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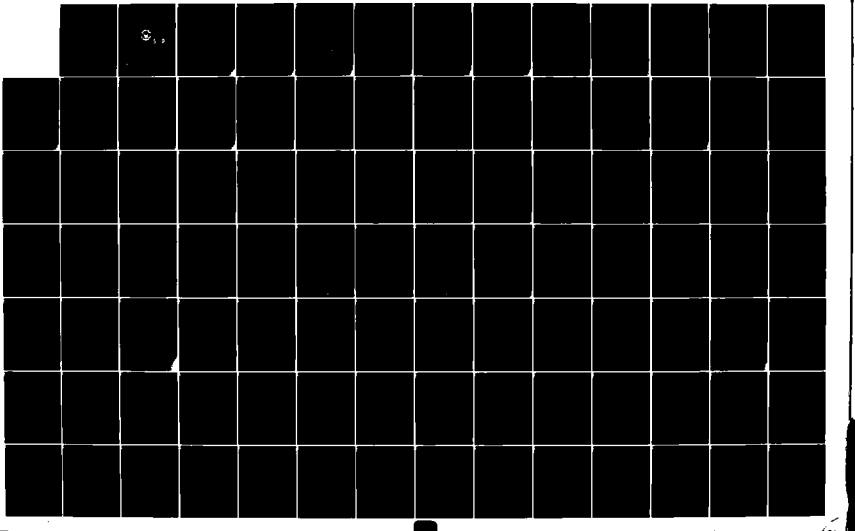

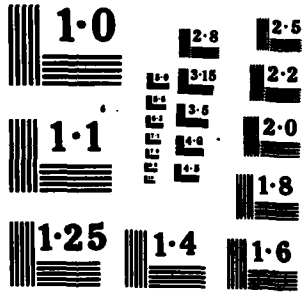
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A STATISTICAL ANALYSIS OF VENEZUELAN DEFENSE SPENDING

by

Thomas P. Wemyss

March, 1985

Thesis Advisor: Robert E. Looney

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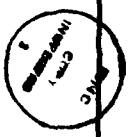

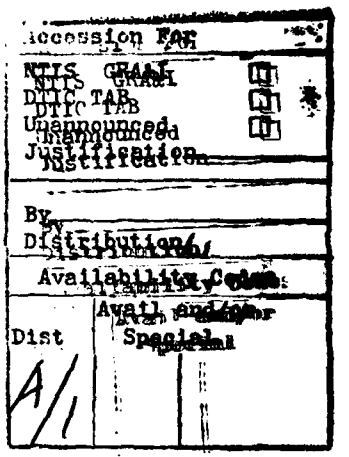

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A Statistical Analysis Of Venezuelan Defense Spending

by

Thomas P. Wemyss
Lieutenant, United States Navy
B.A., Chapman College, 1978

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF ARTS IN NATIONAL SECURITY AFFAIRS

from the

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ABSTRACT

Venezuelan military expenditures have been studied many times. Relatively few of these studies have examined the patterns of government spending policies in terms of the amount and share of government budgets allocated to defense. This thesis was undertaken to prove a reliable, systematic method for the purpose of predicting future Venezuelan defense expenditures can be made with the sole use of economic factors as variables.

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	1945	1948
Sugar	1,950,000 Tons	2,370,000 Tons
Peas	8,000	16,000
Beans	8,000	18,017
Potatos	9,185	16,000

Figure 6 - Venezuelan Production In Metric Tons Of Diet Staples

G. EDUCATION REFORM

Simon Bolivar once said, "The ignorance of the people is the instrument of their own destruction". This had certainly been true of Venezuela. In 1941, Venezuela had 2 million citizens older than 15 years of age. 1.3 million , or 75 percent of them were illiterate. An aggressive program was undertaken to provide Venezuelans with a better education.

Between 1945 and 1948 attendence at primary schools increased by 78 percent. Attendence at secondary schools increased by 91 percent. The number of teachers was increased by 62 percent and the number of schools almost doubled. The junta was making a frontal attack on illiteracy in Venezuela [Ref. 1: p. 210].

fertile, unfit to till. The government established the Forest Ranger Service in an attempt to end this destruction.

In 1946, 800,000 hectares were under cultivation with only 110,000 hectares having permanent irrigation systems. Irrigated land provided a better crop-yield per hectare and produced three crops a year vice one for unirrigated land. Only 700 agricultural machines were available to farm the land. Irrigation and mechanization were deemed imperative to improve production.

In its first two years in office, the government built irrigation channels for 20,000 hectares of land and imported 2,000 agricultural machines to help harvest the crops. The increase in agricultural production was impressive [Ref. 7].

E. INCREASE PRODUCTION OF MEAT AND MILK

A very prosperous cattle industry had once existed in Venezuela. By 1945 it had so declined, it was threatened with extinction. Only 2.8 million head of cattle grazed in the pastures while 7 million head of cattle were required to supply enough meat for the populace. The government now assumed the responsibility of promoting cattle raising and milk production.

The Ministry of Agriculture and the Venezuelan Development Corporation worked closely together formulating a viable program. The plan included technical supervision of credits, the importation of cattle to breed with Venezuelan cattle, the provision of water for cattle through well-drilling and construction of reservoirs, and the prevention of cattle diseases. In 1947, more than Bs. 35 million was invested by the government in this program. This produced 100 water wells, 65 reservoirs, and hundreds of imported bulls [Ref. 1: p. 169].

F. INCREASE AGRICULTURAL PRODUCTION

For years, many forests in Venezuela had been completely destroyed. In some parts of the country this had caused massive erosion, leaving land that was once

Food	1943 Consumption	Minimum Need
Flour, Rice, Cereals	265,265 Tons	292,560 Tons
Cheese, Butter, Milk	248,465	467,760
Meat And Fish	81,655	120,720
Eggs	14,400	33,240
Vegetable Oils	30,759	37,680
Fats	9,769	19,920
Citrus Fruits And Tomatos	65,265	117,360
Vegetables, Potatos, Etc.	76,725	440,640

Figure 5 - Food Needs Vs. Actual 1943 Consumption

D. INCREASE INDUSTRIAL SECTORS EARNINGS

By 1945 some industrialists and merchants were on the verge of bankruptcy. The increase in the purchasing power of the workers along with the government's policy of credits to industry were instramental in the recovery of these firms and the establishment of numerous others. The number of business firms in the Federal District increased from 10,919 in 1947 to 12,910 by 1948 [Ref.5].

negotations with the oil companies. They also received Sundays off with pay, and a fifteen day paid vacation each year [Ref. 4].

	Bs.1946	Bs.1948	Increase Bs.	Increase %
Average Basic Daily Wage	12.9	17.38	4.48	34.7
Other Cash Payments	3.8	13.02	9.22	242.6
Total Daily Wages	16.7	30.4	13.7	82.0
Indirect Benefits	6.38	12.08	5.72	89.9
Total	23.06	42.48	19.42	84.2

Figure 4 - Venezuelan Oil Workers' Wages 1946-1948

C. PROVIDE ADEQUATE AMOUNTS OF FOOD AT AN AFFORDABLE COST

The availability and consumption of food in Venezuela was well below that recommended by a federal conference held at Hot Springs [Ref. 6]. The government intervened to increase food imports to be distributed through commercial channels at a price lower than the import cost. In 1945, food imports were valued at Bs. 63,146 million. In 1948, they totaled Bs. 374,920, an increase of almost 500% [Ref. 1: p. 162].

required all government employees to make public sworn declarations of thier assets upon entering and leaving office.

B. ELIMINATION OF UNEMPLOYMENT AND LOW SALARIES

More jobs were created in the oil industry for Venezuelans. Employment of Venezuelans in the oil industry grew to 52,924 in 1947 and to 68,418 in 1948. The number of Venezuelans participating in the Social Security System grew from 57,333 in 1944 to 77,842 in 1948 [Ref. 5]. Oil production in Venezuela also increased.

Year	Million Barrels	Percentage Of 1938 Production
1938	180	100%
1945	323	172%
1946	388	216%
1947	435	242%
1948	475	264%

Figure 3 - Venezuelan Oil Production 1938-1948

Venezuelan oil workers received a 75% pay raise between 1946 and 1948 largely due to labor union

Party	Number Of Delegates
Accion Democratica	137
COPEI	19
Union Republicana Democratica	2
Partido Communista	2
Total Delegates	160

Figure 2 - National Constituent Assembly Elections -1946

The objectives of the new administration were both to attend to the immediate national needs, and to give a more permanent solution to the fundamental problems of the country.

The Constituent Assembly ratified a new Constitution on July 5, 1947. This constitution was described by Professor Austin F. Macdonald, of the University of California, as "The most democratic document in the history of the Venezuelan nation" [Ref. 2: p. 430]. The Accion Democratica party also strived to restore honesty and prestige to those in public service.

A new law called the Illegal Enrichment of Public Officals was signed into law October 18, 1948. This

After the revolution, the ruling junta strived to restore law and order, and to establish a Democratic ruling government.

A. REVISED PETROLEUM TAX

The revolutionary government decreed an extraordinary tax on December 31, 1945. The decree affected only taxpayers of that year with an income of more than Bs. 800,000. It affected a total of 75 persons or business entities of the 20,000 in the country which paid income taxes. Additional tax funds of Bs. 93,381,775 were collected, of which 98.5% came from the oil companies. The justification for the new tax was based on solid arguements. The old 1943 oil bill called for Venezuela to receive an amount equal to half of the industries' earnings. The new tax insured this [Ref. 3: p. 986].

On October 27, 1946, the first democratic elections were held in Venezuela. Over 36% of the population turned out to cast thier ballots. The voters elected 160 delegates to the National Constituent Assembly [Ref. 1: p. 113].

unethical concessions to the foreign oil companies in exchange for money. Gomez and his Ministers used the oil concessions as if it were a matter of personal wealth, not a matter of State wealth.

By 1936 Venezuela had become a major, world exporter of petroleum but exported little else. In 1936 petroleum accounted for 85% of Venezuelan exports. Land that had once been a major producer of cacao now sat idle. Harvest of cacao was at a minimum as the rural areas generally became impoverished. Ranches and haciendas were foreclosed by banks and loan offices. Much of the income from petroleum went into the hands of government officials and not to the State where it could have been used to improve education and diversify the private industry into areas other than petroleum.

An Oil Reform law was passed in 1943 by the Venezuelan Congress. Although it favored the oil companies, it did improve State income through an increase in oil taxes.

Late in 1945, there was a successful revolutionary coup. The coup was headed by the Accion Democratica party and young members of the military. The revolution had been sparked by an increase in public awareness of the corruption in the Venezuela government.

exploration in Venezuela. Investments by United States companies in Venezuelan oil explorations grew by leaps and bounds:

Year	U.S. Investments In Venezuela
1924	$11 Million
1925	$72 Million
1926	$128 Million
1928	$157 Million

Figure 1 - U.S. Investments In Venezuelan Oil Production

The Venezuelan oil industry grew, but not without legal battles and continued corruption. Standard Oil and Royal Dutch Shell often lodged protests against each other over territorial rights. A truce was finally reached between these two large investers in 1929. It was an "As Is" agreement, each agreeing to keep off the territory of the other.

The corruption in the oil industry continued for many years. The then President of Venezuela, Juan Vincente Gomez, and his Ministers made illegal and

The contract was in clear violation of Venezuela law. Under the Venezuela mining laws, the maximum area that could be granted was 800 hectares. Clearly the Valladares contract for 27 million hectares was in direct violation of this law. No protests were lodged against Valladares by one, single, Venezuelan. Charges were later brought against Valladares by an American and an Englishman. Corruption and bribery were again on Valladares side when the Venezuelan Supreme Court ruled that the mining law restricting area concessions to 800 hectares was unconstitutional.

The door was now open for larger area grants to be explored for petroleum. Large numbers of bidders for the Venezuelan subsoil rights descended hungrily upon the country. Foreign investment in Venezuela soared. The British were among the first to stake thier claims in the northwest coastal area and in the Orinoco delta. American capital in Venezuelan oil development did not arrive until several years later.

Standard Oil had concentrated on controlling the production of petroleum in only the United States. It took World War I to show Standard Oil the importance of large petroleum reserves during a conflict. With the United States oil reserves seriously depleted after World War I, Standard Oil and other U.S. companies with vast capital resources, entered the field of oil

for an industry that was to play such a major part in the economic development of Venezuela.

Rafael Max Valladares, a citizen of Venezuela, is often said to be the man responsible for the first foreign investment in Venezuela oil exploration. He signed a contract in 1910 giving him the rights to explore and develop the Paria peninsula, Benitez district in Sucre state, Pedernales, and the nearby islands in the Orinoco delta. The life of the contract was forty-seven years. Four days later, Valladares transferred the contract to the Bermudez Company. The Bermudez Company, based in Philadelphia, was an affiliate of General Asphalt which had unprofitable relations with Venezuela earlier.

Two years later, Valladares signed another contract with the Venezuelan government. He again used bribery to exploit the corruption in government in order to obtain valuable concessions. He received the rights to explore and develop the subsoil of Sucre, Monagas, Anzoategui, Nueva Esparta, Truillo, Merida, Zulia, Lara, Falcon, Carabolo, and Yaracury. This enormous area covered 27 million hectares (about 68 million acres) [Ref. 1: p. 14]. Two days after signing the contract, Valladares sold the contract to another General Asphalt affiliate, the Caribbean Petroleum Company.

II. HISTORY OF VENEZUELA

Venezuela is situated on the northern coast of South America, bordered by Columbia on the West, Brazil on the South, and Guyana on the East. Venezuela was discovered in 1498 by Columbus on his third voyage. Venezuela, along with what are now Columbia, Panama, and Ecuador revolted against Spain in 1810. In 1821 they gained their independence and formed the "Great Columbia" union. In 1830 the "Great Columbia" union separated and Venezuela began its own existence as a sovereign state.

Throughout the remainder of the 19th century, Venezuela was characterized by frequent periods of political instability, dictatorships and revolutionary turbulance. The beginning of the 20th century for Venezuela was marked with continued dictatorship but also by a growing awareness of the value of the country's natural resources.

Although small in size and population, Venezuela has large deposits of natural resources. The most abundant of its natural resources is petroleum. Drilling for Venezuelan petroleum began as early as 1886 by Guzman Blanco. By 1912 Blancos Company was producing only sixty barrels of crude oil daily and was forced to dissolve [Ref. 1: p. 4]. This was a sputtering start

I. INTRODUCTION

A. NATURE OF THE PROBLEM

Venezuelan military expenditures have been studied many times. Few of these studies have produced any reliable estimates for future predictions. This thesis was undertaken to prove a reliable, systematic method for the purpose of predicting future Venezuelan defense expendictures can be made with the sole use of economic factors as variables.

An initial data base of economic variables for 96 countries was utilized. Factor analysis of these variables was performed to show major trends. Descriminate analysis was conducted in order to divide the countries into two groups. A multiple regression analysis model was used for the group containing Venezuela to determine the correlation coefficients of the economic variables to Venezuelan defense expenditures.

	1945	1948
Ministry Of Education Budget	Bs.38 Million	Bs.119
Primary School Enrollment	281,000	500,000
Secondary School Enrollment	11,598	22,000
Teachers	8,250	13,500
Percentage Of Illiterate Adults	75%	56%

Figure 7 - Venezuelan Educational Reform Report - 1948

H. A STEP BACKWARDS

A successful military coup d'etat, headed by Colonel Carlos Delgado Chalbaud occurred on November 24, 1948. The political regime in which the Venezuelan people had placed their trust and hope was gone, many of its officials in jail. As in pre-1945 dictatorships, corruption in the new military ruling party was rampant. Chalbaud was assinated in 1950 and a military junta, headed by Colonel Marcos Pirez Jimenez took charge. The junta promised general elections but took thier time before holding them. The elections were held on November 30, 1952.

The elections and events immediately preceeding the elections can best be described through the reports of international news agencies. As described by the Economist of London, December 11, 1952:

> The elections on November 30 were impressive in their orderliness. Secrecy of the ballet was observed and more than 80 percent of the electorate voted. The two opposition parties allowed to function legally, the left-of-center URD and the Catholic Copei had no criticism of the voting. As the first results came in URD was getting 54 percent of the votes, Copei 15 percent and the FEI, the government party, only 25 percent [Ref. 8].

Local radio stations had been transmitting election bulletins that revealed a solid defeat of the dictatorship. The entire world knew by the next day that the opposition had won the election.

On December 1, the transmission of news from Venezuela to the outside world was suddenly interrupted by censorship. Local radio stations were occupied by police and were only permitted to transmit music and commercial anouncements. On December 2, with the support of six chiefs of the armed forces, Colonel Perez Jimenez proclaimed himself provisional president. As described by the New York Times:

> What happened in Venezuela these last few days comes as a shock to all who cherish the growth of democracy in Latin America. The shock is no less great because the leader of the military junta, Colonel Perez Jimenez, appears to have done just what everyone expected. He took several years to arrange an election for a constituent assembly, thought he had it sewed up, and then, when - according to the only credible figures - he saw that

> he was losing, he reacted in the old-fasioned way and is retaining power by force.
>
> This is not the way that he and his supporters explain what happened. According to them, the electoral tide, which was running at two and a half to one against them for at least one-third of the votes, took a sudden turn and gave the Government group (the FEI) a numerical superiority. Thereupon - although even the total claimed by the clique represented less than 30 percent of the electorate - Perez Jimenez, "by decision of the armed forces," proclaimed himself provisional president. Yet, according to the electorial law which the junta itself drew up, the constituent assembly was to choose the provisional president on Jan 10 [Ref.9].

The road that was to have been opened by popular election for constitutional government remained closed. From 1953 to 1958 Perez Jimenez imposed a strict dictatorship on the country. The wealth of the country brought increased prosperity for a few, namely the dictator and his associates. The common Venezuelan saw a decrease in his standard of living and his freedoms. Some social programs were reduced while others were eliminated.

The freedom for unions to organize and to bargain for better wages and working conditions was taken away from the Venezuelan people. The workers and peasants had lower living standards than in 1948. The real value of the workers' wages can be shown as their purchasing power, as determined by the cost-of-living index [Ref. 10].

Year	Avg. Daily Wage	Percentage Increase	Cost-Of-Living Index	Real Wage	Increase
1945	7.15	-	100	7.15	-
1948	15.11	111.32	126	11.9	67.7
1953	17.33	14.69	148	11.71	-2.3

Figure 8 - Venezuelan Workers' Wages 1945 - 1953

The situation of the primary schools as revealed in 1954 was disastrous. There were one million children in Venezuela aged seven to fourteen. Of these, only 440,747 attended school, less than half of those eligible for primary schools. The remaining 560,000 added to the growing number of illiterates. Although the birth rate in Venezuela was 75,000 children per year, their attendance in primary schools decreased [Ref. 11].

The Venezuelan dictatorship showed the same incompetence in other government activities as in education. From 1945 to 1948, the agricultural production had shown tremendous increases. This was largely due to the building of irrigation channels and the importation of agricultural machines. No irrigation

channels were built during the dictatorship until 1953, delaying any possible increase in agricultural production by at least five years.

I. A DEMOCRACY THAT LASTS

On January 23, 1958 the armed forces, with overwhelming popular support, ousted President Perez Jimenez from government office and formed a Junta comprised of two civilians and three military officers. The junta made known their main objective was to establish a honest, democratic government. Civil liberties were restored, censorship was removed and political prisoners were released promptly. Procedures for democratic elections were established quickly. Under the election guidelines, national elections would be held every 5 years to elect the President and Members of Congress. The state legislatures, and the city councils would be directly elected. The President could be elected to only one term and could not be reelected until 10 years following the end of that term.

Elections held in December 1958 chose Romulo Betancourt, candidate of the Accion Democratica party, as President of the Republic. Under President Betancourt the government inaugurated a program to

modernize agriculture, implement industrial expansion, and provide educational opportunities for its people.

The steady growth of the manufacturing industry was a key factor in diversifying the Venezuelan economy. The average annual growth rate of manufacturing for the periods: 1955-60 was 7.7 percent, 1960-65 was 9.0 percent, 1965-70 was 4.4 percent, and 1970-73 was 7.9 percent.

The production in the textile industry increased by 221 percent between 1956 and 1970. This not only provided much needed jobs for Venezuelans but also reduced the amount of imports required. Locally manufactured goods satisfied a larger percentage of the domestic market requirement.

A paper industry was established in 1956, not only under the stimulus of import-substitions but also to keep pace with a rapidily expanding demand. In 1957 paper production in Venezuela was 7 thousand tons. By 1964 production had increased to 135 thousand tons and in 1970 it totaled 220 thousand tons [Ref. 12].

The expansion of the steel industry marked a vital stage in the transition of the Venezuelan economy towards the industrial age. Venezuela had two resources that helped advance the steel industry, an abundance of hydroelectric power available at a low cost and large reserves of high grade iron ore. The steel production

in 1958 was 40 thousand tons. With the completion of the Orinoco steel plant in 1962, the production rose to 625 thousand tons in 1965 and to 924 thousand tons in 1972. Some of this steel was destined for the world market via exports [Ref. 13].

Venezuelan petroleum had accounted for more than half the world's exports in the immediate post-war period. It lost a substantial part of its share of the world market as a result of the rapidly increasing supplies of crude oils from the Middle East, North Africa and the Soviet Union. Venezuela's share was reduced to less than one-third by 1960 and to one-tenth in 1970. Venezuelan petroleum exports to the United States have remained stationary since the late 1950's due to restrictions on oil imports imposed by the United States. The combined action of these factors account for the fact that Venezuelan exports, whose volume had increased by 61% in the 1950's, increased by only 25% in the 1960's. At the beginning of the 1970's, the Venezuelan government, in view of the rise in oil prices and the inadequate increases in their reserves, placed limitations on production by establishing maximum output levels below those placed by OPEC [Ref. 14].

President Betancourt was the first democratically elected president to complete his term of office. All

presidents that followed him would be democratically elected.

Raul Leoni, also of the Accion Democratica party, was elected president in 1964. In 1969, Rafael Caldera of the Comite de Organizacion Politica Electoral Independiente (COPEI) party was elected president. His March 1969 inauguration marked the country's first peaceful transfer of power to a president from another political party. This helped to stablize the democracy.

President Caldera was succeeded by AD's Carlos Andres Perez, a vetern party politician and former Betancourt Interior Minister. In 1979 COPEI again returned to power when Luis Herrera Campius became President.

The current administration, inaugurated in February 1984, is headed by President Jaime Lusinchi. The new administration took office while Venezuela was in its worst economic crisis in over a decade. The economic decline appears to have bottomed out.

The country is gradually adjusting to the need to live within a reduced oil income (down 30 percent since 1981) and without new foreign borrowing. Heavy short-term borrowing in 1980-81 and massive capital flight in 1982-83 had given the country two problems. One was a large short-term foreign debt and the other was declining foreign reserves. In February 1983

Venezuela implemented a dual exchange system along with import and price controls in order to halt the decline in foreign reserves. The decline has reversed and Venezuela's foreign reserves have grown to over $12 billion. Due to the import restrictions, imports have dropped from $13 billion in 1982 to $6.8 billion in 1983.

The key to rebuilding confidence in the Venezuelan economy is rescheduling its massive foreign debt. The private sector's foreign debt is $8 billion while the public sector's foreign debt is about $27 billion. Venezuela is holding negotiations with foreign banks on the rescheduling of these debts.

J. DEFENSE SPENDING

The role of the military in any government, plays an important part in the design and makeup of its military forces. For many years, Venezuelan defense expenditures were based on thier need for "internal defense". It was not until the late 1950's that Venezuela decided they required an "external defense". These two defense concepts vary greatly in their cost and in their allocations to particular service branches.

When the role of the Venezuelan military was confined to maintain law and order internally, the

defense expenditures were relatively small. The major appropriations were for hand guns, rifles, ammunition, and military pay. The need for, and the size, of the air force was small. This changed in the late 1950's.

Venezuela saw a need for external security when border disputes with Guyana and Columbia surfaced. The requirement for external security for Venezuela still remains today due to Cuban rebel insurgency activity. The border disputes required development of larger armed forces, organized and equipped on a more professional level, and hence considerably more expensive. The financial impact of expanding the air force and navy was particularly high. Major appropriations were for air craft, ships, advanced schools and increased military pay. The role of the military had changed as had its cost as shown in Figures 9 and 10 [Ref. 1].

Year	Army	Navy	Air Force
1940	85.0%	15.0%	-
1945	89.0%	11.0%	-
1950	na	na	na
1955	na	na	na
1960	37.6%	35.2%	27.2%
1965	42.5%	33.3%	24.2%
1970	41.7%	33.3%	25.0%

Figure 9 - Services' Share Of Total Approations 1940-70

Note: Figures For 1950 & 1955 Are Not Available
Values In Millions Of Bolivars (Bs)

		Expenditures		Military Expenditures As:	
Year	GDP	Fisical Sector	Military	% Of GDP	% Of Fiscal Sector
1940	na	369	37	-	10.0
1945	na	581	46	-	7.9
1950	11826	2074	187	1.6	9.0
1955	17896	2983	240	1.3	8.0
1960	25671	6147	467	1.8	7.6
1965	37925	7400	596	1.6	8.1
1970	49944	10295	806	1.6	7.8

Figure 10 - Venezuelan Military Expenditures In Current Prices In Relation To Gross Domestic Product (GDP) And Fiscal Sector Expenditures

III. PREVIOUS STUDIES

Given this background of socio-political developments in Venezuela, the main issue addressed by this thesis is the extent to which the pattern of Venezuelan military expenditures are unique or to the extent to which they can be explained by comparisons of the patterns of military expenditures in other developing countries.

Relatively few empirical studies have examined the patterns of government spending policies of developing countries, and in particular, the amount and share of government budgets allocated to defense. In an early study Martin and Lewis analyzed the size and composition of public expenditures and revenues of 16 countries, 10 of which can be classified as developing countries. Public expenditures were divivded into current and capital expenditures, and for each group a functional classification was made. The study found that for current expenditures that wealthier countries spend more than the poorer countries relative to GNP on defense, on the public debt, on social security programs, and on food and agricultural subsidies. The relative importance of the remaining government expenditures was not related to per capita income.

The study by Martin and Lewis was one of the first empirical tests of "Wagner's Law" i.e. the existence of a positive relationship between the size of the public sector

and the level of economic development. Wagner argued that public expenditures could be divided into two categories, security and welfare, and that security expenditures were bound to increase with the growth of the "progressive" state as armies became larger and more capital-intensive. In addition, further intrastate conflict between individuals was generated by industrialization, necessitating increased police control. In a similiar manner, welfare expenditures would also increase with the level of economic development as the state gradually took on many of the private sector's former responsibilities such as education and public health [Ref. 16].

A more complete statement of Wagner's Law can be: in industrialized countries, public sector activities and expenditures grow in relative importance as real per capita income increases. According to Wagner, ther' are essentially three reasons to expect expanding state activity and expenditures. First, the state has to expand its administrative and protective functions because of the increasing complexity of legal relationships and communications. Second, the state has to expand its role because of the increase in general public services required by an increasingly affluent society. Third, increases in population and urbanization require higher public expenditure on law and order and economic regulation in order to maintain the efficient operation of an increasingly complex economy in

Tables 2 through 8 which factors may be of more significance in determining the level of military expenditures for Venezuela.

Michael O'Leary and William Coplin indicated in a previous study that gross national product may be the best variable to use when attempting to explain patterns of military expenditures [Ref: 26]. They found a correlation coefficient of 0.88 between military expenditures and gross national product for a sample of 19 Latin American countries for the period of 1967 to 1971.

By including total military expenditures and gross domestic product as variables in the factor analysis, Table 9 yielded some interesting but nonconclusive figures. Both variables, total military expenditures and gross domestic product, loaded highest on factor 3, the level on international reserves. Venezuela also loaded highest on factor 3, as shown on Table 4. There does not appear to be any direct correlation for the other six factors.

O'Leary and Coplin also noted that other measures, such as military expenditures as a share of gross national product, might be a more appropiate measure of the link between economic variables and military expenditures [Ref. 26].

Replacing total military expenditures with military expenditures as a share of gross domestic product however did not significantly improve the factor loading as shown in

Table 8

Country Factor Scores For Factor 7:
Public External Debt 1970

1.	Nigeria	-3.5895
2.	Ivory Coast	-3.4609
3.	Malawi	-3.0665
4.	Uruguay	-2.9409
5.	Dominican Republic	-2.9214
6.	Mexico	-1.9600
7.	Guatemala	-1.8860
8.	Ethiopia	-1.7558
9.	Sudan	-1.6768
10.	Argentina	-1.4392
11.	Colombia	-1.2397
12.	Jamaica	-1.2197
13.	El Salvador	-1.0996
14.	Rwanda	-0.9080
15.	Spain	-0.8756
16.	Korea	-0.5777
17.	Malaysia	-0.4251
18.	Pakistan	-0.3813
19.	Paraguay	-0.1949
20.	Tunisia	-0.1760
21.	Thailand	-0.0660
22.	Algeria	-0.0576
23.	Mauritania	-0.0104
24.	Cen. African Rep.	0.0316
25.	Venezuela	0.3722
26.	India	0.4371
27.	Chile	0.5263
28.	Israel	0.5859
29.	Ghana	0.6319
30.	Costa Rica	0.9238
31.	Peru	1.2437
32.	Indonesia	1.4230
33.	Panama	1.4872
34.	Chad	2.2261
35.	Philippines	2.3347
36.	Bolivia	2.5993
37.	Zambia	2.7008
38.	Mali	4.4498
39.	Greece	4.5781
40.	Ecuador	6.4943

Table 7

Country Factor Scores For Factor 6:
External Debt Service 1982

1.	India	-2.4559
2.	Chad	-2.2902
3.	Pakistan	-1.9948
4.	Greece	-1.8058
5.	Philippines	-1.4571
6.	Mali	-1.3548
7.	Chile	-1.1300
8.	Mauritania	-1.1084
9.	Thailand	-1.0292
10.	Ghana	-0.9413
11.	Rwanda	-0.6823
12.	El Salvador	-0.5749
13.	Ecuador	-0.5693
14.	Sudan	-0.5307
15.	Indonesia	-0.4979
16.	Bolivia	-0.4772
17.	Guatemala	-0.3995
18.	Cen. African Rep.	-0.2883
19.	Spain	-0.1491
20.	Tunisia	-0.0993
21.	Colombia	-0.0679
22.	Israel	0.0199
23.	Dominican Republic	0.1943
24.	Zambia	0.2192
25.	Korea	0.3136
26.	Jamaica	0.3506
27.	Ivory Coast	0.4902
28.	Paraguay	0.5343
29.	Argentina	0.6805
30.	Panama	0.9209
31.	Ehtiopia	0.9364
32.	Venezuela	1.1535
33.	Malawi	1.1673
34.	Nigeria	1.2527
35.	Malaysia	1.2931
36.	Uruguay	1.3708
37.	Costa Rica	1.3722
38.	Peru	1.6916
39.	Algeria	1.8655
40.	Mexico	3.1870

Table 6

Country Factor Scores For Factor 5:
Growth In Imports

1.	Ivory Coast	-5.0761
2.	Malawi	-4.8299
3.	Uruguay	-3.3891
4.	Jamaica	-3.2372
5.	Dominican Republic	-3.1468
6.	India	-3.0464
7.	Sudan	-2.6887
8.	Guatemala	-2.1633
9.	El Salvador	-2.0154
10.	Argentina	-1.8773
11.	Ethiopia	-1.6182
12.	Zambia	-1.2456
13.	Cen. African Rep.	-1.1247
14.	Pakistan	-1.1750
15.	Nigeria	-0.9924
16.	Israel	-0.9019
17.	Colombia	-0.8612
18.	Rwanda	-0.5707
19.	Venezuela	-0.3128
20.	Chile	-0.0551
21.	Tunisia	0.3368
22.	Mauritania	0.3370
23.	Algeria	0.3126
24.	Spain	0.4160
25.	Ghana	0.7502
26.	Paraguay	0.9798
27.	Panama	1.0977
28.	Korea	1.2124
29.	Costa Rica	1.2232
30.	Mali	1.3330
21.	Malaysia	1.1502
32.	Mexico	1.6052
33.	Peru	1.6304
34.	Chad	1.8443
35.	Thailand	2.3142
36.	Indonesia	2.9950
37.	Bolivia	3.0814
38.	Philippines	3.7085
39.	Greece	6.8672
40.	Ecuador	9.0682

Table 5

Country Factor Scores For Factor 4: Share Of 1982 External Public Debt In GDP

1.	India	-1.5818
2.	Guatemala	-1.4559
3.	Ghana	-1.4076
4.	Ethiopia	-1.3944
5.	Sudan	-1.1581
6.	Colombia	-1.0837
7.	Venezuela	-1.0523
8.	Paraguay	-1.0067
9.	Nigeria	-0.9689
10.	El Salvador	-0.9331
11.	Uruguay	-0.7912
12.	Dominican Republic	-0.7558
13.	Argentina	-0.5884
14.	Chile	-0.5333
15.	Peru	-0.4784
16.	Spain	-0.3265
17.	Malawi	-0.3010
18.	Mexico	-0.2499
19.	Rwanda	-0.2259
20.	Ivory Coast	-0.2202
21.	Indonesia	-0.1013
22.	Pakistan	-0.0949
23.	Cen. African Rep.	0.0666
24.	Bolivia	0.0711
25.	Thailand	0.2233
26.	Philippines	0.2709
27.	Jamaica	0.2823
28.	Algeria	0.6071
29.	Tunisia	0.7297
30.	Zambia	0.7498
31.	Malaysia	0.7798
32.	Korea	0.8679
33.	Chad	0.9890
34.	Greece	1.0370
35.	Costa Rica	1.0955
36.	Ecuador	1.2952
37.	Israel	1.3849
38.	Panama	1.4027
39.	Mali	1.5900
40.	Mauritania	3.6628

Table 4

Country Factor Scores For Factor 3: Gross International Reserves

1.	Malawi	-1.3833
2.	Sudan	-1.3014
3.	Cen. African Rep.	-1.1758
4.	Ethiopia	-1.1215
5.	Jamaica	-0.9842
6.	Rwanda	-0.9074
7.	Mauritania	-0.8214
8.	Ghana	-0.7378
9.	Uruguay	-0.7286
10.	El Salvador	-0.7281
11.	Guatemala	-0.6881
12.	Chad	-0.6759
13.	Pakistan	-0.6004
14.	Paraguay	-0.5945
15.	Costa Rica	-0.5353
16.	Mali	-0.5090
17.	Ecuador	-0.5034
18.	Panama	-0.4762
19.	Tunisia	-0.4503
20.	Bolivia	-0.3492
21.	Ivory Coast	-0.2372
22.	Mexico	-0.0828
23.	Dominican Republic	-0.0602
24.	Nigeria	0.1027
25.	Peru	0.2230
26.	Philippines	0.3535
27.	Zambia	0.3978
28.	Korea	0.4096
29.	Chile	0.4503
30.	Israel	0.4825
31.	Indonesia	0.5626
32.	Colombia	0.6586
33.	Algeria	0.8570
34.	Greece	0.8900
35.	Malaysia	0.8978
36.	Thailand	1.0872
37.	Argentina	1.1156
38.	India	1.9638
39.	Venezuela	2.3875
40.	Spain	3.2244

Table 3

Country Factor Scores For Factor 2:
Factors Contributing To 1982 External Debt

1.	Ecuador	-7.2788
2.	Greece	-5.2601
3.	Bolivia	-3.2939
4.	Chad	-3.1120
5.	Ghana	-2.3874
6.	Costa Rica	-2.2553
7.	Philippines	-2.1711
8.	Panama	-1.9885
9.	Peru	-1.9263
10.	Thailand	-1.8878
11.	Paraguay	-1.4533
12.	Spain	-0.8909
13.	Mali	-0.8001
14.	Mauritania	-0.7809
15.	Malaysia	-0.7651
16.	Zambia	-0.6972
17.	Tunisia	-0.4030
18.	Rwanda	-0.3004
19.	Chile	-0.2683
20.	Cen. African Rep.	-0.0380
21.	Ethiopia	0.2070
22.	Indonesia	0.2639
23.	Pakistan	0.8766
24.	Venezuela	1.0693
25.	Colombia	1.1655
26.	El Salvador	1.1777
27.	Korea	1.2816
28.	Guatemala	1.3695
29.	Algeria	1.4794
30.	Jamaica	1.4931
31.	Sudan	1.5025
32.	Israel	1.5378
33.	Argentina	1.6393
34.	Uruguay	1.8396
35.	Dominican Republic	1.9734
36.	Nigeria	2.1722
37.	India	3.3307
38.	Malawi	3.3971
39.	Ivory Coast	4.0038
40.	Mexico	4.6507

Table 2

Country Factor Scores For Factor 1:
Factors Facilitating Public Consumption

1.	Ecuador	-2.4890
2.	Greece	-2.2314
3.	Chad	-1.5948
4.	Bolivia	-1.2513
5.	Philippines	-0.9176
6.	Peru	-0.8290
7.	Costa Rica	-0.8130
8.	Ghana	-0.7771
9.	Indonesia	-0.7387
10.	Thailand	-0.7264
11.	Paraguay	-0.6062
12.	Cen. African Rep.	-0.3525
13.	Chile	-0.3499
14.	Mauritania	-0.3401
15.	Panama	-0.2948
16.	Malaysia	-0.2398
17.	Tunisia	-0.2020
18.	Zambia	-0.1940
19.	Korea	-0.1934
20.	Israel	-0.1797
21.	Spain	-0.1589
22.	Ethiopia	-0.1538
23.	Mexico	-0.1269
24.	Venezuela	-0.0653
25.	El Salvador	0.0479
26.	Rwanda	0.1129
27.	Argentina	0.1188
28.	Colombia	0.1393
29.	India	0.2503
30.	Guatemala	0.2876
31.	Nigeria	0.3075
32.	Algeria	0.3260
33.	Uruguay	0.5893
34.	Sudan	0.6179
35.	Jamaica	0.6553
36.	Dominican Republic	0.8972
37.	Malawi	1.2501
38.	Ivory Coast	1.5882
39.	Mali	3.5955
40.	Pakistan	4.8531

Table 1

Orthogonally Rotated Factor Pattern: (Loadings)
Economic Variables

Variables	Factors 1 Factors Facilitating Public Consumption	2 Factors Contributing to High External Debt	3 Gross International Reserves	4 Share of Debt in Total External Debt	5 Growth of Exports	6 External Debt Service 1982	7 Public External Debt
Gross Inflow Public Loans/ Exports 1982	97*	0	-14	8	2	-9	5
Public Debt/ Exports 1982	96*	3	-11	2	-4	-13	-6
Resource Balance as % of GDP 1982	94*	11	1	-14	7	7	7
Growth in Public Consumption 1970-82	92*	3	-5	4	26	-7	2
Public External Borrowing Commitments/Exports 1982	91*	-4	-13	8	12	-11	23
Gross Inflow Public Loans/GDP 1982	86*	7	-8	-2	-11	-13	-25
Public Consumption as % of GDP 1982	63*	-5	-9	55	-13	-5	27
Growth in Private Consumption 1970-1982	62*	12	10	1	48	8	2
Private Consumption as % of GDP 1960	-72*	7	-15	-16	1	-13	-44
Private Consumption as % of GDP 1982	-82*	-15	-16	-28	-11	-19	-10
Terms of Trade 1982	-81*	21	21	9	10	17	-5
Total Public External Debt 1982	0	94*	11	0	20	20	-4
Gross Inflow Public Loans 1970	14	92*	20	-7	-18	-7	9
Interest Payments on External Debt 1970	9	90*	13	-16	-20	2	-10
Repayment of Principal on Public Loans 1982	4	89*	10	-11	-15	12	-17
Gross Inflow Public Loans 1982	-5	86*	10	1	29	28	-11
Public External Borrowing Commitments 1982	-6	85*	14	-4	34	19	-4
Interest Payments on External Debt 1982	-6	82*	6	2	35	39	-8
Total Public External Debt 1970	15	80*	19	-14	-23	-10	11
Net Inflow of Public External Loans 1970	19	77*	23	-2	-17	-19	25
Repayment of Principal on External Loans 1982	-4	73*	21	5	31	37	7
Growth in Exports 1970-82	-2	35*	25	3	5	-8	-36
Current Account Balance 1970	15	-80*	-1	-6	-29	1	19
Gross International Reserves 1982	-8	19	89*	-11	9	-7	9
Gross International Reserves 1970	-8	29	85*	-5	-7	1	-6
Average Maturity of Public External Debt	23	-19	-48*	5	-11	-43	23
Current Account Balance 1982	13	-26	-53*	10	-22	-3	21
Public External Debt as % of GDP 1982	3	-3	-29	76*	-15	12	17
Exports as % of GDP 1982	-8	-8	7	76*	4	22	5
Growth in Exports 1960-1970	8	2	-6	67*	7	-27	-24
Public Consumption as % of GDP 1960	47	-11	-12	55*	20	-18	37
Growth in Imports 1970-82	36	-18	19	-1	71*	-6	1
External Debt Service as % of GDP 1982	-8	27	-7	5	-6	53*	7
Public External Debt as % of GDP 1970	50	0	-23	20	5	-1	55*

Note: All military variables together with Gross Domestic Product and per capita income are omitted.

taken from the U. S. Arms Control and Disarmament Agency [Ref. 24].

In order to formulate relationships between military expenditures and specify dimensions of the economy, factor analysis was used [Ref. 25]. Factor analysis allows for the patterning of several variables into a smaller number of linear combinations of the variables.

Thirty-four variables for each country were used as imputs into the factor analysis. The results of the orthogonally rotated factor pattern, Table 1, indicated that 99 percent of the observed variance in the data set could be accounted for by seven factors.

Forty countries were retained in the analysis. The remaining 56 were eliminated from the factor analysis due to necessary data not being available. The loadings of each country on the seven factors is given in Tables 2 through 8. Each factor represents a different dimension of the underlying economic debt conditions experienced by our sample of countries.

It is interesting to note that Venezuela does not always place at the high or low end of the spectrum. The same is true of the other countries. This leads to a conclusion that factor scores alone, although suggestive, are not sufficient to group countries as high or low debtors or as any other conceivable catagorization based on the sample of economic variables included in one analysis. Nor is it clear from

IV. DISCRIPTION OF ANALYSIS

A. FACTOR ANALYSIS

As noted in chapter III, previous studies using cross section analysis did not consider the effects revenue constraints and external financing play in government spending decisions. That such constraints exist for developing countries has been stressed by Walter Heller [Ref. 20].

In the following section an attempt will be made to gain some understanding of the effects of revenue constraint and external sources of funds on the pattern of military expenditures in our sample of developing countries. Particular attention will be given to how these factors influence defense spending in Venezuela.

The data base used for cross sectional analysis differs from those used in previous independent studies in two respects. First, the sample is much larger. The initial data base contained 96 developing countries. Second, the data base comprises both economic and socio-political variables. Economic variables were taken from the World Bank data base [Ref. 21] and the International Money Fund [Ref. 22]. The political and social indicators were taken from the Yale Data Base [Ref. 23]. The military expenditures were

The analysis will attempt to prove whether external debt will help in explaining a significant part of the pattern of defense spending in Venezuela? This analysis uses a cross section analysis consistent with Wagner's Law.

strong however, suggesting one or more pertinent factors may have been excluded.

A. VENEZUELAN FOREIGN DEBT

In principle, foreign debt represents a liability for the borrower and also produces an asset. Unfortunately, this was often not the case for Venezuela. Some of their loans were not well invested while others were used to increase defense expenditures. As a result, the ratio of external debt-service to export goods and services rose sharply. Lower oil prices and the rise of "Capital Flight" from Venezuela added to the problem of an increasing foreign debt. By 1983 the external debt was equivalent to 47 percent of GDP. It would have required 35 percent of its exports to service the external debt [Ref. 19].

The thesis developed below is that previous attempts to explain defense expenditure patterns using cross section data have failed because they did not include a profile of external debt and the relationship between debt and the financing of defense expenditures. By incorporating external debt and the financing of defense expenditures into the cross section analysis, the study provides valuable insight into the parameters necessary for a more detailed, time series analysis of Venezuela.

the rising frictions of urban life. Wagner also predicted an expansion of public expenditures on education and the distribution of income.

The final element in Wagner's framework is that as industrialization progresses, technological change and large scale investment expenditures require larger amounts of capital than the private sector can provide. Therefore, the state must provide the necessary capital to finance large scale investment projects.

A major test of Wagner's Law was undertaken by J. R. Lotz in 1970 [Ref. 17]. He investigated several components of public expenditures, of which defense spending was one. He performed a factor analysis of 37 developing countries (using mid-1960s cross section data) to conclude that defense spending was not closely related to the particular stage of economic development of these countries. Lotz explains this by using the hypothesis that there exists a certain minimum size for a military establishment, determined by technical factors. This implies a minimum level of defense spending regardless of the size of the national income. He stated that smaller, poorer nations have therefore been obligated to spend more than their fair share on defense because of the fear of possible mobilization of other wealthier states.

David Whynes performed a study in 1977 that was similiar to Lotz's [Ref. 18]. Whynes' conclusions supported those of Lotz and Wagner's Law. The results are not particularly

Table 9

Oblique Rotated Factor Pattern: Economic Variables, Total Military Expenditure, Gross Domestic Product

Variables	Factors							
	1 Overall External Debt	2 Growth in Public Consumption	3 Military Expenditures	4 Public Consumption as % of GDP	5 External Debt 1970	6 Growth in Consumption	7 Debt Service 1982
Gross Inflow Public Loans 1982	99*	2	-3	2	-11	12	6
Interest Payment External Public Debt 1982	99*	2	-6	2	-16	10	16
External Public Debt 1982	94*	2	-2	2	9	8	9
Repayment of Principal on Public External Loans 1970	92*	11	1	-5	5	-29	0
Public External Borrowing Commitments 1982	89*	-2	-1	-4	0	22	4
Interest Payment on External Public Debt 1970	83*	14	5	-10	17	28	0
Repayment of Principal on Public External Loans 1982	66*	-5	8	4	11	23	33
Gross Inflow Public Loans 1970	65*	7	7	-3	52	-7	4
Current Account Balance 1970	-85*	19	13	-10	-10	-14	17
Gross Inflow Public Loans/GDP 1982	0	98*	-3	0	2	8	-7
Gross Inflow Public Loans/ Exports 1982	2	97*	-8	6	0	1	-2
External Public Debt/Exports 1982	0	97*	-7	2	3	5	-5
Public Borrowing (External) Commitments/Exports 1982	0	97*	-10	2	0	5	-6
Resource Balance as % of GDP 1982	12	92*	3	-25	0	3	15
Growth in Public Consumption 1970-82	3	89*	-5	0	-1	32	-9
Private Consumption as % of GDP 1970	17	-61*	-39	-12	2	10	-39
Private Consumption as % of GDP 1982	-12	-70*	-20	-32	0	-9	-21
Terms of Trade 1982	14	-82*	16	15	13	17	19
Gross International Reserves 1982	-25	-9	96*	-8	18	11	5
Gross International Reserves 1970	2	1	96*	1	-10	-11	-9
Gross Domestic Product 1982	40	-1	59*	-14	2	4	-16
Military Expenditure 1981	16	-5	58*	16	39	6	-28
Average Maturity External Debt 1982	-18	9	-50*	0	33	0	-23
Current Account Balance 1982	-17	4	-62*	5	22	-15	21
Growth in Exports 1960-70	9	3	-1	81*	-5	5	-51
Public External Debt as % of GDP 1982	8	-8	-25	78*	0	-22	12
Exports as % of GDP 1982	2	-11	15	77*	-16	-2	12
Public Consumption as % of GDP 1960	-17	0	-10	68*	28	16	-8
Public Consumption as % of GDP 1982	-3	46	4	67*	8	-16	0
Net Inflow Public External Loans 1970	34	3	9	-1	77*	8	6
Public External Debt 1970	41	2	10	-9	68*	-13	-4
Public External Debt as % of GDP 1970	-5	-7	-41	12	58*	8	25
Growth in Imports 1970-82	18	10	11	-8	-2	77*	-20
Growth in Private Consumption 1970-82	-1	51	-2	-3	11	66*	10
Debt Service as % of Exports 1982	34	-8	-24	3	9	-12	62*
Growth in Exports 1970-82	39	3	21	19	-5	0	-45*

Table 10. In any case, Table 10 does not indicate a clear pattern of military expenditures as a major trend in the data.

The poor correlations of military expenditures on the economic trends in the data could be a result of one or both of two hypothesises: (1) political and social variables account for most of the observed patterns of military spending between countries; (2) the sample of countries is not a homogenous set with regard to underlying economic and military expenditure linkage.

A test of whether political and social variables were more prominently correlated to military expenditures was conducted using factor analysis. The imput variables were selected from the Yale data set [Ref. 23]. The results showed very little correlation between the variables, disproving this hypothesis.

With regard to the second hypothesis, previous studies have stated that developing countries may lack homogeneity with respect to the decision making process for levels of defense expenditures and their impact on the overall economic growth of the country. Frederiksen and Looney contend that under certain circumstances defense spending can help the economic growth of a country while under a different set of circumstances it may hinder economic growth. Both propositions are likely to be true for the same country at different points in time [Ref. 27].

Table 10

Oblique Rotated Factor Pattern: Economic Variables, Military Expenditures - GNP, Gross Domestic Product

Variables	Factors 1 External Debt 1982	2 Growth in Public Consumption	3 Gross Domestic Product	4 Determinants of Military Expenditures	5 External Debt 1970	6 Growth Consumption	External Debt 1982
Gross Inflow Public Loans 1982	84*	1	-2	1	-9	12	7
Repayment of Principal Public Loans 1982	82*	10	1	-5	2	-27	2
Interest Payments External Public Debt 1982	82*	1	-4	0	-13	10	17
External Public Debt 1982	81*	1	-1	1	8	8	10
Public Borrowing Commitments (External) 1982	76*	-3	0	-3	0	21	4
External Public Debt 1970	75*	13	5	-10	13	-26	1
Gross Inflow Public Loans 1970	61*	7	5	0	43	-7	3
Repayment of Principal External Public Loans 1982	55*	-5	7	2	10	21	32
Growth in Exports 1970-1980	37*	1	16	22	-1	1	-35
Current Account Balance 1970	-75*	18	12	-13	-9	-14	13
Gross Inflow Public Loans Income 1982	0	89*	-2	2	2	8	-7
Gross Inflow Public Loans/Exports 1982	2	89*	-7	5	-1	1	-2
External Public Debt/Exports 1982	0	88*	-6	2	2	5	-5
Public Borrowing Commitments/Exports 1982	0	88*	-8	3	0	4	-6
Resource Balance/GDP 1982	9	84*	2	-24	0	3	12
Growth in Public Consumption 1970-80	3	82*	-4	0	-2	31	-8
Private Sector Consumption as % of GDP 1960	17	-54*	-34	-9	0	9	-34
Private Sector Consumption as % of GDP 1982	-10	-65*	-16	-25	1	-7	-23
Terms of Trade 1982	12	-73*	13	11	9	15	20
Gross International Reserves 1982	-18	-8	83*	-3	18	11	0
Gross International Reserves 1970	5	0	83*	4	-5	-10	-11
Gross Domestic Product 1982	39	-5	51*	-10	1	4	-16
Average Maturity of External Debt 1982	-12	9	-43*	3	27	0	-22
Current Account Balance 1982	-16	5	-53*	1	16	-15	21
Export Growth 1960-70	12	5	-1	76*	-7	4	-19
Exports as % of GDP 1982	0	-8	12	65*	-16	-3	19
External Public Debt as % of GDP 1982	6	-5	-21	65*	-4	-23	20
Public Consumption as % of GDP 1982	-2	41	3	64*	8	-15	3
Public Consumption as % of GDP 1960	-12	1	-8	64*	23	13	-2
Military Expenditures/GNP 1981	0	-11	6	59*	35	5	-15
Net Inflow Public External Loans 1970	36	3	7	4	65*	7	4
External Public Debt 1970	43	3	8	-3	56*	-13	-6
External Public Dent as % of GDP 1970	-4	-6	-37	12	48*	7	24
Growth in Imports 1970-82	15	11	10	-5	-2	72*	-18
Growth in Private Sector Consumption 1970-82	-2	47	-2	-3	9	61*	9
Debt Service as % of Exports 1982	25	-7	21	-3	6	-11	60*

Frederiksen and Looney state the crucial determinant of the impact of defense expenditures on economic growth is the country's financial resource constraints. According to them a country that is severely resource constrained will probably cut higher growth development programs from their budget in order to maintain defense programs. They also contend the opposite is likely for countries with a relative abundance of financial resources. These countries can easily afford the high growth development programs while maintaining or even increasing defense programs.

B. DISCRIMINANT ANALYSIS

Based on the above and the lack of determinancy in the country factor scores, it makes sense to split the sample of developing countries into groups based on some measure of resource constraint. Measures of debt and capital flow from Table 1 were used to perform a discriminant analysis. Variables with the highest loading in each of the individual factors were used.

The results of the discriminant analysis on Table 11 show a high degree of probability of correct placement in each group. The discriminant analysis was able to split the country sample into two distinct groups based largely on the external debt facing each country. Venezuela is in group II along with several other major oil exporters. Group I

Table 11

Discriminant Analysis Total Sample Countries Based On Economic Factor Analysis High Loadings

Group I		Group II	
Country	Probability Of Correct Placement	Country	Probability Of Correct Placement
1. Israel	69.14	1. Greece	57.78
2. Honduras	81.38	2. India	84.91
3. Cameroon	60.73	3. Nigeria	69.07
4. Sudan	66.37	4. Indonesia	90.67
5. Costa Rica	92.64	5. Egypt	68.20
6. Bolivia	86.27	6. Korea	89.95
7. Somalia	86.46	7. Rwanda	69.08
8. Tunisia	68.11	8. Turkey	66.95
9. Morocco	73.06	9. Spain	51.89
10. Guatemala	54.97	10. Venezuela	80.26
11. Malawi	91.30	11. Mexico	99.69
12. El Salvador	65.90	12. Brazil	99.02
13. Mali	97.12	13. Algeria	76.44
14. Pakistan	86.98	14. Philippines	55.78
15. Paraguay	80.02	15. Libya	75.69
16. Ecuador	56.61	16. Colombia	54.63
17. Dominican Republic	74.32	17. Thailand	60.95
18. Liberia	91.77	18. Malayasia	65.16
19. Ivory Coast	84.42	19. Argentina	66.09
20. Mauritania	96.04	20. Saudi Arabia	94.65
21. Sierra Leone	86.45	21. Kuwait	81.31
22. Panama	94.37	22. Syria	61.95
23. Chile	70.09	23. Jordan	50.81
24. Chad	87.18		
25. Uruguay	67.87		
26. Tanzania	79.87		
27. Uganda	88.76		
28. Ethiopia	70.24		
29. Cen. African Rep.	76.89		
30. Ghana	78.72		
31. Burma	82.91		
32. Sri Lanka	75.19		
33. Jamaica	90.66		
34. Trinidad	77.42		
35. Zambia	95.88		
36. Peru	71.67		
37. Zimbabwe	85.68		
38. Kenya	86.61		

countries seem to be the poorer, less economically dynamic nations.

Further insight in the profile of the two groups can be gained by examining Table 12, the means of variables used in the discriminant analysis. Group II countries spend 1.5 times as much per gross domestic product on military expenditures as do group I countries. Military expenditures per person in group II countries are 4 times that of group I and total military expenditures for group II are 7.5 times as large as those for group I.

Group II countries are considerably larger, more affluent, and less reliant on external debt, as a percentage of GNP, than are group I countries.

C. REGRESSION ANALYSIS

Based on the profiles of groups I and II, one might predict that the public external debt and external capital flow have played a larger role in facilitating military expenditures in group I. Venezuela and the remainder of the group II countries may have alternative means by which military expenditures can be financed and thus less dependent on external debt and capital flow.

Various measures of military expenditures were used to test this hypothesis. They are: (1) total military expenditures; (2) military expenditures as a proportion of gross national product; (3) military expenditures per capita;

Table 12

Means Of Discriminant Analysis Variables

Variable	Total Sample	Group I	Group II
Discriminating Variables			
RCIBR	0.70	0.94	0.26
PDB	5932.00	2429.30	11786.90
GIRB	2587.20	583.80	6138.80
PDPB	35.30	44.30	19.20
ZB	4.10	1.09	9.60
DSRB	14.10	15.00	12.50
PDPA	17.30	21.20	10.40
Other Variables			
MEY	4.20	3.60	5.10
GNPPKR	1793.20	1066.70	3048.20
MEP	117.90	57.70	223.30
GFDB	14.10	13.40	15.30
ME	1318.10	389.10	2943.90

RCIBR = Gross Inflow of Public Loans 1982 Divided by Exports 1982
PDB = External Public Debt 1982
GIRB = Gross International Reserves 1982
PDPB = External Public Debt as a Percentage of Gross Domestic Product 1982
ZB = Average Annual Growth in Imports 1970-82
DSRB = Debt Service as a Percentage of Exports 1982
PDPA = External Public Debt as a Percentage of Gross Domestic Product 1970

MEY = Military Expenditure as a Percentage of Gross National Product 1981
GNPPKR = Per Capita Gross National Product 1982
MEP = Military Expenditure Per Capita 1981
GFDB = Defense Expenditures as a Percentage of Total Government Expenditure
ME = Total Military Expenditure 1981

and (4) military expenditures as a percentage of the government budget. These were first analyzed by factor analysis and then by regression analysis.

The factor analysis served to show how group I and group II countries differed from each other and how they differ from the total sample of countries in terms of the loading of the various measures of military expenditures on the economic factors. The regression analysis was performed to obtain a more accurate depiction and quantification of the econommic variables most responsible for the observed difference in military expenditures between countries.

Gross domestic product, gross national product per capita and a measure of military expenditures were added to the variables from Table 1 for the factor analysis. The first measure of military expenditure examined was total military expenditures. The results showed that the separate groups of countries point to different variables being associated with total military expenditures than does the total country sample.

The total country sample in Table 13 loads highest on factor 3. This indicates that gross national product per capita and international reserves play a large role in affecting military expenditures. The group I countries load highest on factor 1. This indicates group I countries have a strong association between military expenditures and public external debt. Group II countries on Table 15 loaded highest

Table 13

Oblique Rotated Factor Pattern: Economic Variables, Total Military Expenditures, Total Country Sample

Variables	Factors 1 Factors Affecting Total External Debt 1982	2 Factors Facilitating Public Consumption Share	3 Factors Affecting Total Military Expenditure	4 External Debt, Exports 1982	5 Growth in Consumption	6 Debt Service 1982	7 Public External Debt 1970
Repayment of Principal on Public External Loans 1970	100*	-4	-4	0	-27	8	0
Payment of Interest on External Public Debt 1970	97*	-9	-1	6	-24	3	9
Total Public External Debt 1982	95*	1	-2	4	11	14	6
Gross Inflow Public Loans 1982	94*	2	-4	2	15	11	-13
Payment of Interest on External Public Debt 1982	89*	0	-2	0	12	23	-15
Public External Borrowing Commitments 1982	88*	-4	-4	7	27	3	-5
Gross Inflow Public Loans 1970	86*	-2	3	3	-8	7	41
Total Public External Debt 1970	70*	-7	0	6	-10	-8	53
Repayment of Principal on Public External Debt 1982	61*	2	14	-4	26	37	12
Gross Domestic Product 1982	52*	-15	44	0	7	-24	-7
Growth in Exports 1970-82	46*	23	4	-37	-18	-22	-12
Current Account Balance 1970	-87*	-11	17	5	-10	6	-5
Growth in Exports 1960-70	14	85*	-13	-7	5	-45	-8
Gross Inflow Public Loans 1982/ GDP 1982	9	87*	1	26	-4	0	-10
Public Consumption as % GDP 1982	-2	82*	18	1	-19	7	12
Public External Debt % GDP 1982	4	78*	-15	14	-11	16	8
Exports as % GDP 1982	-7	75*	21	-10	6	21	-6
Public Consumption % GDP 1960	-15	71*	-7	-11	14	-3	31
Resource Balance % GDP 1982	24	-53*	13	-26	-10	55	0
Gross International Reserves 1982	-13	-12	89*	0	13	-11	11
Gross National Product per Capita 1982	-7	10	86*	0	-13	15	19
Gross International Reserves 1970	12	-2	83*	-9	-12	-15	-14
Total Military Expenditures 1981	37	16	43*	-14	-1	-26	26
Current Account Balance 1982	-19	4	-50*	5	-14	30	28
Private Consumption % GDP 1960	23	-12	-63*	-3	9	-37	0
Average Maturity of External Public Debt 1982	-8	4	-69*	-9	0	-21	35
Public External Loan Commitments/ Exports 1982	3	0	-3	95*	4	-20	-8
Gross Inflow Public Loans/Exports 1982	8	13	11	88*	-7	0	-12
Public External Debt/Exports 1982	4	2	-8	88*	-2	-4	11
Growth in Private Consumption 1970-82	-11	-10	6	20	86*	8	14
Growth in Imports 1970-82	11	-7	-2	-8	82*	-24	-6
Growth in Public Consumption 1970-82	2	4	-23	-19	68*	-1	-5
Terms of Trade 1982	20	21	26	5	46*	13	22
Debt Service External Public Debt % Exports 1982	24	3	-7	-6	-4	74*	18
Private Consumption % GDP 1982	-12	-38	-37	6	-21	-41*	-5
Net Inflow Public External Loans 1970	60	0	8	4	7	5	65*
Public External Debt % GDP 1970	0	12	-31	-6	5	36	59*

Table 14

Oblique Rotated Factor Patterns: Economic Variables, Total Military Expenditures, 1981, Group I Countries

Variables	Determinants of Total Military Expenditures	Factors Facilitating Share of Public Consumption	Debt Servicing	External Debt to Exports 1982	Growth in Public Consumption	Growth in Private Consumption	Public External Debt Share of GDP 1970
			Factors				
Total Military Expenditures 1981	100*	4	-20	-2	-13	0	1
Net Inflow Public External Loans 1970	97*	8	6	2	-9	-1	27
Total Public Debt 1982	95*	-3	-9	14	10	11	2
Gross International Reserves 1982	92*	-4	3	-11	-13	6	9
GNP Per Capita 1982	88*	-11	-11	14	6	-4	1
Total Public Debt 1970	87*	4	31	-3	-10	-5	25
Gross Inflow Public Loans 1970	85*	8	37	2	-7	-1	27
Interest Payments External Debt 1982	82*	-3	4	1	34	6	-2
Repayment of Principal on Public External Loans 1982	79*	-4	1	0	28	12	-22
Gross International Reserves 1970	77*	-9	10	-18	0	-12	-29
Gross Inflow Public Loans 1982	73*	2	23	12	15	5	-24
Public External Borrowing Commitments 1982	71*	0	21	10	9	9	-32
GDP 1982	55*	-33	24	-6	-7	-14	-2
Current Account, Balance of Payments 1982	-72*	0	-25	5	7	-8	14
Current Account, Balance of Payments 1970	-84*	-6	51	3	2	14	-18
Growth of Exports 1960-70	-22	95*	8	-4	-6	1	3
Gross Inflow Public Loans/GDP 1982	-14	85*	20	19	16	-5	-16
Public External Debt % of GDP 1982	-13	83*	7	10	26	-5	7
Public Consumption % of GDP 1960	11	81*	-14	-19	-23	20	-2
Public Consumption % of GDP 1982	42	68*	-13	4	15	-21	-2
Exports % of GDP 1982	5	65*	3	0	49	-20	1
Resource Balance % of GDP	-1	-70*	13	-15	53	-12	16
Repayments of Principal on Public Loans 1970	20	5	97*	1	1	0	15
Interest Payments on External Debt 1982	24	2	92*	-1	-3	-6	14
Average Maturity of External Debt 1982	-9	10	-49*	-26	-24	0	11
Public External Debt/Exports 1982	4	1	0	94*	-16	9	22
Public External Borrowing Commitments/Exports 1982	2	6	5	93*	-26	11	-19
Gross Inflow Public External Loans/ Exports 1982	-1	9	13	89*	1	-4	-3
Growth in Exports 1970-82	36	16	24	-41*	-15	19	-7
Growth in Public Consumption 1970-82	-33	2	-0	-21	69*	24	8
External Debt Service % of Exports 1982	18	-4	14	-16	69*	21	-5
Private Consumption % of GDP 1982	-12	-30	1	-2	-79*	-3	-9
Growth in Imports 1970-82	-1	5	16	-9	14	86*	24
Growth in Private Consumption 1970-82	12	-14	-20	30	15	81*	22
Terms of Trade 1982	7	48	-14	-4	27	47*	3
Private Consumption % of GDP 1960	-34	-18	22	9	3	24	72*
Public External Debt % of GDP 1970	39	7	0	-5	15	24	58*

Table 15

Oblique Rotated Factor Pattern: Economic Variables, Total Military Expenditures, 1981, Group II Countries

Variables	Factors 1	2	3	4	5	6
	Efficient Public External Debt 1982	Efficient Public External Debt/Exports 1982	Determinants of Public External Debt 1982	Public External Debt 1970	Growth in Public Consumption	Growth in Exports
Interest Payments on External Debt 1982	100*	-8	1	-14	8	-3
Gross Inflow Public External Loans 1982	100*	-1	3	-3	15	0
Public External Borrowing Commitments	93*	3	-12	9	34	0
Total Public External Debt 1982	93*	-1	4	16	4	4
Repayments of Principal on Public External Loans 1970	74*	2	-2	18	-39	17
Repayments of Principal on Public External Loans 1982	68*	-13	35	19	19	-12
Debt Service on External Debt as % of Exports 1982	68*	6	28	-4	-14	-31
Interest Payments on External Public Debt 1970	67*	4	-12	30	-35	8
Resource Balance as % GDP 1982	57*	-40	13	15	-22	-12
Current Account Balance of Payments 1970	-89*	-6	14	-7	-15	-24
Public External Borrowing Commitments/Exports 1982	1	84*	-22	0	0	-18
Average Maturity Public External Debt 1982	-42	80*	-5	27	0	9
Public External Debt/Exports 1982	26	69*	-1	20	-44	-13
Gross Inflow Public Loans/Exports 1982	51	65*	4	-32	-32	-8
Current Account Balance of Payments 1982	-22	47*	49	37	-9	-6
Terms of Trade 1982	43	-48*	-1	28	33	-25
Gross Domestic Product 1982	44	-57*	-46	22	-8	7
Gross International Reserves 1982	-32	-71*	-10	29	-13	-28
GNP Per Capita 1982	4	-72*	12	-30	-34	-5
Gross International Reserves 1970	0	-78*	-13	0	-42	10
Public Consumption % GDP 1970	-26	-6	79*	27	17	14
Public External Debt % GDP 1982	45	23	79*	2	-6	7
Exports % GDP 1982	2	-25	71*	-16	25	34
Gross Inflow Public Loans/GDP 1982	37	17	67*	-21	9	21
Public Consumption % GDP 1982	-21	2	55*	-26	-24	17
Resource Balance % GDP 1982	-18	23	-75*	-7	10	15
Net Inflow Public External Loans 1970	18	8	3	93*	9	-6
Total Public External Debt 1970	16	12	-14	80*	-13	7
Public External Debt % GDP 1970	7	17	38	69*	36	7
Gross Inflow Public Loans 1970	49	6	0	66*	-14	5
Total Military Expenditures 1981	-8	-44	1	59*	-18	53
Growth in Imports 1970-80	19	7	-14	-5	90*	-7
Growth in Public Sector Consumption 1970-82	-1	36	3	8	80*	2
Growth in Private Consumption 1970-82	15	-11	39	8	69*	-21
Growth in Exports 1970-82	20	-6	20	1	-35	82
Growth in Exports 1960-82	-7	-4	23	5	2	81*
Private Consumption % GDP 1960	14	32	-49	6	22	56*

on factors 4 and 6. This indicates that the group II countries have a more diverse pattern of economic variables that affect military expenditures.

The number of variables for regression analysis was expanded to include the results of the factor analysis. Variables that reflected the main factors upon which military expenditures loaded heavily on were added to the data set.

A step wise regression for the total country sample, Table 16, indicated that the order of importance of variables affecting total military expenditures was: (1) the share of military expenditure for 1981 in the total government budget (GEBD); (2) the gross domestic product (GDPB; (3) the public external debt in 1970 (PDA); (4) the gross domestic product per capita (GNPPER). The debt service as a percentage of exports in 1982 (DSEB) was also significant but had a negative sign.

The best equation on Table 16 for estimating military expenditures was number 9. This equation was expected to explain 79 percent of the fluctuations in military expenditures. A comparison of actual values versus predicted values, using equation number 9 from Table 16, is shown in Table 17. Only one country, the Philippines, had a predicted value within 5 percent of the actual level of its military expenditure. Venezuela's predicted value was 25 percent below its actual level.

Table 16

Determinants Of Military Expenditures, Total Country Sample, Economic Variables

(Standardized Estimates)

Equation	Independent Variables								Statistics		
	GEDB	GDPB	PDA	POP	PBCB	GNPPER	ECNIA	PDB DSEB	r^2	F	DF
1 MEB1=	0.46	0.47	0.33								
	(4.88)	(3.97)	(2.84)						.704	30.91	42
2	0.47	0.46	0.31	0.06							
	(4.87)	(3.79)	(2.54)	(0.55)					.706	22.85	42
3	0.46	0.72	0.40		-0.37						
	(5.28)	(5.09)	(3.63)		(-2.78)				.754	29.13	42
4	0.46	0.62	0.46		-0.33	0.18					
	(5.70)	(4.44)	(4.17)		(-2.57)	(2.35)			.789	27.00	41
5	0.47	0.40	0.40			0.21					
	(5.13)	(3.83)	(3.46)			(2.58)			.750	27.84	41
6	0.47	0.50	0.43				-0.13				
	(4.86)	(3.81)	(2.19)				(-0.61)		.706	22.90	42
7	0.45	0.71	0.39		-0.50		0.67				
	(5.14)	(4.91)	(3.27)		(-1.52)		(0.41)		.755	22.83	42
8	0.47	0.50	0.33					-0.17			
	(5.09)	(4.31)	(2.94)					(-2.0)	.732	25.29	41
9	0.46	0.61	0.44		-0.45		0.13	-0.18			
	(5.56)	(4.27)	(3.86)		(-1.42)		(0.42)	(-2.29)	.790	22.01	41

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

Table 17

Total Military Expenditures , Total Country Sample

	Country	Actual	Predicted	Actual/ Predicted	Placement
1.	Uganda	97	1739	.0558	Below
2.	Rwanda	21	251.524	.0835	Below
3.	Senegal	55	426.875	.1288	Below
4.	Bolivia	196	1187	.1651	Below
5.	Liberia	36	207.245	.1737	Below
6.	Paraguay	78	425.798	.1832	Below
7.	El Salvador	116	556.246	.2085	Below
8.	Burma	204	812.653	.2510	Below
9.	Trinidad	42	162.577	.2583	Below
10.	Ghana	141	317.939	.4435	Below
11.	Zimbab	419	795.108	.5270	Below
12.	Dominican Rep.	104	183.831	.5657	Below
13.	Uruguay	363	603.748	.6012	Below
14.	Brazil	1837	2965	.6196	Below
15.	Ecuador	296	453.439	.6528	Below
16.	Kuwait	1254	1876	.6684	Below
17.	Sudan	289	417.592	.6921	Below
18.	Mexico	1196	1713	.6982	Below
19.	Jordon	874	1213	.7205	Below
20.	Tunisia	228	261.472	.8720	Below
21.	Chile	1175	1331	.8828	Below
22.	India	5151	5787	.8901	Below
23.	Kenya	198	222.328	.8906	Below
24.	Philippines	848	824.042	1.0291	
25.	Tanzania	277	257.711	1.0748	Above
26.	Syria	2437	2252	1.0821	Above
27.	Thailand	1335	1089	1.2259	Above
28.	Venezuela	1059	842.796	1.2565	Above
29.	Spain	3655	2817	1.2975	Above
30.	Israel	4374	3242	1.3492	Above
31.	Korea	4157	2943	1.4125	Above
32.	Car	14	9.285	1.5078	Above
33.	Morocco	1080	698.584	1.5460	Above
34.	Argentina	3,86	1921	1.6585	Above
35.	Indonesia	2867	1611	1.7796	Above
36.	Peru	1026	569.440	1.8018	Above
37.	Malaysia	1446	536.720	2.6941	Above

Notes:
Based on regression equation:
MEBI= 0.46GEDB + 0.62GDP + 0.45PDA - 0.33PBCB + 0.19GNPPER
(5.70) (4.44) (4.17) (-2.57) (2.35)
Below = Countries whose Actual is less than 95% of Predicted value
Above = Countries whose Actual is greater than 105% of Predicted value

the government deficit as a percentage of gross domestic product in 1982 (GDB) is highly significant, but negative. The share of military expenditures in the total government budget (GEDB) is also statistically significant with a postitve sign as is the net flow of external loans in 1970.

Group II countries again indicate a pattern different than that of group I countries. The results of the regression for group II countries, Table 27, show that gross domestic product per capita (GNPPER) and the current account of the balance of payment (CAB) account for the majority of the flucuations in military expenditures per capita. The share of public consumption in 1982 was also statistically significant. It is interesting to note that all measures of external debt were statistically insignificant in accounting for flucuations in military expenditures per capita. Group II countries therefore appear to maintain a much stronger balance of payments position than do group I countries.

A comparison of the actual versus the predicted value in Table 28 for the group II countries show some improvement over the result obtained from the total country sample. The predicted value for Venezuela is, however, worse than it was in the total country sample.

In summary, the basic regression equation for military expenditures per capita shows the following differences by sample group:

Table 26

Determinants Of Military Expenditures Per Capita, Group I Countries' Economic Variables

(Standardized Estimates)

Equation	(MEPS1)	Independent Variables								Statistics		
	GNPPER	GDB	PCB	GEDB	ECNIA	PCB	ECNIB	CAB	PBCB	GDP	r^2	F	DF
1	0.54												
	(3.63)										.291	13.14	33
2	0.58	-0.46											
	(4.22)	(-3.39)									.505	13.28	28
3	0.74	-0.24	0.09										
	(6.43)	(-2.93)	(0.64)								.782	26.34	25
4	0.56	-0.44		0.46									
	(5.99)	(-4.65)		(4.87)							.807	30.75	25
5	0.38	-0.30		0.32	0.40								
	(4.39)	(-3.44)		(3.74)	(3.77)						.885	40.64	25
6	0.45	-0.31		0.37		0.29							
	(4.63)	(-3.10)		(3.94)		(2.45)					.850	29.82	25
7	0.37	-0.30		0.31	0.48		-0.13						
	(4.36)	(-3.64)		(3.72)	(4.09)		(-1.64)				.896	34.56	25
8	0.44							-0.38					
	(3.13)							(-2.64)			.424	11.05	32
9	0.25	-0.22			0.67				-0.04				
	(2.65)	(-2.14)			(4.67)				(-0.35)		.788	22.32	28
10	0.52	-0.47								0.28			
	(3.94)	(-3.65)								(2.11)	.580	11.52	28

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

Table 25

Military Expenditures Per Capita, Total Country Sample

	Country	Actual	Predicted	Actual/ Predicted	Placement
1.	Rwanda	3.962	113.482	.0349	Below
2.	India	7.360	194.503	.0378	Below
3.	Tanzania	14.427	183.659	.0786	Below
4.	Jamaica	14.348	178.117	.0806	Below
5.	Panama	13.500	138.394	.0975	Below
6.	Kenya	11.579	95.773	.1209	Below
7.	Indonesia	18.581	142.405	.1305	Below
8.	Malawi	5.968	43.122	.1384	Below
9.	Liberia	18.000	124.965	.1440	Below
10.	Ethiopia	13.600	81.351	.1672	Below
11.	Ivory Coast	13.253	62.912	.2107	Below
12.	Mexico	16.634	66.962	.2484	Below
13.	Zimbab	53.038	149.006	.3559	Below
14.	Mauritius	37.333	104.454	.3574	Below
15.	El Salvador	25.217	66.254	.3806	Below
16.	Algeria	91.959	236.599	.3887	Below
17.	Morocco	50.000	126.109	.3965	Below
18.	Tunisia	34.030	69.864	.4871	Below
19.	Venezuela	62.663	118.725	.5278	Below
20.	Chile	104.911	138.791	.7559	Below
21.	Argentina	111.010	143.741	.7723	Below
22.	Kuwait	836.000	987.910	.8462	Below
23.	Saudi Arabia	2110.000	2028.000	1.0404	
24.	Jordon	273.125	243.730	1.1206	Above
25.	Greece	265.773	220.175	1.2071	Above
26.	Korea	103.666	76.012	1.3638	Above
27.	Malaysia	101.119	68.533	1.4755	Above
28.	Uruguay	125.172	83.365	1.5015	Above
29.	Thailand	27.413	17.900	1.5315	Above
30.	Peru	53.717	29.329	1.8315	Above
31.	Isarael	1151.000	585.107	1.9672	Above
32.	Bolivia	35.000	15.876	2.2046	Above
33.	Spain	96.693	30.954	3.1238	Above
34.	Ecuador	35.663	6.120	5.8273	Above

Notes:

Based on regression equation:

MEP81= 0.23GNPPER + 0.77CAB + 0.31PCB + 0.18ECNIA - 0.15PDPB
(3.21) (13.47) (4.39) (3.21) (2.06)

Below = Countries whose Actual is less than 95% of Predicted value

Above = Countries whose Actual is greater than 105% of Predicted value

Table 24

Determinants Of Military Expenditures Per Capita, Total Country Sample, Economic Variables

(Standardized Estimates)

Equation	Independent Variables (MEPBI)										Statistics		
	GNPPER	CAB	PCB	ECNIA	PDPB	EGB	GDPB	GEDB	GDB	PDB	r^2	F	DF
1	0.32	0.75											
	(4.42)	(10.15)									.730	67.84	52
2	0.29	0.75	0.21										
	(4.60)	(12.06)	(3.41)								.834	72.12	46
3	0.28	0.79	0.22	0.19									
	(4.98)	(13.82)	(3.84)	(3.38)							.869	70.06	46
4	0.23	0.76	0.31	0.17	-0.14								
	(3.94)	(13.47)	(4.39)	(3.21)	(-2.06)						.882	61.22	46
5	0.26	0.77	0.29	0.14	-0.12	0.12							
	(4.52)	(14.27)	(4.40)	(2.66)	(-1.86)	(2.29)					.896	57.19	46
6	0.28	0.78	0.22	0.17			0.03						
	(4.78)	(12.20)	(3.23)	(2.41)			(0.43)				.870	55.08	46
7	0.63		0.29					0.33					
	(7.71)		(3.09)					(3.66)			.787	40.83	36
8	0.83		0.30						-0.28				
	(4.91)		(2.56)						(-1.66)		.697	27.71	39
9	0.28	0.78	0.22							0.13			
	(4.67)	(12.71)	(3.69)							(2.11)	.850	59.51	46
10	0.22	0.75	0.33		-0.17					0.12			
	(3.61)	(12.51)	(4.43)		(-2.26)					(2.13)	.866	53.36	46

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

Table 23

Oblique Factor Pattern: Economic Variables, Military Expenditure Per Capita, Group II Countries

Variables	Factors 1 Determinants of External Debt 1982	2 Public External Borrowing Commitments 1982	3 Determinants of Military Expenditure per Capita 1981	4 Growth in Public Consumption	5 Public External Debt 1970	6 Growth in Exports
Interest Payments on External Public Debt 1982	100*	-6	2	10	-15	-4
Gross Inflow Public Loans 1982	100*	0	2	17	-5	7
Total Public External Debt 1982	94*	-1	3	4	15	4
Public External Borrowing Commitmetns 1982	91*	2	-3	34	7	1
Repayment of Principal on Public External Debt 1970	76*	3	-4	-38	15	15
Interest Payments on External Public Debt 1970	69*	3	-14	-36	26	7
Repayment of Principal on Public External Debt 1982	69*	-13	35	20	20	-11
Debt Service on External Debt as % Exports 1982	69*	9	30	-13	-5	-32
Resource Balance % GDP 1982	58*	-35	9	-19	16	-14
Current Account Balance 1970	-88*	-4	11	-12	-5	-28
Public External Borrowing Commitments/Exports 1982	0	82*	-21	-1	1	-15
Average Maturity Public External Debt 1982	-42	77*	-8	1	29	9
Public External Debt/Exports 1982	27	69*	-1	-45	19	-13
Gross Inflow Public Loans/Exports 1982	51	66*	8	-33	-12	-9
Terms of Trade 1982	43	-51*	2	26	22	-18
Gross Domestic Product 1982	45	-59*	-48	-10	17	9
GNP Per Capita 1982	3	-71*	18	-36	-28	-1
Gross International Reserves 1982	-32	-73*	-13	-14	29	-24
Gross International Reserves 1970	0	-77*	-16	-39	1	9
Public Consumption as % GDP 1960	-26	-8	30*	17	34	17
Public External Debt % GDP 1970	47	16	77*	0	6	0
Exports % GDP 1982	3	-21	68*	31	-9	28
Gross Inflow Public External Loans/GDP 1982	38	21	66*	14	-17	14
Public Consumption % GDP 1982	-19	6	60*	-23	-25	12
Military Expenditures Per Capita 1981	-9	-31	57*	-39	-14	32
Current Account Balance 1982	-23	44	48*	-9	43	-2
Private Consumption as % GDP 1982	-21	20	-71*	4	-9	22
Growth in Imports 1970-82	17	6	-13	88*	-8	-4
Public Consumption Growth 1970-82	-2	35	0	81*	7	0
Private Consumption Growth 1970-82	14	-12	37	71*	12	-19
Net Inflow Public External Loans 1970	20	1	0	3	90*	1
Total Public External Loans 1970	19	6	-18	-18	75*	11
Public External Debt % GDP 1970	8	11	35	32	70*	10
Gross Inflow Public External Loans 1970	52	2	-2	-17	61*	8
Growth in Exports 1960-70	-7	-6	24	1	12	84*
Growth in Exports 1970-82	21	-7	20	-34	1	82*
Private Consumption % GDP 1982	13	29	-47*	18	3	59*

Table 22

Oblique Factor Pattern: Economic Variables, Military Expenditures Per Capita, Group I Countries

Variables	Factors 1 Determinants of Military Expenditures Per Capita 1981	2 Public Consumption as % GDP	3 Repayment of Public External Debt 1970	4 Public Debt/ Exports 1982	5 Growth in Public Consumption	6 Growth in Private Consumption	7 Public External Debt as % GDP 1970
Military Expenditures per Capita 1981	100*	7	-35	-2	-11	0	2
Net Inflow Public External Loans 1970	96*	8	10	2	-9	-1	27
Total Public External Debt 1982	94*	-2	-6	14	10	12	2
Gross International Reserves 1982	92*	-4	5	-11	-14	6	-10
Gross National Product per Capita 1982	89*	-13	-12	14	5	-4	0
Total Public External Debt 1970	86*	4	36	-3	-10	-5	26
Gross Inflow Public Loans 1970	83*	8	41	2	-7	-1	27
Interest Payments on External Debt 1982	82*	-3	6	1	34	7	-2
Repayment of Principal on Public External Loans 1982	78*	-3	4	0	28	13	-22
Gross International Reserves 1970	75*	-9	12	-18	0	-12	-30
Gross Inflow Public External Loans 1982	71*	2	24	12	15	5	-25
Public External Borrowing Commitments	69*	0	23	10	9	9	-32
Gross Domestic Product 1982	53*	-33	27	-6	-7	-14	-1
Current Account Balance 1982	-10*	0	-28	5	7	-8	14
Current Account Balance 1970	-87*	0	51	3	2	14	-17
Growth in Exports 1960-70	-22	95*	8	-4	-5	1	3
Gross Inflow Public External Loans/GDP 1982	-13	85*	19	19	16	-5	-17
Public Debt as % *GDP 1982*	-12	83*	7	10	26	-6	7
Public Consumption as % GDP 1960	10	82*	-12	-10	-22	20	-1
Public Consumption as % GDP 1982	42	68*	-10	4	15	-21	-2
Exports as % GDP 1982	5	65*	3	0	49	-20	0
Resource Balance as % GDP 1982	0	-71*	12	-16	53	-12	16
Repayment of Principal on Public External Loans 1970	17	5	99*	1	0	-1	15
Interest Payments on Public External Debt 1970	21	3	95*	-1	-3	-7	15
Average Maturity of Public External Debt 1982	-10	11	45*	-26	-23	0	13
Public Debt/Exports 1982	4	1	0	94*	-15	10	23
Public Borrowing Commitments/Exports 1982	2	6	4	93*	-26	11	-17
Gross Inflow Public External Loans/ Exports 1982	0	8	11	89*	1	-4	-4
Growth of Exports 1970-82	36	14	22	-41*	-16	19	-9
Growth of Public Consumption 1970-82	-32	9	-11	-21	70*	24	9
Debt Service Public External Debt as % Exports 1982	17	-3	16	-16	69*	21	-4
Private Consumption % GDP 1982	-13	-29	2	-2	-79*	-3	-8
Growth of Exports 1970-82	0	5	14	-9	14	85*	23
Growth of Private Consumption 1970-82	13	-14	-21	30	15	82*	22
Terms of Trade 1982	6	49	-13	-4	28	47*	3
Private Consumption as % GDP 1960	-33	-18	21	9	3	24	72*
Public External Debt % GDP 1970	38	7	3	-5	15	24	59*

percentage of gross domestic product in 1970. In sharp contrast, a factor analysis of group I countries show very high loadings in the factor 1 column for various measures of external debt on Table 22. This result is very similar to the findings for total military expenditures. The factor analysis for group II countries, Table 23, loaded high on a factor representing the balance of payments, exports and public consumption. As in the examination of total military expenditures, group I countries and group II countries load highest on different economic factors with regard to measures of military expenditures per capita.

A step wise regression for the total country sample, Table 24, indicated that three variables, the gross national product per capita (GNPPER), the current account of the balance of payments (CAB) and the share of public consumption in gross domestic product for 1982 (PCB) account for over 83 percent of the fluctuations in military expenditures per capita. While the overall regression results appear to be satisfactory, the best regression equation, number 4 on Table 25, was able to predict only one country's military expenditures per capita within 5 percent of the actual value as shown in Table 26. Venezuela's predicted value was considerably higher than its actual value.

The results for group I countries, Table 25, again show a pattern much different than that obtained from the total sample. In addition to gross national product per capita,

Table 21

Oblique Factor Pattern: Economic Variables, Military Expenditures Per Capita, Total Country Sample

Variables	Factors: 1 Factors Affecting Total External Debt 1982	2 Public Consumption Share in GDP 1982	3 International Reserves	4 External Debt/ Exports 1982	5 Growth in Consumption	6 Debt Service as % of Exports 1982	7 Military Expenditure per Capita 1981
Repayment of Principal on Public External Loans 1970	100*	-1	-5	0	-26	9	-10
Interest Payments on External Debt 1970	100*	-7	-3	5	-23	1	-4
Gross Inflow Public Loans 1970	94*	-4	1	3	-6	1	29
Total External Debt 1982	94*	2	-1	3	11	16	3
Gross Inflow External Loans 1982	89*	6	-3	1	14	17	-13
Public External Borrowing Commitments 1982	85*	0	-4	6	26	7	-8
Total Public External Debt 1970	83*	-9	-3	6	-8	-17	34
Interest Payments on External Debt 1982	82*	3	0	0	11	29	-11
Net Inflow Public External Loans 1970	73*	-6	7	4	9	-4	54
Repayment of Principal on Public External Loans	60*	0	15	-3	27	37	13
Gross Domestic Product 1982	56*	-11	39	-1	8	-27	-19
Growth of Exports 1970-82	43*	22	3	-38	-18	-14	-4
Current Account Balance 1970	-86*	-13	14	8	-8	0	-10
Growth in Exports 1960-70	15	89*	-16	-9	5	-43	-9
Gross Inflow Public Loans/ GDP 1982	6	84*	0	26	-2	0	-10
Public Consumption as % GDP 1982	-1	79*	20	0	-19	5	21
External Public Debt % GDP 1982	4	76*	-12	15	-8	14	8
Exports % GDP 1982	-10	72*	20	-9	8	21	0
Public Consumption % GDP 1960	-10	67*	-5	-11	16	-10	36
Resource Balance % GDP 1982	21	-55*	12	-23	-9	56	-3
Gross National Product per Capita 1982	-7	6	86*	0	-13	14	10
Gross International Reserves 1982	-4	-14	84*	-1	16	-23	5
Gross International Reserves 1970	17	0	77*	-10	-10	-21	-17
Current Account Balance 1982	-19	0	-46*	8	-13	27	27
Private Consumption as % GDP 1960	22	-9	-62*	-5	5	-27	-6
Average Maturity Public External Debt 1982	-2	4	-67*	-9	0	-25	28
Public External Borrowing Commitments/Exports 1982	2	2	-2	95*	3	-18	-10
Gross Inflow Public External Loans/ Exports 1982	5	14	11	88*	-7	3	-13
Total Public External Debt/Exports 1982	5	1	-6	88*	-2	-3	7
Growth in Private Consumption 1970-82	-12	-12	8	21	87*	8	14
Growth in Imports 1970-82	10	-3	-2	-10	80*	-20	-9
Growth in Public Consumption 1970-82	0	8	-25	-20	67*	1	-16
Terms of Trade 1982	23	18	24	6	49*	7	18
Debt Service % Exports 1982	20	-2	-4	-3	-2	73*	22
Private Consumption % GDP 1982	-12	-35	-35	4	-24	-38*	-4
Public External Debt % GDP 1970	-4	3	-26	-3	6	31	63*
Military Expenditures per Capita 1981	7	30	35	-10	-17	9	54*

In summary the basic regression equation for total military expenditures shows the following differences by sample group:

	GEDB	PDB	PDA	POP	GDPB	GNPPER
Total	+	0	+	0	+	+
Group I	+	+	0	+	0	0
Group II	+	-	+	-	+	0

Figure 11 - Summary Of Regression Equation For Total Military Spending

Notes : + = Statistically Significant With A Positive Sign At The 95% Level
- = Statistically Significant With A Negative Sign At The 95% Level
0 = Statistically Insignificant

The results, therefore, lend support to the idea of testing development countries as groups based on a common economic environment rather than as a total sample.

The second measure of military expenditure examined was military expenditure per capita, the results of which confirmed the splitting of the developing countries into two groups based on common economic environment. A factor analysis of the total country sammple showed that military expenditures per capita loaded only moderately on one factor on Table 21. This was factor 7, public external debt as a

Table 20

Comparison Of Actual Vs. Predicted Values of Total Military Expenditures, Group II Countries

Country	Actual	Predicted	Actual/ Predicted	Placement
1. Rwanda	21	463	.0453	Below
2. Mexico	1196	1484	.8059	Below
3. Kuwait	1254	1524	.8228	Below
4. Syria	2437	2755	.8845	Below
5. Jordan	874	955	.9146	Below
6. India	5151	5220	.9868	
7. Spain	3655	3670	.9959	
8. Brazil	1837	1844	.9962	
9. Venézuela	1059	1048	.9962	
10. Korea	4157	5023	1.0333	
11. Indonesia	2867	2706	1.0595	Above
12. Argentina	3186	2018	1.0918	Above
13. Thailand	1355	1069	1.2488	Above
14. Philippines	848	351	2.4097	Above

Notes:
Based on regression equation:
ME81=0.52GEDB + 1.04GDP + 3.3PDA - 1.98PDB - 2.38POP - 0.29ECIBE + 0.38ECNIB
(6.13) (6.68) (6.49) (-5.57) (-5.49) (-3.04) (2.23)
Below = Countries whose Actual is less than 95% of Predicted value
Above = Countries whose Actual is greater than 105% of Predicted value

(GDPB); (2) the public external debt in 1970 (PDA); (3) the share of military expenditures for 1981 in the total government budget. In sharp contrast to group I countries, the public debt in 1982 (PDB) is highly significant but is negative for group II countries as is the population (POP) and public external borrowing commitments in 1982 (PBCB).

Group II countries present a picture of countries that borrowed heavily in the early 1970s in order to facilitate military expenditures, but for one reason or another ceased this pattern toward the end of the 1970s and early 1980s. Group I countries however appear to have used external capital inflows toward the end of the 1970s and the early 1980s as a means of increasing the amount of funds allocated for military spending.

The best equation on Table 19 for estimating military expenditures was number 6. This equation was expected to explain 96.8 percent of the flucuations in military expenditures. A comparison of actual values versus predicted values, using equation number 6, is shown in Table 20. Venezuela's predicted value was within one half of one percent of the actual value.

Table 19

Determinants Of Military Expenditures, Group II Countries' Economic Variables

(Standardized Estimates)

Equation	Independent Variables								Statistics		
	GEDB	GDPB	PDA	PDB	POP	PBCB	ECIBE	ECIB	r^2	F	DF
1 ME81=	0.67	0.76									
	(2.85)	(3.21)							.507	6.18	14
2	0.52	0.83	0.51	-0.61							
	(2.57)	(2.90)	(2.38)	(-2.41)					.736	6.98	14
3	0.48	1.12	3.39	-1.90	-2.48						
	(3.70)	(5.61)	(4.49)	(-5.13)	(-3.88)				.901	16.45	14
4	0.43	0.91	2.73	-1.44	-1.86	-0.25					
	(3.95)	(4.93)	(4.05)	(-4.04)	(-3.17)	(-2.35)			.941	21.55	14
5	0.49	0.91	3.06	-1.46	-2.18		-0.29				
	(4.71)	(5.04)	(4.96)	(-4.24)	(-4.12)		(-2.44)		.944	22.32	14
6	0.51	1.05	3.39	-2.49	-2.38		-0.26	0.79			
	(6.06)	(6.67)	(6.54)	(-4.77)	(-5.49)		(-2.72)	(2.31)	.968	30.40	14

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

Table 18

Determinants Of Military Expenditures, Group I Countries' Economic Variables

(Standardized Estimates)

Equation	Independent Variables								Statistics		
	GEDB	PDB	GDPB	PDA	PCP	ECNIA	DSEB	GIRBY	r^2	F	DF
1 ME=81	0.25	0.77									
	(2.99)	(8.29)							.862	77.78	27
2	0.27	0.72	0.09								
	(3.16)	(7.58)	(1.14)						.868	52.92	27
3	0.24	0.49	-0.07	0.54							
	(3.13)	(4.19)	(-0.77)	(3.14)					.909	44.36	27
4	0.25	0.49		0.47	0.28						
	(3.34)	(4.22)		(3.25)	(2.90)				.907	56.92	27
5	0.20	0.36			0.26	0.60					
	(2.96)	(3.01)			(3.29)	(4.14)			.922	68.44	27
6	0.20	0.36		0.05	0.27	0.55					
	(2.88)	(2.96)		(0.22)	(3.00)	(2.09)			.923	52.15	27
7	0.22	0.56			0.27	0.45	-0.19				
	(3.69)	(4.50)			(4.00)	(3.36)	(-3.01)		.945	72.91	26
8	0.22	0.38			0.36	0.53		0.17			
	(3.43)	(3.36)			(4.15)	(3.83)		(2.17)	.936	64.55	27

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

A step wise regression for the group I countries, Table 18, indicated that the order of importance of variables affecting total military expenditures was: (1) the public debt in 1982 (PDB); (2) the population for 1982 (POP); (3) the share of military expenditure for 1981 in the total government budget (GEDB); and (4) the net flow of external loans in 1970 (ECNIA). As with the total country sample, the debt service as a percentage of exports in 1982 (DSEB) was statistically significant and negative. The best equation on Table 18 for estimating military expenditures was number 7. This equation was expected to explain 94.5 percent of the fluctuations in military expenditures. As might be expected, the public debt in 1982 (PDB) had the highest correlation with total military expenditures. PDB was not statistically significant in the total country sample. Interestingly the public debt in 1970 (PDA), which was important in explaining the pattern of military expenditures for the total country sample, is not statistically significant for group I countries when the regression equation includes population (POP) and net external capital inflows for 1970 (ECNIA).

Regression equations for group II countries, Table 19, as with the two previous groups produced a positive and statistically significant relationship with the share of military expenditures for 1981 in the total government budget. The order of importance of variables affecting total military expenditures was: (1) the gross domestic product

Table 27

Determinants Of Military Expenditures Per Capita, Group II Countries' Economic Variables

(Standardized Estimates)

Equation	Independent Variables								Statistics		
	GNPPER	CAB	PCB	PCB	GEDB	GDB	ECNIA	GDP	r^2	F	DF
1 MEPBI=	0.21	0.90									
	(3.15)	(13.35)							.923	102.05	19
2	0.19	0.91	0.08								
	(4.73)	(22.30)	(1.80)						.979	215.33	17
3	0.19	0.91	0.07	-0.02							
	(4.48)	(21.31)	(1.53)	(-0.38)					.979	151.10	17
4	0.80		0.43		0.01						
	(8.37)		(4.54)		(0.11)				.921	35.14	12
5	0.56		0.34			0.29					
	(3.17)		(4.34)			(2.74)			.953	68.13	13
6			0.43		0.01	0.80					
			(4.54)		(0.11)	(8.37)			.921	35.14	12
7	0.19	0.91	0.06				-0.03				
	(4.48)	(21.82)	(1.28)				(-0.73)		.979	156.26	17
8	0.19	0.89	0.10					0.04			
	(4.67)	(19.34)	(2.03)					(0.95)	.980	160.67	17

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

Table 28

Military Expenditures Per Capita, Group II Countries

	Country	Actual	Predicted	Actual/ Predicted	Placement
1.	Rwanda	3.962	164.274	.0241	Below
2.	India	7.360	64.386	.1143	Below
3.	Columbia	13.759	110.325	.1247	Below
4.	Indonesia	18.581	147.319	.1261	Below
5.	Mexico	16.634	110.519	.1505	Below
6.	Thailand	27.413	136.867	.2003	Below
7.	Philippines	16.792	52.817	.3179	Below
8.	Algeria	91.959	222.219	.4138	Below
9.	Venezuela	62.663	130.375	.4806	Below
10.	Spain	96.693	133.193	.7260	Below
11.	Argentina	111.010	127.112	.8733	Below
12.	Kuwait	836.000	870.248	.9606	
13.	Korea	103.666	105.488	.9827	
14.	Saudia Arabia	2110.000	1956.000	1.0787	Above
15.	Malaysia	101.119	74.901	1.3500	Above
16.	Greece	265.773	194.039	1.3697	Above
17.	Jordon	273.125	189.901	1.4382	Above
18.	Syria	267.802	183.639	1.4583	Above

Notes:
Based on regression equation: MEP81= 0.21GNPPER + 0.91CAB
(3.15) (13.35)
Below = Countries whose Actual is less than 95% of Predicted value
Above = Countries whose Actual is greater than 105% of Predicted value

	GNPPER	CAB	PCB	PDB	GDB	GEDB	PDA
Total	+	+	+	+	0	+	0
Group I	+	−	0	+	−	+	0
Group II	+	+	0	0	+	0	0

Figure 12 - Summary Of Regression Equation For Military Expenditures Per Capita

Notes: + = Statistically Significant With A Positive Sign At The 95% Level
− = Statistically Significant With A Negative Sign At The 95% Level
0 = Statistically Insignificant

The third measure of military expenditure examined was military expenditures as a percentage of gross national product. A factor analysis was run for the total country sample, group I countries and then for the group II countries. The results of these were similar to those of the previous two, in that there was an improvement in the military expenditure loading when the countries were split into two groups.

The factor analysis for the total country sample, Table 29, loaded moderately well on factor 2. This factor consists of public consumption as a percentage of gross domestic product and several other measures of public external debt in

Table 29

Oblique Rotated Factor Pattern: Economic Variables, Military Expenditures As % GNP, Total Country Sample

Variables	Factors 1 Overall External Debt	2 Military Expenditures	3 Per Capita Income	4 External Debt/ Exports 1982	5 Growth in Consumption	6 Debt Service 1982	7 External 1970
Repayment of Principal on External Public Loans 1970	100*	-5	-5	0	-27	8	-5
Interest Payments on External Public Loans 1970	98*	-10	-1	5	-25	2	3
External Public Debt 1982	95*	2	-1	3	11	14	7
Gross Inflow Public Loans 1982	92*	3	-4	1	15	12	-10
Gross Inflow Public Loans 1970	90*	-1	4	3	-7	6	37
Public Borrowing Commitments 1982	87*	-1	-3	7	26	3	-3
Interest Payments on External Public Debts 1982	86*	0	-1	0	12	23	-12
External Public Debt 1970	76*	-5	1	7	-10	-10	46
Repayment of Principal on External Debt 1982	61*	2	16	-3	26	37	15
Gross Domestic Product 1982	56*	-13	41	0	5	-27	-12
Growth in Exports 1970-82	44*	24	2	-38	-15	-18	-7
Current Account Balance 1970	-87*	-15	17	7	-10	4	-8
Growth in Exports 1960-70	15	86*	-14	-5	5	-40	-9
Public Consumption as % of GDP 1982	-2	83*	19	2	-17	10	17
Gross Inflow Public Loans/GDP 1982	7	78*	1	29	-3	4	-12
External Public Debt as % of GDP 1982	4	72*	-12	17	-11	21	4
Public Consumption as % of GDP 1960	-11	72*	-4	-9	12	-1	32
Exports as % of GDP 1982	-8	70*	21	-7	8	26	-5
Military Expenditures/GNP 1981	8	65*	12	-17	-3	-7	43
Resource Balance as % of GDP 1982	21	-58*	13	-25	-8	54	-3
Gross International Reserves 1982	-6	-9	88*	0	12	-16	9
GNP Per Capita 1982	-5	13	83*	-1	-13	12	-1
Gross International Reserves 1970	15	0	80*	-10	-11	-19	-14
Current Account Balance 1982	-21	0	-46	8	-12	31	27
Private Consumption as % of GDP 1970	22	-11	-64*	-4	8	-33	-3
Average Maturity External Debt 1982	-7	5	-65*	-8	1	-21	33
Public Borrowing Commitments (External)/ Exports 1982	2	0	-3	96*	4	-20	-7
Gross Inflow Public Loans/ Exports 1982	6	10	10	89*	-6	1	-12
External Public Debt/Exports 1982	4	1	-7	86*	-3	-3	9
Growth in Private Sector Consumption 1970-82	-9	-7	9	22	85*	9	18
Growth in Imports 1970-82	13	-2	-1	-8	80*	-22	-4
Growth in Public Consumption 1970-82	2	3	-22	-17	69*	1	-7
Debt Service as % of Exports 1982	22	-1	-5	-5	-5	75*	17
Private Sector Consumption as % of GDP 1982	-13	-33	-37	2	-23	-44*	-4
Net Inflow Public External Loans 1970	67	2	11	6	8	3	63*
External Public Debt as % of GDP 1970	2	12	-27	-4	4	37	59*

1982. The export position of the country was also an important element contained in this factor.

Group I countries, in Table 30, loaded much higher on factor 1 which is comprised of several measures of public external debt in both 1970 and 1982. This is consistent with the previous two factor analysis of group I countries.

The factor analysis for the group II countries, Table 31, shows a realtively high loading in factors 3 and 6. Factor 3 contains several measures of public consumption as a percentage of gross domestic product together with several measures of public external debt in 1982. Factor 6 contains several measures of the countries position in exports.

A step wise regression for the total country sample, Table 32, indicates that approximately 60 percent of the flucuations in military expenditures as a percentage of gross national product can be explained by two variables. The variables are the share of public consumption in gross domestic product in 1982 (PCB) and the share of military expenditures in the total government budget (GEDB). Gross domestic savings as a percentage of gross domestic product for 1982 (GDSB) is also statistically significant but with a negative sign.

A comparison of actual values versus predicted values using equation 8 from Table 32 is shown in Table 33. While Table 33 indicates an improvement in the overall total

Table 30

Oblique Factor Pattern: Economic Variables, Military Expenditures As % Of GNP, Group I Countries

Variables	Factors 1	2	3	4	5	6	7
Net Inflow Public External Loans 1970	96*	6	3	5	-8	-1	28
Public External Debt 1982	96*	-4	15	-10	10	11	2
Gross International Reserves 1982	91*	-5	-10	2	-13	6	-8
Public External Debt 1970	84*	3	-2	30	-10	-5	26
GNP per Capita 1982	81*	-13	15	-13	7	-4	1
Gross Inflow External Loans 1970	81*	7	2	36	-7	-1	28
Interest Payments on External Debt 1982	82*	-5	1	2	34	6	-1
Repayment of Principal on Public External Loans 1982	82*	-5	0	0	28	12	-21
Gross International Reserves 1970	81*	-10	-18	9	-1	-12	-28
Military Expenditures as % GNP 1982	74*	32	-9	-24	-19	3	0
Gross Inflow Public Loans 1982	56*	2	12	21	5	5	-24
Public External Borrowing Commitments 1982	72*	0	19	20	8	9	-32
Gross Domestic Product 1982	68*	-33	-7	22	-9	-13	-2
Current Account Balance 1982	-75*	1	5	-24	7	-8	12
Current Account Balance 1970	-81*	1	2	51	1	15	-19
Growth in Exports 1960-70	-33	96*	-4	9	-3	1	2
Gross Inflow Public Loans/GNP 1982	-12	85*	19	21	19	-4	-17
Public External Debt % GNP 1982	-14	82*	19	8	29	-5	7
Public Consumption % GDP 1960	9	81*	-18	-12	-19	19	-1
Public Consumption % GDP 1982	41	67*	4	-13	16	-21	-2
Exports % GNP 1982	3	63*	0	4	53	-21	2
Resource Balance % GNP 1982	-1	-72*	-17	12	51	-11	16
Public Debt/Exports 1982	3	1	94*	-1	-16	10	22
Public External Borrowing Commitments/Exports 1982	3	6	94*	5	-26	11	-19
Gross Inflow Public Loans/ Exports 1982	0	9	89*	12	1	-4	-4
Growth in Exports 1970-82	37	17	-41*	25	-14	19	-6
Repayment of Principal on Public External Loans 1970	24	6	0	95*	0	0	14
Interest Paid on Public External Debt 1970	28	3	-3	90*	-4	-6	14
Average Maturity of Public External Debt	-12	9	-25	-48*	-23	0	11
Debt Service on External Debt as % Exports 1980	21	-5	-16	13	69*	21	-5
Growth in Public Consumption 1970-82	-31	2	-22	-10	68*	25	7
Private Consumption % GDP 1982	-12	-28	-1	1	-81*	-3	-9
Growth in Imports 1970-82	0	6	-9	17	14	86*	24
Growth in Private Consumption 1970-82	12	-14	30	-20	15	81*	22
Terms of Trade 1982	6	47	-3	-12	30	47*	3
Private Consumption % GDP 1960	-36	-17	8	21	1	25	21*
Public External Debt % GDP 1970	16	5	-5	0	16	23	58*

Table 31

Oblique Rotated Factor Pattern: Economic Variables, Military Expenditures As % Of GNP, Group II Countries

Variables	Factors 1	2	3	4	5	6
	Factors Affecting Total External Debt 1982	Factors Affecting External Debt Exports 1982	Factors Affecting Military Expenditures % GNP 1981	Growth in Public Consumption	Public External Debt 1970	Growth in Exports
Interest Payments on External Debt 1982	100*	-6	0	10	-14	-5
Gross Inflow Public Loans 1982	100*	0	2	16	-4	7
Total Public External Debt 1982	91*	-1	3	4	15	3
Public External Borrowing Commitments 1982	92*	3	-11	34	10	1
Repayment of Principal on External Loans 1982	75*	2	-1	-40	16	16
Repayment of Principal on External Loans 1982	69*	-12	14	20	18	-14
Debt Service % of Exports 1982	68*	9	28	-11	-5	-14
Interest Payments on External Debt 1970	67*	2	-13	-16	28	9
Reserve + Balance 1982	54*	-40	10	-21	15	-13
Current Account Balance 1970	-88*	-5	12	-14	-7	-26
Public Borrowing Commitments/Exports 1982	10	84*	-22	1	1	-19
Average Maturity of External Debt 1982	-41	78*	-7	1	27	6
Public External Debt/Exports 1982	26	69*	-1	-42	20	-15
Gross Inflow Public External Loans/ Exports 1982	51	66*	7	-29	-11	-8
Terms of Trade 1982	42	-48*	1	32	27	-20
Gross Domestic Product 1982	44	-58*	-47	-10	21	9
Gross National Product per Capita 1982	3	-71*	13	-34	-28	-3
Gross International Reserves 1982	-13	-72*	-11	-15	29	-25
Gross International Reserves 1970	-1	-79*	-14	-44	0	12
Public Consumption % GDP 1960	-24	-8	78*	15	27	14
Public External Debt % GDP 1982	48	24	78*	-5	1	2
Exports as % GDP 1982	5	-25	70*	23	-15	32
Gross Inflow Public Loans/GDP 1982	39	18	69*	9	-20	19
Military Expenditures % GNP 1981	-20	-9	68*	-2	16	63
Public Consumption % GDP 1982	-19	4	57*	-24	-28	15
Current Account Balance 1982	-21	45	47*	-9	18	-7
Private Consumption as % GDP 1982	-20	22	-74*	9	-5	18
Growth in Imports 1970-82	19	9	-14	92*	-6	-9
Growth in Public Consumption 1970-82	0	37	3	81*	7	0
Growth in Private Consumption 1970-82	15	-11	39	70*	10	-20
Net Inflow of Public External Loans 1970	18	4	2	6	92*	-1
Total Public External Debt 1970	17	8	-14	-18	79*	12
Public External Debt % GDP 1970	8	14	37	32	69*	7
Gross Inflow Public Loans 1970	50	3	0	-17	65*	7
Growth in Exports 1970-82	23	-0	18	-40	1	81*
Growth in Exports 1960-70	-4	-7	20	-2	5	80*
Private Consumption % GDP 1960	14	31	-49	19	5	58*

Table 32

Determinants Of Military Expenditures Per Gross National Product, Total Country Sample, Economic Variables

(Standardized Estimates)

Equation	Independent Variables							Statistics		
	PCB	GEDB	GDSB	GNPPER	GDB	PDB	DSGB	r^2	F	DF
1 MEY81=	0.60									
	(5.09)							.351	25.97	48
2		0.68								
		(5.96)						.464	35.43	42
3	0.35	0.51								
	(2.81)	(4.08)						.603	39.31	42
4	0.33	0.48	-0.20							
	(2.71)	(3.86)	(-1.90)					.642	20.34	37
5	0.48	0.50		0.02						
	(4.39)	(4.61)		(0.17)				.714	27.56	36
6	0.43	0.46	-0.24	0.09						
	(4.24)	(4.61)	(-2.55)	(1.02)				.763	25.76	36
7	0.37	0.50		0.22	-0.24					
	(2.76)	(4.60)		(1.25)	(-1.40)			.732	21.14	35
8	0.45	0.43	-0.28	0.10		0.11				
	(4.36)	(4.24)	(-2.83)	(1.15)		(1.20)		.774	21.19	36
9	0.27	0.49	-0.25				0.18			
	(2.20)	(4.04)	(-2.34)				(1.70)	.671	16.84	37

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

Table 33

Military Expenditures Per Gross National Product, Total Country Sample

	Country	Actual	Predicted	Actual/ Predicted	Placement
1.	Ivory Coast	1.330	3.765	.3533	Below
2.	Senegal	2.261	6.364	.3553	Below
3.	Rwanda	1.657	3.932	.4214	Below
4.	Pakistan	5.836	12.210	.4780	Below
5.	Bolivia	2.875	5.940	.4840	Below
6.	Car	2.068	4.081	.5067	Below
7.	Ecuador	2.252	3.521	.6396	Below
8.	Sudan	2.878	4.497	.6399	Below
9.	El Salvador	3.323	5.147	.6456	Below
10.	Kenya	3.056	4.018	.7606	Below
11.	Korea	6.677	8.300	.8045	Below
12.	Argentina	2.646	3.197	.8277	Below
13.	Chile	3.716	4.441	.8367	Below
14.	Paraguay	1.395	1.655	.8417	Below
15.	Morocco	7.152	7.992	.8903	Below
16.	Thailand	3.811	4.164	.9152	Below
17.	Liberia	3.871	4.079	.9490	Below
18.	Malawi	2.970	3.102	.9519	
19.	Uruguay	3.149	3.293	.9563	
20.	India	3.117	3.251	.9588	
21.	Peru	4.787	4.920	.9729	
22.	Dominican Rep.	1.500	1.489	1.0074	
23.	Ghana	.5071	.5017	1.0106	
24.	Tanzania	5.304	4.595	1.1542	Above
25.	Philippines	2.209	1.912	1.1553	Above
26.	Tunisia	2.731	2.319	1.1777	Above
27.	Zimbab	6.554	5.292	1.2385	Above
28.	Israel	20.274	16.342	1.2406	Above
29.	Malaysia	6.023	3.964	1.5194	Above
30.	Costa Rica	0.5978	0.3207	1.7457	Above
31.	Indonesia	3.476	1.938	1.7936	Above
32.	Jordon	21.720	11.815	1.8383	Above
33.	Kuwait	3.865	1.135	3.4052	Above
34.	Venezuela	1.555	0.2805	5.5439	Above

Notes:

Based on regression equation: MEY81= 0.27PCB + 0.49GEDB - 0.25GDSB + 0.18DSGB
(2.20) (4.04) (-2.35) (1.71)

Below = Countries whose Actual is less than 95% of Predicted value

Above = Countries whose Actual is greater than 105% of Predicted value

country sample, the predicted value for Venezuela was quite low, less than 20 percent of the actual value.

A step wise regression for group I countries, Table 34, indicate they follow a similar pattern to that observed in the analysis of total military expenditures and military expenditures per capita. These countries tend to resort to public external sources (PDB) and governments deficits (GDB) for the financing of military expenditures. The gross domestic product per capita (GNPPER) is also statistically significant while gross domestic savings as a percentage of gross domestic product in 1982 is not. As with the other measures of military expenditures, there is a large improvement in the correlation coefficient for group I countries over that obtained in the total sample.

A step wise regression for group II countries, Table 35, again differs from those in group I in that external debt and government deficits do not play a significant role in measuring the amount of military expenditures as a percentage of gross national product. The share of government expenditures in gross domestic product in 1981 (GETYB) and the share of military expenditures in the total government budget along with gross domestic savings as a percentage of gross domestic product in 1982 which has a negative sign, account for nearly 90 percent of the flucuations in military expenditures as a percentage of gross domestic product.

Table 34

Determinants Of Military Expenditures Per Gross National Product, Group I Countries Economic Variables

(Standardized Estimates)

Equation	Independent Variables						Statistics		
	PCB	GEDB	GNPPER	GDSB	GDB	PDB	r^2	F	DF
1 MEY81=	0.65								
	(4.61)						.423	21.23	30
2	0.42	0.40	0.28						
	(4.50)	(3.81)	(3.21)				.903	61.84	23
3	0.44	0.34	0.32	-0.11					
	(4.82)	(2.99)	(3.57)	(-1.45)			.912	49.52	23
4	0.19	0.43	0.34		-0.26				
	(2.18)	(5.28)	(4.94)		(-3.86)		.949	82.56	22
5	0.37	0.33	0.20	-0.08		0.20			
	(4.04)	(3.18)	(2.06)	(-1.25)		(2.02)	.928	46.94	23

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

Table 35

Determinants Of Military Expenditures Per Gross National Product, Group II Countries' Economic Variables

(Standardized Estimates)

Equation	Independent Variables				Statistics		
	GETYB	GEDB	GDSB	GNPPER	r^2	F	DF
1 MEY81=	0.62						
	(2.99)				.301	8.95	15
2		0.70					
		(3.45)			.491	12.58	14
3	0.48	0.58					
	(3.10)	(3.71)			.718	15.31	14
4	0.43	0.44	-0.54				
	(4.27)	(4.16)	(-5.03)		.899	29.70	13
5	0.49	0.57		-0.03			
	(2.93)	(3.32)		(-0.20)	.719	9.40	14

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

A comparison of actual values versus predicted values using equation 4 from Table 35 is shown in Table 36. The predicted values show a great improvement over those for the total country sample with Venezuela being within 8 percent of the actual value.

In summary the basic regression equation for military expenditures as a percentage of gross national product shows the following differences by sample group:

	PCB	GEDB	GNPPER	GDSB	DSGB	PDB	GDB
Total	+	+	0	-	+	0	0
Group I	+	+	+	0	0	+	-
Group II	+	+	0	-	0	0	0

Figure 13 - Summary Of Regression Equation For Military Expenditures As A Percentage Of Gross National Product

Notes: + = Statistically Significant With A Positive Sign At The 95% Level
- = Statistically Significant With A Negative Sign At The 95% Level
0 = Statistically Insignificant

The fourth measure of military expenditure examined was the share of military expenditures in the total government budget. This was analyzed using the total country sample,

Table 36

Military Expenditures Per Gross National Product, Group II Countries

	Country	Actual	Predicted	Actual/ Predicted	Placement
1.	Rwanda	1.657	4.746	.3491	Below
2.	Spain	1.990	3.342	.5955	Below
3.	Indonesia	3.476	5.168	.6726	Below
4.	Malaysia	6.023	7.898	.7626	Below
5.	Argentina	2.646	2.933	.9021	Below
6.	Thailand	3.811	4.111	.9270	Below
7.	Venezuela	1.555	1.674	.9289	Below
8.	Korea	6.677	7.111	.9390	Below
9.	Jordon	21.720	19.335	1.1234	Above
10.	Brazil	.6699	.5904	1.1346	Above
11.	India	3.117	2.499	1.2473	Above
12.	Philippines	2.209	.8667	2.5487	Above
13.	Kuwait	3.865	1.494	2.5870	Above

Notes:
Based on regression equation: MEY81= 0.43GETYB - 0.55GDSB + 0.44GEDB
(4.27) (-5.03) (4.16)
Below = Countries whose Actual is less than 95% of Predicted value
Above = Countries whose Actual is greater than 105% of Predicted value

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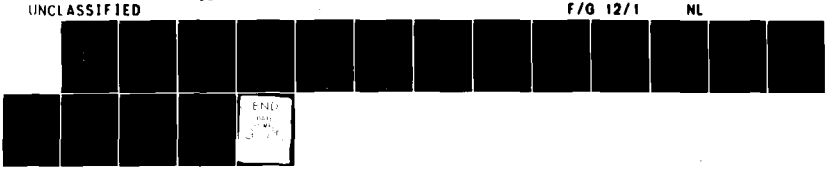

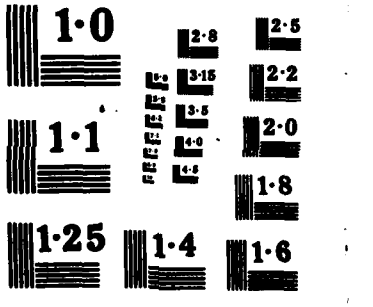
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1·8
1·6

followed by a similar analysis of group I and group II countries.

The factor results for the total country sample, Table 37, show that this measure of military expenditures loads fairly high on one factor, export growth. It however, has little correlation with other main trends in the data.

The group I countries, Table 38, again load heavily on factor 2, one which includes a number of debt variables. These variables are the total external public debts in 1970 and 1982, and several measures of the inflow of external loans. The gross national product per capita is also included in this factor.

The group II countries, Table 39, load heavily on factor 5. As with other measures of military expenditures, this factor does not contain debt variables. Factor 5 consists mainly of the effects of export growth.

A step wise regression for the total country sample, Table 40, indicated that patterns in military expenditures in the government budget tend to be rather stable when taken as a share of the total government budget, i.e. the share of military expenditures in the total government budget for 1971 (GEDA) was highly significant in explaining the level of military expenditures in the total government budget for 1981 (GEDB).

Table 37

Oblique Rotated Factor Pattern: Economic Variables, % Defense Expenditure In Total Government Budget, Total Sample

Variables	Factors 1 Factors Facilitating Public Consumption	2 Factors Influencing Foreign External Debt 1982	3 Foreign Reserves	4 Factors Influencing Share Of Military Expen. In Gvt. Budget	5 Debt Ratio 1982	6 Growth in Private Consumption
Gross Inflow Public Loans a % of GDP 1982	99*	0	-1	-5	-4	6
Resource Balance as % of GDP 1982	96*	1	-8	-6	-4	5
Gross Inflow Public Loans as % of Exports 1982	98*	14	7	-20	7	-3
Public Borrowing Commitments as % of Exports 1982	98*	2	-5	-8	-2	5
Public Debt as % of Exports 1982	97*	0	-6	-6	-6	7
Growth in Public Consumption 1970-82	83*	6	-8	-3	-13	12
Public Consumption as % of GDP 1982	82*	-6	11	26	33	-8
Public Consumption as % of GDP 1960	70*	-13	-7	26	7	17
External Public Debt as % of GDP 1970	68*	5	-26	20	16	-2
Terms of Trade 1982	-78*	21	12	7	14	11
Private Consumption as % of GDP 1982	-83*	-13	-23	-5	-30	-9
Private Consumption as % of GDP 1960	-91*	10	-28	21	-7	-1
External Public Debt 1982	-1	98*	-2	0	7	14
Interest Payments on External Public Debt 1970	9	94*	2	-12	-1	-29
Repayment of Principal on External Public Loans 1970	8	94*	2	-12	10	-28
Gross Inflow Public Loans 1982	-4	93*	-3	-8	10	24
Public Borrowing Commitments 1982	-6	92*	4	-4	-1	31
Gross Inflow Public Loans 1970	6	91*	5	17	-4	-22
Interest Payments on Public Debt 1982	-2	90*	-1	-15	19	22
Repayment of Principal on Public Loans 1982	-3	86*	8	1	21	19
External Public Debt 1970	9	74*	2	23	-23	-31
Net Inflow Public External Loans 1970	4	73*	7	37	-15	-14
Current Account Balance 1970	7	88*	15	-27	-4	-15
Gross International Reserves 1982	4	-9	93*	4	-30	7
Gross International Reserves 1970	5	4	91*	1	-18	-2
Gross National Product Per Capita 1982	-1	-11	83*	10	27	-6
Gross Domestic Product 1982	1	50	52*	-7	-33	5
Average Maturity of External Public Debt 1982	23	-10	-59*	21	-29	3
Current Account Balance 1982	-2	-16	-81	-3	3	1
Percent of Defense Expenditures in Total Government Expenditures 1981	-7	8	0	74*	0	0
Export Growth 1960-70	-4	-1	0	69*	4	23
Export Growth 1970-82	-21	25	24	42*	10	-3
Public External Debt as % of GDP 1982	37	1	-23	12	65*	-10
External Debt Service as % of GDP 1982	-8	35	-15	-18	61*	-20
Exports as % of GDP 1982	7	-11	21	37	55*	22
Growth in Private Consumption 1970-82	21	4	-3	10	-4	76*
Growth in Imports 1970-82	43	19	3	12	-23	68*

Table 38

Oblique Factor Pattern: Economic Variables, % Defense Expenditures In Total Government Budget, Group I Countries

Variables	Factors 1 Factors Facilitating Public Consumption	2 Factors Influencing Share of Military Expend. in Gvt. Budget	3 Servicing External Debt 1982	4 Export Position	5 External Public Debt 1982	6 Growth in Exports
Gross Inflow Public Loans as % of GDP 1982	100*	-2	4	-4	-7	4
Public Borrowing Commitments as % of GDP 1982	100*	-3	3	-3	-9	1
Gross Inflow Public Loans as % of GDP 1982	100*	-3	5	0	-9	0
Public Debt as % Exports 1982	98*	-3	0	-3	-7	-2
Resource Balance 1982	95*	-18	20	6	-1	-1
Growth in Public Consumption 1970-82	93*	-14	-6	0	12	4
Growth in Imports 1970-82	80*	0	-19	-4	13	37
Public Consumption as % of GDP 1982	77*	36	-6	28	2	-6
Public Consumption as % of GDP 1970	76*	15	-9	18	-22	-1
External Public Debt as % of GDP 1970	76*	18	-9	11	-5	-16
Private Consumption as % of GDP 1982	-79*	0	0	-32	-17	-17
Terms of Trade 1982	-92*	3	-16	20	22	13
Private Consumption as % of GDP 1960	-97*	-7	-4	8	0	0
Gross International Reserves 1982	4	98*	6	-18	-6	22
Net Inflow Public External Loans 1970	4	95*	5	10	-5	-9
Gross National Product Per Capita 1982	-10	92*	-6	4	-12	33
Percent of Defense Expenditures in Total Government Expenditures 1981	3	91*	-43	-16	1	-1
External Public Debt 1970	9	85*	31	1	-2	-12
External Public Debt 1982	-5	82*	-14	8	37	-4
Gross Inflow External Loans 1970	6	81*	35	10	-1	4
Gross International Reserves 1970	2	74*	26	-15	9	13
Interest Payments on External Debt 1982	-3	72*	0	0	45	2
Repayment of Principal on Public Loans 1982	-1	63*	0	3	60	-3
Gross Inflow Public Loans 1982	2	56*	23	8	49	0
Gross Domestic Product 1982	-6	46*	29	-41	18	-31
Current Account Balance 1982	-10	-75*	-25	21	-3	-28
Current Account Balance 1970	10	-89*	40	-10	25	0
Repayment of Principal on Public External Loans 1970	7	12	90*	4	9	10
Interest Payments on External Debt 1970	7	16	89*	-1	7	0
Growth of Private Consumption 1970-82	46	5	-57*	-5	28	33
Exports as % of GDP 1982	0	2	15	88*	16	18
Public External Debt as % of GDP 1982	18	-16	4	83*	16	1
Growth in Exports 1960-70	-4	8	-28	69*	-	-17
External Debt Service as % of Exports 1982	-21	1	1	14	75*	2
Public External Borrowing Commitments 1982	5	53	22	3	53*	-2
Growth in Exports 1970-82	-21	42	38	30	-26	42*
Average Maturity of External Public Debt 1982	32	-16	-29	11	-22	41*

Table 39

Oblique Factor Pattern: Economic Variables, % Defense Expenditures In Total Government Budget, Group II Countries

	Factors				
	1	2	3	4	5
Variables	Factors Influencing External Public Debt	Determinants of Growth in Public Consumption	Factors Influencing Share of Public Consumption	Growth in Imports	Factors Influencing Share of Military Expend. in Govt. Budget
External Public Debt 1982	99*	2	-5	7	-4
Gross Inflow Public Loans 1982	96*	5	8	18	-8
Interest Payments on External Public Debt 1982	94*	-1	11	10	-16
Repayment of Principal on Public External Loans 1970	92*	-11	2	21	-3
Public External Borrowing Commitments 1982	92*	12	-9	15	-13
Repayment of Principal on Public External Loans 1982	87*	-5	-1	-39	14
Debt Service on Public External Debt as % of Exports 1982	84*	-7	28	-18	-12
Interest Payments on External Public Debt 1970	84*	-3	-18	-14	4
Gross Inflow Public Loans 1970	79*	0	-19	-9	15
Resource Balance as % of GDP 1982	69*	-51	-6	-15	1
Gross Inflow Public Loans as % of Exports 1982	67*	56	24	-29	-15
Terms of Trade 1982	60*	-48	-31	41	-16
Current Account Balance 1970	-88*	-7	11	-10	-19
Public Borrowing Commitments as % of Exports 1982	5	92*	-6	-7	-24
Average Maturity of Public External Debt 1982	-41	87*	-15	-6	1
Current Account Balance 1982	-16	80*	-16	26	0
Average Annual Growth in Public Consumption 1970-82	-7	71*	-2	61	-10
Public External Debt as % of Exports 1982	50	59*	-6	-47	-9
Gross International Reserves 1982	-25	-73*	-40	9	-21
Gross International Reserves 1970	-9	-83*	-20	-26	0
Gross National Product per Capital 1982	-5	-81*	8	-5	-19
Gross Inflow Public Loans as % Exports 1982	18	11	72*	30	10
Public External Debt as % of GDP 1982	64	15	66*	12	15
Public Consumption as % of GDP 1982	-22	2	65*	-10	-1
Exports as % of GDP 1982	-4	-24	62*	49	28
Gross Domestic Product 1982	42	-49	-55*	-13	-4
External Public Debt 1982	49	-7	-57*	-15	17
Private Consumption as % GDP 1982	-43	45	-62*	1	-3
Net Inflow Public External Loans 1970	57	6	-64*	17	13
Growth in Private Consumption 1970-82	17	-1	13	88*	-14
Growth in Imports 1970-82	10	37	-3	80*	-13
Public Consumption as % of GDP 1982	-16	-3	23	66*	26
Public External Loans as % GDP 1970	39	9	-24	55*	38
Percent of Defense Expenditures in Total Government Expenditures 1981	-13	14	5	7	86*
Growth in Exports 1970-82	12	-14	8	-21	81*
Growth in Exports 1960-70	-17	-2	6	12	75*
Private Consumption % of GDP 1960	1	48	-37	-8	54*

Table 40

Determininants Of The Share Of Military Expenditures In Government Budgets, Total Sample

(Standardised Estimates)

Equation	Independent Variables						Statistics		
	GEDA	RDTB	PDB	GETB	GEOB	YPRS	r^2	F	DF
1 GEDB=	0.87 (8.98)						.763	80.71	26
2	0.90 (9.86)	0.20 (2.21)					.803	49.03	26
3	0.90 (10.07)	0.20 (2.33)	-0.13 (-1.50)				.821	35.12	26
4	0.85 (5.60)			-0.16 (-1.04)			.635	16.58	21
5	0.91 (10.45)	0.20 (2.35)			-0.15 (-1.84)		.828	37.01	26
6	0.89 (9.73)					0.19 (2.06)	.799	47.69	26
7	0.91 (10.52)				-0.18 (-2.07)	0.21 (2.42)	.830	37.56	26

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

A comparison of the actual versus the predicted values in Table 41 is somewhat disappointing. Venezuela's actual value is only 70 percent of the predicted value.

The step wise regression for group I countries, Table 42, indicates there are two variables of significance in determining the share of military expenditures in the total government budget. These variables are the share of the military expenditures in the total government budget for 1971 (GEDA) and other government expenditures as a percentage of the total government budget (GEOB). These variables account for 76 percent of the observed fluctuations in military expenditures.

Two sets of regressions were performed on the group II countries in an attempt to see if factors that affect the share of military expenditures in the total government budget of Venezuela can be predicted without the use of past shares of the budget. The first set, equations 1 through 4 on Table 43 contain the 1971 share of military expenditures in the total government budget (GEDA) while the second set, equation 5 on Table 43 does not.

With regard to the first set, past shares of government expenditures allocated to defense (GEDA) together with the share of total government expenditures in gross national product (GETYB) and the share of private consumption in gross domestic product account for around 93 percent of the fluctuations in the defense expenditures share of the budget.

Table 41

Share Of Military Expenditures In Government Budgets, Total Sample

	Country	Actual	Predicted	Actual/ Predicted	Placement
1.	Ghana	3.700	9.678	.3823	Below
2.	Brasil	3.400	8.818	.3856	Below
3.	Costa Rica	2.600	6.321	.4113	Below
4.	Mexico	2.500	5.290	.4726	Below
5.	Sudan	13.200	22.183	.5951	Below
6.	Venezuela	3.900	5.535	.7046	Below
7.	Tansania	11.200	14.832	.7551	Below
8.	Spain	4.400	5.588	.7874	Below
9.	Paraguay	13.200	15.592	.8466	Below
10.	Malaysia	15.100	17.760	.8502	Below
11.	Thailand	20.600	23.875	.8628	Below
12.	Philippines	14.200	16.068	.8837	Below
13.	Tunisia	8.300	9.280	.8944	Below
14.	Syria	37.700	41.719	.9037	Below
15.	Kuwait	9.900	9.776	1.0025	
16.	Chile	12.000	11.632	1.0316	
17.	Israel	39.800	37.896	1.0505	Above
18.	Uruguay	12.900	11.507	1.1211	Above
19.	Bolivia	22.700	18.456	1.2300	Above
20.	Korea	35.200	28.345	1.2418	Above
21.	Argentina	11.400	9.134	1.2481	Above
22.	Uganda	34.500	27.321	1.2628	Above
23.	Peru	13.800	10.800	1.2778	Above
24.	Kenya	10.700	7.537	1.4197	Above
25.	Morocco	16.200	10.692	1.5152	Above
26.	Malawi	8.400	5.532	1.5184	Above
27.	El Salvador	16.800	7.043	2.3853	Above

Notes:
Based on regression equation:
GEDP= 0.92GEDA - 0.18GEOB + 0.21XPRS
(10.52) (-2.06) (2.42)
Below = Countries whose Actual is less than 95% of Predicted value
Above = Countries whose Actual is greater than 105% of Predicted value

Table 42

Determinants Of The Share Of Military Expenditures In Government Budgets, Group I Countries

(Standardised Estimates)

Equation	Independent Variables			Statistics		
	GMDA	GMOB	RDTB	r^2	F	DF
1 GMDB=	0.84					
	(5.73)			.701	32.82	15
2	0.91	-0.27				
	(6.55)	(-1.93)		.767	21.49	15
3	0.96	-0.29	0.16			
	(6.73)	(-2.01)	(1.17)	.792	15.19	15

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

Table 43

Determinants Of The Share Of Military Expenditures
In Government Budgets, Group II Countries

(Standardised Estimates)

Equation	Independent Variables								Statistics		
	GEDA	GEYTB	PRB	SSPB	PDB	DSGA	PDPA	RDTB	r^2	F	DF
1 GEDB=	0.94 (8.56)								.890	73.41	10
2	1.04 (10.24)	-0.23 (-2.25)							.933	55.86	10
3	0.89 (8.53)	-0.36 (-2.85)	-0.25 (-1.99)						.935	29.08	9
4	0.89 (15.73)	-0.33 (-4.79)	-0.17 (-2.39)	0.23 (3.91)					.984	77.76	9
5					-0.45 (-3.49)	-0.53 (-3.51)	0.53 (3.84)	0.68 (4.92)	.857	15.04	14

Notes: See text for definition of variables
( ) = t statistic
r^2 = correlation coefficient
F = F statistic
DF = degrees of freedom

Equation 5 indicates that over 85 percent of the fluctuations in the defense expenditures share of the total government budget for 1981 can be accounted for without resorting to the use of past budget shares. The variables that are statistically significant are: (1) the external debt in 1982 (PDB); (2) the debt service to gross domestic product in 1970 (DSGA); (3) the total external debt as a percentage of gross domestic product in 1970 (PDPA); and (4) the central government domestic taxes as a percentage of total revenues.

This would lend evidence to the theory that one can predict the fluctuations in the defense expenditures share of the total government budget without using past shares of the budget as a variable, although the results would not be as good as if past shares were included.

A comparison of actual versus predicted values in Table 44 shows that the predicted value for Venezuela is approximately 12 percent greater than the actual value.

In summary, the basic regression equation for the share of military expenditures in the total government budget is shown in Figure 14.

Table 44

Share Of Military Expenditures In Government Budgets, Group II Countries

	Country	Actual	Predicted	Actual/ Predicted	Placement
1.	Costa Rica	2.600	5.941	.4376	Below
2.	Dominican Rep.	8.900	14.341	.6206	Below
3.	Trinidad	2.000	2.907	.6880	Below
4.	Brazil	3.400	4.454	.7634	Below
5.	Chile	12.000	13.538	.8864	Below
6.	Bolivia	22.700	22.371	1.0147	
7.	Argentina	11.400	11.062	1.0306	
8.	Nicaragua	11.000	10.475	1.0501	Above
9.	Peru	13.800	12.873	1.0720	Above
10.	Uruguay	12.900	11.992	1.0757	Above
11.	El Salvador	16.800	15.225	1.1034	Above
12.	Venezuela	3.900	3.457	1.1281	Above
13.	Ecuador	11.900	9.292	1.2700	Above
14.	Paraguay	13.200	9.265	1.4247	Above
15.	Mexico	2.500	1.705	1.4663	Above

Notes:
Based on regression equation:

$$\text{GEDB} = \underset{(-3.49)}{-0.46}\text{PDB} - \underset{(-3.51)}{0.53}\text{DSGA} + \underset{(3.84)}{0.53}\text{PDPA} + \underset{(4.93)}{0.69}\text{RDTB}$$

Below = Countries whose Actual is less than 99% of Predicted value
Above = Countries whose Actual is greater than 105% of Predicted value

	GEDA	RDTB	GETYB	GEOB	PDB	PDPA
Total	+	+	0	-	0	0
Group I	+	0	0	-	0	0
Group II	+	+	-	0	-	+

Figure 14 - Summary Of Regression Equation For The Share Of Military Expenditures In The Total Government Budget

Notes: + = Statistically Significant With A Positive Sign At The 95% Level
- = Statistically Significant With A Negative Sign At The 95% Level
0 = Statistically Insignificant

V. CONCLUSION

The analysis of the various measures of military expenditures has shown several significant patterns. Most of the observed differences in military expenditures can be explained exclusively with economic variables. Analysis of the patterns of military expenditures for developing countries, as a total country sample, does not produce as clear a pattern as that obtained from analyzing countries in seperate groups based on economic environments. As shown in Table 20, Venezuelan defense spending can be accurately predicted with the use of economic variables.

With this in mind, the analysis has demonstrated that Venezuelan military expenditures are not typical when compared to less developed countries as a whole. However, grouping Venezuela in a sample of countries, experiencing a similar economic environment, produces results that indicate Venezuela's military expenditures are largely functions of that environment. They are also typical of countries experiencing similar structural economic constraints.

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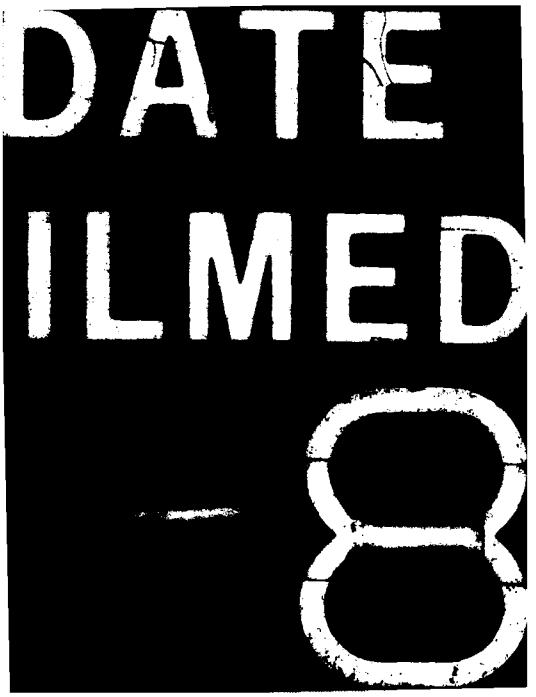
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