capita	Government Expenditures	RHO	$\frac{\text{Statistics}}{t^2}$	F	DW
(1)	0.44 (6.33)							0.05 (0.67)		0.72 (3.13)	0.874	20.94	2.44
(2)	0.62 (3.00)							0.03 (2.57)		0.25 (0.78)	0.752	9.10	1.60
(3)		0.62 (3.38)						0.01 (2.13)		-0.53 (-1.88)	0.209	7.33	2.44
(4)			0.65 (0.48)					0.01 (2.70)		0.19 (0.60)	0.484	2.82	2.16
(5)				0.08 (1.56)				0.03 (1.15)		0.02 (0.06)	0.418	2.07	2.18
(6)					0.06 (2.23)				0.04 (1.62)	0.29 (0.91)	0.476	2.72	1.80
(7)						-1.01 (-2.23)			0.02 (-3.90)	0.51 (1.82)	0.771	10.14	2.38
(8)							-3.30 (12.81)	-0.01 (-15.66)		-0.33 (-1.06)	0.985	201.25	2.62

Notes: Estimations are made using Cochrane-Orcutt two stage iteration procedure for serial correlation correction.

( ) = t statistic

F = F statistic

DW = Durbin-Watson statistic

L = Variable lagged one year

Data from International Monetary Fund, *Government Finance Statistics Yearbook*, various issues; International Monetary Fund, *International Financial Statistics Yearbook*, 1984.

**Table 11**  
**COSTA RICA: DEFENSE EXPENDITURE-BUDGETARY TRADEOFFS 1972-1982**

Equation	Budget Categories						Control Variables				Statistics		
	Public Services	Education	Health	Social Security Welfare	Other Community Services	Economic Services	Other Purposes	Government Expenditures Per Capita	GDP Per Capita	RHO	F	$\chi^2$	DW
(1)	-17.59 (-0.89)						-0.01 (-1.56)			-0.38 (-0.66)	0.12	0.56	0.86
(2)		1.24 (1.41)						0.01 (0.26)		0.92 (9.81)	0.872	27.43	1.02
(3)			-12.13 (-3.18)				0.02 (0.49)			0.94 (12.83)	0.561	5.11	0.84
(4)				7.60 (2.48)				-0.02 (-1.50)		0.80 (4.23)	0.667	8.03	1.23
(5)					-1.37 (-1.85)		0.05 (-1.87)			-0.39 (-1.23)	0.464	3.47	2.00
(6)					0.55 (4.14)		0.02 (3.68)			-0.72 (-2.46)	0.941	63.94	1.21
(7)						1.56 (0.69)	-0.02 (-1.83)			-0.04 (-0.11)	0.357	2.22	1.72
(8)							-20.50 (-0.96)	-0.01 (-1.65)		-0.39 (-0.68)	0.147	0.69	0.86

Notes: Estimations are made using Cochrane-Orcutt two stage iteration procedure for serial correlation correction:

- ( ) = t statistic
- F = F statistic
- DW = Durbin-Watson statistic
- L = Variable lagged one year

Data from International Monetary Fund, *Government Finance Statistics Yearbook*, various issues; International Monetary Fund, *International Financial Statistics Yearbook*, 1984.

**Table 13**  
**EL SALVADOR: DEFENSE EXPENDITURE-BUDGETARY TRADEOFFS 1973-1983**

Equation	Budget Categories					Control Variables			Statistics			
	Public Services	Education	Health	Other Community Services	Economic Services	Other Purposes	Gov't Expenditures Per GDP	Gov't Expenditures Per Capita	RHO	F	DW	
(1)	-0.46 (-6.02)					-0.03 (-3.23)			-0.31 (-1.06)	0.841	15.86	1.96
(2)		-0.90 (-7.46)				-0.05 (-4.18)			-0.20 (-0.42)	0.890	24.39	1.94
(3)			-0.14 (-2.00)			-0.07 (-0.31)			-0.17 (-0.54)	0.456	2.51	2.38
(4)				0.15 (1.61)			0.02 (1.62)		0.36 (1.22)	0.283	1.18	1.93
(5)					-0.13 (-4.69)			0.41 (1.8)		0.593	4.38	1.42
(6)					-0.40 (-4.69)			0.78 (3.96)		0.765	9.80	2.72
(7)								0.04 (0.91)		0.223	0.86	2.31
(8)								-0.54 (-2.03)		0.919	34.47	2.41

Notes: Estimations are made using Cochrane-Orcutt two stage iteration procedure for serial correlation correction.

( ) = t statistic

DW = F statistic

LW = Durbin-Watson statistic

L = Variable lagged one year

Military Data from Stockholm International Peace Research Institute, *World Armament and Disarmament*; SIPRI Yearbook, 1984; other data from International Monetary Fund, *Government Finance Statistics Yearbook*, various issues; International Monetary Fund, *International Financial Statistics Yearbook*, 1984.

Table 14  
LATIN AMERICA: ARMS PRODUCERS - NON ARMS PRODUCERS  
DEFENSE EXPENDITURES BUDGETARY TRADEOFFS

(t Statistics from regressions)

	Budget Categories							Other Purpose
	Public Services	Education	Health	Social Services Welfare	Housing	Community Services	Economic Services	
<b>Arms Producers</b>								
Venezuela	-3.36	-1.43	-1.62	-2.33	-2.19	+0.83	+2.56	-2.04
Brazil	-0.78	-0.08	-0.37	-0.26	-2.00	-2.32	-1.64	-1.32
Argentina	-2.27	-4.35	-1.94	-1.46	-1.05	+1.39	-0.35	+4.08
Chile	-2.27	-5.25	+2.40	-3.28	+3.36	-0.21	+8.17	-2.70
Ecuador	-0.50	-0.09	-2.81	-3.26	-	-	-3.79	-1.88
Dominican Republic	-2.79	+0.64	-0.19	+0.42	+0.62	-1.77	-1.16	-2.32
Mexico	-1.64	-4.56	+1.93	-0.60	-	-	+2.04	-1.66
Peru	-0.61	-0.15	+0.51	-1.55	+0.73	-	-	-1.05
<b>Non-Arms Producers</b>								
Bolivia	+6.33	+3.00	+3.38	+0.48	+1.56	+2.13	-2.23	-12.81
Paraguay	+2.75	+1.45	+2.44	+2.51	+1.00	+1.92	-4.98	-1.66
Uruguay	+0.33	+0.23	+3.26	+2.48	+0.24	+2.61	+1.37	-1.91
Costa Rica	-0.89	+1.41	-3.18	+2.48	-1.85	+4.14	+0.69	-0.96
El Salvador	-6.02	-7.46	-2.00	+1.61	-2.32	-4.69	-1.00	+6.51

Note: Based on t values for budget category regressed on military expenditures presented in tables.

and economic services would tend to reinforce this conclusion. For examples, it has often been claimed that many governments of less developed countries tend to regard capital expenditure as investment and recurrent expenditure as consumption. Economic growth is seen to depend largely on investment, so that government recurrent expenditure has to be curbed in order to generate "public savings" for investment purposes for instance, see Lim. There are also political reasons for this belief. Governments are more likely, at least in the short run, to obtain greater political benefits by having more, but less efficient, projects than by having fewer, but more efficient, ones. The former are simply more visible and more politically rewarding.

One important implication of this view is that scarce government revenue is more likely to be spent on new projects or on the expansion of existing ones than on recurrent operational and maintenance costs. There are certainly examples in less developed countries of new schools being built and opened without there being sufficient qualified teachers to man them, or even to man already existing ones. If, in fact, this view is correct, one might expect economic services in general to be positively correlated — or at least not statistically significant — when regressed on defense expenditures.

One comes back to the fact that a fairly close link exists between the government budget (surplus-deficit), public consumption and military expenditures in the arms producing countries. These countries show defense expenditures linked to budgetary deficits, i.e., defense expenditures rise with government deficits. Other expenditures may be cut back during periods of high deficits. With surpluses, defense expenditures, everything else equal tend to decline in percentage terms.

These patterns are not found in the non-producing countries. Apparently because these countries depend more on tax revenues, all expenditures are increased as revenues rise and decreased when revenues decline. The non-arms producing countries would not be able to attach any special stabilizing role to military expenditures that could not be performed as well by other types of expenditure. The positive tradeoffs between defense and social expenditures for the non-arms producers are, therefore, somewhat puzzling. Why aren't education, health, etc. negatively related to increases in defense spending for these countries? Why are

- America: The Case of Defense Industries*, the North American Economics and Finance Association Third International Meetings, Mexico City, 1985.
- Nordlinger, E., "Soldiers in Mufti: The Impact of Military Rule upon Economic and Social Change in the Non-Western State," *American Political Science Review*, Dec. 1970.
- Peroff, K. and M. Podolak-Warren, "Does Spending on Defense Cut Spending on Health? A Time Series Analysis of the U.S. Economy, 1929-74," *British Journal of Political Science*, Jan. 1979.
- Pluta, J., "The Performance of South American Civilian and Military Governments from a Socio-Economic Perspective," *Development and Change*, July 1979.
- Pryor, F. L., *Public Expenditures in Communist and Capitalist Nations*, Richard D., Irwin, Homewood, Ill. 1968.
- Russett, B. M., *What Price Vigilance?* Yale University, New Haven, 1970.
- Schmitter, P., "Military Intervention, Political Competitiveness and Public Policy in Latin America, 1950-67," Janowitz, M. and J.V. Doorn, eds., *On Military Intervention*, Rotterdam University Press, Rotterdam, 1971.
- Smith, R.P., "Military Expenditure and Investment in OECD Countries, 1954-1973," *Journal of Comparative Economics*, Mar. 1980.
- Weaver, J., "Assessing the Impact of Military Rule: Alternative Approaches," P. Schmitter, ed., *Military Rule in Latin America: Function, Consequences and Perspectives*, Sage Publications, Beverly Hills, 1973.
- Whynes, D., *The Economics of Third World Military Expenditure*, University of Texas Press, Austin, 1979.