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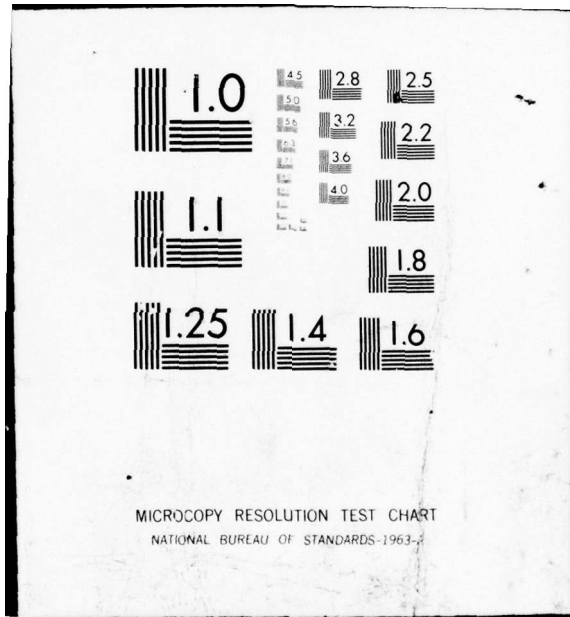
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UNITED STATES MILITARY AID AND
RECIPIENT NATION DEFENSE EXPENDITURES:
A QUANTITATIVE ANALYSIS

⑨ Doctoral thesis,

by

⑩ DAVID LEE PEARCE

B. A., Princeton University, 1960

M. A., Syracuse University, 1975

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ABSTRACT OF DISSERTATION

Submitted in partial fulfillment of the requirements for
the degree of Doctor of Philosophy in International Relations
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Michael K. O'Leary

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ABSTRACT

This dissertation explores the impact of United States military aid upon the defense expenditures of the recipient nations. A review of the literature concerning post-World War II military assistance efforts of the United States reveals that many scholars contend that military aid has a positive effect upon recipient nation defense spending. This positive effect can be attributed either to a direct linkage between military aid and defense expenditures or to an indirect linkage involving the nature of the regime of the recipient nation. In this latter case, military aid is seen as creating or strengthening military regimes within the recipient nations. In turn, these regimes, by their inherent nature, tend to increase defense spending.

United States military aid is defined as the value of all grant aid, thus excluding military sales and the various military advisory programs from consideration. Defense expenditures are defined as the value of all recipient nation expenditures for national security. Three additional variables, relating to the most obvious domestic and international environmental factors capable of effecting defense expenditures, also are introduced into the research model. These additional variables are external threat, nature of the regime, and brevity or "newness" of independence.

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nations for this study are the 72 countries which have received United States military aid during the period from 1950 through 1972.

As a first step, defense expenditures are regressed on the four independent variables for all the case nations. The actual data used is the value for each of the variables, averaged over all of the 23 years of the time period under consideration. The results indicate only a weak positive direct relationship between military aid and defense expenditures. No relationship is indicated between military aid and the nature of the regime as well as between the nature of the regime and defense spending, thus apparently precluding any indirect linkage.

Next, these same statistical procedures are applied to four subgroupings of the case nations, resulting in significantly different effects. No relationship between military aid and defense spending is discovered for the NATO nations, a moderate positive relationship is indicated for the "forward defense nations" (those countries situated on the Sino-Soviet peripheries), an extremely strong positive relationship is indicated for the Latin American nations, and a moderately strong positive relationship is indicated for the remaining less developed nations.

Finally, the statistical tests again are repeated for all of the case nations combined and for each of the four subgroups using data for four separate subperiods within the 23 year time frame under consideration. For each of these

subperiods, the same relationships described above are indicated; however, a trend in recent years towards a lessening of the strength of each of the positive relationships is shown.

The various results of this study are analyzed both in the context of an abstract international policy impact model and in the context of the applied process of United States military policy-making. In summary, factors such as the proportion of total distributed military aid received by each of four subgroupings of case nations, the proportion of total defense expenditures again generated by each of the four subgroups, the long-term trends of both military aid and defense spending, and the effects of the other independent variables are considered.

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Michael A. Kirby

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PREFACE

This dissertation is an attempt to explore the impact of United States military aid upon the defense expenditures of the recipient nations. The selection of this particular topic is prompted by two personal considerations. First, as a graduate student pursuing a doctorate in international relations, the global theme of this study has considerable academic appeal. Second, as a professional Army officer with fifteen years of service, the military nature of this study bears a close relationship to my past career experiences and to my future career goals. It is an attempt to combine abstract research in the field of international relations with applied research in the field of military policy-making.

Since its inception, the United States military assistance program has experienced a considerable amount of controversy. The rationale and justification for military aid distribution has been debated publicly in Congressional chambers and privately in academic circles. Its critics and its proponents have been both vocal and adamant. This dissertation, however, attempts neither to support nor to condemn this particular governmental activity. Hopefully, instead, an impartial and quantitative measurement of the impact of military

aid upon recipient nation defense spending, free from any normative judgements, emerges as the end result.

The cooperation of the Defense Security Assistance Agency was instrumental in gathering much of the data analyzed on the following pages and is greatly appreciated. I also wish to thank Professor Michael K. O'Leary for his many hours of thoughtful guidance as I struggled through this project and Professor William D. Coplin for first introducing me to the exciting field of international relations. Finally, I wish to thank all my fellow graduate students for their endless patience in enduring my excessive preoccupation with this task.

David L. Pearce
Major, United States Army
Syracuse, New York

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CHAPTER I

PURPOSE

The purpose of this dissertation is to explore the impact of United States military aid upon the defense expenditures of the recipient nations. Hopefully, an empirical study of this sort will generate results relevant at several theoretical levels. First, some broad insights into the international effects of public policies possibly can be discerned. Second, some order among the myriad and diverse scholarly propositions relating to the impact of military assistance can be established. Third, some quantitative methodologies for governmental policy-making can be demonstrated. In the order listed above, this chapter will briefly outline the applicability of this dissertation topic to each of these three general areas.

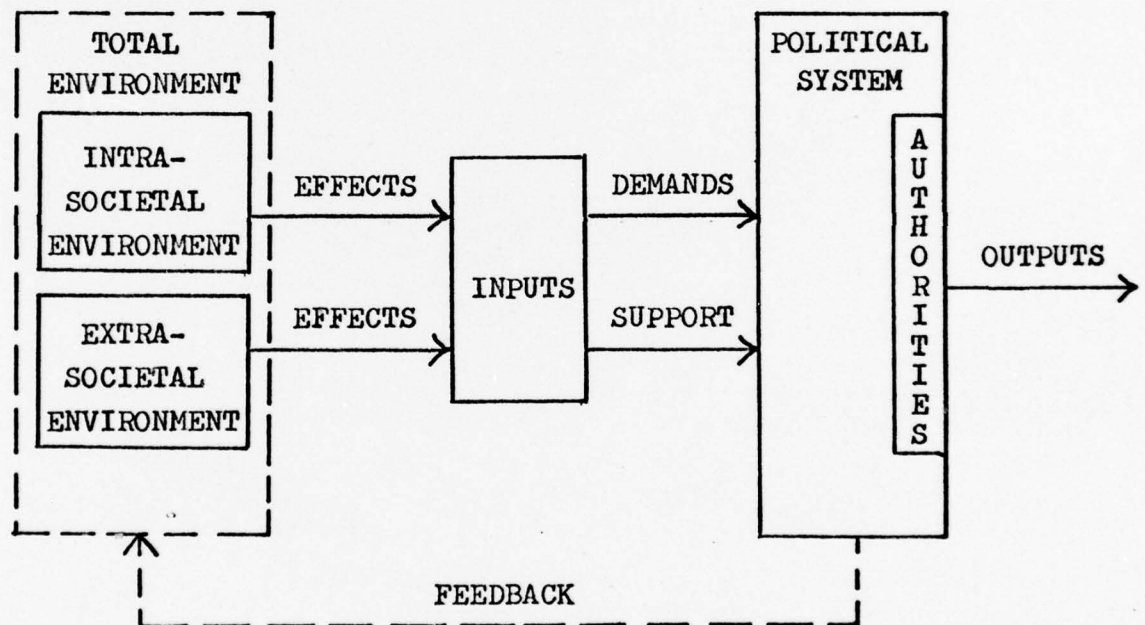
Policy science long has been recognized as a rewarding area of study. However, the majority of research within this field has tended to focus primarily upon the policy formulation process itself. Using the political system models of Dye¹ or Easton,² scholars have looked at the effects of political, economic, sociological, and other

¹Thomas R. Dye, Understanding Public Policy, (Englewood Cliffs, New Jersey: Prentice-Hall, 1973), p. 5.

²David Easton, A Framework for Political Analysis, (Englewood Cliffs, New Jersey: Prentice-Hall, 1965), p. 110.

environmental factors upon the authoritative policy-makers. Figure 1 below indicates a simplified version of Easton's 1965 model.

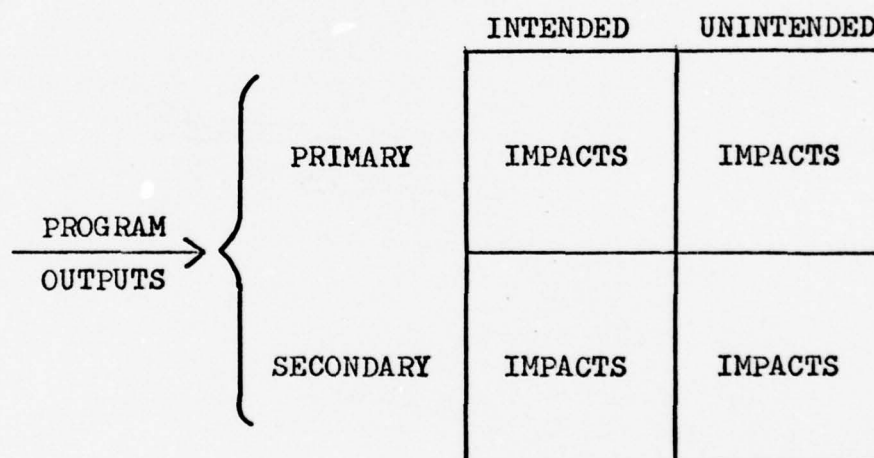
Figure 1. Easton's Political System Model³



³Ibid.

Recently, however, policy scientists have turned their attention to studying the effects of policy outputs. Cook and Scioli suggest that "a neglected aspect of policy research has been the systematic analysis of policy impacts."⁴ Coleman offers the argument that "a coherent and self-conscious methodology for studying impacts of public policy must be developed if the social sciences are to function as policy sciences."⁵ Cook and Scioli note that policy impacts, both primary and secondary, often achieve unintended as well as intended objectives, and offer a "program impact model" as shown in Figure 2 below.

Figure 2. Cook and Scioli's Program Impact Model⁶



⁴Thomas J. Cook and Frank P. Scioli, Jr., "A Research Strategy for Analyzing the Impacts of Public Policy," Administrative Science Quarterly 17 (1972): 328-339.

⁵James S. Coleman, Policy Research in the Social Sciences, (Morristown, New Jersey: General Learning Press, 1972), p. 1.

⁶Cook and Scioli, "A Research Strategy," p. 331.

Policy science also has tended to concentrate upon domestic policies and has generated limited research within the field of international relations. Part of this neglect of international policy science can be attributed to the hesitation of many scholars to recognize the existence of international policies themselves. However, Robinson and Snyder offer two distinct types of policy-making -- national and international -- and then define this latter process as "decentralized interaction among relatively independent hierarchies of leaders."⁷ Going one step further, O'Leary and Coplin argue that "just as there is also such a thing as public policy within a nation-state, there is also such a thing as transnational public policy" and then proceed to define this transnational public policy as "any set of actions by governments that protects a given distribution of values, changes the allocation of values, or otherwise affects the lives of people in more than one state."⁸ Similar concepts of international and transnational policies are presented by Madecki, Hawden and Kaufman, Alger, and

⁷James A. Robinson and Richard C. Snyder, "Decision-Making in International Politics," in International Behavior, ed. Herbert C. Kelman (New York: Holt, Rinehart, and Winston, 1966), p. 451.

⁸Michael K. O'Leary and William D. Coplin, An Introduction to Transnational Policy Analysis (Mimeographed, Syracuse University, 1974), p. 1.

Schwebel.⁹ Finally, it also can be argued that, with the increasing amount of interdependence within the global community, even domestic public policies, especially those formulated by the "super powers," often have substantial impact upon other nations of the world.

However, what little work has been done in the field of transnational or international policy science once again has been devoted mainly to the analysis of the policy-making process as opposed to the study of policy impacts. Thus, Snyder, Bruck and Sapin, and Robinson and Snyder discuss the effect of the external and internal setting upon the nation-state decision-maker; Braybrooke and Lindblom offer a typology of decision-making; Verba explores rational and non-rational decision-making; and Hilsman describes the political pressures upon policy-makers.¹⁰

In summary then, most research in policy science has tended to focus (1) upon policy formulation as opposed to

⁹B. E. Madecki, Establishment of the International Finance Corporation and United States Policy (New York: Praeger Publishers, 1957); John G. Hawden and J. Kaufman, How United Nations Decisions are Made (Leyden, Sijthoff, 1960); Chadwick F. Alger, "Non-Resolution Consequences of the United Nations and the Effects on International Conflict," Journal of Conflict Resolution 7 (1962), 50-78; and Stephen M. Schwebel, ed., The Effectiveness of International Decisions (Leyden: Sijthoff, 1971).

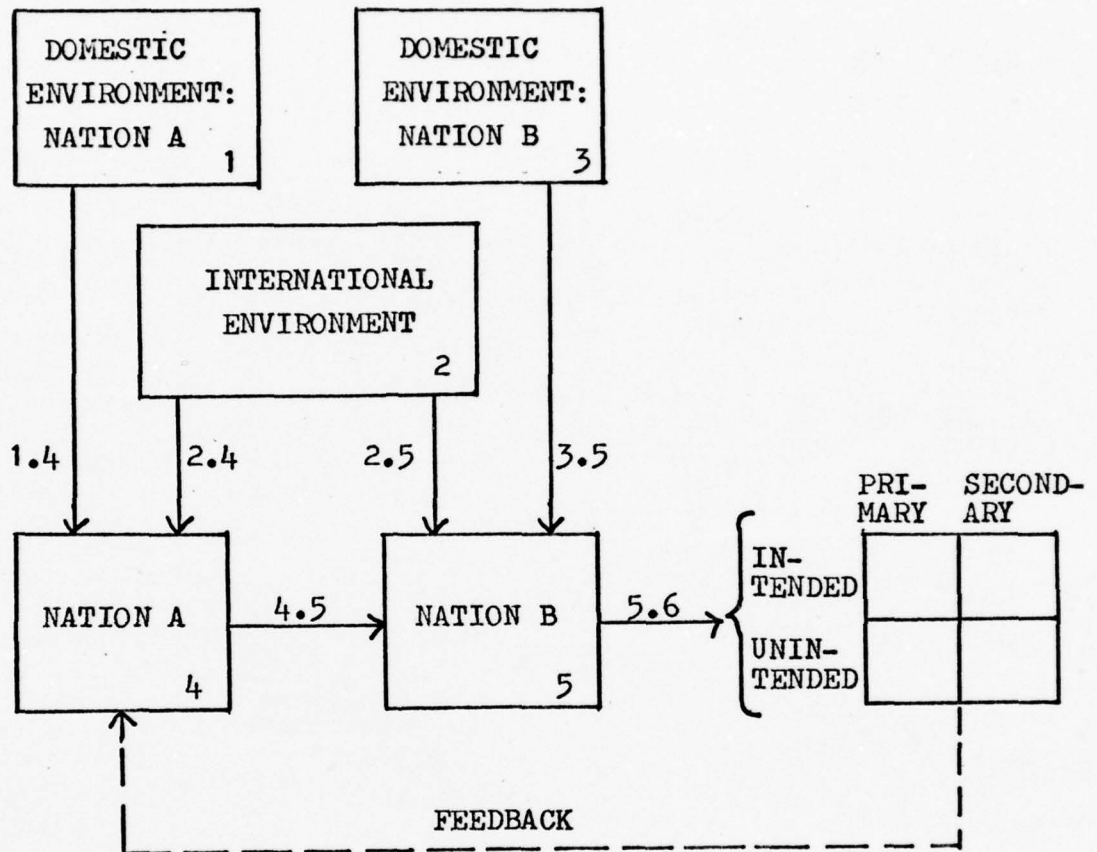
¹⁰Richard C. Snyder, H. W. Bruck, and Burton Sapin, Foreign Policy Decision-Making: An Approach to the Study of International Politics (New York: The Free Press, 1962); Robinson and Snyder, "Decision-Making"; David Braybrooke and Charles E. Lindblom, A Strategy of Decision (New York: The Free Press, 1972); Sidney Verba, "Assumptions of Rationality and Non-Rationality in Models of the International System," in The International System: Theoretical Essays, ed. Klaus Knorr and Sidney Verba (Princeton, New Jersey: Princeton University Press, 1961); and Roger Hilsman, To Move a Nation (New York: Doubleday and Company, 1964).

policy impacts and (2) upon domestic policies as opposed to international policies. What appears to be needed, therefore, is more research in the specific area of international policy impact analysis. In order to provide a conceptual framework for this research, a model of the international policy process is offered in Figure 3 on the following page. This schematic attempts to fuse Easton's political system model and Cook and Scioli's impact model and then apply this combined model to the international environment.

In order to understand the concepts implied in the international policy process model, it is necessary at this point to define some specific terms and relationships. First, policy outputs, represented by path 4.5 in the model, can be defined as the immediate, tangible, and measurable results of the policy-making process. Implicit within this definition is the assumption that the authoritative policy-makers also exercise authority over the agencies or forces actually generating the outputs. Thus, all policy outputs are considered intentional from the viewpoint of the policy-makers.

Second, policy inputs, represented by paths 1.4, 2.4, 2.5, and 3.5 in the model, can be defined as the impact or effect of domestic and international factors upon the authoritative policy-makers. It is important to realize that the resultant policy output of one nation (path 4.5) often becomes, in effect, another international input into the policy-making process of another nation.

Figure 3. The International Policy Process Model.



Third, policy outcomes, represented by path 5.6 in the model, can be defined as the long-range effects of a policy output once it has impacted upon its target and has caused this target to take some specific action. Thus, this specific action is both an output of the target nation as well as an outcome as viewed by the policy-makers of the original

policy. If this action meets the objective of the policy-makers of the original policy, then it can be defined as an intended outcome. However, since, in the international environment, the authoritative policy-makers do not exercise authority over the political systems that convert their policy outputs into policy outcomes, the results often can lead to unintended outcomes. Finally, both intended and unintended outcomes further can be divided into primary and secondary outcomes in order to identify the major results of the policy outputs as opposed to other minor but related effects.

For the sake of conceptual simplicity, Figure 3 illustrates a dyadic model. Implicit within the design, however, is the understanding that a more realistic international policy process model would include similar linkages between a larger number of nation-states as well as between international governmental and non-governmental organizations. Additional linkages, representing transnational relationships, also could be envisioned between subnational interest groups in each nation. Furthermore, the feedback linkage shown in Figure 3 is intended to indicate a dynamic model as opposed to a static model. Through this feedback linkage, primary and secondary, intended and unintended policy outcomes, in turn, become policy inputs to the original policy-makers, thus initiating new policy outputs.

In addition to being an explanatory vehicle, a systemic model, such as the international policy process model, can

serve as a conceptual framework for subsequent empirical study. The various linkages suggest potentially profitable areas of research into the quantitative measurement of the international relationships between political systems. However, even within a simplified model, such as the one shown in Figure 3, the sheer number of complex relationships involving numerous interrelated variables precludes any reliable empirical study of the total system at this time. It is clear that one of the principal aims of research in international relations is to gain knowledge about general phenomena at as broad and universal a level as possible. Graham states that "one objective (of political analysis) is to make a concept as general as one can so that it will encompass as many kinds of phenomena as possible without loss of precision."¹¹ However, the operationalization requirements involved in most empirical research techniques usually narrow the scope of consideration from broad and general theories to specific hypotheses of more limited applicability. As a result, many of the more complex and universal theories of international relations, in actuality, are built upon a foundation of more limited and specific empirical studies.

The first basic purpose of this study is to explore empirically only one of the many relationships suggested by the international policy process model. Since little attention has been given previously to the specific field of

¹¹George J. Graham, Methodological Foundations for Political Analysis (Waltham, Massachusetts: Xerox College Publishing, 1971), pp. 61-62.

international policy impact analysis, linkages 4.5 and 5.6 of Figure 3 seem to indicate an especially rewarding area of research. This study, therefore, attempts to quantitatively measure the impact of an international policy output of one nation upon the policy-making processes and subsequent policy outputs of other nations. The specific task is to explore the effect of United States military aid upon the defense expenditures of the recipient nations.

Policy outputs can be considered at various related levels of generality. Thus, high-level long-range United States national defense policies, formulated by the executive and legislative branches, produce middle-level policy outputs in the form of broad guidance to the various subordinate departments of the government. Whether this guidance fits Robinson and Snyder's definition of international policies or the O'Leary and Coplin definition of transnational policies, given the global role of the United States, many of these broad outputs, such as alliance participation, stationing of American forces abroad, and cooperation in defense-related research and development efforts, clearly have substantial international impact. This middle-level policy guidance is then converted into specific short-range policy outputs by the appropriate implementing agencies. It is at this final level that these international policy outputs become suitable for quantitative analysis, such as, in the field of military assistance, the measurement of the actual amount and distributional pattern of aid. And it is also at this level that

the international linkages between the United States and the specific recipient nations can physically be identified.

It is also apparent that defense expenditures are valid examples of policy outputs of the nations receiving United States military aid. The expenditures represent the results, at the quantitatively measurable level, of conscious decisions made by authoritative policy-makers involving the allocation of a portion of a nation's resources for a specific governmental purpose. It is difficult to conceive that these decisions can be made without considering, along with numerous other factors, the influx of United States military assistance. The determination of the extent of the impact of this aid upon defense spending, of course, remains the basic purpose of this dissertation.

In addition to the desire to enter the relatively unexplored field of international policy impact analysis, two other considerations prompted the selection of the particular subject of this study. The first of these is the large number of empirically untested and sometimes contending theories relating military aid to recipient nation defense spending. Most of these theories have evolved as a result of the claims and counterclaims by the supporters and the critics of the United States military assistance program. The desired effects of military aid, from the viewpoint of its proponents, will be discussed shortly; however, at this point the various theories concerning the military aid-defense spending relationship suggested by the critics of the program need to be examined.

Although the United States military aid program has produced a large number of vocal opponents, the theories of these critics can be grouped into three basic schools of thought. The first of these can be classified as the "spiraling arms race theory," which contends that, in addition to encouraging the recipient nations to spend inordinate amounts of their own resources for military purposes, United States military aid also prompts nonrecipients to attempt to gain similar military assistance, either from the United States or from other nations, in a sort of "one-upmanship action." While actually a proponent of the United States military assistance program, Hovey supports the first part of this argument by admitting the "deliveries under the military assistance program have probably influenced at least some . . . nations to maintain military establishments larger than they would have maintained in the absence of this assistance."¹² In turn, Lieuwen supports the second part of the same argument by contending that "it seems incontrovertible that the aid program exacerbates endemic rivalries and mutual suspicions . . . and gives rise to arms races."¹³ A similar theory is proposed by Stanley Meisler who argues that "in most cases, military aid . . . has tended . . . to force weak nations into devoting huge percentages of their vital capital to armaments . . . and to promote arms races between their

¹²Harold Hovey, United States Military Assistance (New York: Frederick A. Praeger, 1965), p.66.

¹³Edwin Lieuwen, Arms and Politics in Latin America, (New York: Frederick A. Praeger, 1961), p. 229.

governments."¹⁴ Finally, Liska points out an additional spiraling effect between defense expenditures and United States military aid and claims that "one of the built-in tendencies (of the foreign aid program) is for foreign aid to breed more aid."¹⁵ The basic underlying premise of all of these theories contends that the ultimate effect of United States military aid is a greater increase in recipient nation military spending than would have occurred in the absence of this aid.

The second school of thought relating United States military aid to recipient nation defense expenditures centers around the concept of "military regime." In one aspect, this theory is similar to the arms race theory, that is, military aid is assumed to have a strong positive impact upon the inordinate defense spending of the recipient nations. However, in this case, the impact is an indirect effect of military assistance and, furthermore, it is applicable only to those nations with military-controlled or military-oriented regimes. This indirect impact is seen as a two step process. First, since the military leaders use this military assistance to further consolidate and strengthen their leadership position, a positive relationship is expected between United States military aid and the military orientation of the regime. Second, due to the inherent military nature of these

¹⁴Charles Wolf, Jr., United States Policy and the Third World (Boston: Little, Brown and Company, 1967), p. 96.

¹⁵George Liska, The New Statecraft (Chicago: University of Chicago Press, 1960), p. 29.

regimes, a similar positive relationship between the strength of the regime and government defense spending is also argued. Thus, Lieuwen suggests that "where the civilian and military elements are vying for power, United States military aid could unwittingly tip the balance in favor of the Armed Forces,"¹⁶ and Wolf contends that "political institutions would become more tightly controlled and authoritarian as military aid grows -- or more generally, as the size of the military establishment and its claim on resources increases."¹⁷ This indirect linkage between United States military aid and the defense expenditures of nations with military regimes is also suggested by Senator Fullbright, who first asks "how do you explain this unusual coincidence that countries where you put the most military aid are the very ones who have lost their civilian governments?" and then states "that the countries where there have been the biggest (local) military programs all seem to turn up with a military dictatorship."¹⁸

The third school of thought concerning the military aid-defense expenditure relationship is based on the concept of "national prestige" and theorizes that United States military assistance has little or no effect upon the defense spending of the recipient nations. Instead, most of these nations, especially those who have recently achieved their independence, are committed to a program of increasing their armed forces as a type of "international status symbol"

¹⁶Lieuwen, Arms and Politics, p. 230.

¹⁷Wolf, United States Policy, p. 94.

¹⁸Ibid., p. 95.

regardless of whether or not they receive aid. Walterhouse strongly supports this theory stating that "it is clear that the underdeveloped countries are going to have armed forces; national prestige will not permit otherwise."¹⁹ A Stockholm International Peace Research Institute study concludes that "the possession of an army serves both as a mark of nationhood and as a symbol of national unity above ethnic allegiances."²⁰ Additional insight is provided by Kemp who argues that "the motives behind the extensive demand for arms are mixed: some countries merely want prestige symbols; others face genuine security needs; still others want arms for both prestige and military security."²¹ And finally, Frank, taking a more universal view, states that "as long as there are rivalries between nations or within nations, there will be a demand for weapons."²²

As stated earlier, most of these theories outlined above have not been subjected to rigorous empirical testing. Benoit and Wolf have considered the impact of all military assistance upon the economic growth of underdeveloped nations; Tanter and Wolf have examined the relationship between United States military aid and political development

¹⁹ Harry F. Walterhouse, A Time to Build (Columbia, South Carolina: University of South Carolina Press, 1964), p. 6.

²⁰ Stockholm International Peace Research Institute, The Arms Trade with the Third World (New York: Humanities Press, 1971), p. 602.

²¹ Geoffrey Kemp, "Arms Traffic and Third World Conflicts," International Conciliation 577 (1970): 6.

²² Lewis Frank, The Arms Trade in International Relations (New York: Frederick A. Praeger, 1960), p. 20.

in the recipient nations; McGowan has explored United States and Soviet military aid to Sub-Sahara African nations and their subsequent interaction in the international environment; Rowe has studied the linkages between United States military assistance and coups d'etat; and, Singer and Sensenig have related United States military aid to the United Nations voting activity of the recipient nations.²³ While military aid has been the independent variable in each of these studies, none of them have focused specifically upon defense spending as the dependent variable.

One of the principal causes for the limited research in this field has been the previous lack of reliable data relating to defense expenditures of the individual nations of the world. No data within the discipline of international relations can be considered completely accurate; however, a minimum threshold of reliability exists below which quantitative application of any data is useless. Unfortunately, worldwide defense expenditures have usually fallen below this

²³Emile Benoit, Defense and Economic Growth in Developing Countries (Lexington, Massachusetts: Lexington Books, 1973); Wolf, "Military Assistance Programs," in Defense Management, ed. Stephen Enke (Englewood Cliffs, New Jersey: Prentice-Hall, 1967); Raymond Tanter, "Towards a Theory of Conflict Behavior in Latin America," in The Politics of International Organization, ed. Robert Cox (New York: Praeger Publishers, 1970); Wolf, United States Policy; Patrick J. McGowan, "Africa and Non-Alignment: A Comparative Study of Foreign Policy," International Studies Quarterly 12 (1968): 262-295; Edward Thomas Rowe, "Aid and Coups d'Etat," International Studies Quarterly 18 (1974): 239-253; and, Joel David Singer and B. Sensenig, III, "Elections within the United Nations: an Experimental Study Utilizing Statistical Analyses," International Organization 17 (1963): 901-925.

reliability threshold. The major problems in accurately measuring defense spending not only include the technical difficulties of accounting for inflationary trends, currency exchange rates, and the varying statistical procedures of each nation, but also involve the more difficult task of determining the delineation between military and nonmilitary spending within national budgets. Loftus points out that often there are hidden expenses within a national budget that are devoted to military spending and cites, as examples, pensions for retired military personnel and the operational cost of nonmilitary functions, such as national airlines, that, in actuality, are run by a branch of the armed forces.²⁴ Lieuwen supports this argument and concludes that, in many less developed nations, funding allocated to the Ministry of the Interior or money provided for such areas as public works and communications, are, in fact, a type of military spending since the armed forces are usually responsible for operating these segments of the government.²⁵

One source of data on world-wide defense expenditures that can be considered reasonably reliable is the annual report of the United States Arms Control and Disarmament Agency, which first was published in 1966.²⁶ However, the data in these reports are limited to 1961 or later. A more recent and comprehensive measurement of nation-by-nation

²⁴Joseph E. Loftus, Latin American Defense Expenditures (Santa Monica, California: Rand Corporation, 1968), p. 4.

²⁵Lieuwen, Arms and Politics, p. 36.

²⁶United States Arms Control and Disarmament Agency, World Military Expenditures (Washington: Government Printing Office, annual reports from 1966 to 1972).

defense expenditures from 1950 to the present can be found in the Stockholm International Peace Research Institute's annual yearbook.²⁷ The exhaustive research by this group appears to have been conducted with sufficient discipline to lift their measurements of world-wide defense spending above the reliability threshold for empirical research. Thus, using this SIPRI data, this study is attempting to gather empirical evidence concerning United States military aid and recipient nation defense expenditures for the additional purpose of establishing some possible order among the varied and contending theories outlined above.

The last consideration prompting the direction of this dissertation involves the delineation between pure and applied research. Coleman suggests that "it is important . . . to distinguish sharply between a methodology that has as its philosophic base the testing and development of theories, and a methodology that has as its philosophic base a guide to action."²⁸ Wolf adds that there are two types of policy research: heuristic, which "sharpens and deepens penetrations on policy issues," and operational, which "focuses on specific policies or programs."²⁹ Finally, Dror states that "fusing pure and applied research, policy science is concerned mainly with improving policy-making."³⁰ All of these authors

²⁷Stockholm International Peace Research Institute, World Armaments and Disarmament: SIPRI Yearbook (New York: Humanities Press, 1972).

²⁸Coleman, Policy Research, p. 2.

²⁹Wolf, United States Policy, pp. 181-182.

³⁰Yehezkey Dror, Ventures in Policy Sciences (New York: American Elsevier, 1971), p. 6.

seem to imply that a major difference between pure and applied research in policy science is the ability of policy-makers to physically act upon the results of the latter approach. In more general terms, applied international policy science research is concerned not only with understanding the relationship between the variables involved in the research model, but in using this understanding for future manipulation of the independent variables in order to modify their effects upon the dependent variable.

While the basic purpose of this study is to search for linkages between policy outputs of two or more nations within the theoretical framework of the international policy process model, the independent variable, United States military aid, seems to suit itself especially well to the area of applied research. It is logical to assume that the military assistance policy-makers formulate desired objectives around which the distribution of military aid is planned. Thus, any quantitative techniques which measure whether or not United States military aid actually achieves these desired objectives can be of practical use for future policy-making.

The expressed objectives of military aid, as stated by the United States national defense policy-makers, is to strengthen the security of the noncommunist nations of the world against the threat of communist expansion, and thus ultimately to strengthen the security of the United States itself. Von Vorys analyzed 57 speeches by 45 members in the United States House of Representatives during foreign aid debates in 1963 and 1964 as well as 14 major statements by

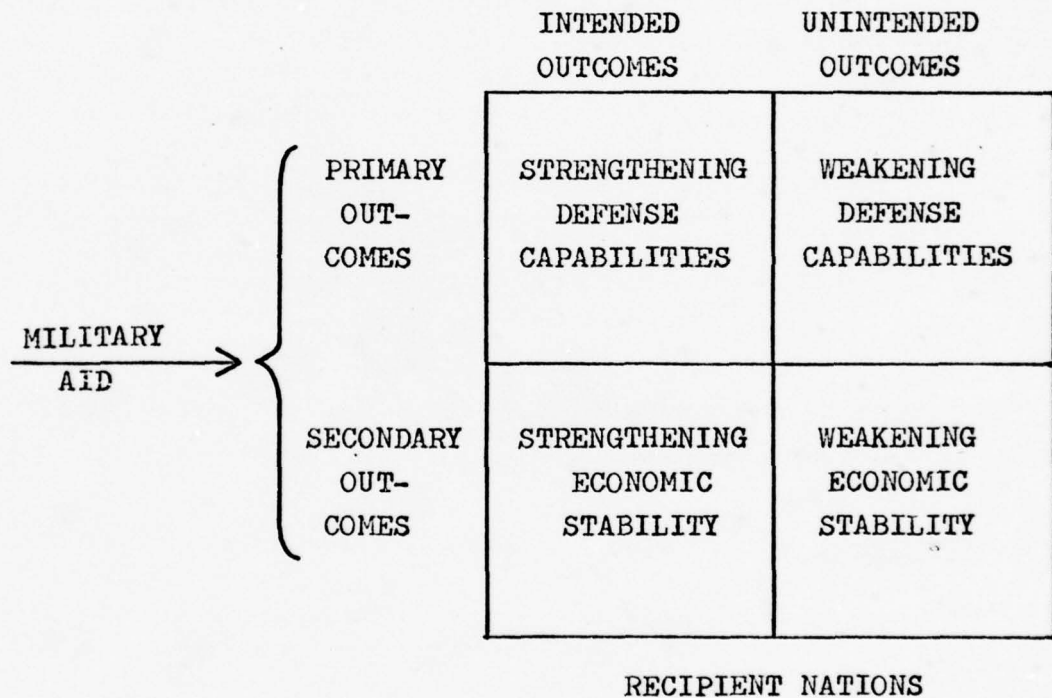
Kennedy, Johnson, Rusk, and McNamara and compiled the following six objectives of United States foreign aid, including military assistance, as perceived by these leaders: (1) to promote the security of the United States, (2) to counter the world-wide communist threat, (3) to stimulate economic development within the recipient nations, (4) to advance the welfare and security of the free world, (5) to cultivate friendship for the United States, and (6) to assist the newly independent nations.³¹

Returning to the policy impact model of Cook and Scioli, discussed earlier, it is possible to categorize both the primary and secondary, intended and unintended objectives or outcomes of the United States military aid program based on von Vorys' analysis. The primary intended outcome, from the viewpoint of the military planners, is to strengthen the military capabilities of the recipient nations. However, if, as some critics claim, military aid tends to strengthen only the political power of the military leadership at the expense of national security, then the ultimate weakening of the recipient nation's defense capabilities must be considered as a primary unintended outcome. Similarly, again from the viewpoint of these same military planners, any tendency for military assistance to strengthen the economic stability of the recipient nation would be considered as a secondary intended outcome. Finally, if, as other critics claim, the real effect of military aid is to force the recipient nation

³¹Karl von Vorys, The Political Dimensions of Foreign Aid, Research Monograph Series (Philadelphia: Foreign Policy Research Institute, University of Pennsylvania, 1967) pp. 63-64.

into a spiral of military spending at the expense of its economy, then the weakening of economic stability must be included as a secondary unintended outcome. Figure 4 below illustrates this possible cross-classification of the outcomes of United States military aid, improvising upon Cook and Scioli's policy impact model.

Figure 4. Military Aid Policy Impact Model



There are numerous approaches to the evaluation of defense capabilities, to include consideration of such measurable data as defense spending and military manpower or such abstract data as weapon sophistication and national

resolution.³² Modelski argues that "the index of military power most convenient . . . are world military expenditures," and that "expenditure data are particularly servicable because they are the only way of bringing under one common denominator the multifarious facets and aspects of mobilized military strength."³³ Thus, if military manpower is measured by the subsistence cost of a nation's standing forces, if the state of weaponry is measured by the price of a nation's investment in defense related research and development, and, if national resolve is measured by the percentage of a nation's GNP that its leaders are willing to devote to military spending, then total defense expenditure becomes a relatively accurate index of total military power.

Even though military spending appears to be a valid indicator of defense capabilities when considered by itself, increases or decreases in these expenditures, when combined with military aid, cannot be viewed as conclusive evidence that the United States military assistance program's primary intended or unintended outcomes are being achieved. As will be seen later, the majority of United States military aid has

³²Karl W. Deutsch, "On the Concepts of Politics and Power," Journal of International Affairs 21 (1967): 332-341; Kemp, Classification of Weapons Systems and Force Designs in Less Developed Country Environments (Cambridge, Massachusetts: Arms Control Project, Center for International Studies, Massachusetts Institute of Technology, 1970); Klaus Knorr, Military Power and Potential (Lexington, Massachusetts: D. C. Heath and Company, 1970); and George Modelski, World Power Concentrations: Typology, Data, Explanatory Framework (Morristown, New Jersey: General Learning Press, 1974) are a few of the works addressing this subject.

³³Modelski, World Power Concentrations, pp. 5-6.

consisted of grants of equipment and weapons. Therefore, an increase in defense spending by a recipient nation, as a result of the distribution of this grant military aid, would tend to indicate that the nation had increased its armed forces, and thus its defense capabilities, in order to utilize both the newly acquired equipment and weapons as well as the equipment and weapons already within its possession. However, a decrease in defense spending, as a result of the receipt of grant military aid, would not necessarily mean a similar decrease in defense capabilities. It is possible that the amount of this decrease, based on the elimination of the need for the recipient nation to purchase equipment and weapons that instead were being provided by the United States, could be less than the value of this grant aid received. In this case, even with an actual decrease in military spending, the defense capability of the recipient nation would experience an overall net increase. Thus, the actual amount of increase or decrease in defense expenditures must be considered in relationship to the actual amount of increase or decrease in military aid for each recipient nation.

A detailed country-by-country analysis of the relationship between military aid and defense expenditures, to include consideration of the actual amount of each variable as well as the numerous other specific factors suggested above, is beyond the scope of this study. In addition, consideration of the secondary impact of United States military

assistance upon economic stability also is not included, but is left for future research. However, the attempt to measure the general direction and strength of the overall relationship between United States military assistance and recipient nation defense spending is a feasible first step towards identifying those areas within the military aid program where additional, more detailed applied research would provide the most potential rewards.

CHAPTER II

RESEARCH DESIGN

Both United States military aid and recipient nation defense expenditures can vary between all the individual nations at any given time as well as within each individual nation over a specific period of time. Therefore, the most profitable method of gathering data for these two variables is in the form of a matrix, with one axis representing each of the recipients of military aid and the other axis representing each year that this aid has been distributed. Each cell within this matrix contains the annual amount of military aid and the annual amount of defense expenditures for one nation for one year. Figure 5 on the following page is a schematic representation of such a data matrix.

Figure 5 also suggests two basic quantitative approaches that can be used to measure the relationship between the military aid and the defense expenditure data contained within the matrix: time-series (longitudinal) techniques or cross-nation (cross-sectional) techniques. Each of these approaches is flexible and contains similar methodological variations.

The most specific technique within the time-series approach is to correlate annual military aid and annual defense expenditures for one individual recipient nation

Figure 5. Schematic Data Matrix

		TIME-SERIES					
		Indi- vidual- Nation Time- Series				Aggregate- Nation Time- Series	
		$\underbrace{\hspace{10em}}$ $N_1 \quad N_2 \quad N_3 \dots N_n$					
C R O S S- N A T I O N	One-Year Cross- Nation	$\left\{ \begin{array}{l} Y_1 \\ Y_2 \\ Y_3 \\ \cdot \\ \cdot \\ \cdot \\ Y_i \end{array} \right.$	a/e	a/e	$a/e \dots a/e$	$\Sigma a / \Sigma e$	
	Y_2		a/e	a/e	$a/e \dots a/e$	$\Sigma a / \Sigma e$	
	Y_3		a/e	a/e	$a/e \dots a/e$	$\Sigma a / \Sigma e$	
	\cdot		\cdot	\cdot	$\cdot \dots \cdot$	\cdot	
	\cdot		\cdot	\cdot	$\cdot \dots \cdot$	\cdot	
	Y_i		a/e	a/e	$a/e \dots a/e$	$\Sigma a / \Sigma e$	
	Aggregate- Year Cross- Nation	$\left\{ \begin{array}{l} \Sigma a / \Sigma e \quad \Sigma a / \Sigma e \quad \Sigma a / \Sigma e \dots \Sigma a / \Sigma e \end{array} \right.$					

N = Recipient Nations

Y = Years

a = Military Aid

e = Defense Expenditures

over a given period of time (Individual-Nation Time-Series in Figure 5). While this procedure permits maximum consideration of the various factors that are unique to the selected nation, the results lack the more general relevance desired in this dissertation. In fact, it is this type of detailed individual-nation research, as suggested in Chapter I, that would be the logical followup to the more general and exploratory research being conducted here.

At the opposite or least specific end of the spectrum of the time-series approach is the Aggregate-Nation Time-Series technique, as shown in Figure 5. Here, the annual military aid and annual defense expenditures of all the recipient nations are summed for each year and the aggregate annual results correlated over a given period of time. While this methodology explores the general relationship between total annual military aid and total annual defense expenditures, it is possible, if the results of all of the individual-nation time-series range from strongly positive to strongly negative relationships, that the aggregate result of such a range of relationships would be highly misleading. However, the validity of the aggregate-nation time-series results can be ascertained relatively easily if these results are compared with a number of carefully selected individual-nation time-series studies.

The second basic quantitative approach, that of the cross-nation technique, is similar in many respects to the time-series approach. In this case, the most specific methodology is to correlate annual military aid and annual

defense expenditures for one individual year over all the individual recipient nations (One-Year Cross-Nation in Figure 5). However, the selection of the year, similar to the selection of the nation in the case of the individual-nation time-series approach, becomes especially critical and again tends to narrow the overall relevance of the results.

The most general cross-nation approach is to sum or average the annual military aid and annual defense expenditures for each recipient nation over the entire time period being considered and to correlate these aggregate or mean results across all the nations (Aggregate-Year Cross-Nation in Figure 5). Once again, however, it is possible that extreme variations between the results of all the one-year cross-nation correlations could produce a highly artificial aggregate result. Therefore, this technique requires that the aggregate-year cross-nation results be compared with a number of cross-nation studies for selected individual years or groups of years within the overall time period under consideration.

Both the time-series and the cross-nation techniques are extremely flexible. In each approach, the time period and/or the number of nations can be varied. Furthermore, specific groups of nations within the total number of recipients or specific time periods within the total number of years being considered can be selected for cross-comparison. However, in each approach, technical statistical requirements must be considered if serious quantitative analysis is to be attempted.

The most basic requirement to be met, if correlation techniques are to be employed, is that each case must be independent of each other case.¹ Thus, for the time-series approach, the amount of both military aid and defense expenditures for one year for any one nation must be assumed independent from that of any other year for that same nation, while, for the cross-nation approach, the amount of both military aid and defense expenditures for any one nation for any one year must be assumed independent from that of any other nation for that same year.

While it is probable that the defense expenditures of certain individual nations are effected strongly by the defense expenditures of certain other nations, the independence of these expenditures, as well as of military aid, when all the recipient nations are considered together, can be assumed without excessive distortion. However, a similar assumption, in the case of the time-series approach, does not appear as feasible. For instance, in budget planning, including funding for defense, previous years' expenditures quite often play a significant role in determining current projections.

An additional problem involved in the time-series approach is the effect of long-term or secular trends.² While the desired goal of this study is to measure the relationship

¹A good explanation of this requirement can be found in Fred N. Kerlinger, Foundations of Behavioral Research, 2nd ed. (New York: Holt, Rinehart and Winston, 1973), pp. 105-110.

²See both V.O. Key, Jr., A Primer of Statistics for Political Scientists (New York: Thomas Y. Crowell, 1966) and Ted Robert Gurr, Politimetrics: An Introduction to Quantitative Macropolitics (Englewood Cliffs, New Jersey: Prentice-Hall, 1972).

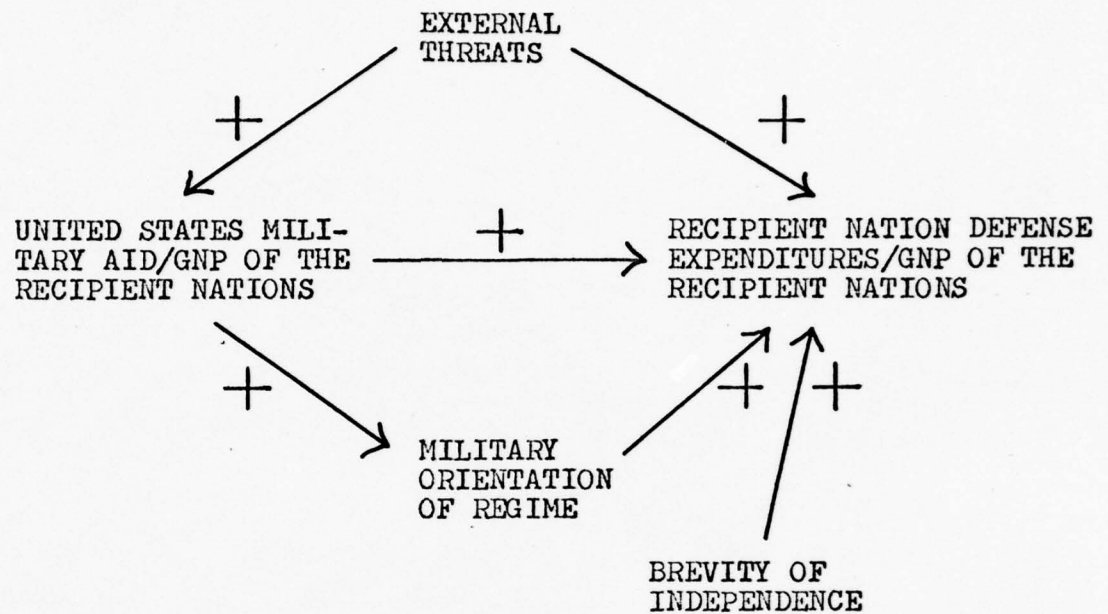
between fluctuations in United States military aid distribution and similar fluctuations in recipient nation defense spending, it is strongly possible that long-term trends in defense expenditures could cloud the results of such measurements. For example, as will be seen later, a long-term, upwards trend in world-wide defense expenditures can be attributed with some certainty to a similar long-term, upwards trend in both gross national product and total government spending for most of the nations of the world.

Based upon these considerations, the primary methodological approach selected is that of the cross-nation techniques. Since, as discussed earlier, this study is an initial foray into a relatively unexplored field of research with the goal of obtaining only general results at this stage, the aggregate-year cross-nation technique is employed. However, additional cross-nation correlations for selected individual years or brief time periods are also considered as part of the analysis of the aggregate correlation results.

In chapter I, an international policy process model was presented and the specific linkages with which this study is concerned were identified. This model, however, is merely a conceptual framework. Therefore, at this point, it is necessary to construct a more detailed research model in order to identify the specific variables and relationships that will be measured using the methodology described above. Figure 6 on the following page illustrates this research model.

The basic path or linkage to be measured in this model is the effect of United States military aid upon the defense

Figure 6. Research Model



expenditures of the recipient nations. Although there are a number of contending theories regarding this effect, the largest group of these theories suggest that this relationship is a positive one, as indicated in Figure 6. Unfortunately, even in a relatively modest research study such as this, a bivariate analysis, while conceptually simple, ignores even the most basic factors operating within the domestic and international environment and thus is subject to serious criticism. The introduction of an excessive number of additional variables increases the risk of encountering

multicollinearity, however, and the possibility that the independent variables are highly intercorrelated and that the correlation results with the dependent variable are therefore unreliable increases significantly.³ Therefore, only a limited number of additional but theoretically relevant independent variables are entered into the research model.

The first of these additional independent variables, external threat, is considered to reduce the chance of a spurious relationship between United States military aid and recipient nation defense expenditures. As seen in Chapter I, the basic purpose of military aid from the viewpoint of the United States policy-makers is to strengthen the defenses of the recipient nations against communist threats. If these threats are perceived by the recipient nations, then it is logical to assume that increased defense expenditures will follow. Furthermore, since these same threats also are perceived by the United States policy-makers, it is probable that the threats will have a similar positive relationship with military aid distribution. Therefore, if a positive relationship between United States military aid and recipient nation defense expenditures is discovered, the possible spurious nature of this relationship must be considered if similar positive relationships also are discovered between each of these variables and external threats.

The second additional independent variable, the military orientation of the regime of the recipient nation, represents

³Gurr, Politimetrics, p. 155; and Kerlinger, Foundations, p. 625.

a possible intervening factor and is suggested by the second group of theories presented earlier. Thus, in addition to or even in the absence of a direct positive relationship between United States military aid and recipient nation defense expenditures, an indirect link could be inferred if increases in military aid strengthen the military control of the recipient governments and, in turn, these stronger military regimes tend to increase defense spending.

The third group of theories presented earlier suggest that newly independent nations tend to spend excessive amounts on armaments for the purpose of initially building an armed force as a display of national prestige. Thus a third additional independent variable, the brevity of independence, unrelated to United States military aid but linked to recipient nation defense spending, is introduced into the research model.

Since cross-nation analysis techniques are to be employed, another factor, the gross national products of the recipient nations, must be considered. A given amount of United States military aid can be assumed to have a greater impact upon a nation with a relatively small GNP than upon a nation with a relatively larger GNP. Likewise, a given amount of defense expenditures by the nation with the smaller GNP cannot be considered the same as a similar amount of defense expenditures by the nation with the larger GNP. This factor could be introduced into the research design as another independent variable. However, unlike the additional

variables outlined above, GNP can be measured in the same terms (i. e. dollar values) as both military aid and defense expenditures. Therefore, for cross-nation comparison purposes, it is simpler merely to express these latter two variables as percentages of the recipient nation's gross national product.

Of the numerous other independent variables that are not considered in the research design, one seems to have the most obvious potential for impact upon both military aid and defense spending. Thus, the reason for its exclusion needs to be explained. As will be seen in the following chapter, the threat of world-wide communist inspired subversion, primarily within the less developed nations, was initially emphasized by the newly elected Kennedy administration in 1961. Consequently, a large portion of military aid after this date was aimed at counter-insurgency operations, especially within the Latin American nations.⁴ Thus, this internal security threat, similar to the external threat discussed earlier, possibly can lead to another spurious relationship between United States military aid and recipient nation defense expenditures. However, this variable is extremely difficult to operationalize since its measurement depends heavily upon the domestic reporting procedures of the individual nations. The reliability of these reporting procedures, especially in the cases of the less developed

⁴Liska, The New Statecraft, p. 68; Hovey, Military Assistance, pp. 56-66; William F. Barber and Neal C. Ronning, Internal Security and Military Power (Columbus, Ohio: The Ohio State University Press, 1966), p. 217; and Frank, Arms Trade, p. 33.

nations, is questionable in many instances. Furthermore, counter-insurgency efforts often fall into the category of paramilitary, police, and economically oriented civic action activities, thus limiting their effects upon actual defense expenditures. In view of these considerations, as well as the problem of multicollinearity raised earlier, internal security threats are not included as an additional independent variable.

The most appropriate statistical tools to measure the various linkages suggested in the research model of Figure 6 as well as to explore the basic relationship between military aid and defense spending appear to be the related techniques of multiple correlation and regression, partial correlation, and bivariate correlation.⁵ First, multiple correlation and regression can test the existence of the suggested linkages and, when standardized regression coefficients or beta-weights are computed, can also assess the relative importance of each independent variable upon the total explained variance in the dependent variable. Second, partial correlation can measure the direct effect of United States military aid upon the recipient nation defense expenditures when the effects of the other variables are all held constant. Third, bivariate correlations between military aid and both external threat and military orientation of regime can explore the possibility of spurious and indirect relationships as discussed earlier.

⁵Key, Primer of Statistics, pp. 147-152; John E. Mueller, ed., Approaches to Measurement in International Relations (New York: Meredith Corporation, 1969), pp. 305-308; Gurr, Politimetrics, pp. 149-156; and Kerlinger, Foundations, pp. 603-656.

CHAPTER III

THE UNITED STATES MILITARY AID PROGRAM

Before proceeding to operationalize the variables outlined in the last chapter, it is necessary at this point to take a somewhat clinical look at the United States military aid program.¹ This summary focuses upon two general considerations. First, a brief outline of the military aid efforts of the United States is presented, with emphasis upon the shifting distributional patterns. This short history becomes helpful in later chapters in the analysis of military aid and defense expenditures in terms of specific geographical regions and specific periods of time. Second, the nature or

¹Most of the information on United States military aid presented in this chapter was compiled from the following governmental sources: Defense Security Assistance Agency, Department of Defense, Foreign Military Sales and Military Assistance Facts (1974); Department of State, Assistance to Greece and Turkey (quarterly reports to Congress from 1947 to 1949); Agency for International Development, The Foreign Assistance Program (annual reports to Congress) and United States Overseas Loans and Grants and Assistance from International Organizations (annual reports to Congress); and Department of Defense and Agency for International Development, Proposed Mutual Defense and Development Programs (annual joint summary presentations to Congress).

Also used extensively was Hovey, Military Assistance, and excellent summary of aid prior to 1965; Robert K. Sawyer, Military Advisors in Korea (Washington: Government Printing Office, 1962); Andrew F. Westwood, Foreign Aid in a Foreign Policy Framework (Washington: The Brookings Institute, 1966); von Vorys, Political Dimensions; Congressional Quarterly Service, Global Defense: U.S. Military Commitments Abroad (Washington: Congressional Quarterly Incorporated, 1969); Kemp, "Arms Traffic"; and Jacob S. Refson, United States Military Training and Advice: Implications for Arms Transfer Policies (Cambridge, Massachusetts: Arms Control Project, Center for International Studies, Massachusetts Institute of Technology, 1970)

components of United States military aid is outlined. This summary helps to shed some light upon the operationalization of this variable in the next section.

The roots of the United States military aid program reach back as far as the 19th century. The first recorded instance of the present day concept of military assistance was in 1888, when three American officers were dispatched as military advisors to Korea. The majority of the remaining pre-World War II military aid programs consisted largely of a number of small military missions established in Latin America. The first large scale United States military assistance efforts came into existence as a result of the outbreak of World War II, the prime examples being the transfer of naval destroyers to Great Britain in 1940 and the Lend-Lease Program from 1941 to 1945.

The United States military assistance program, however, is basically a post-World War II phenomenon, conceived in the early years of the Cold War as a reaction to the growing awareness of the threat of Soviet expansion. As part of the Truman Doctrine, the Greek-Turkish Aid Act of 1947 allocated both military and economic assistance to these two nations for the expressed purpose of supporting the governmental forces in the Greek Civil War and bolstering Turkish defenses against Soviet pressure in the Dardenelles. This Congressionally approved act placed all assistance under the control of the President but failed to delineate between economic and military assistance. Thus, of the initial \$625 million

allocated, \$498 million was distributed for military purposes and, by 1949, over 900 United States military advisors were stationed in the two countries. It was not until the passage of the Economic Cooperation Act in 1948 that a separate agency, the Economic Cooperation Agency, was established solely to administer economic assistance.

Although military assistance to Greece and Turkey was the most publicized early post-war program, it was not the first. One year earlier, in 1946, Congress authorized technical assistance and the dispatch of non-combat naval vessels to China and, in that same year, a military advisory group for that nation was established by presidential action. This was followed by the China Aid Act of 1948, with the first annual allocation of \$123 million of military assistance to aid Chiang Kai-shek in his losing mainland battle with the Chinese Communists. Also in 1946, as a reaction to the Hukbalahaps insurgency, the Philippines Military Assistance Act was approved by Congress, providing for United States sponsored training of Philippine military personnel, the establishment of an American military mission, and the rehabilitation and transfer of approximately \$20 million worth of United States military equipment and supplies. In addition, the pre-war military missions in Latin America and Korea remained in these countries after 1945, with the military advisors in the latter nation assisting in the transfer of \$56 million worth of equipment left by the departing United States regular forces. Within five years, much of this and

subsequent military assistance was to play a major role in the Korean War. Concurrently with the transfer of aid to Greece and Turkey in 1947, United States credit of \$25 million was authorized to Iran for the purpose of purchasing surplus American military equipment, thus signaling the start of the weapon sales program. Finally, in conjunction with the establishment of the NATO alliance in 1949, the Mutual Defense Assistance Program was created, under which the first transfer of massive United States military aid to Western Europe began. This program also consolidated all the existing military assistance programs and placed them under the direction of the State Department.

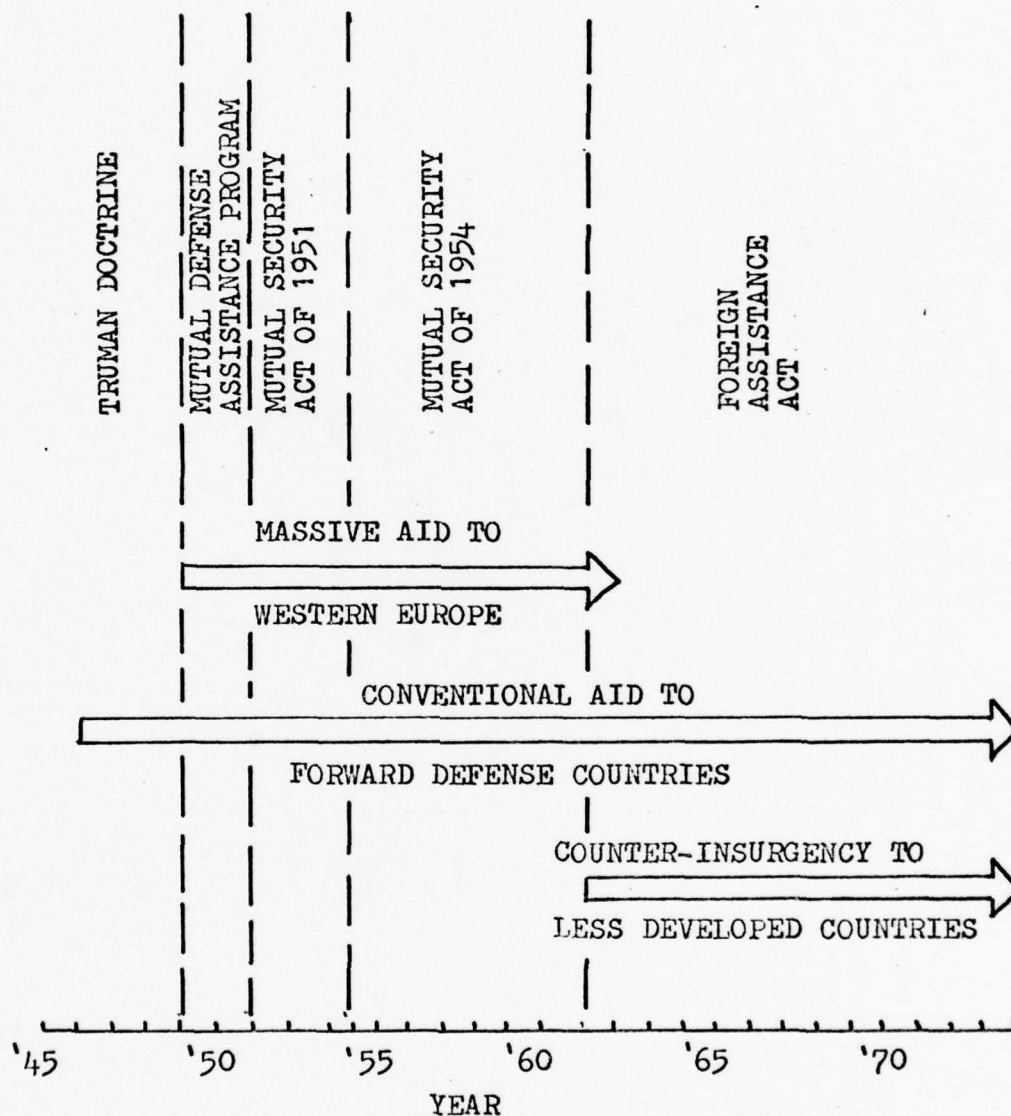
From this early, but far from modest beginning, the United States military aid program, to include military sales, has expanded until, by 1974, 89 nations have received assistance. Of these, 76 have received grant aid while the remaining 13 have been involved only with weapon sales. This expansion was coordinated through a rather bewildering series of legislative actions. The Mutual Security Act of 1951 placed all military assistance under the supervision of the newly created Mutual Security Agency, later changed to the Foreign Operation Administration. This was followed by the Mutual Security Act of 1954, which re-delegated the administration of military aid to the Department of State and the Department of Defense. Then, in 1961, the Foreign Assistance Act once more changed the supervisory agencies and placed all military assistance under the United States Agency for

International Development (USAID), one of the major new agencies created by the Kennedy administration. Currently, the supervision of military aid remains the task of this agency, with assistance provided by the Department of Defense.

The shifting patterns of emphasis on the geographical distribution of military assistance have somewhat paralleled the various changes in the bureaucratic structure of the United States military aid program. These patterns, however, seem to cluster around three groups of nations as shown in Figure 7 on the following page. First, since its post-war inception, the United States military aid program has been concerned with strengthening the conventional military forces of the "forward defense countries" on the Sino-Soviet peripheries. The aid program for most of these countries was instituted shortly after World War II and has continued to the present, with the majority of this assistance consisting of grant aid of conventional weapons.

The second basic group of military aid recipients are the NATO countries of Western Europe. Concurrently with the economic portion of the Marshall Plan, massive military aid was transferred to these nations, beginning in 1949. However, by 1960, it had become quite apparant that, due to the rapid recovery of the economies of the Western European nations, the United States was spending a substantially larger portion of its GNP for defense than were the recipient countries. Consequently, under Congressional pressure, grant military aid was phased out for all of these nations.

Figure 7. Patterns of Military Aid



The third basic group of countries receiving United States military aid are the less developed countries of the world, particularly the Latin American nations. In 1961,

American defense strategy planners perceived the importance of the emerging Third World countries, the threat of communist supported insurgencies within these nations, and the need to shift from the massive retaliation posture of the Eisenhower era to the flexible response posture of the Kennedy administration. As part of this shift in strategy, military assistance to the less developed nations, largely in the form of counter-insurgency support, was begun or increased. This form of United States military assistance also has continued until the present, with the largest portion being distributed in Latin America.

Having looked at a brief history of the United States military assistance effort, it is necessary, as mentioned earlier, to consider what constitutes the nature of military aid itself. Unfortunately, the components of military assistance are nearly as confusing as its history, and the delineation of military aid from economic aid is, at times, nearly as vague as the evolution of the numerous agencies created to administer it.

The largest portion of military assistance is distributed under the United States Military Assistance Program (MAP). Contrary to some public misconception, especially among the critics of the American military aid program, this assistance is not grant aid in the form of cash. Instead, MAP funds are used to purchase United States weapons and supplies, to repair and rehabilitate these items when necessary, and to ship this equipment to the recipient nations.

The nature of this equipment, which is procured either from the original manufacturer or drawn from existing United States military stocks, varies from such sophisticated weaponry as high-performance jet aircraft and missiles to such non-military items as bulldozers and medical supplies. The type of aid distributed depends on such factors as the technical ability of the recipient nations to maintain the items and whether the recipient's defense emphasis is targeted towards external threats from conventional forces or towards internal threats from insurgency forces.

In addition, MAP funds provide military training to members of the armed forces of the recipient nations. Much of this effort, of course, is directed towards training personnel on the use and maintenance of United States equipment that has been provided to these nations. Most of this type of training is conducted within the recipient countries by American military advisors. Other, less technically oriented training, such as military tactics and defense strategy is provided to foreign military personnel within the United States in the established service school system.

The second major component of the United States military assistance effort falls within the category of the Foreign Military Sales Program (FMS). While cash sales of military equipment, either by the United States government or by private American firms directly to foreign governments, does not fit the definition of military aid as such, credit sales by the United States government certainly can be considered a

form of military assistance. These credit sales can be classified into two categories -- credit guaranties and credit assistance. Credit guaranties involve the cash loans to foreign governments by private American firms, usually banks, in order to enable these governments to purchase United States weapons and supplies, with the United States government guaranteeing the total amount of the loans. Credit assistance involves direct sales by the United States government to foreign governments on credit terms.

In addition to these two specific components of United States military aid, there are several other existing programs that can fit within the general category of military assistance. Since it is recognized that the use and maintenance of grant military equipment can incur additional expenses within the recipient nations, the President is authorized by Congress to allocate a limited portion of United States Supporting Assistance Funds (known as Defense Support Funds prior to 1964) towards cash grants as a means to alleviate these expenses. The largest portion of these funds, however, are used to assist in maintaining economic stability within the nations allied with the United States and to pay for indigenous personnel employed on United States foreign bases.

Public Law 480 authorizes United States agricultural commodities to be introduced into a foreign economy, under the supervision of the United States Department of Agriculture, with the profits gained from the subsequent sale to be

retained by the host government. These profits can be utilized by these governments for local purchases, to include subsistence for military personnel. The Agency for International Development's Public Safety Program allocates funds for the purpose of training and strengthening foreign police and paramilitary forces and thus, in many cases, can be considered as a form of military assistance. United States Code 10, Section 7307, provides for the transfer of naval vessels to foreign governments and generally requires the return of the vessel only "if available" and thus also can be considered as a type of military grant aid. Finally, the President's Contingency Fund authorizes relatively small emergency cash grants to foreign countries faced with critical national security problems.

CHAPTER IV

VARIABLES AND CASE NATIONS

In order to employ quantitative techniques to explore the relationship between United States military aid and the defense expenditures of the recipient nations, it is necessary at this point to (1) select the time period to be considered, (2) list the case nations, and (3) operationalize the variables involved.

As seen in the last chapter, the United States military aid program basically has been a post-World War II phenomenon. Therefore, the 23 year interval from 1950 through 1972 constitutes the time period to be considered in this study. Prior to 1950, the number of nations receiving United States military aid is limited and the defense expenditures of most countries tend to be distorted by post-war rearmament and recovery effects. Although current United States military aid figures can be obtained, recipient nation defense expenditures, due to reporting and compiling delays, are not available after 1972.

During the period from 1950 through 1972, 76 nations received some form of grant military aid from the United States for at least one year. Defense expenditures, however, for two of these nations -- Jamaica and Malta -- are not available. Since these two nations have received only

small amounts of United States military aid for three years and one year respectively, they are eliminated as case nations. Cuba received United States military aid from 1953 through 1961, however, Cuban defense expenditures are available only from 1960 through 1970. Due to this mismatch of data, as well as the anticipated impact of Soviet aid upon Cuban defense spending subsequent to 1961, this country is not included as a case nation. South Vietnam also is eliminated as a case nation based upon the difficulty of separating United States military aid from the total Defense Department budget for the American forces that were operating within this area. It also is doubtful, due to the unique circumstances surrounding this nation, whether any conclusions reached about the impact of United States aid upon defense spending in South Vietnam would be applicable to the more general conclusions sought in this dissertation.

The remaining 72 countries, shown in Table 1 on the following page, constitute the case nations to be considered. Based upon the aid patterns outlined in the last chapter, the NATO and Western European nations, the forward defense nations, and the Latin American nations are grouped separately. With the exception of five cases, the remaining nations all share the attribute of commonly being described as less developed countries. These 28 case nations therefore also are considered as a separate subgroup.

As seen in the last chapter, United States military aid is made up of various components. The operationalization of

Table 1. Case Nations

1. NATO, Western European, and Developed Nations (n = 10):⁽¹⁾

Belgium/Luxembourg ⁽²⁾	Japan ⁽³⁾	United Kingdom
Denmark	Netherlands	West Germany
France	Norway	Yugoslavia ⁽³⁾

2. Forward Defense Nations (n = 10):⁽⁴⁾

Cambodia	Pakistan	Taiwan
Greece	Philippines	Thailand
Iran	South Korea	Turkey
Laos		

3. Latin American Nations (n = 19):

Argentina	Ecuador	Nicaragua
Bolivia	El Salvador	Panama
Brazil	Guatemala	Paraguay
Chile	Haiti	Peru
Colombia	Honduras	Uruguay
Costa Rica	Mexico	Venezuela
Dominican Republic		

Table 1. Case Nations (Continued)

4. Less Developed Nations (n = 28):

Afganistan	Jordan	Nigeria
Burma	Lebanon	Saudi Arabia
Cameroon	Liberia	Senegal
Dahomey	Libya	Singapore
Ethiopia	Malaysia	Sri Lanka
Guinea	Mali	Sudan
India	Morocco	Tunisia
Indonesia	Nepal	Upper Volta
Iraq	Niger	Zaire
Ivory Coast		

5. Remaining Nations (n = 5):

Austria	New Zealand	Spain
Canada	Portugal	

Notes:

(1) Spain and Portugal are excluded from this group since their distributional patterns of United States aid are dissimilar to those included here. Both countries are continuing to receive aid at the present time and are shown in the last group. Greece and Turkey, while both members of NATO during the time period under consideration, are listed more appropriately as forward defense nations.

(2) Both United States military aid and defense expenditures are combined values for Belgium and Luxembourg.

(3) Japan and Yugoslavia are included here due to the similarity of their distributional patterns of United States aid with those of the NATO nations. For the sake of brevity, all subsequent references to this group will be as "NATO nations." This term implies the inclusion of Japan and Yugoslavia and the exclusion of Canada, Greece, Portugal, and Turkey.

Table 1. Case Nations (Continued)

Notes (Continued):

(4) The designation of Cambodia and India as forward defense nations differs between various governmental sources. Since Cambodia has received United States aid for 13 years compared to only 9 years for India, it is included here with India being listed in the Less Developed Nations group.

this variable therefore consists of selecting those components which will be included in the definition of military aid and then determining what measurement techniques will be employed.

Military sales, especially those on credit terms, can be considered a form of military aid. However, military sales also are included as a portion of the defense expenditures of the purchasing nations. It therefore seems apparent that increased military sales by the United States will lead to increased defense spending by the purchasing nations. This relationship, however, has little theoretical significance and touches only slightly upon the basic effects of military aid being explored here. Military sales, therefore, are not considered within the technical definition of United States military aid for this study.

Military training is another component of United States military aid and theoretically can be measured in the dollar costs to the United States or in the number of American military advisors stationed in foreign nations. However, it is often difficult to separate the exact cost or exact number of advisors from the total defense costs of the United States

or from the total number of American forces stationed overseas. Furthermore, since the majority of American military advisors are engaged in instructing foreign military personnel in the use and maintenance of United States grant equipment, there appears to be a close relationship between the number of advisors in a given nation and the amount of grant aid received by that nation. Therefore, military training also is not considered within the operational definition of United States military aid for this study.

The third major component of military aid -- grants of weapons and supplies -- constitutes the bulk of the United States military assistance effort. From 1950 through 1972, the dollar cost of this type of aid made up 67% of the total dollar value of both grant aid and weapons sales. Furthermore, grant aid constitutes 89% of the total from 1950 through 1963, indicating that military sales are a more recent phenomenon.¹ The amount of United States grant aid can be measured relatively easily in terms of the United States dollar cost of the equipment being distributed. In addition, since these items are purchased by the Defense Department from United States manufacturers, a United States wholesale price index can be used to convert these costs to a constant base year price, thus controlling for inflationary trends.²

¹United States Defense Security Assistance Agency, Department of Defense, Foreign Military Sales and Military Assistance Facts (Washington: Government Printing Office, 1974).

²United States Bureau of the Budget, Statistical Abstract of the United States (Washington: Government Printing Office, 1972) is the source of this index.

Therefore, United States military aid (MILAID) is defined as the annual value, in United States dollars at constant 1960 United States prices, of all grant aid received by each case nation for each year from 1950 through 1972.

Included in this definition are (1) grants of military equipment, supplies, and services from MAP appropriated funds; (2) grants of excess equipment; (3) the military portions of the Greek-Turkish Aid Act, China Naval Aid Act, Public Law 454 Philippines Aid Act, and vessel loans; and (4) special assistance for South Korea, Laos, Thailand, and the Philippines funded directly from the Defense Department budget. The sources for this data are the annual reports to Congress by the United States Agency for International Development³ and unclassified extracts from the Defense Security Assistance Agency journals. The remaining minor components of United States military aid discussed in Chapter 3 are included only when reported by these sources.

No actual missing data is encountered for MILAID for the 23 year time period under consideration. However, MILAID for Austria and Pakistan for the period from 1950 through 1961 is classified and therefore is treated as missing data for all statistical computations. In addition, not all of the 73 case nations received MILAID for each of the 23 years being considered. The lack of MILAID for any specific nation for

³United States Agency for International Development, United States Foreign Assistance and Assistance from International Organizations, Obligations and Loan Authorizations, and United States Overseas Loans and Grants and Assistance from International Organizations, Obligations and Loan Authorizations, special reports prepared for the House Foreign Affairs Committee (Washington: Government Printing Office, 1961, 1967, and 1972).

any specific year is not considered as missing data but merely is assigned a value of 0 for the amount of MILAID received for that year. Furthermore, 16 of the case nations did not achieve independence until various years after 1950. The pre-independence portion of the 23 year time period therefore is eliminated from consideration for these nations.

The problems involved in accurately measuring defense expenditures were outlined in Chapter I and the recent work in this field by the Stockholm International Peace Research Institute was discussed. Thus, both the definition and the measurement of this variable is taken directly from the SIPRI's annual yearbook.⁴ Defense expenditures (DEFEXP), therefore, are defined as the annual central government expenditures for national defense, in United States dollars at constant 1960 case nation prices and exchange rates, for each case nation for each year from 1950 through 1972. Within the scope of this definition, military aid is included in the budget of the donor country but excluded from the budget of the recipient nation. Inflationary trends have been erased by converting all figures to 1960 prices utilizing recipient nation consumer price indices.⁵

For several of the less developed nations, missing DEFEXP data for the earlier years of the 23 year time period under consideration is encountered. Due to delays in reporting and compiling, missing data for many of the case nations

⁴SIPRI, SIPRI Yearbook.

⁵Appendix 4A (pp. 74-81) of the 1972 SIPRI Yearbook presents a more detailed discussion of the measurement and conversion techniques employed.

also is encountered for 1971 and 1972. The impact of this missing data is considered in subsequent analyses where appropriate. Similar to MILAID, DEFEXP for the pre-independence years of the nations achieving independence after 1950 is excluded from consideration.

Annual DEFEXP figures are based upon calendar year accounting while annual MILAID data is reported on a fiscal year basis. Thus an automatic six month time lag between MILAID and DEFEXP is encountered. Since, for subsequent analyses, both MILAID and DEFEXP are aggregated or averaged over a given number of years, however, time lag considerations, to include this six month lag, do not become critical.

As seen earlier in the research model, it is necessary to express both MILAID and DEFEXP as a percentage of GNP in order to employ cross-nation comparison techniques. Therefore, annual GNP, in United States dollars at constant 1960 case nation prices, is computed for each case nation for each year from 1950 through 1972.⁶ Due to the lack of wholesale price indices for many of the less developed nations, consumer price indices are used to convert annual GNP figures to 1960 prices. Thus, as can be seen, MILAID is converted to

⁶The primary source for this data is United States Agency for International Development, Gross National Product, Growth Rates and Trend Data (Washington: Government Printing Office, annually from 1962 to 1972). In addition, United Nations, Statistical Yearbook and Yearbook of National Accounts Statistics (annually from 1950 to 1972) are utilized as secondary sources. Where more than one source is utilized for a case nation, overlapping of at least one year between the primary and secondary sources is insured, thus allowing the data from the latter source to be proportionally adjusted to conform to the former source.

constant prices using a wholesale price index from United States Bureau of the Budget sources, DEFEXP is converted using individual case nation consumer price indices computed by the SIPRI, and GNP is converted using individual case nation consumer price indices compiled by USAID. This dissimilarity of these sources lead to artificial results for some individual nations; however, since all three sources are used for all nations for all years, the overall cross-nation analysis results are unaffected. That is, any statistical discrepancies are applied uniformly to all case nations.

The final operationalization procedures to be discussed are the definitions of the three remaining independent variables -- external threat, military orientation of the regime, and brevity of independence -- and the measurement techniques to be employed for each. The first to be considered is external threat.

In this case, the procedure to be followed is to prepare a 23 year worksheet for each of the 72 case nations and then to assign an artificial and arbitrary index representing external threat for each country for each of these years. The attention given to the forward defense nations on the Sino-Soviet periphery by United States military aid planners, suggests that border contiguity with a communist nation is one indication of external threat. Thus, each nation fitting this description is assigned one point for each year that this situation has existed. Since the Cold War has been part of the international scene since the end of World War II,

each nation bordering on a communist country is assigned one point for all of the 23 years under consideration. Cambodia and Thailand, while not contiguous to a communist nation, both border on many of the communist controlled areas of Laos and thus are included in this group of nations. Yugoslavia, however, due to its communist orientation, is not considered as seriously threatened by its communist neighbors and is excluded. Finally, based on the relatively neutral stance of Yugoslavia, Italy also is not included with the group of nations contiguous to communist countries.

The next step is to search for case nations which have tended to border on traditional long-term enemies other than communist nations. India and Pakistan's common border, Zaire's proximity to surrounding hostile African nations, and Lebanon and Jordan's contiguity with Israel are the prime examples in point. Iraq is also included with the latter two nations, even though it does not physically border on Israel, due to its vulnerability to Israeli air attack. Both the India-Pakistan rivalry and the Middle East situation have existed over the entire time period being considered, therefore, all five of these nations are assigned one point for each of the 23 years. In turn, Zaire is assigned one point for each year since it gained its independence.

The third step is to determine if any of the border situations over the 23 year time period can be classified as "active" in terms of continuous military action, such as harassment, probing, and other physical acts short of actual warfare. Four nations, South Korea, Taiwan, Jordan, and

Lebanon, seem to fit this description and thus are assigned an additional point for each of the 23 years.

The final step is to assign one point for each nation for each year that it is engaged in actual conflict with an external foe. Actual conflict is defined as sufficient military action to be included in reference works by Dupuy and Blanchard, Goldmann, or Taylor and Hudson.⁷ While this procedure is admittedly crude, it is hoped that it will provide at least a rough comparative index of the amount of external threat faced by each case nation. Table 2, beginning on the following page, indicates the assignment of points to the various case nations while Table 3, on page 60, ranks these nations on their average "external threat score" for the period from 1950 through 1972 or, in the case of the newly independent nations, for the portion of this time period that they have existed as independent states.

Similar 23 year worksheets for each case nation are prepared for the military orientation of the regime variable. The annual index in this case is taken from Banks.⁸ This source uses an index of 3 to represent a strong military regime, 2 to represent a government subject to strong military influence, and 1 to represent a civilian controlled

⁷T. N. Dupuy and Wendell Blanchard, The Almanac of World Military Power (New York: R. R. Bowker, 1972); Kjell Goldmann, International Norms and War Between States (Stockholm: Laromedelsforlagen, 1971); and Charles Lewis Taylor and Michael C. Hudson, World Handbook of Political and Social Indicators, 2nd ed. (New Haven, Connecticut: Yale University Press, 1972).

⁸Arthur S. Banks, Cross-Polity Time-Series Data (Cambridge, Massachusetts: The MIT Press, 1971).

Table 2. Measurement of External Threat

Note: The dates in the parentheses after each nation indicate the years in which the various situations have existed. Nations in parentheses are non-case nations. Where two case nations are involved, equal threat is assumed on each side, with the exception of the Bizerte crisis between Tunisia and France. In this instance, it is assumed that Tunisia perceived a threat from France but was not in the position to return this threat.

1. Nations Bordering on Communist Countries (1 point):

Afganistan (50-72)	India (50-72)	South Korea (50-72)
Austria (50-72)	Iran (50-72)	Taiwan (50-72)
Burma (50-72)	Laos (50-72)	Thailand (50-72)
Cambodia (50-72)	Nepal (50-72)	Turkey (50-72)
Greece (50-72)	Pakistan (50-72)	West Germany (50-72)

2. Nations Bordering on Traditional Enemies (1 point):

Jordan - (Israel) (50-72)
 Lebanon - (Israel) (50-72)
 Iraq - (Israel) (50-72)
 Zaire - (Surrounding Nations) (60-72)
 India - Pakistan (50-72)

3. Nations with Active Hostile Borders (1 point):

Jordan - (Israel) (50-72)
 Lebanon - (Israel) (50-72)
 South Korea - (North Korea) (50-72)
 Taiwan - (China) (50-72)

Table 2. Measurement of External Threat (Continued)

4. International Conflict (1 point):

Costa Rica - Nicaragua (55)
Nicaragua - Honduras (57)
Honduras - El Salvador (67, 69-71)
South Korea (North Korea, China) (50-53)
Taiwan - (China) (54-58)
Laos - (North Vietnam) (53-72)
Cambodia - (North Vietnam) (70-72)
Burma - (China) (50-54)
Indonesia - Malaysia (63-66)
India - Pakistan (59, 65, 71)
India - (China) (62)
Jordan - (Israel) (67)
Lebanon - (Israel) (67)
Iraq - (Israel) (67)
Tunisia - France (61)
Ethiopia - (Somalia) (61-68)
Morocco - (Algeria) (63)
West Germany - (USSR) (61)

Table 3. Average External Threat
Score, 1950 through 1972

Note: Average score is shown in parentheses after each nation. The remaining case nations not shown are all assumed to face no serious external threat as defined in the main text.

Taiwan (2.22)	Iraq (1.04)	Ethiopia (0.35)
India (2.17)	West Germany (1.04)	Malaysia (0.25)
Pakistan (2.13)	Afganistan (1.00)	Honduras (0.22)
South Korea (2.13)	Austria (1.00)	El Salvador (0.17)
Jordan (2.04)	Greece (1.00)	Indonesia (0.17)
Lebanon (2.04)	Iran (1.00)	Nicaragua (0.09)
Laos (1.87)	Nepal (1.00)	Morocco (0.06)
Zaire (1.31)	Thailand (1.00)	Tunisia (0.06)
Burma (1.22)	Turkey (1.00)	Costa Rica (0.04)
Cambodia (1.13)		

regime. For coding simplicity, these values are converted to 2, 1, and 0 respectively.

Unfortunately, Banks presents data only through 1966. Using Keesing's,⁹ however, each of the individual nation time-series are extended through the additional six years. This procedure involves comparing Banks' coding scheme to pre-1966 regimes listed in the Archives and then assigning similar

⁹Keesing's Contemporary Archives (London: Keesing's Publications Limited, annual editions from 1966 to 1972).

values to similar post-1966 regimes. Table 4 below ranks the case nations by their average "military regime score" for either the entire 23 year period or for the portion of this period that a case nation existed as an independent state.

Table 4. Average Military Orientation of
Regime Score, 1950 through 1972

Note: Average score is shown in parentheses after each nation. The remaining case nations not shown are all assumed to have had no military regimes during the 23 year time period.

Iraq (1.35)	Brazil (0.39)	Libya (0.24)
Nigeria (1.08)	Ecuador (0.39)	Pakistan (0.17)
Thailand (1.00)	Bolivia (0.35)	Zaire (0.15)
Burma (0.96)	Mali (0.35)	Guatemala (0.13)
Argentina (0.74)	Greece (0.30)	South Korea (0.09)
Dahomey (0.69)	Venezuela (0.30)	Turkey (0.09)
Upper Volta (0.62)	Cambodia (0.26)	Dominican Rep. (0.04)
El Salvador (0.57)	Colombia (0.26)	Haiti (0.04)
Sudan (0.47)	Honduras (0.26)	Indonesia (0.04)
Peru (0.43)		

A third and final worksheet for each nation is prepared for the last independent variable, brevity of independence. This variable is suggested by the group of theories discussed earlier which contends that newly independent nations tend to increase their defense spending in order to achieve an armed force as a type of national prestige symbol. Two basic

assumptions are made concerning this phenomenon. First, the tendency to spend excessive amounts on defense decreases as the length of independence increases and, second, after a given period of time, the defense expenditure pattern of the no longer newly independent nation becomes somewhat similar to those of other, more established states. Unfortunately, little quantitative research has been conducted in this area and no empirical evidence exists upon which to base the length of this "maturity period." Thus, a strictly arbitrary decision is made to weight the newly independent nations utilizing an eight year linear decreasing scale. This procedure again is somewhat crude; however, since the same criteria is applied to all the case nations, a rough comparative index can be constructed.

Thus a value of 8 is assigned for the initial year of independence for each of the 17 nations gaining their independence between 1950 and 1972. A value of 7 then is assigned for the second year of independence, a value of 6 for the third year, and so forth until a value of 0 is reached after the eighth year. In addition to these 17 nations, there are also 9 nations which achieved independence within eight years prior to 1950. The portion of these nations' "independence index" that continues into the 23 year time period under consideration therefore also is included. Table 5 on the following page ranks these various nations, once again by their average score.

Table 5. Average Brevity of Independence
Score, 1950 through 1972

Note: The year that independence was gained is shown in the first parentheses after each nation. The average score is shown in the second parentheses. The remaining case nations not shown all gained their independence at least eight years prior to 1950.

Cameroon (1960) (1.57)	Sudan (1956) (1.57)
Dahomey (1960) (1.57)	Tunisia (1956) (1.57)
Guinea (1958) (1.57)	Upper Volta (1960) (1.57)
Indonesia (1950) (1.57)	Zaire (1960) (1.57)
Ivory Coast (1960) (1.57)	Cambodia (1949) (1.22)
Libya (1952) (1.57)	Laos (1949) (1.22)
Malaysia (1957) (1.57)	Burma (1948) (0.91)
Mali (1960) (1.57)	South Korea (1948) (0.91)
Morocco (1956) (1.57)	Sri Lanka (1948) (0.91)
Niger (1960) (1.57)	India (1947) (0.65)
Nigeria (1960) (1.57)	Pakistan (1947) (0.65)
Senegal (1960) (1.57)	Jordan (1946) (0.43)
Singapore (1965) (1.57)	Lebanon (1943) (0.04)

The Appendix presents the entire 23 year data set for each of the variables defined in this chapter for each of the 72 case nations.

CHAPTER V

UNIVARIATE ANALYSIS OF MILAID

Prior to considering the interrelationship of all of the variables outlined in the last chapter, univariate analyses of MILAID and DEFEXP can be helpful at this point. These analyses focus upon three specific areas. First, the total amount of MILAID distributed to all the case nations from 1950 through 1972 and the total amount of DEFEXP by these same nations for this same period is considered, thus helping to further define the scope of these two variables. Second, the annual trends of total MILAID and DEFEXP over all of the 23 years are explored. These patterns illustrate both short-term or cyclic fluctuations and long-term trends. Since time-series bivariate techniques are not employed in this study, these short-term variations can be ignored. The long-term trends, however, can assist in determining which specific years or groups of years should be included in subsequent cross-nation multivariate analyses. Third, the 23 year aggregate and average measures of MILAID and DEFEXP for each case nation -- the actual data which is used in the primary cross-nation analyses -- are presented. This chapter considers MILAID while the next chapter looks at DEFEXP.

Excluding only the assistance provided to South Vietnam, the United States has distributed approximately

\$36,181,280,000 worth of grant military aid, at constant 1960 United States prices, during the entire 23 year period from 1950 through 1972. When aid to Cuba, Jamaica, and Malta also is excluded, the total amount of MILAID distributed to the remaining 72 case nations decreases only slightly to \$36,163,180,000. The largest share of this total MILAID -- \$17,564,500,000 or approximately 49% -- has been distributed to the forward defense nations identified in Table 1 of the last chapter. \$15,545,398,000 or 43% has gone to the NATO nations, \$1,071,698,000 or 3% has gone to the Latin American nations, \$832,098,400 or 2% has gone to the remaining less developed nations, and \$1,149,500,000 or 3% has gone to Austria, Canada, New Zealand, Portugal, and Spain.

Table 6 on the following page indicates the total amount of MILAID distributed annually during the 23 year period from 1950 through 1972. The annual number of recipient nations, the annual average amount of MILAID distributed, and the annual average amount of MILAID expressed as a percentage of each of the recipient nation's GNP also are included in this table. Finally, Figure 8 on pages 67 and 68 presents graphical depictions of all of the annual totals and illustrates the 23 year trend for each of these measures of MILAID.

Turning to the first two graphs in Figure 8, three general phases of the United States military aid program can be discerned. From 1950 to 1953, a rapid increase in the total amount of MILAID distributed annually and a more gradual rise in the annual number of recipient nations is indicated. This

Table 6. Annual MILAID from 1950
through 1972 for All Case Nations

YEAR	TOTAL MILAID (U.S. \$ x 1 Million)	NUMBER OF RECIPIENTS	AVERAGE MILAID (U.S. \$ x 1 Million)	AVERAGE MILAID AS % OF GNP (%)
1950	109.5	11	9.95	0.25
1951	1,108.0	15	73.87	1.25
1952	1,525.3	18	84.74	1.43
1953	3,532.6	22	160.57	4.00
1954	3,102.9	27	114.92	2.88
1955	2,426.4	29	83.67	2.89
1956	3,037.6	34	89.34	4.47
1957	2,288.1	36	63.56	2.90
1958	2,166.3	39	55.54	3.80
1959	1,768.3	40	44.21	2.54
1960	1,706.7	43	39.70	2.25
1961	1,248.2	49	25.47	2.46
1962	1,349.7	59	22.88	1.86
1963	1,450.9	56	25.91	2.13
1964	1,027.6	58	17.72	1.43
1965	1,139.1	59	19.31	1.77
1966	913.0	53	17.22	2.12
1967	1,077.8	47	22.93	2.72
1968	1,127.6	42	26.85	3.69
1969	936.8	43	21.79	2.71
1970	805.5	43	18.73	2.48
1971	1,173.5	46	25.51	4.04
1972	1,141.7	41	27.85	4.22

Figure 8. Trend of Annual MILAID from 1950 through 1972 for All Case Nations

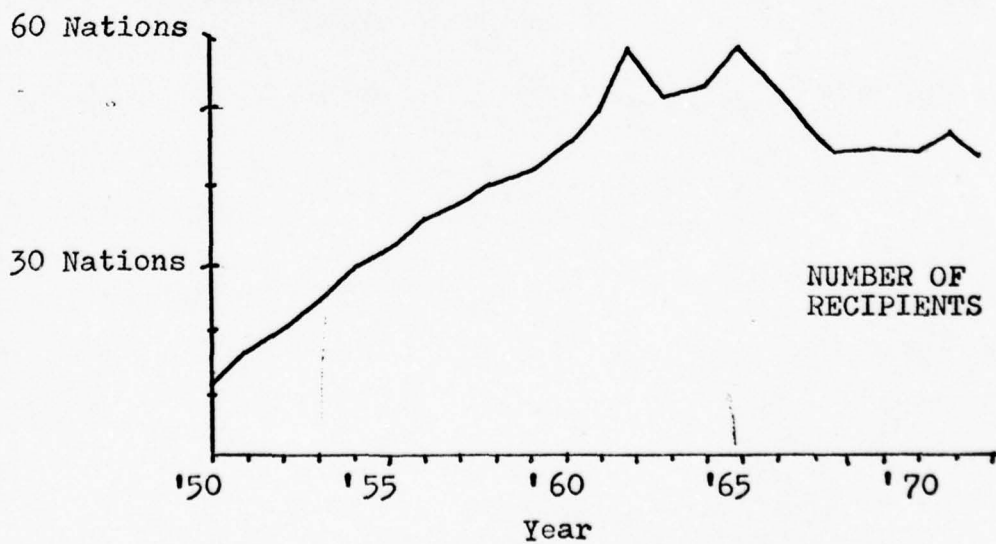
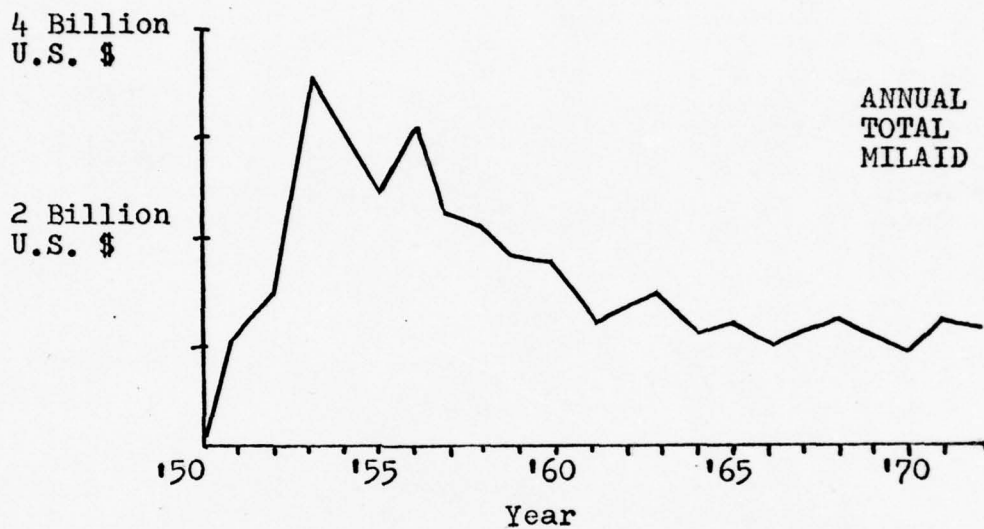
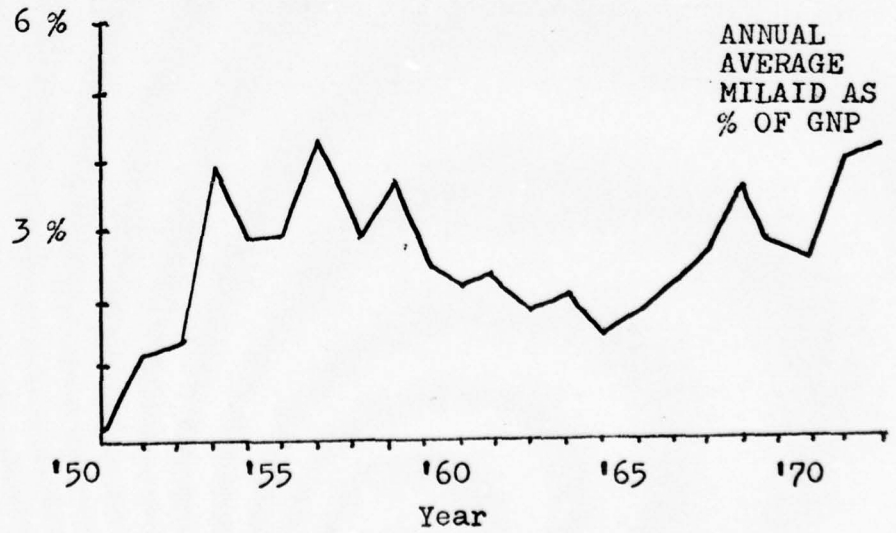
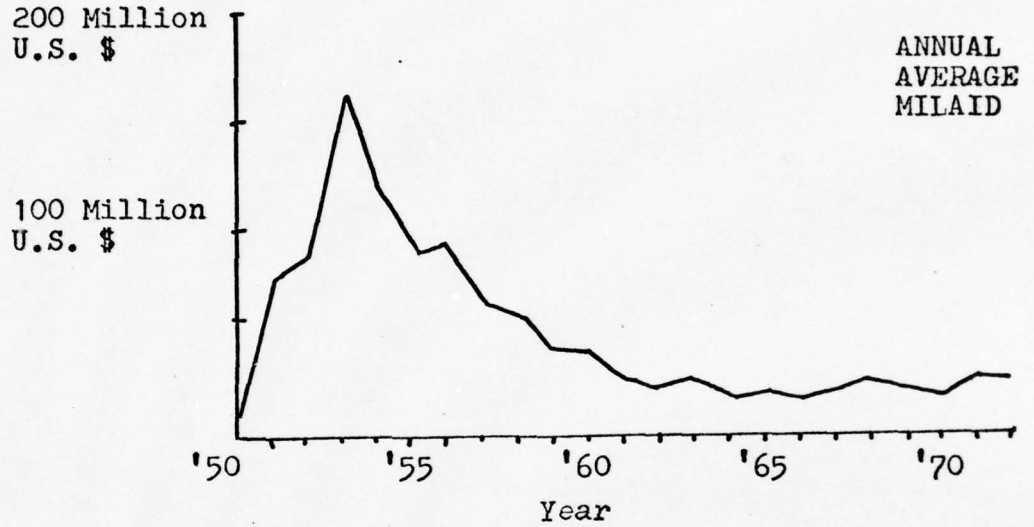


Figure 8. Trend of Annual MILAID from 1950 through 1972 for All Case Nations (Continued)



period corresponds to the expansion phase of the United States military aid program at the beginning of the Cold War. From 1954 to 1965, however, the annual total MILAID declines while the number of recipient nations continues to grow. This segment defines the period when the United States gradually begins to phase out massive aid programs to the relatively small number of NATO and other developed nations, whose economies had recovered from World War II and who no longer faced a direct military threat from the Soviet Union, while instituting an increasing number of smaller aid programs to the new Third World nations who now faced internal security problems. The third and final period from 1966 to 1972 indicates a slight decrease in the annual number of recipients as MILAID to the NATO nations is completely terminated and then leveling off of the aid program for the remaining countries at a relatively constant and more modest level. Both of these trends also are illustrated in the third graph in Figure 8. Here, annual MILAID averaged for the recipient nations rises initially as rapidly increasing amounts of aid are received by a less rapidly increasing number of nations, then declines as the large European aid program is phased out and more modest aid is distributed to a continually increasing number of nations, and finally levels off at a relatively constant rate.

The last graph in Figure 8 indicates annual average MILAID expressed as a percentage of the GNP of the recipient nations. Although in this case the short-term fluctuations

are more obvious than in the other three graphs, some long-term trends can be identified. A general rise in the early years of the time period under consideration followed by a long-term decline again seems to indicate a period when large amounts of aid are received by a relatively small number of nations whose economies are suffering from the effects of World War II, followed by a period of decreasing total annual aid being distributed to a larger number of nations, most of whose economies are now growing. Finally, from 1965 to 1972, a rather rapid increase in annual average MILAID expressed as a percentage of GNP is indicated, unlike the relatively constant trend of the three earlier graphs. This last pattern seems to suggest that although the annual number of recipient nations is relatively constant during this period, there is a trend to concentrate MILAID in those nations with smaller economies.

Since the forward defense and NATO nations account for approximately 92% of the total amount of MILAID distributed between 1950 and 1972, the patterns shown in Figure 8 are largely a function of the patterns of these two subgroups of case nations. In addition, the trends of the other two groups of nations defined earlier -- the Latin American states and the remaining less developed nations -- while not contributing as much to the overall total pattern, can add some insight into the long-term trends described above. Therefore, similar analyses of the trends of annual MILAID for each of these subgroups can be of value at this point.

Although Japan, Yugoslavia, and the Western European NATO nations received slightly less total MILAID than the forward defense nations, most of this MILAID is concentrated in the 13 year period from 1950 to 1962, as is shown in Table 7 and Figure 9 on the following three pages. Due to this concentration of aid, the pattern of annual total MILAID for this group during this earlier period is quite similar to the pattern of annual total MILAID for all the case nations together. The NATO nations thus dominate the entire United States military aid program during this phase. Since the number of the nations receiving aid in this group remains relative constant, the pattern of the annual MILAID averaged among them is similar to that of their annual total MILAID. Finally, since each of these nations exhibits a rapid growth in GNP during the same period when MILAID is being phased out, the pattern of their annual average MILAID, expressed as a percentage of GNP, indicates a sharp decrease from 1953 through 1968.

While the forward defense nations account for approximately half of the total MILAID from 1950 through 1972, this MILAID, as shown in Table 8 and Figure 10 on pages 75 through 77, is distributed more evenly across all 23 years and thus has less initial impact on the earlier portion of the pattern of annual total MILAID for all of the case nations. Furthermore, after the initiation phase of the aid program from 1950 to 1955, the relatively constant long-term trend of MILAID from 1955 to 1972 illustrates the continued emphasis by

Table 7. Annual MILAID from 1950
through 1972 for the NATO Nations

YEAR	TOTAL MILAID (U.S. \$ x 1 Million)	NUMBER OF RECIPIENTS	AVERAGE MILAID (U.S. \$ x 1 Million)	AVERAGE MILAID AS % OF GNP (%)
1950	77.5	7	11.07	0.09
1951	895.0	7	127.86	0.75
1952	1,228.1	8	153.51	1.21
1953	2,713.7	9	301.52	2.21
1954	2,286.6	9	254.06	1.98
1955	1,506.0	9	167.33	1.21
1956	1,786.0	10	178.60	0.99
1957	1,287.1	10	128.71	0.46
1958	855.0	10	85.50	0.44
1959	653.3	9	72.59	0.28
1960	697.6	9	77.51	0.30
1961	372.9	9	41.43	0.18
1962	369.2	9	41.02	0.18
1963	289.2	9	32.13	0.15
1964	209.1	10	20.91	0.16
1965	254.0	10	25.40	0.18
1966	45.6	4	11.40	0.12
1967	18.9	3	6.30	0.12
1968				
1969				
1970				
1971				
1972				

ALL MILAID TERMINATED AFTER 1967

Figure 9. Trend of Annual MILAID from 1950 through 1972 for the NATO Nations

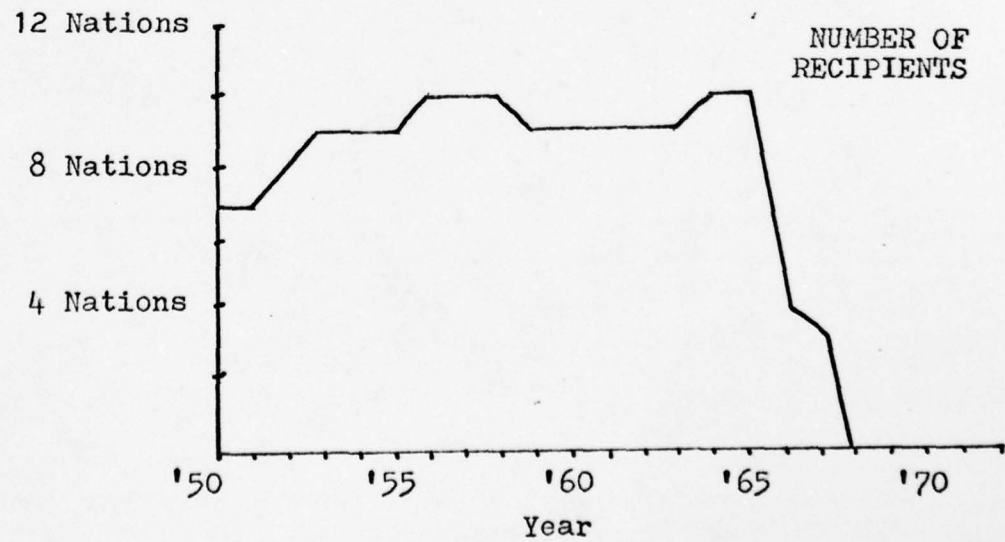
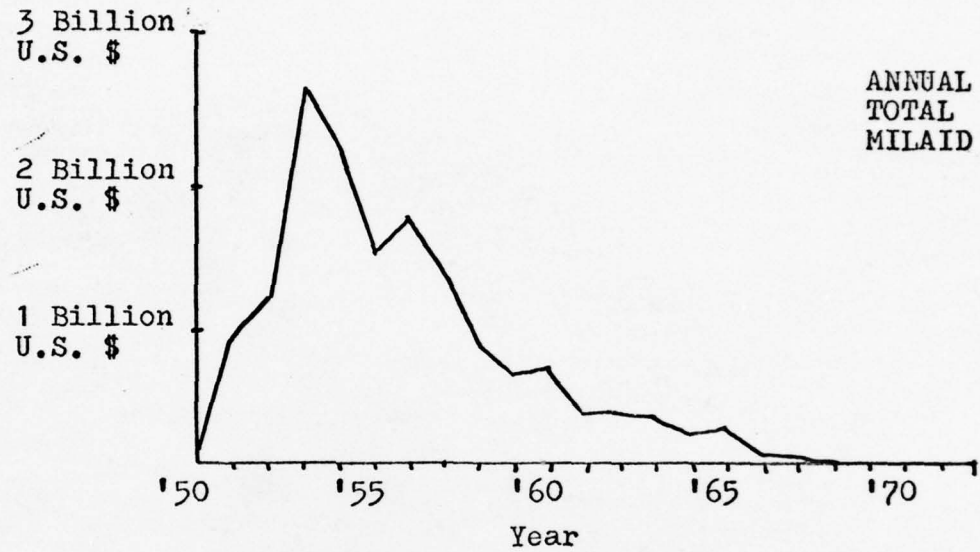


Figure 9. Trend of Annual MILAID from 1950 through 1972 for the NATO Nations (Continued)

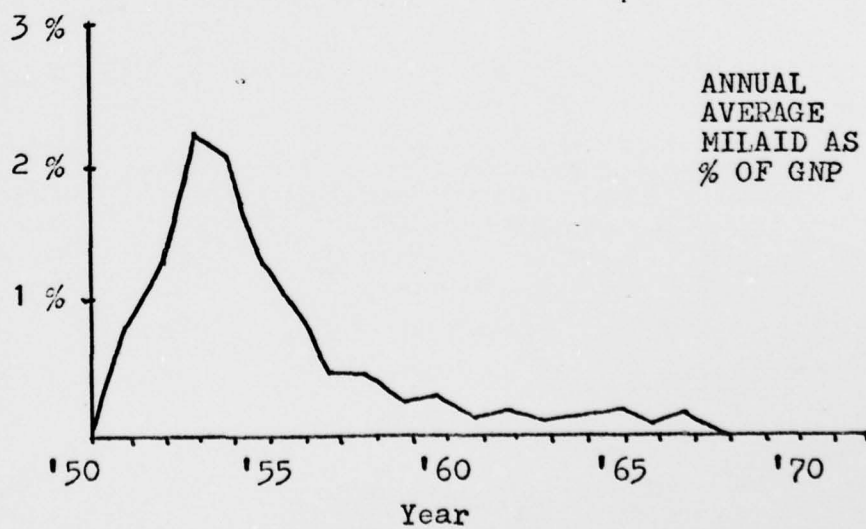
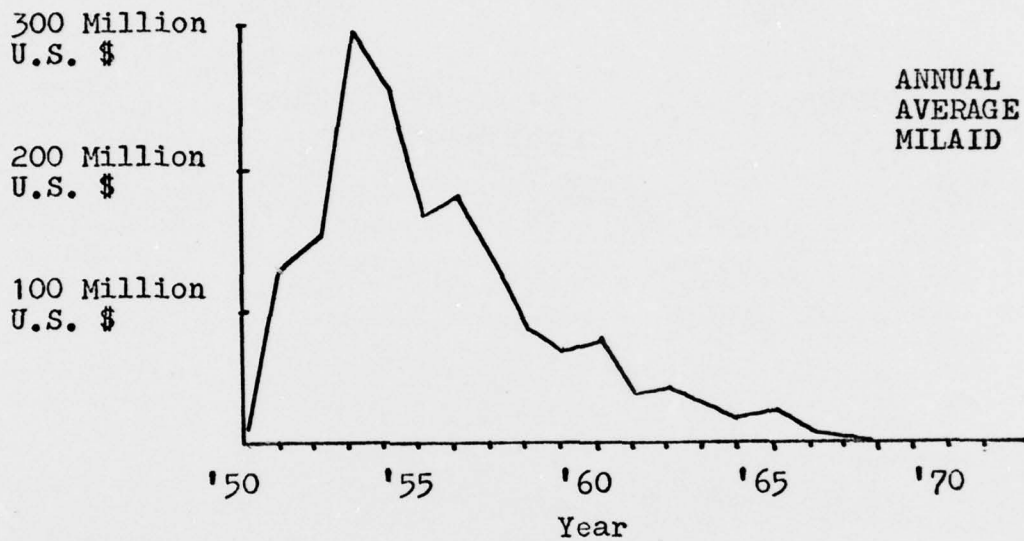


Table 8. Annual MILAID from 1950 through
1972 for the Forward Defense Nations

YEAR	TOTAL MILAID (U.S. \$ x 1 Million)	NUMBER OF RECIPIENTS	AVERAGE MILAID (U.S. \$ x 1 Million)	AVERAGE MILAID AS % OF GNP (%)
1950	32.0	4	8.00	0.54
1951	212.6	7	30.37	1.92
1952	280.4	7	40.09	2.16
1953	664.2	7	94.89	5.47
1954	702.9	7	100.41	5.61
1955	764.1	7	109.16	7.40
1956	1,102.0	9	122.14	14.11
1957	808.2	9	89.80	8.65
1958	1,123.9	9	124.88	11.83
1959	973.6	9	108.18	8.54
1960	868.5	9	96.50	8.57
1961	706.1	9	78.46	10.86
1962	729.3	10	72.93	6.82
1963	910.6	10	91.06	8.42
1964	627.3	10	62.73	5.49
1965	719.0	10	71.90	8.18
1966	712.1	9	79.12	9.97
1967	926.2	8	115.78	13.54
1968	1,037.5	9	115.28	15.40
1969	888.7	9	98.74	12.01
1970	735.4	10	73.54	9.63
1971	1,050.9	10	105.09	17.51
1972	991.5	10	99.15	16.06

Figure 10. Trend of Annual MILAID from 1950 through 1972 for the Forward Defense Nations

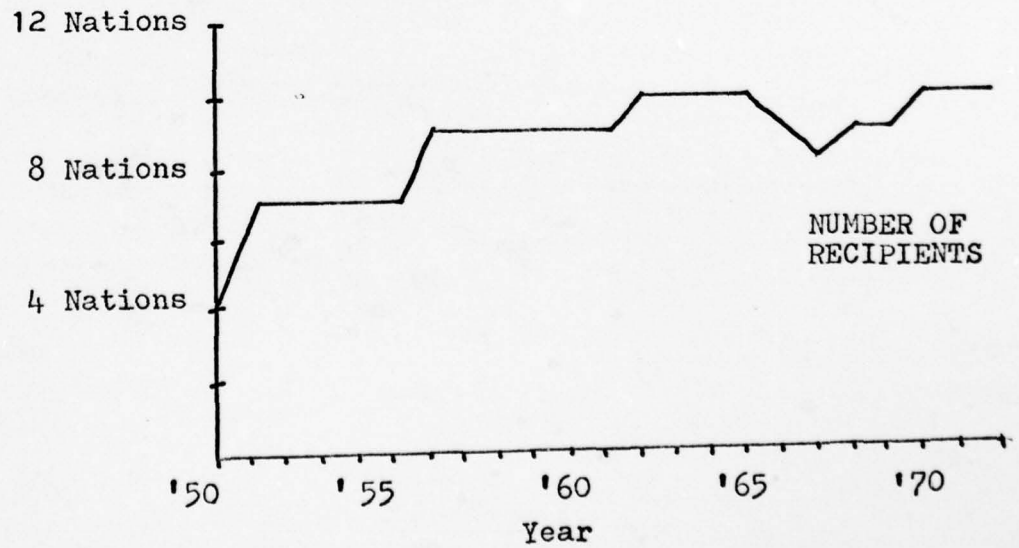
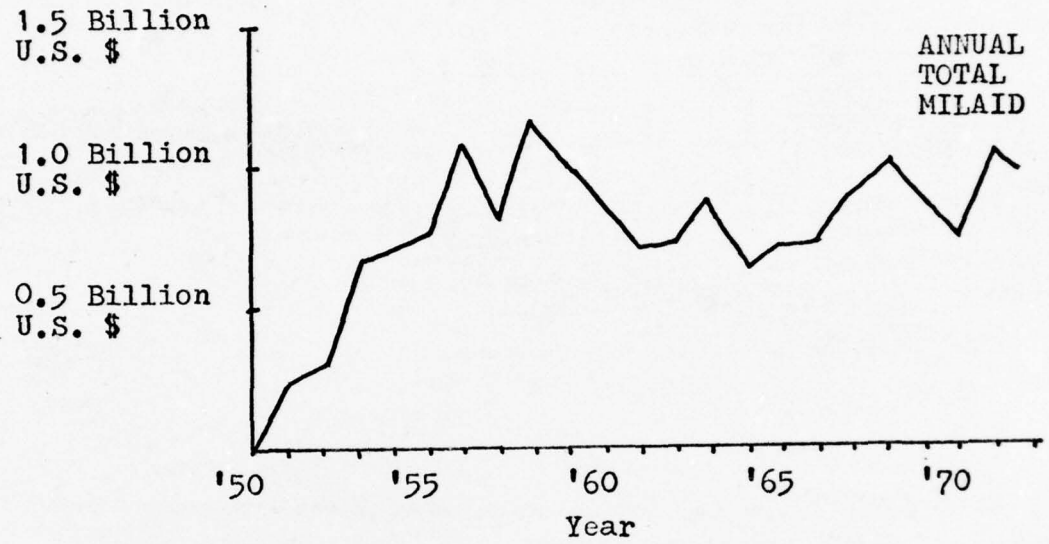
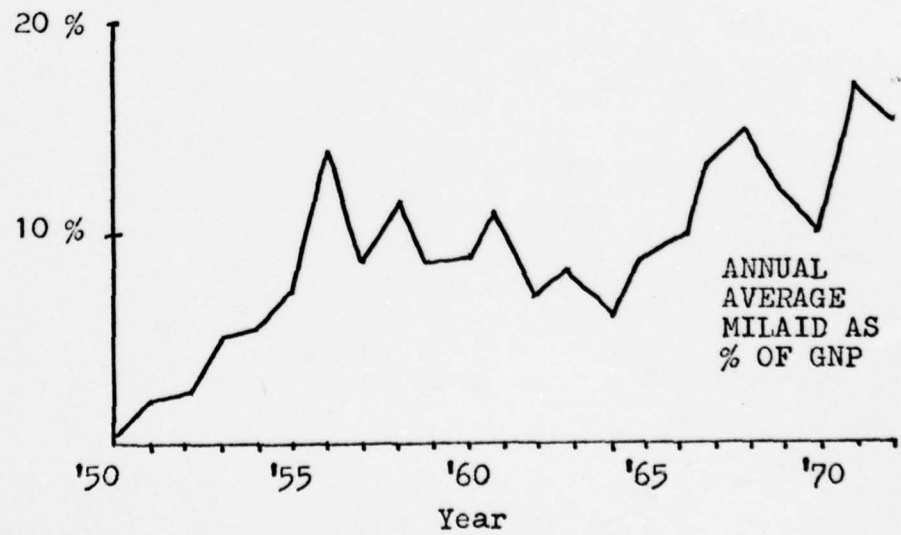
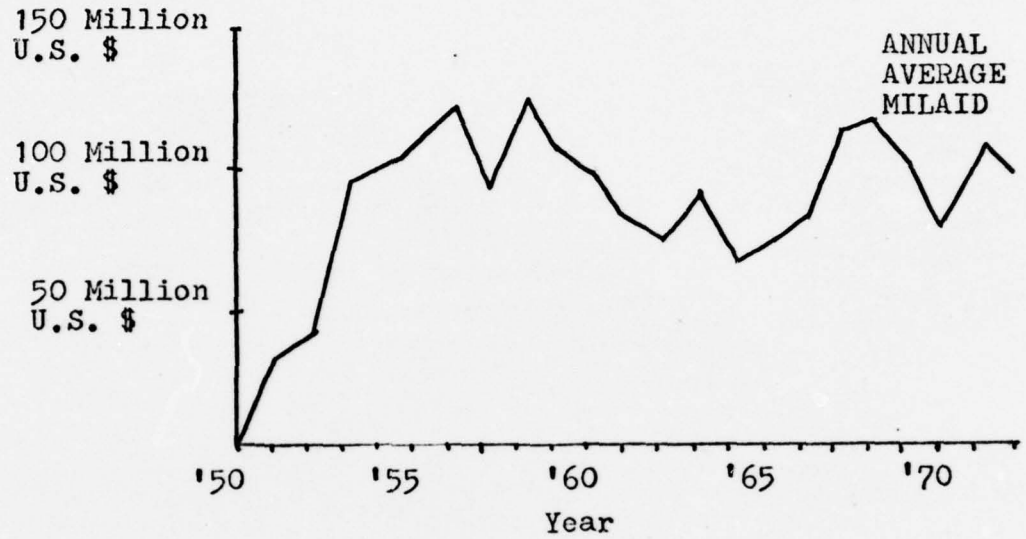


Figure 10. Trend of Annual MILAID from 1950 through 1972 for the Forward Defense Nations (Continued)



United States defense planners towards the security of this group of nations. Thus, once MILAID to the NATO countries is phased out, the annual pattern of the forward defense nations accounts for the relatively level trend of total annual MILAID for all the case nations in this latter period. Again, since the number of forward defense nations receiving aid remains relatively constant from 1956 through 1972, the pattern of their annual average MILAID closely resembles that of their annual total MILAID.

With the level of MILAID and the number of recipient nations remaining relatively constant and with the GNP assumedly growing for most of these countries, a decrease in MILAID expressed as a percentage of this GNP can be expected. However, when this trend is plotted, only a slight decline after 1956 initially can be seen, followed by a rapid increase subsequent to 1964. This phenomenon probably can be partially explained by noting that the GNP of these forward defense nations is not growing as rapidly as many of the other, more developed nations of the world and that after 1964, large amounts of MILAID are shifted to Cambodia and Laos, the two forward defense nations with the smallest gross national products. This increase after 1964 also accounts for much of the similar increase, shown earlier, in MILAID expressed as a percentage of GNP for all of the case nations.

As shown in Table 9 and Figure 11 on the following three pages, the long-term trend of annual total MILAID for the Latin American nations centers around two peak periods. The

Table 9. Annual MILAID from 1950 through
1972 for the Latin American Nations

YEAR	TOTAL MILAID (U.S. \$ x 1 Million)	NUMBER OF RECIPIENTS	AVERAGE MILAID (U.S. \$ x 1 Million)	AVERAGE MILAID AS % OF GNP (%)
1950	0	0	0	0
1951	0	0	0	0
1952	0.20	2	0.10	0.02
1953	75.30	5	15.06	5.21
1954	42.60	8	5.32	2.18
1955	43.20	9	4.80	1.87
1956	25.20	11	2.29	0.98
1957	41.70	11	3.79	1.55
1958	61.20	12	5.10	2.29
1959	43.40	12	3.62	1.50
1960	45.40	14	3.24	0.93
1961	68.10	17	4.01	0.96
1962	130.30	18	7.23	1.82
1963	87.20	18	4.84	1.36
1964	79.40	18	4.41	0.92
1965	62.10	18	3.45	0.71
1966	86.00	18	4.78	0.98
1967	59.40	17	3.49	0.60
1968	38.00	17	2.23	0.41
1969	20.00	17	1.18	0.21
1970	20.00	17	1.18	0.24
1971	20.00	18	1.11	0.19
1972	23.00	16	1.44	0.29

Figure 11. Trend of Annual MILAID from 1950 through 1972 for the Latin American Nations

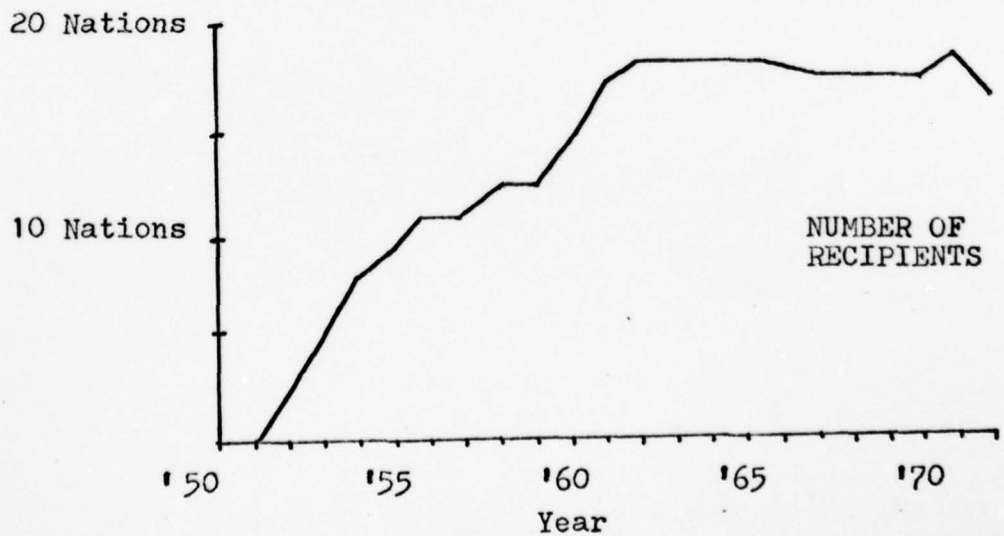
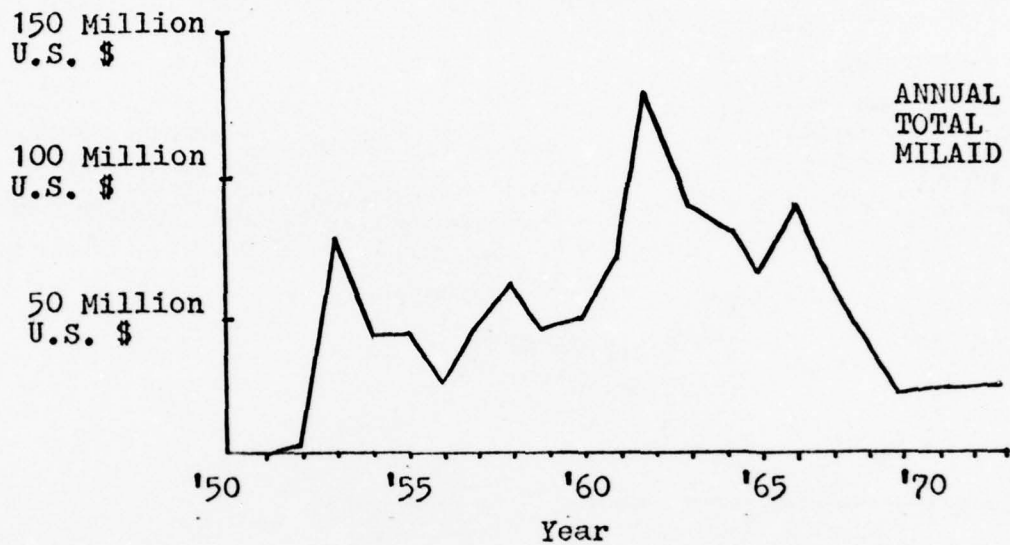
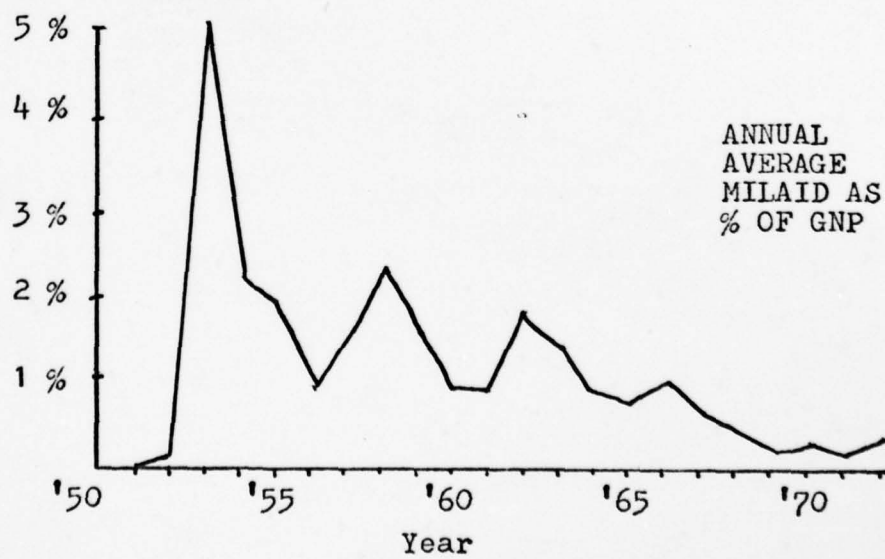
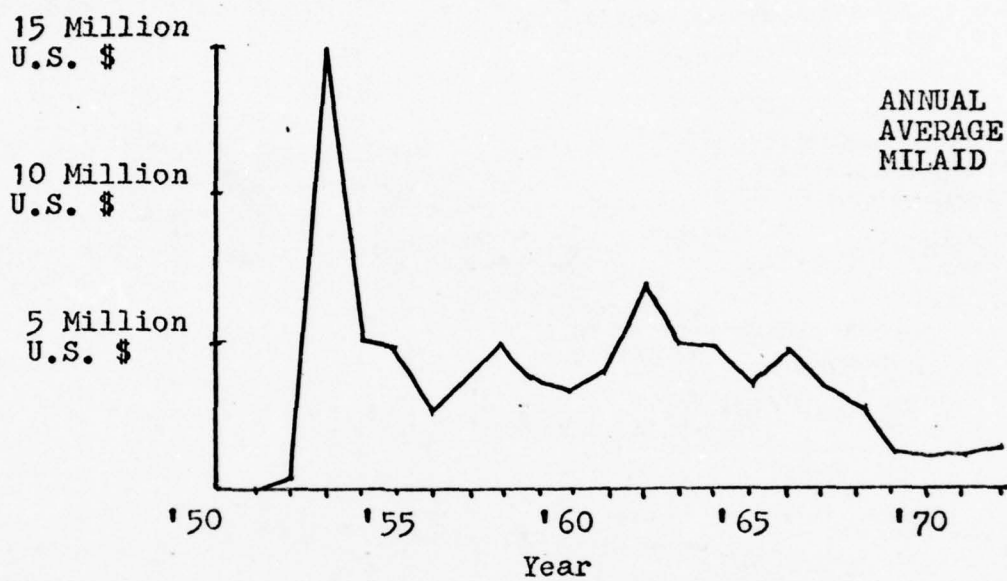


Figure 11. Trend of Annual MILAID from 1950 through 1972 for the Latin American Nations (Continued)



first peak, in 1953, relates to large amounts of MILAID being distributed to a small group of nations, with the majority of this aid going to Brazil. The second peak, in 1962, seems to illustrate the shift in emphasis by the Kennedy administration from conventional MILAID for the NATO allies to counter-insurgency MILAID for the Latin American nations as a reaction to the hemispheric activities of Castro and his communist sponsors. However, a decline in MILAID subsequent to 1962 suggests that this shift in emphasis was only a short-lived token action.

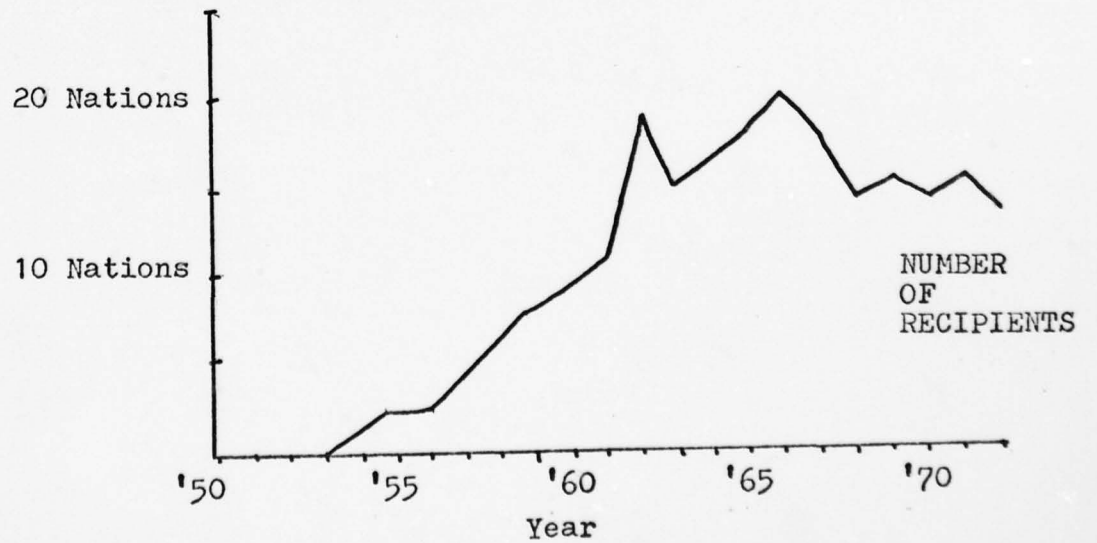
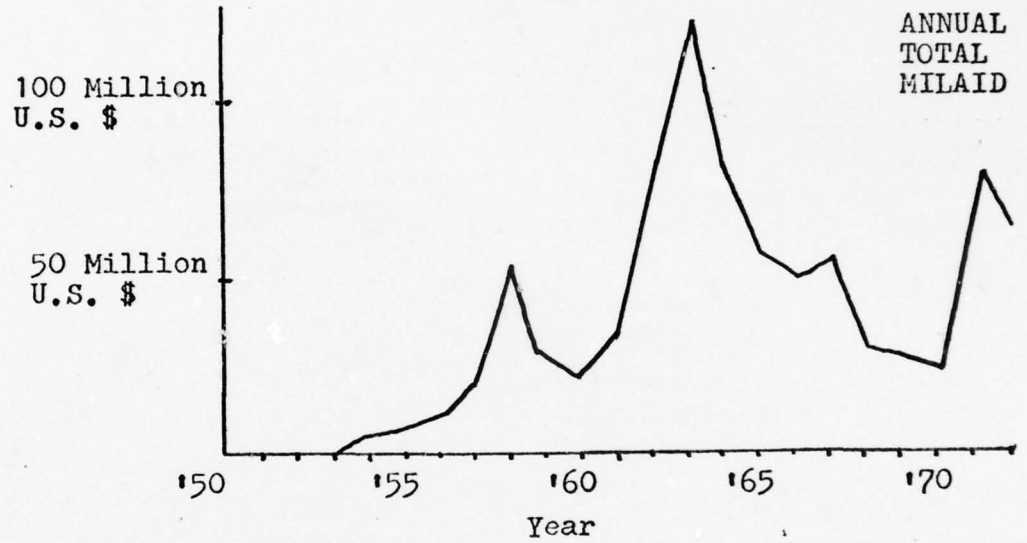
Since the total annual amount of MILAID recipients in Latin America does not reach the maximum number until 1962, the initial peak of annual total MILAID in 1953 is distributed to a small number of nations. Thus, the annual average MILAID and the annual average MILAID expressed as a percentage of GNP is extremely high for this year. In 1962, the number of recipients has grown to the extent that the average amount of MILAID for this peak year is considerably lower. Finally, the continuous long-term decline in MILAID expressed as a percentage of GNP subsequent to 1953 seems to be caused primarily by both the growing GNP of the Latin American countries and the distribution of MILAID over a larger number of recipient nations.

Similar to the patterns of MILAID for the Latin American nations, the long-term patterns for the remaining less developed countries are dominated by a series of peak years as shown in Table 10 and Figure 12 on the following three pages.

Table 10. Annual MILAID from 1950 through
1972 for the Less Developed Nations

YEAR	TOTAL MILAID (U.S. \$ x 1 Million)	NUMBER OF RECIPIENTS	AVERAGE MILAID (U.S. \$ x 1 Million)	AVERAGE MILAID AS % OF GNP (%)
1950	0	0	0	0
1951	0	0	0	0
1952	0	0	0	0
1953	0	0	0	0
1954	4.4	1	4.40	0.88
1955	6.9	2	3.45	0.47
1956	10.7	2	5.35	0.76
1957	22.5	4	5.63	0.74
1958	53.0	6	8.83	1.46
1959	27.9	8	3.49	0.36
1960	20.9	9	2.32	0.31
1961	34.4	11	3.13	0.36
1962	77.2	19	4.06	0.35
1963	120.9	15	8.06	0.44
1964	80.4	17	4.73	0.40
1965	55.0	18	3.06	0.32
1966	46.5	20	2.32	0.23
1967	53.6	17	3.15	0.38
1968	27.1	14	1.94	0.17
1969	24.9	15	1.66	0.13
1970	22.2	14	1.59	0.12
1971	78.2	15	5.21	0.48
1972	65.4	13	5.03	0.58

Figure 12. Trend of Annual MILAID from 1950 through 1972 for the Less Developed Nations



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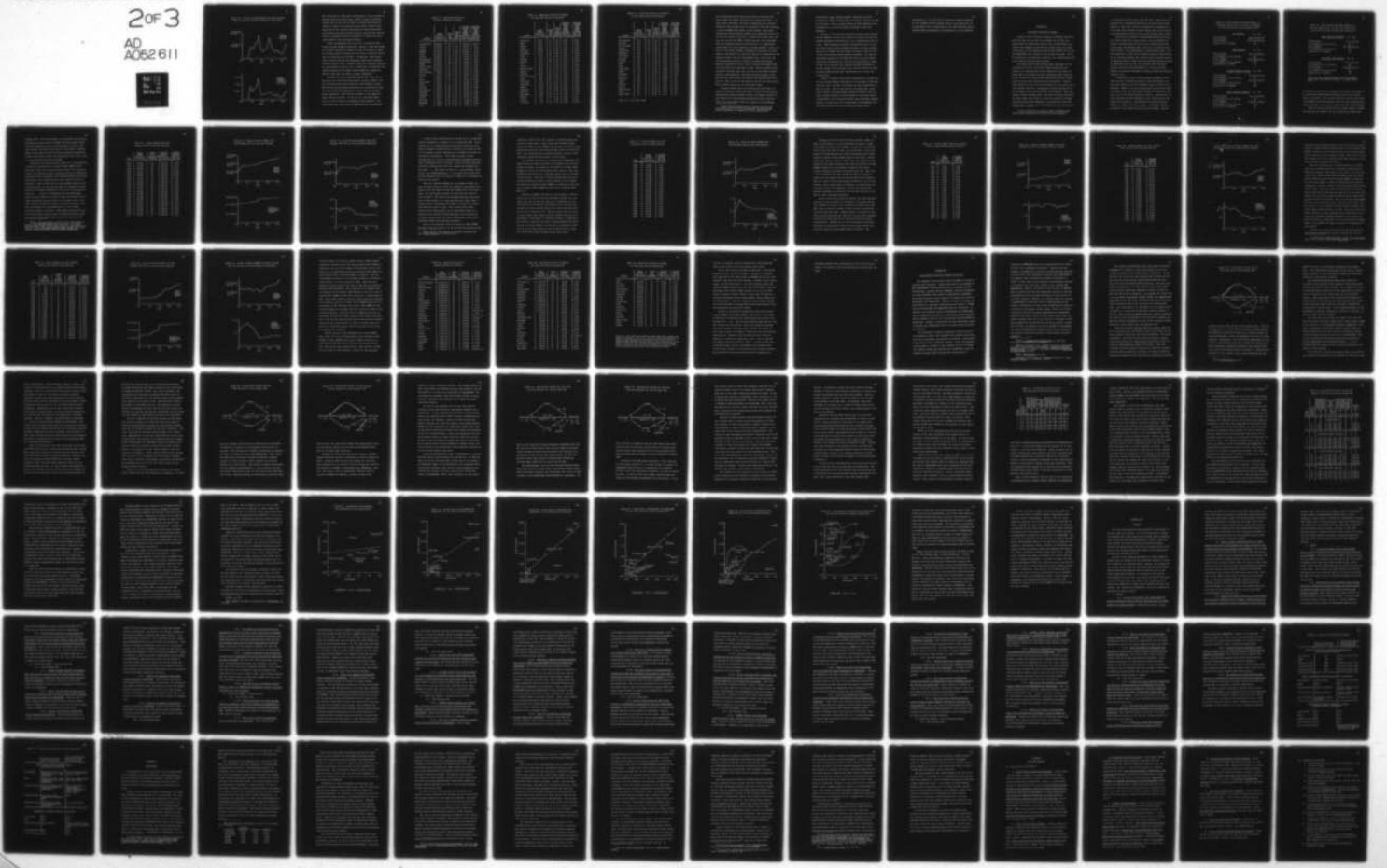
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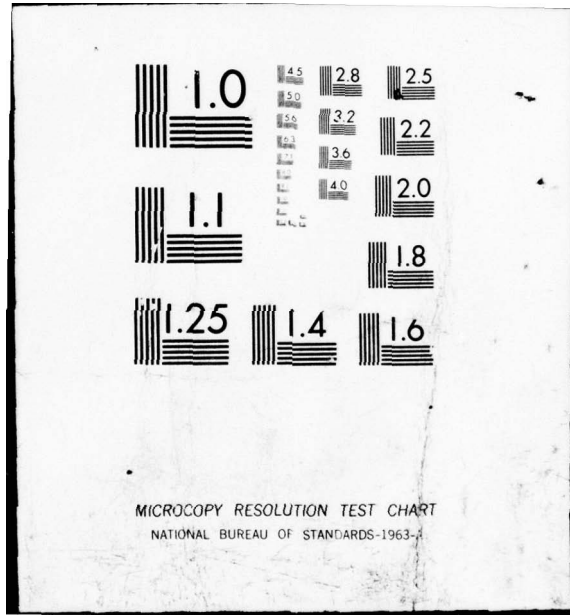
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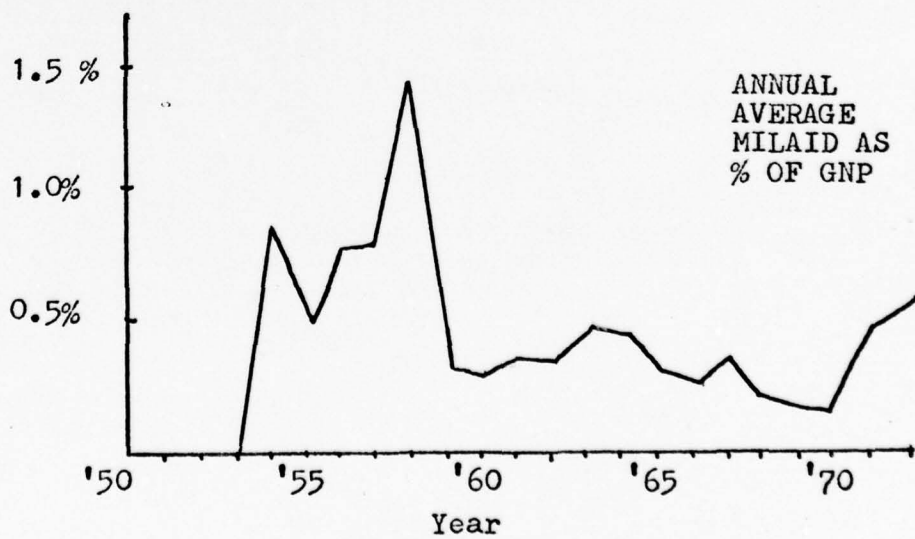
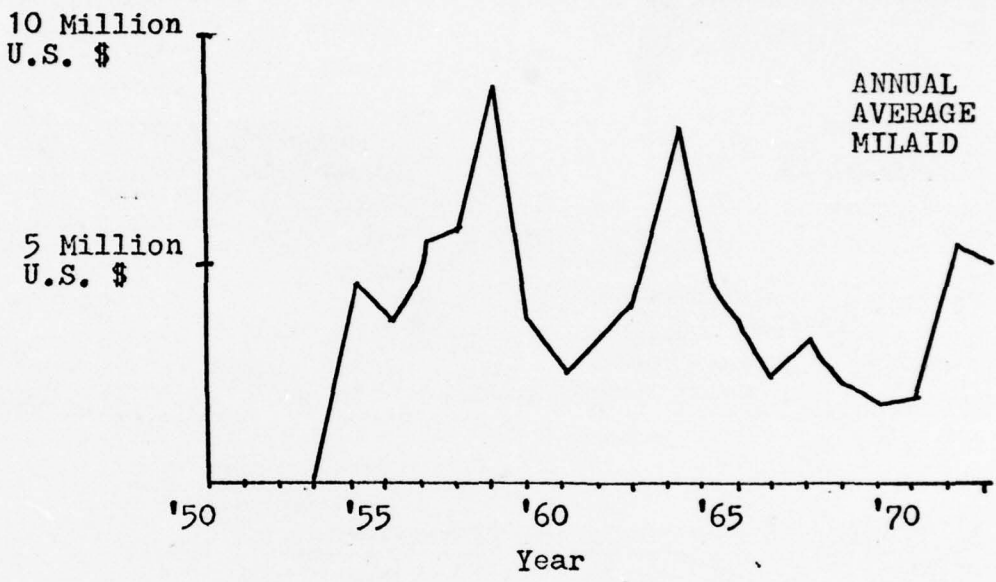
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MICROCOPY RESOLUTION TEST CHART
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Figure 12. Trend of Annual MILAID from 1950 through 1972 for the Less Developed Nations (Continued)



The first peak in 1958 can be attributed to large amounts of MILAID being received by Iraq, Jordan, Lebanon, and Saudi Arabia; the second peak in 1963 to a short-term influx of MILAID to India as a reaction to its border conflict with China and to the initial distribution of aid to the newly independent Sub-Sahara African nations; and the last peak in 1971 to a general increase in MILAID to a varied and unrelated group of less developed nations.

Three corresponding peak years are encountered when annual average MILAID is observed. However, since the number of recipient nations is limited for the first peak in 1958, the average amount of MILAID for this year is greater than in the two following peak periods. In addition, since these 1958 recipient nations had relatively small gross national products at that time, a similar high peak in MILAID expressed as a percentage of GNP is seen. Conversely, in 1963 when the largest portion of the annual total MILAID is compared to India's large GNP, the peak is nearly eliminated.

Turning now to the aggregate MILAID data that will be the basis for subsequent multivariate analysis, Table 11 on the following three pages indicates total MILAID, average MILAID, and average MILAID expressed as a percentage of GNP for each of the case nations for the 23 year time period being considered. (The nations in Table 11 are ranked by total MILAID received.) As can be seen from this table, there are two methods for computing average MILAID -- one considering only those years in which aid was received and

Table 11. Aggregate Measures of
MILAID for Each Case Nation

NATION	TOTAL MILAID (U.S. \$ x 1 Million)	YEARS OF MIL- AID	YEARS OF INDE- PEND- ENCE	AVERAGE MILAID FOR YEARS INDE- PENDENT (U.S. \$ x 1 Million)	AVERAGE MILAID FOR YEARS INDE- PENDENT AS % OF GNP (%)
South Korea	5,309.2	23	23	230.84	26.96
France	4,559.7	16	23	198.25	0.40
Turkey	3,290.7	23	23	143.07	3.70
Taiwan	3,204.8	22	23	139.34	9.14
Italy	2,636.3	17	23	114.62	0.37
Greece	1,836.4	23	23	79.84	2.32
Belgium/Lux.	1,347.6	16	23	58.59	0.46
Netherlands	1,332.4	16	23	57.93	0.50
Japan	1,203.3	15	23	52.32	0.11
United King.	1,161.2	16	23	50.49	0.09
Thailand	1,033.7	22	23	44.94	1.38
West Germany	969.1	10	23	42.14	0.05
Norway	913.0	18	23	39.70	0.82
Laos	885.7	17	23	38.51	32.73
Iran	857.7	22	23	37.29	0.75
Yugoslavia	781.0	7	23	33.96	0.89
Spain	764.9	19	23	33.26	0.27
Denmark	641.8	18	23	27.90	0.50
Philippines	540.6	23	23	23.50	1.12
Cambodia	411.3	13	23	17.88	3.65
Portugal	367.5	22	23	15.98	0.07
Brazil	365.9	20	23	15.91	3.83
Pakistan	194.4	10	23	8.45	0.38
Ethiopia	183.8	19	23	7.99	0.99
Chile	133.9	20	23	5.82	4.40

Table 11. Aggregate Measures of MILAID
for Each Case Nation (Continued)

NATION	TOTAL MILAID (U.S. \$ x 1 Million)	YEARS OF MIL- AID	YEARS OF INDE- PEND- ENCE	AVERAGE MILAID FOR YEARS INDE- PENDENT (U.S. \$ x 1 Million)	AVERAGE MILAID FOR YEARS INDE- PENDENT AS % OF GNP (%)
Indonesia	134.3	13	23	5.84	0.07
Peru	119.7	21	23	5.20	0.33
Jordan	116.0	15	23	5.04	1.22
India	102.8	9	23	4.47	0.02
Colombia	102.0	20	23	4.44	0.35
Argentina	76.6	13	23	3.33	0.25
Burma	54.1	10	23	2.35	0.16
Uruguay	52.9	19	23	2.30	2.30
Ecuador	51.4	20	23	2.24	0.38
Iraq	51.2	9	23	2.23	0.25
Tunisia	37.5	12	17	2.21	0.21
Saudi Arabia	36.7	15	23	1.60	0.17
Morocco	36.3	13	17	2.14	0.08
Bolivia	29.5	15	23	1.28	0.44
Dominican Rep.	29.0	18	23	1.26	0.15
Zaire	24.0	10	13	1.85	0.14
Venezuela	24.0	12	23	1.04	0.01
Guatemala	20.9	17	23	0.91	0.07
Libya	14.9	13	21	0.71	0.06
Paraguay	13.9	15	23	0.60	0.16
Lebanon	13.8	15	23	0.60	0.07
Nicaragua	13.8	19	23	0.60	0.12
Mexico	12.7	12	23	0.55	(1)
Canada	9.2	1	23	0.40	(1)
Honduras	9.0	18	23	0.39	0.09

Table 11. Aggregate Measures of MILAID
for Each Case Nation (Continued)

NATION	TOTAL MILAID (U.S. \$ x 1 Million)	YEARS OF MIL- AID	YEARS OF INDE- PEND- ENCE	AVERAGE MILAID FOR YEARS INDE- PENDENT (U.S. \$ x 1 Million)	AVERAGE MILAID FOR YEARS INDE- PENDENT AS % OF GNP (%)
El Salvador	7.0	12	23	0.30	0.04
Liberia	6.7	13	23	0.29	0.14
New Zealand	5.4	2	23	0.27	0.01
Panama	5.3	12	23	0.23	0.03
Afganistan	4.2	14	23	0.18	0.02
Malaysia	2.8	7	16	0.18	(1)
Sri Lanka	2.6	2	23	0.11	0.01
Senegal	2.6	5	13	0.20	0.04
Austria	2.5	4	23	0.11	(1)
Haiti	2.2	5	23	0.10	0.05
Mali	2.1	7	13	0.16	0.06
Costa Rica	1.9	6	23	0.08	0.02
Nepal	1.8	4	23	0.08	0.01
Singapore	1.5	1	8	0.19	0.01
Nigeria	1.2	6	13	0.09	(1)
Câmeroon	0.2	1	13	0.02	(1)
Sudan	0.2	2	13	0.02	(1)
Dahomey	0.1	1	13	0.01	(1)
Guinea	0.1	1	15	0.01	(1)
Ivory Coast	0.1	1	13	0.01	(1)
Niger	0.1	1	13	0.01	(1)
Upper Volta	0.1	1	13	0.01	(1)

Note: (1) Less than 0.01%

one considering all of the years within the 23 year time period that the nation existed as an independent state. In this latter procedure, the lack of MILAID for any specific nation for any specific year is indicated merely by assigning a 0 and including this value in the average. The values obtained by each averaging method, when correlated across all of the case nations, generate a coefficient of .97 (.95, .99, .99, and .94 for the NATO, forward defense, Latin American, and less developed nations respectively), indicating that either value is a true measure of average MILAID.¹ Since, as will be seen later, defense spending is assumed to be undertaken by each nation for each year that it is independent, the MILAID averaged over all independent years seems to be the most appropriate method to employ to insure consistency. Identical procedures can be used to average and compare MILAID expressed as a percentage of GNP. Similar strong coefficients of .99 (.83, .98, .99, and .98 for the NATO, forward defense, Latin American, and less developed nations respectively) also lead to the selection of the method which averages the value of all of the years of the 23 year time period that a nation existed as an independent state.

Several related facts can be discerned from Table 11. First, it should be noted that only 5 of the 72 case nations (South Korea, France, Turkey, Taiwan, and Italy) account for over 50% of the total MILAID distributed between 1950 and 1972. If 7 more nations (Greece, Belgium and Luxembourg,

¹Since all data being used is assumed to be at the interval or ratio level of measurement, Pearson product moment techniques are employed for all correlations.

Netherlands, Japan, United Kingdom, Thailand, and West Germany) are added to this group, the figure reaches over 75% of the total. Thus, a large portion of total MILAID is concentrated in an extremely small percentage of the case nations.

Second, a cross-nation correlation between total MILAID and the number of years that MILAID is received for all case nations produces a coefficient of .44, significant at the .01 level. This relatively moderate relationship seems to suggest that there is only a slight tendency for those nations that receive MILAID for the longest periods of time to also receive the greatest total amounts of MILAID. This fact is especially apparent in the NATO and Latin American nations where the correlations are .23 and .49 respectively. There is more of a trend for the long-term MILAID recipients to receive larger total amounts in the forward defense and less developed nations where the coefficients are .55 and .64 respectively.

Third, a similar cross-nation comparison of average MILAID and average MILAID expressed as a percentage of GNP again produces only a moderate correlation of .48, significant at the .01 level. Thus it can also be concluded that, among those nations receiving larger amounts of MILAID, there is only a slight tendency for this MILAID to represent larger percentages of the recipient nation's gross national product. However, in this case, the relationship is strengthened for the Latin American and less developed nations, where

correlations of .74 and .73 are observed; remains unchanged for the forward defense nations, where a correlation of .44 is generated; and is eliminated for the NATO nations, where a statistically insignificant correlation of $-.13$ is obtained.

CHAPTER VI

UNIVARIATE ANALYSIS OF DEFEXP

Similar to the univariate analysis of MILAID, this analysis considers the overall total DEFEXP for all the case nations for the entire time period under consideration, the annual total DEFEXP for all the case nations for each individual year, and the aggregate and average DEFEXP for each of the individual case nations for all of the 23 years. Due to the problems of missing data, however, some modifications have to be made to each of these measures.

For those nations with missing data, aggregate defense expenditures for the period from 1950 through 1972 are obtained by computing the average DEFEXP for the years for which data is available and then multiplying this figure by 23 or, in the case of the newly independent nations, by the number of years that they have been independent. Overall total DEFEXP for all of the case nations for the period from 1950 through 1972 then is obtained merely by summing all of the aggregate values of all of the case nations.¹ This procedure, albeit somewhat crude, does give a fairly valid overall total figure but fails to solve the problem of missing data when annual total DEFEXP is considered for each individual year. In this case, the majority of the missing data

¹A more detailed discussion of these technical data modification procedures is presented in the Appendix.

is encountered for the years 1971 and 1972. These two years therefore are eliminated from all of the time-series trend analyses. The small amount of missing data remaining for a few of the less developed nations during some of the earlier years should have little effect on the overall annual totals.

Using these procedures, approximately \$515,842,340,000, at constant 1960 case nation prices, can be attributed to defense spending by all of the 72 case nations during the period from 1950 through 1972. The largest portion of this total DEFEXP -- \$352,369,840,000 or approximately 68% -- has been expended by Japan and the Western European NATO nations. Of the remaining amount, the forward defense nations account for \$39,404,790,000 or 8%, the Latin American nations account for \$28,418,110,000 or 5%, the remaining less developed nations account for \$46,696,608,000 or 9%, and Austria, Canada, New Zealand, Portugal, and Spain account for \$48,952,992,000 or 9%.

A comparison of these total amounts of DEFEXP and the total amounts of MILAID presented in the last chapter can give some indication of the potential impact of this latter variable. Table 12 on the following page presents this data in summary form. Several facts, useful for subsequent analyses, can be discerned from these figures. First, where the great majority of total MILAID has been distributed to two groups of recipients -- the NATO and the forward defense nations -- only one of these groups -- the NATO countries -- account for any sizable portion of total DEFEXP. Second,

Table 12. Total MILAID and Total DEFEXP, at
Constant 1960 Prices, for All Case Nations
for the Period from 1950 through 1972 (1)

<u>ALL NATIONS</u>		(n = 72)
Total MILAID:		\$36,163,180,000
Total DEFEXP:		\$515,842,340,000
MILAID as % of DEFEXP:		7%
 <u>NATO NATIONS</u>		 (n = 10)
Total MILAID:		\$15,545,398,000
% of MILAID for all Nations:		43%
Total DEFEXP:		\$352,369,840,000
% of DEFEXP for all Nations:		68%
MILAID as % of DEFEXP:		4%
 <u>FORWARD DEFENSE NATIONS</u>		 (n = 10)
Total MILAID:		\$17,565,500,000
% of MILAID for all Nations:		49%
Total DEFEXP:		\$39,404,790,000
% of DEFEXP for all Nations:		8%
MILAID as % of DEFEXP:		45%
 <u>LATIN AMERICAN NATIONS</u>		 (n = 19)
Total MILAID:		\$1,071,698,000
% of MILAID for all Nations:		3%
Total DEFEXP:		\$28,418,110,000
% of DEFEXP for all Nations:		6%
MILAID as % of DEFEXP:		4%

Table 12. Total MILAID and Total DEFEXP, at Constant 1960 Prices, for All Case Nations for the Period from 1950 through 1972 (Continued)

LESS DEVELOPED NATIONS (n = 28)

Total MILAID:	\$832,098,000
% of MILAID for all Nations:	2%
Total DEFEXP:	\$46,696,608,000
% of DEFEXP for all Nations:	9%
MILAID as % of DEFEXP:	2%

REMAINING CASE NATIONS (n = 5)

Total MILAID:	\$1,149,500,000
% of MILAID for all Nations:	3%
Total DEFEXP:	\$48,952,992,000
% of DEFEXP for all Nations:	9%
MILAID as % of DEFEXP:	2%

Note: (1) The nations within each of the groups shown above are listed in Table 1 on pages 48 and 49.

the nations which appear to possess the greatest potential to be effected by United States military aid are the forward defense countries. Here, total MILAID is equal to 45% of the total DEFEXP for these nations, while for the remaining three groups, MILAID, in each case, equals less than 10% of DEFEXP.

Table 13 on page 98 indicates the total amount of DEFEXP for all the case nations for the 21 year period from 1950

through 1970. The annual number of independent case nations, the annual average amount of DEFEXP, and the annual average amount of DEFEXP expressed as a percentage of each of the case nation's GNP also are included in this table. Finally, Figure 13 on pages 99 and 100 presents graphical depictions of all of the annual totals and illustrates the 21 year trend for each of these measures of DEFEXP.

Turning to the first graph in Figure 13, a long-term and relatively consistent rise in annual total DEFEXP can be observed. Since the 72 case nations account for a large percentage of world-wide defense spending and since inflationary trends have been eliminated, this upwards pattern illustrates the theory of the "spiraling arms race" argued by numerous scholars.² Part of this rise in total DEFEXP, however, must be attributed to the increasing number of independent states engaged in military spending, as seen in the second graph of Figure 13. Indeed, as illustrated by the third graph, annual average DEFEXP, from 1953 to 1960, when most of these newly independent nations appear on the global scene, actually declines slightly as slowly increasing world-wide military expenditures are distributed over a more rapidly increasing number of nations. After 1960, however, the number of independent states reach a relatively constant level and average annual DEFEXP again begins its upwards climb.

²Frank, The Arms Trade; Wynfred Joshua and Stephen P. Givert, Arms for the Third World (Baltimore: The Johns Hopkins Press, 1969); Kemp, "Arms Traffic"; John Stanley and Maurice Pearton, The International Trade in Arms (New York: Praeger Publishers, 1972); and the SIPRI, Arms Trade.

Table 13. Annual DEFEXP from 1950
through 1970 for All Case Nations

YEAR	TOTAL DEFEXP (U.S. \$ x 1 Million)	NUMBER OF INDEPENDENT NATIONS	AVERAGE DEFEXP (U.S. \$ x 1 Million)	AVERAGE DEFEXP AS % OF GNP (%)
1950	10,784	56	192.57	9.68
1951	15,203	56	271.48	10.14
1952	18,395	57	322.72	8.12
1953	19,491	57	341.95	10.87
1954	18,352	57	321.96	10.04
1955	18,169	57	318.75	10.65
1956	19,305	60	321.75	10.29
1957	19,575	61	320.90	9.66
1958	18,939	62	305.47	9.21
1959	19,912	62	321.16	8.06
1960	20,746	71	292.20	6.68
1961	21,394	71	301.32	6.64
1962	23,285	71	327.95	6.84
1963	24,229	71	341.25	6.00
1964	24,908	71	350.81	5.78
1965	25,420	72	353.06	6.23
1966	25,832	72	358.78	6.24
1967	27,054	72	375.75	6.65
1968	26,982	72	374.75	6.49
1969	27,721	72	385.02	6.52
1970	28,784	72	399.78	6.66

Figure 13. Trend of Annual DEFEXP from 1950 through 1970 for All Case Nations

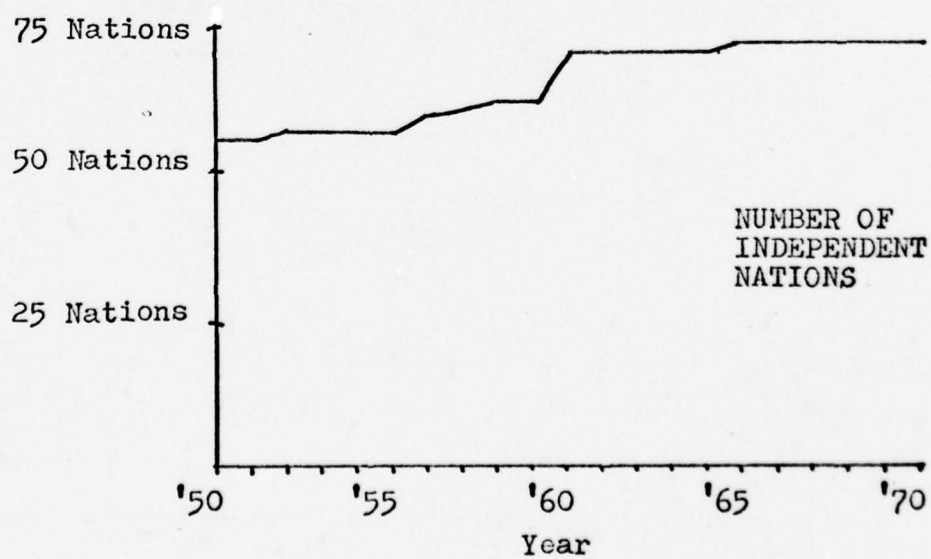
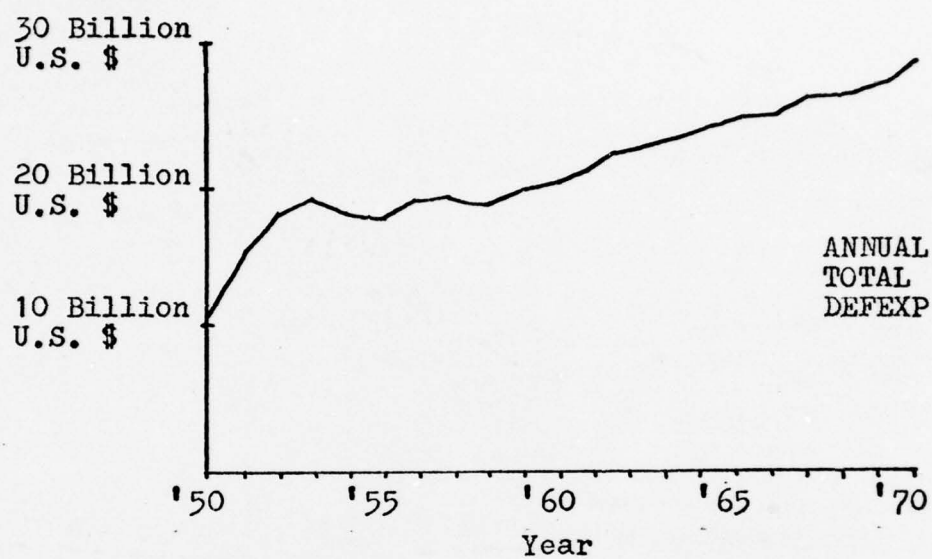
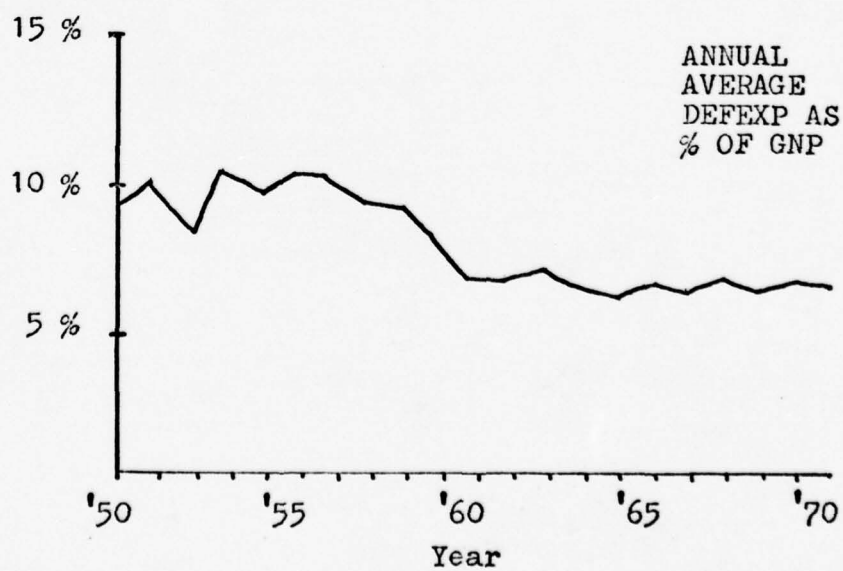
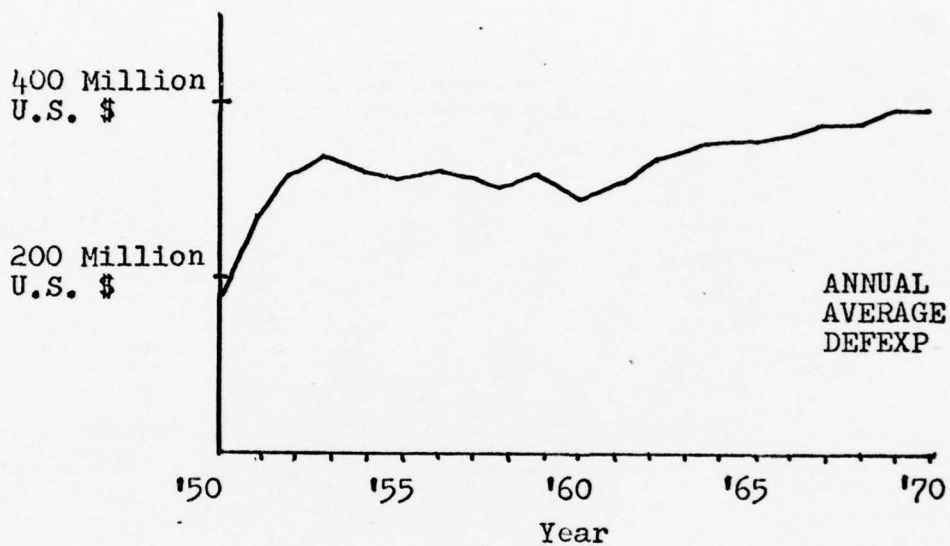


Figure 13. Trend of Annual DEFEXP from 1950 through 1970 for All Case Nations (Continued)



Another factor influencing the steady rise in world-wide defense spending is a similar rise in world-wide GNP. There appears to be a common tendency among many nations to maintain government expenditures as a constant percentage of GNP and to maintain defense spending as a constant percentage of government expenditures. Since GNP is rising in most nations, the net amount of both government spending and military expenditures also is growing. Knorr describes this phenomenon by stating that "the more rapidly and steadily the GNP grows . . . the easier it will be -- economically, politically, and administratively -- to increase the defense budget by allowing it to rise short of, equal to, or somewhat in excess of the GNP."³

Thus, by computing DEFEXP as a percentage of GNP, not only can this measure be used for effective cross-nation comparison, but the impact of GNP upon DEFEXP also can be analyzed. The last graph in Figure 13 describes the trend of this variable. The pattern of military spending, when measured in this manner, is a long-term decline, rather than a steady growth, indicating that DEFEXP is rising at a slower rate than the growth of GNP. The leveling off of this decline after 1965 possibly can be attributed either to a slowing of the growth of world-wide GNP, or an increase in military spending among the newly independent nations with relatively small gross national products.

Some of the questions about the trend of total DEFEXP for all of the case nations can be answered by looking at the

³Klaus Knorr, "The Concept of Economic Potential for War," World Politics 10 (1957), 49-61.

component trends of the four groups of countries being considered in this study. Since Japan and the NATO nations account for 68% of total DEFEXP, the pattern of defense spending by this group has the greatest impact upon the total pattern. The remaining three groups of nations, however, also contribute significantly to this overall trend.

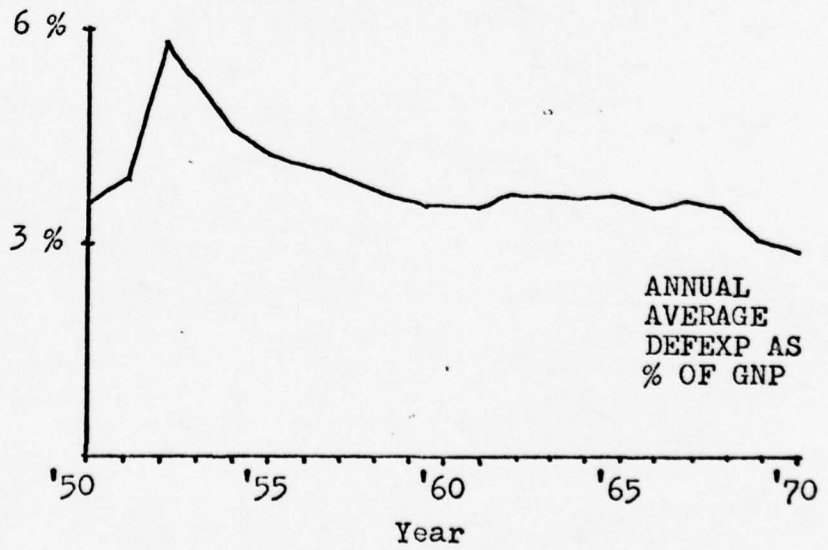
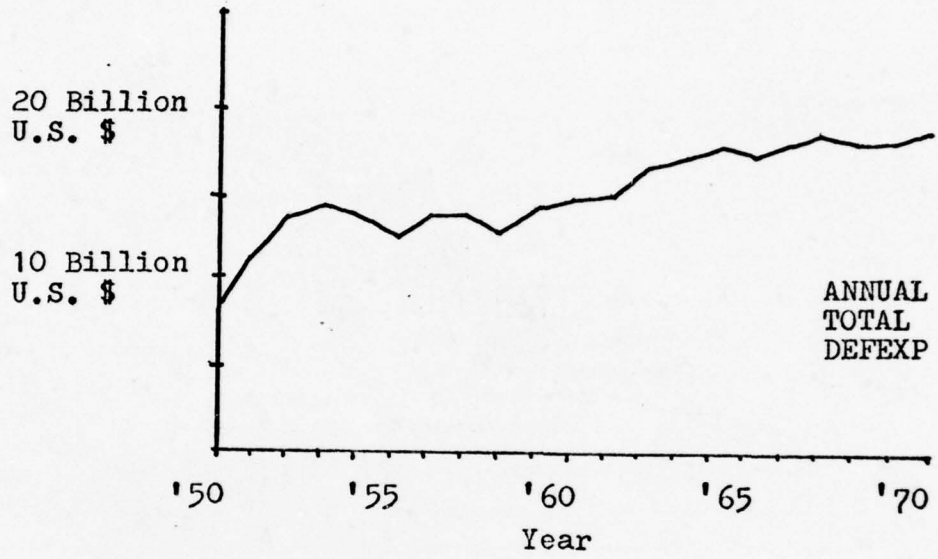
As expected, the pattern of annual total DEFEXP for the NATO nations, as shown in Table 14 and Figure 14 on the following two pages, is similar to the pattern of annual total DEFEXP for all of the case nations shown earlier. The only significant difference is a slightly slower rate of increase for this group. Since all of these nations have been independent during all of the 21 years depicted in the graphs, the pattern of annual average DEFEXP is identical to the pattern of annual total DEFEXP and therefore is omitted from Table 14.

Turning to DEFEXP expressed as a percentage of GNP for this group, as shown in the second graph in Figure 14, the sharp rise between 1950 and 1952 can be attributed to the rapid growth in rearmament expenditures at a time when the economies of these nations had not yet fully recovered from the effects of World War II. However, after 1952, as these economies begin their rapid recovery, DEFEXP expressed as a percentage of GNP begins a continuous decline. Furthermore, this decline continues past 1965, indicating that the leveling off of average DEFEXP expressed as a percentage of GNP for all of the case nations is due to the effects of countries other than those included within this group.

Table 14. Annual DEFEXP from 1950 through 1970 for the NATO Nations

YEAR	TOTAL DEFEXP (U.S. \$ x 1 Million)	AVERAGE DEFEXP AS % OF GNP (%)
1950	8,075	3.51
1951	11,187	3.83
1952	13,917	5.82
1953	14,155	5.34
1954	13,272	4.79
1955	12,889	4.30
1956	13,598	4.19
1957	13,896	4.05
1958	12,901	3.72
1959	13,967	3.64
1960	14,539	3.54
1961	14,862	3.50
1962	16,331	3.63
1963	16,845	3.57
1964	17,254	3.50
1965	17,372	3.53
1966	17,500	3.47
1967	18,166	3.43
1968	17,732	3.30
1969	17,752	3.08
1970	17,969	2.96

Figure 14. Trend of Annual DEFEXP from 1950 through 1970 for the NATO Nations



Looking next at the forward defense nations, shown in Table 15 and Figure 15 on the following two pages, a long-term growth in annual total DEFEXP, in spite of a relatively level period from 1959 to 1964, can be observed. Since the number of independent nations within this group also remains constant, annual average DEFEXP again is not shown. Unlike either the combined trends of all of the case nations or the pattern of the NATO countries, the long-term trend of average DEFEXP expressed as a percentage of GNP for this group remains relatively constant at approximately 10%. This fact seems to indicate that both DEFEXP and GNP are rising at nearly the same annual rate for the forward defense nations. And, the effect of more rapid growth of GNP in a few of these nations, such as South Korea and Taiwan, is countered by the necessity of Laos and Cambodia, nations with small gross national products, to spend more for national defense in the face of overt communist hostility.

Of all of the four groups of nations, the Latin American countries, shown in Table 16 and Figure 16 on pages 108 and 109, display the slowest rate of growth in annual total DEFEXP, with the greatest amount of this increase concentrated in the period after 1962. Significantly, the growth in this latter period parallels the increased concern about communist subversion in Latin America as expressed by United States policy-makers. Similar to the first two groups of nations, the number of independent states in this group remains constant and annual average DEFEXP again is omitted. The

Table 15. Annual DEFEXP from 1950 through
1970 for the Forward Defense Nations

YEAR	TOTAL DEFEXP (U.S. \$ x 1 Million)	AVERAGE DEFEXP AS % OF GNP (%)
1950	1,013	8.86
1951	1,168	9.74
1952	1,187	10.68
1953	1,180	10.00
1954	1,230	10.45
1955	1,302	10.19
1956	1,338	9.31
1957	1,402	9.44
1958	1,645	10.70
1959	1,801	11.16
1960	1,461	10.97
1961	1,511	11.04
1962	1,595	10.22
1963	1,563	9.87
1964	1,643	8.40
1965	1,946	9.74
1966	2,054	10.06
1967	2,169	9.69
1968	2,449	10.08
1969	2,750	10.50
1970	3,135	12.30

Figure 15. Trend of Annual DEFEXP from 1950 through 1970 for the Forward Defense Nations

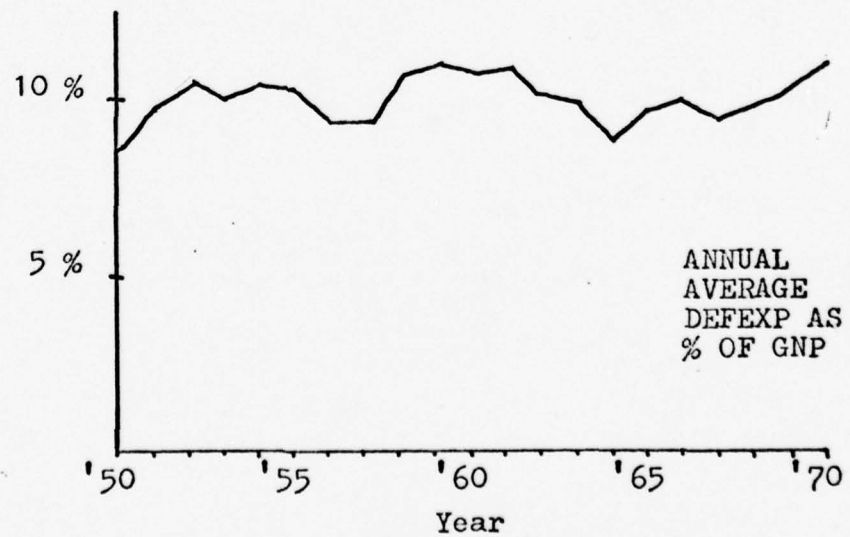
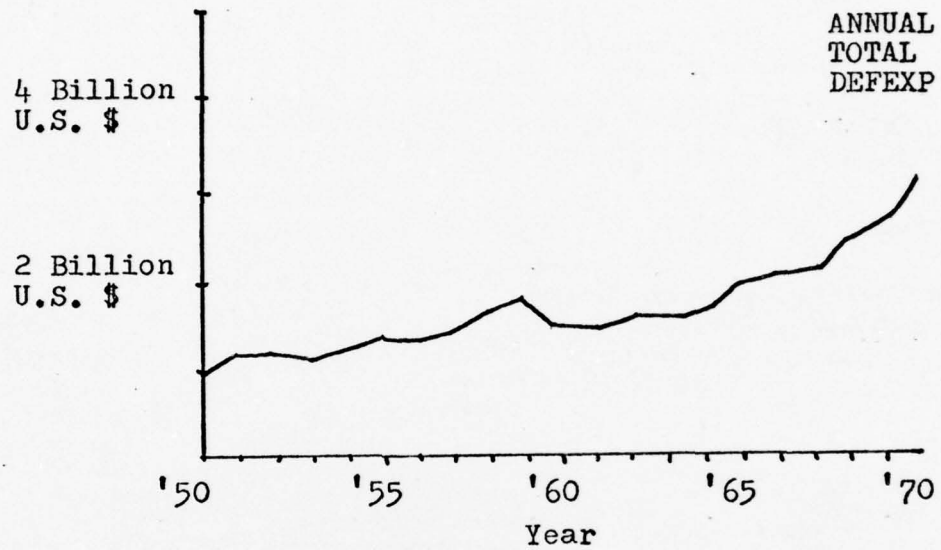
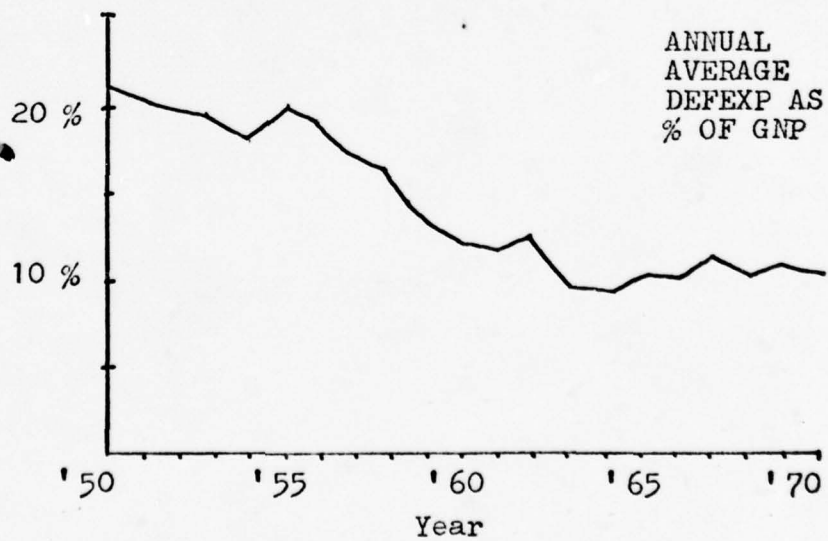
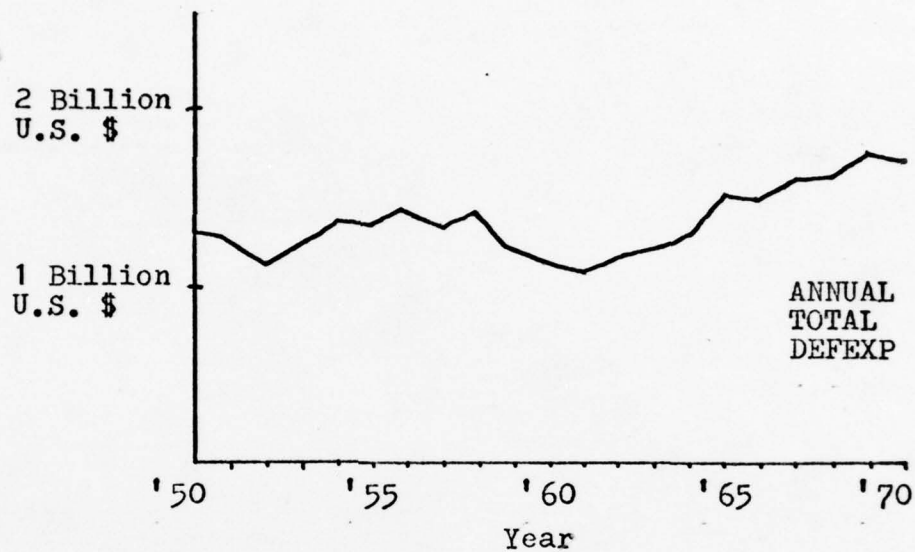


Table 16. Annual DEFEXP from 1950 through
1970 for the Latin American Nations

YEAR	TOTAL DEFEXP (U.S. \$ x 1 Million)	AVERAGE DEFEXP AS % OF GNP (%)
1950	1,302	21.04
1951	1,277	20.35
1952	1,138	19.67
1953	1,228	19.12
1954	1,345	17.58
1955	1,360	20.17
1956	1,409	18.96
1957	1,302	16.94
1958	1,378	16.98
1959	1,179	13.09
1960	1,125	11.90
1961	1,106	11.79
1962	1,185	12.57
1963	1,217	9.37
1964	1,287	9.50
1965	1,458	10.55
1966	1,448	10.12
1967	1,611	11.58
1968	1,659	10.66
1969	1,733	10.83
1970	1,710	10.63

Figure 16. Trend of Annual DEFEXP from 1950 through 1970 for the Latin American Nations



relatively steady annual growth of GNP of the Latin American nations, coupled with the slower growth of their annual total DEFEXP, produces a rather rapid decline when military spending is expressed as a percentage of GNP. This decline levels off and then even rises slightly after 1963, however, as the rate of defense spending increases.

When the remaining less developed nations are considered, the increasing number of independent states must be taken into account. Thus Table 17 and Figure 17 on the following three pages include both the annual number of independent nations and the annual average DEFEXP. Looking at the first two graphs, a period of relatively level defense spending by a constant number of nations can be observed from 1950 to 1956. This early phase is followed by a four year period from 1956 to 1960 when the majority of the newly independent nations achieve statehood and assumedly embark upon programs of defense spending. Thus, the annual total DEFEXP for this same period also rises. However, after 1960, when the number of less developed nations remains constant, this annual total DEFEXP continues to grow. How much of this continued growth in defense spending can be attributed to the desire for "national military prestige" by the newly independent nations, as suggested earlier by Walterhouse, Frank, Kemp, and the SIPRI, can only be a matter of conjecture at this point.⁴

A little more light can be shed on this phenomenon by observing the remaining two graphs in Figure 17. In the

⁴ Walterhouse, A Time to Build; Frank, The Arms Trade; Kemp, "Arms Traffic"; and SIPRI, Arms Trade.

Table 17. Annual DEFEXP from 1950 through
1970 for the Less Developed Nations

YEAR	TOTAL DEFEXP (U.S. \$ x 1 Million)	NUMBER OF INDE- PENDENT NATIONS	AVERAGE DEFEXP (U.S. \$ x 1 Million)	AVERAGE DEFEXP AS % OF GNP (%)
1950	923	13	71.00	5.47
1951	990	13	76.15	7.43
1952	994	14	71.00	7.93
1953	1,008	14	72.00	8.65
1954	1,028	14	73.43	9.18
1955	1,030	14	73.57	8.19
1956	1,159	17	68.18	7.62
1957	1,186	18	65.89	7.24
1958	1,365	19	71.84	5.29
1959	1,375	19	72.37	4.73
1960	1,595	27	59.07	3.09
1961	1,781	27	65.96	3.26
1962	1,927	27	71.37	3.48
1963	2,466	27	91.33	3.70
1964	2,463	27	91.22	3.61
1965	2,577	28	92.04	3.68
1966	2,671	28	95.39	3.91
1967	2,755	28	98.39	4.07
1968	2,882	28	102.92	4.22
1969	3,331	28	118.96	4.15
1970	3,323	28	118.68	3.95

Figure 17. Trend of Annual DEFEXP from 1950 through 1970 for the Less Developed Nations

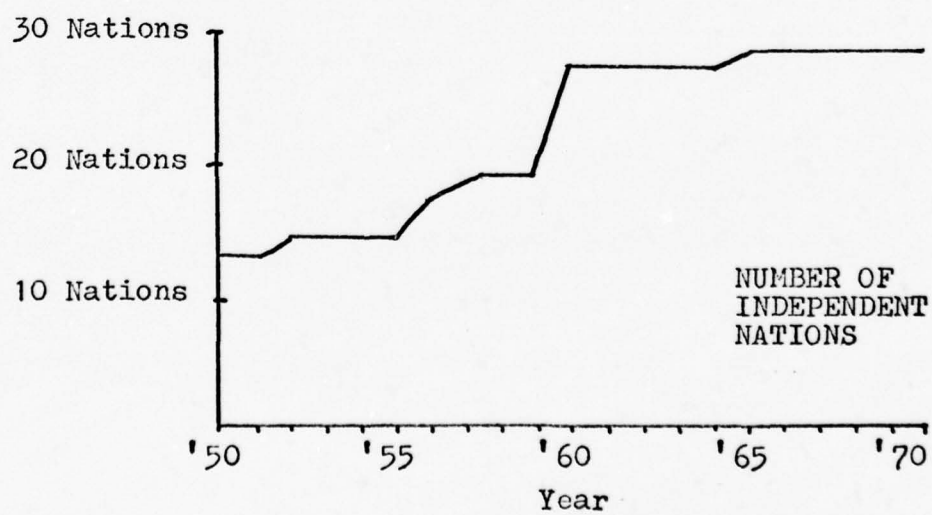
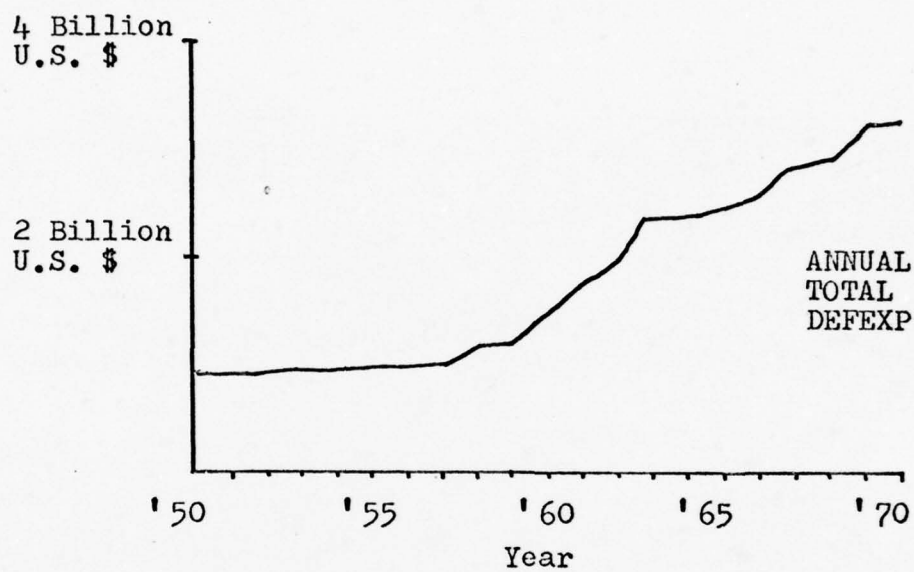
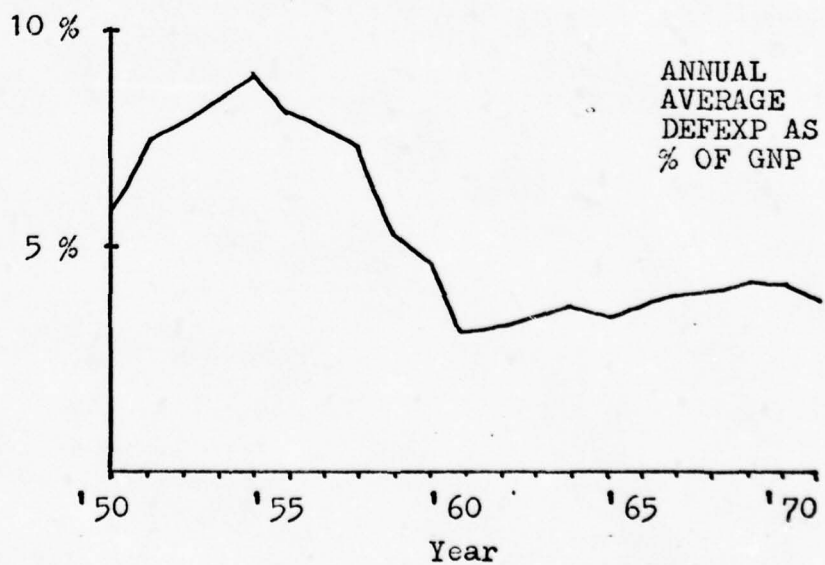
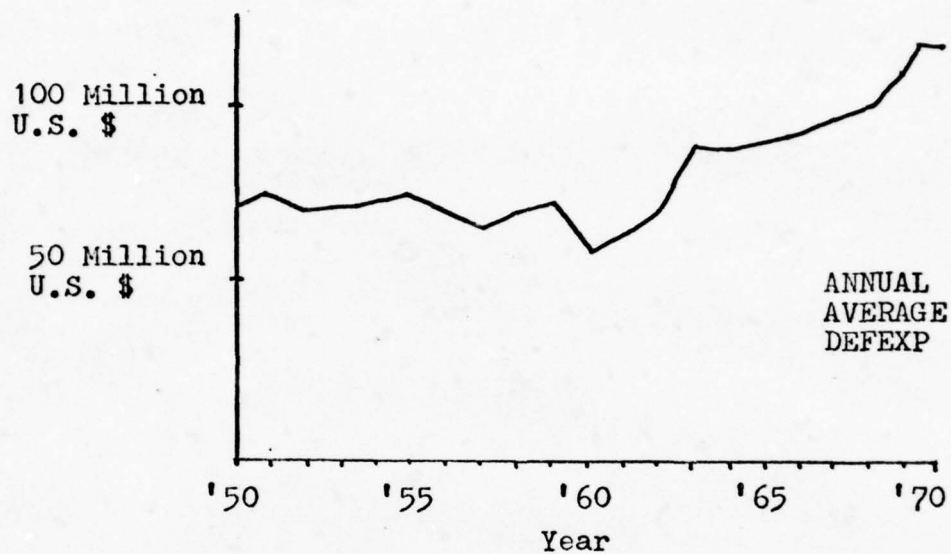


Figure 17. Trend of Annual DEFEXP from 1950 through 1970 for the Less Developed Nations (Continued)



first of these, as expected, annual average DEFEXP remains relatively constant as the increasing annual total DEFEXP is matched by the increasing number of independent states, and then rises as additional increases in annual total DEFEXP are distributed across a constant number of nations. However, when DEFEXP expressed as a percentage of GNP is considered, a rapid decline is observed prior to 1960. (The four year increase in this measure from 1950 to 1954 can be attributed mainly to missing data.) This trend seems to indicate that the majority of the nations contributing to the level rate of annual total DEFEXP at this time experience a rapid growth in GNP. After 1960, however, when the newly independent nations are included, a slow but steady rise in DEFEXP expressed as a percentage of GNP indicates that annual total DEFEXP is now rising slightly more rapidly than the economies of these less developed nations. This slow rise of DEFEXP expressed as a percentage of GNP after 1960, together with similar increases after 1965 for the Latin American and forward defense nations, apparently has enough impact to slow the overall long-term decrease of the NATO nations when the patterns of all of the case nations are combined.

Turning finally to the aggregate and average DEFEXP data, Table 18 on the following three pages indicates total DEFEXP, average DEFEXP, and average DEFEXP expressed as a percentage of GNP for each of the case nations for the 23 year time period under consideration. (The nations in Table 18 are ranked by total DEFEXP.) Similar to the aggregate

Table 18. Aggregate Measures of
DEFEXP for Each Case Nation

NATION	TOTAL DEFEXP (U.S. \$ x 1 Million)	YEARS OF INDE- PENDENCE	AVERAGE DEFEXP (U.S. \$ x 1 Million)	AVERAGE DEFEXP AS % OF GNP (%)
United Kingdom	110,034.94	23	4784.13	7.43
France	90,188.94	23	3921.26	5.53
West Germany	70,509.94	23	3065.65	2.79
Canada	38,902.40	23	1691.41	4.40
Italy	29,678.99	23	1290.39	3.11
India	20,024.63	23	870.64	4.19
Japan	13,634.82	23	592.82	0.88
Netherlands	12,586.00	23	547.22	3.55
Belgium/Lux.	9,651.23	23	419.62	2.71
Yugoslavia	7,852.99	23	341.43	5.99
Indonesia	7,537.95	23	327.74	5.18
Brazil	7,418.04	23	322.52	75.63 (1)
Turkey	6,473.45	23	281.45	6.84
Argentina	6,320.61	23	274.81	23.14 (1)
Pakistan	6,074.09	23	264.09	16.08
South Korea	5,760.35	23	250.45	32.12
Iran	5,540.54	23	236.55	3.64
Taiwan	5,024.89	23	218.47	10.02
Saudi Arabia	4,655.58	23	202.42	11.66
Greece	4,640.77	23	201.77	4.93
Norway	4,229.00	23	183.87	3.08
Denmark	4,003.00	23	174.05	2.48
Venezuela	3,841.00	23	167.00	2.87
Portugal	3,566.04	23	155.05	4.73
Spain	2,974.32	23	129.32	1.02
Iraq	2,940.71	23	127.86	10.80
Chile	2,570.25	23	111.75	87.97 (1)

Table 18. Aggregate Measures of DEFEXP
for Each Case Nation (Continued)

NATION	TOTAL DEFEXP (U.S. \$ x 1 Million)	YEARS OF INDE- PENDENCE	AVERAGE DEFEXP (U.S. \$ x 1 Million)	AVERAGE DEFEXP AS % OF GNP (%)
Philippines	2,262.76	23	98.38	4.67
Mexico	2,197.05	23	95.52	0.73
Burma	1,945.14	23	84.57	6.73
New Zealand	1,846.27	23	80.27	2.23
Colombia	1,795.04	23	78.05	6.07
Thailand	1,767.71	23	76.86	2.44
Austria	1,664.00	23	72.35	0.82
Cambodia	1,529.50	23	66.50	12.15
Peru	1,429.29	23	62.14	3.91
Malaysia	1,272.00	16	79.56	2.18
Jordan	1,225.57	23	53.29	22.71
Zaire	1,114.45	13	85.73	6.42
Morocco	976.73	17	57.45	2.24
Nigeria	949.00	13	73.00	1.83
Dominican Rep.	734.23	23	31.92	3.83
Ethiopia	529.00	23	23.00	2.68
Lebanon	485.09	23	21.09	2.17
Libya	466.85	21	22.23	1.09
Ecuador	449.78	23	19.56	3.24
Laos	430.73	23	18.73	17.59
Singapore	411.00	8	51.38	3.18
Uruguay	406.33	23	17.67	17.67 (1)
Sudan	344.05	17	20.24	1.50
Tunisia	264.07	17	15.53	1.81
Afghanistan	244.64	23	10.64	1.09
Sri Lanka	236.57	23	10.29	0.95
Guatemala	230.00	23	10.00	0.91

Table 18. Aggregate Measures of DEFEXP
for Each Case Nation (Continued)

NATION	TOTAL DEFEXP (U.S. \$ x 1 Million)	YEARS OF INDE- PENDENCE	AVERAGE DEFEXP (U.S. \$ x 1 Million)	AVERAGE DEFEXP AS % OF GNP (%)
Mali	213.90	13	16.46	3.12
Bolivia	181.13	23	7.88	2.75
Cameroon	179.83	13	13.83	2.73
El Salvador	177.73	23	7.73	1.24
Nicaragua	164.29	23	7.14	1.60
Paraguay	150.27	23	6.53	1.89
Guinea	147.50	15	9.83	3.08
Senegal	131.08	13	10.08	1.69
Ivory Coast	127.64	13	9.82	1.16
Haiti	123.05	23	5.35	2.52
Honduras	110.62	23	4.81	1.36
Costa Rica	96.38	23	4.19	0.87
Nepal	89.91	23	3.91	0.81
Dahomey	54.60	13	4.20	2.10
Liberia	53.67	23	2.33	1.22
Upper Volta	49.64	13	3.82	1.45
Niger	24.82	13	1.91	0.83
Panama	23.00	23	1.00	0.17

Note: (1) The values for these 4 Latin American nations are artificially high. The price index to adjust GNP utilized by USAID is considerably more severe than the price index to adjust DEFEXP utilized by the SIPRI. This difference is constant for all the case nations and thus has no statistical effect. However, the excessive inflation in these specific four countries produces the large percentages shown.

measures of MILAID, several considerations concerning the data in this table need to be noted at this point.

First, the top three nations in Table 18 -- the United Kingdom, France, and West Germany -- account for slightly more than 50% of the total amount of DEFEXP for all the case nations. When the next five nations -- Canada, Italy, India, Japan, and the Netherlands -- are added to this group, the combined DEFEXP accounts for over 75% of the total. Not surprisingly, six of these eight countries are from the NATO group of nations defined earlier. These same six nations -- the United Kingdom, France, West Germany, Italy, Japan, and the Netherlands -- also are among the twelve nations listed in the last chapter receiving 75% of the total amount of MILAID distributed by the United States.

Second, a cross-nation statistical comparison between average DEFEXP and average DEFEXP expressed as a percentage of GNP fails to indicate any relationship between these two variables ($r = .01$). This finding suggests that when all the case nations are considered, there is no apparent tendency for those countries spending larger amounts on defense to also devote larger percentages of their GNP to their military expenditures. However, when the NATO and Latin American nations are considered separately, correlations of .62 and .63 suggest just the opposite. That is, those nations with relatively larger defense expenditures are devoting relatively larger portions of their GNP to this defense spending. The trend for the forward defense and the remaining less

developed nations, with correlations of .14 and .19 respectively, is similar to that when all the case nations are combined.

CHAPTER VII

MULTIVARIATE ANALYSIS OF MILAID AND DEFEXP

The original research model shown in Figure 6 on page 31 included five variables: DEFEXP expressed as a percentage of GNP (DEFEXP/GNP), MILAID expressed as a percentage of GNP (MILAID/GNP), external threats (EXTTHR), military orientation of regime (MILREG), and brevity of independence (BREVIND). The primary purpose of this study is to measure the effect of MILAID/GNP upon DEFEXP/GNP. However, in order to explore the possibility of a spurious relationship, the impact of EXTTHR upon both MILAID/GNP and DEFEXP/GNP must be considered. In addition, the indirect effect of MILAID/GNP upon DEFEXP/GNP must be analyzed by testing the relationship between MILAID/GNP and MILREG as well as the relationship between MILREG and DEFEXP/GNP. Finally, consideration of the independent impact of BREVIND upon DEFEXP/GNP must be included in the multivariate analysis.

The statistical techniques employed to test the inter-relationship of these five variables are multiple regression, bivariate correlation, and partial correlation. This methodology produces four analytical results. First, the multiple R (R) provides a measure of the combined effects of MILAID/GNP, EXTTHR, MILREG, and BREVIND upon DEFEXP/GNP, while the multiple R squared (R^2) indicates the total amount of

variance in DEFEXP/GNP that can be attributed to the effect of these four independent variables.¹ Second, the beta weights or standardized regression coefficients (B) allow the effects of the four independent variables upon DEFEXP/GNP to be compared, thus indicating the relative importance of each.² If the value of the multiple R and multiple R squared is extremely low, these beta weights become analytically meaningless. That is, if little of the variance in DEFEXP/GNP is explained by the four independent variables, then the contribution of each of these variables to this variance is of little interest. However, if a sizable amount of variance in DEFEXP/GNP is explained, then an understanding of the relative contribution of each of the independent variables is essential to the purpose of this study. Third, the partial correlation (partial r) between MILAID/GNP and DEFEXP/GNP indicates the direct effect of this former measure upon the latter variable while all of the effects of the three remaining variables are controlled for or held constant.³ Fourth, the bivariate correlation (r) between EXTTHR and MILAID/GNP and between MILAID/GNP and MILREG assists in the analysis of the possible spurious and indirect relationships discussed earlier.⁴

¹Mueller, Approaches to Measurement, p. 307; and Kerlinger, Foundations, pp. 617-618.

²Hubert M. Blalock, Jr., "Casual Inferences, Closed Populations, and Measures of Association," American Political Science Review 61 (1967): 130-136; and Mueller, Approaches to Measurement, p. 307.

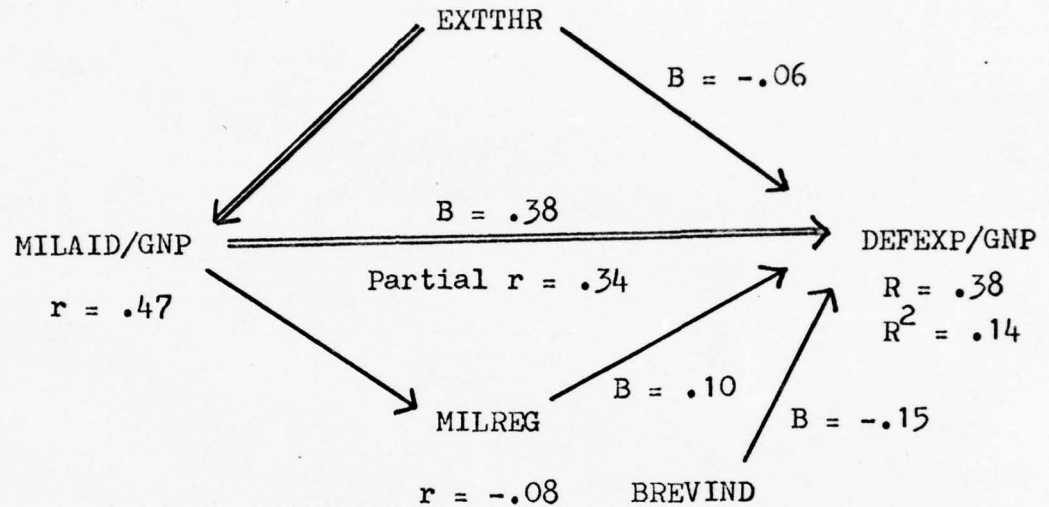
³Gurr, Politometrics, p. 150.

⁴Blalock, "Controlling for Background Factors," Sociological Inquiry 34 (Winter): 28-40.

Two primary considerations arise when these statistical techniques are employed. First, the specific cases (i.e. recipient nations) to be tested must be determined. Second, the year or, in the case when aggregate and average measures are used, the group of years across which these specific cases are to be correlated must be selected. The most appropriate methodology is to begin with the most general procedures and then, based upon subsequent results, to move to more specific areas of analysis. Accordingly, the first step is to correlate MILAID/GNP, EXTTHR, MILREG, and BREVIND with DEFEXP/GNP across all of the 72 nations with all of the variables averaged for all of the 23 years from 1950 through 1972. The actual data to be correlated are the values listed in Tables 3, 4, and 5 and in the last columns of Tables 11 and 18. These initial procedures thus are aimed at measuring the effect of the distribution of United States military aid upon the defense expenditures of all of the recipient nations during the entire period from 1950 through 1972.

Using the original research model as a guide, Figure 18 on the following page graphically depicts the results of this first multiple regression, bivariate correlation, and partial correlation. For this and all similar subsequent figures, relationships which are statistically significant at the .01 level are highlighted by double lined paths. Since all recipients of United States military aid, with the exception of South Vietnam, Jamaica, and Malta, are being considered, statistical sampling is not utilized and significance testing,

Figure 18. Statistical Results for All Case Nations for 1950 through 1972



in this context, adds little to the results shown. However, the argument can be made that the period for which MILAID and DEFEXP are measured is limited to a specific number of years and therefore a type of sampling across time is being employed. Furthermore, even when closed populations are considered, some scholars argue that significance testing provides additional information helpful to the complete analysis of the relationship between variables.⁵ A detailed presentation of the somewhat controversial arguments for and

⁵Gurr, Politimetrics, p. 138

against the use of significance testing is not included here. The statistical significance of the various results shown in Figure 18 and in subsequent figures are indicated solely for informational purposes.

The remaining discussions within this chapter are devoted to the reporting of the results of the various quantitative procedures being employed. It is important to keep in mind that these results are merely statistical in nature and are products of the initial data that was generated earlier. When applicable to the statistical techniques, a consideration of the validity of these results in the context of the extremely complex but more realistic international environment is touched upon. A more detailed analysis of the quantitative findings, including the problem of validity, is deferred until the next chapter.

The first fact to be noted from Figure 18 is that all four independent variables explain only a small portion (14%) of the variance in the dependent variable, DEFEXP/GNP. However, a comparison of the beta weights indicates that the largest portion of this small amount of explained variance can be attributed to the direct effect of MILAID/GNP. Thus, a weak but statistically significant partial correlation between DEFEXP/GNP and MILAID/GNP (partial $r = .34$) is obtained when the effects of the remaining independent variables are held constant.

The statistical results also suggest that, when all the case nations are included for all 23 years of the time period

under consideration, external threat, nature of regime, and brevity of independence have no apparent impact upon defense spending. That is, nations which are faced by serious external dangers, which are governed by military controlled regimes, or which are newly independent do not necessarily generate larger defense expenditures as a percentage of their GNP than do nations which do not fit within these specific categories. Furthermore, these same results also indicate that there is little tendency for United States military aid to encourage the institution or strengthening of military regimes. However, a moderate and significant relationship ($r = .47$) is obtained between EXTTHR and MILAID/GNP. This result seems to suggest that while the perception of external threats by the recipient nations does not encourage increased military expenditures by these countries, the perception of these same external threats by United States defense planners does have a significant effect upon the distributional pattern of military assistance.

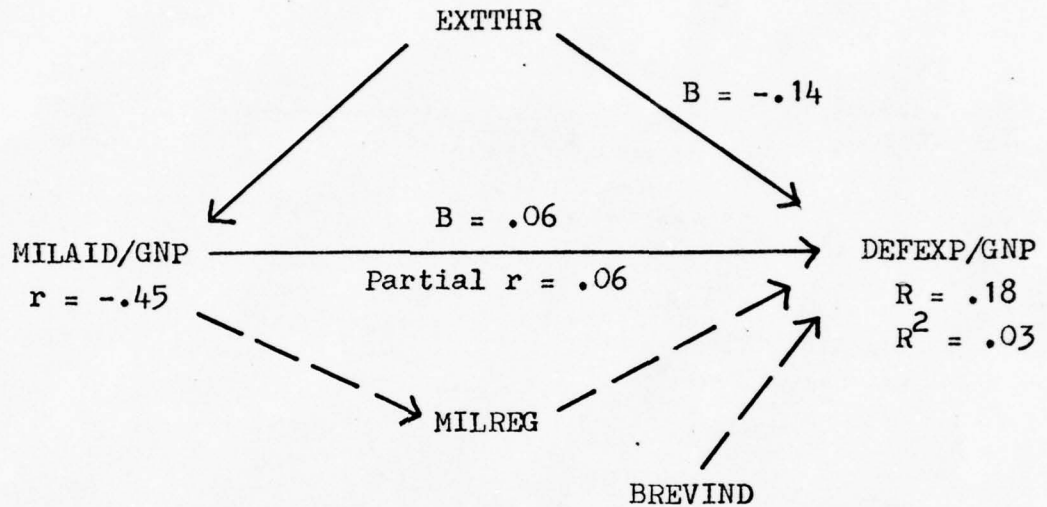
Since, by definition, each case nation has received MILAID for at least one year during the period from 1950 through 1972, when this variable is averaged over all 23 years, all case nations are included in this correlation. However, several case nations received MILAID for extremely limited periods of time, including eight countries which received MILAID for only one year. It can be argued that MILAID for such a short duration can have little effect upon DEFEXP and that to average this small amount over 23 years and then to

include the resultant data in a correlation with nations receiving MILAID for much longer periods of time could lead to highly artificial results. As a check, therefore, the regression and correlation techniques described above are repeated, eliminating all case nations which received MILAID for a period of less than 5 years. This procedure reduces the number of case nations to 59. The subsequent results differ only slightly for those when all 72 case nations are included and thus the same general conclusions can be reached from an analysis of this second correlation and regression.

From the viewpoint of the basic purpose of this study, the results in Figure 18 of both the direct and indirect effects of United States military aid upon defense expenditures by the recipient nations are far from conclusive. However, since this is the most general example to be considered, employing all of the case nations and all of the years of the 23 year time period, it is possible that more significant relationships for individual groups of nations or for specific years are clouded by these broad overall results. Thus it is necessary to pursue further analyses with more specific orientations. First, still considering the average value of each of the variables for all 23 years, multiple regressions, bivariate correlations, and partial correlations are undertaken for each of the four basic groups of case nations defined earlier.

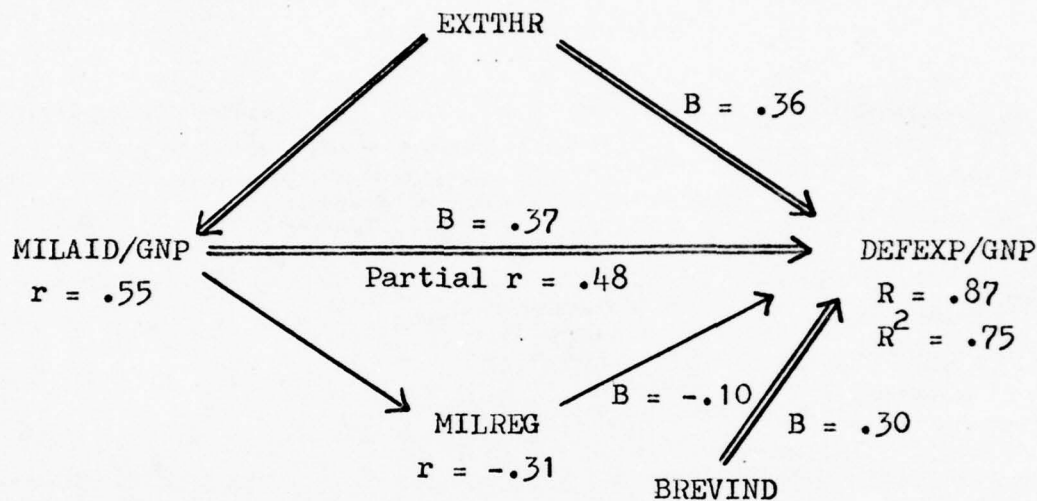
Figure 19 on the following page indicates the statistical results when the NATO nations are considered. For this

Figure 19. Statistical Results for the
NATO Nations for 1950 through 1972



group of nations, both brevity of independence and military orientation of regime is not applicable and therefore is omitted. The remaining two variables, MILAID/GNP and EXTTHR, are shown as having no effect upon DEFEXP/GNP. Thus, among the NATO group of nations, variance in defense spending appears to be the result of other variables not defined within the research model. The moderate negative correlation between EXTTHR and MILAID/GNP ($r = -.45$), which is not statistically significant at the .01 level due to the small number of case nations involved, is due solely to the fact that

Figure 20. Statistical Results for the Forward Defense Nations for 1950 through 1972



West Germany, the only nation within this group facing external threats as defined, has received less MILAID/GNP than most of the other NATO countries.

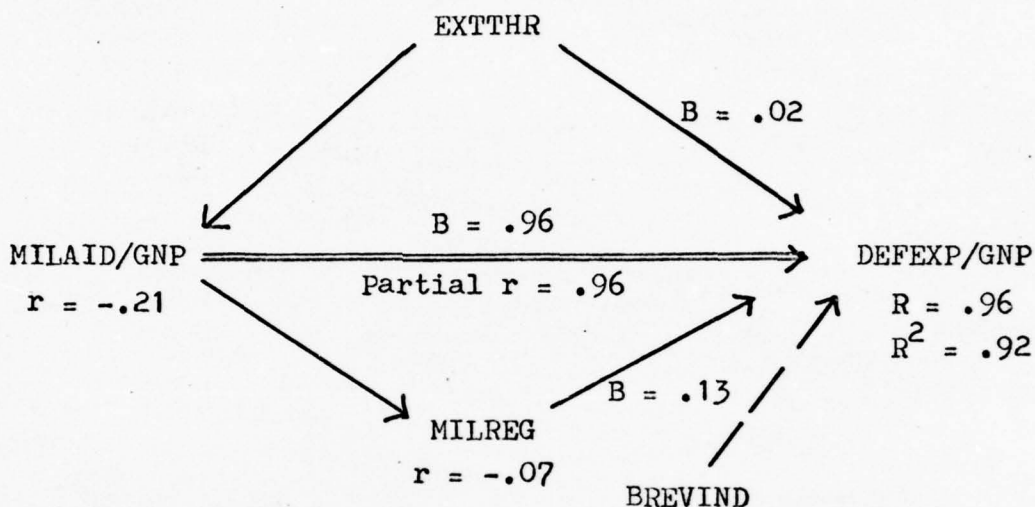
Turning next to the forward defense nations, substantially different results are obtained, as shown in Figure 20 above. Again, as when all the case nations are combined, there appears to be no indirect effect, through the intervening variable of MILREG, of MILAID/GNP upon DEFEXP/GNP. However, the direct effect of MILAID/GNP, combined with the effects of EXTTHR and BREVIND, account for 75% of the

variance in the independent variable. The largest portion of this total effect, as indicated by the beta weight of .37 and the partial r of .48, can be attributed to MILAID/GNP. The remaining two variables, with beta weights nearly as large, however, contribute only slightly less towards the total explained variance.

As will be seen shortly, this is the only group of nations in which the brevity of independence appears to be significant. A more detailed interpretation of this phenomenon is not possible until further results, considering specific years, are analyzed. However, before leaving this group of nations, the moderate positive correlations between EXTTHR and both MILAID/GNP and DEFEXP/GNP suggest that much of the direct relationship between these latter two variables may be of a spurious nature. Since, by definition, the forward defense nations are those countries which are not only located on the Sino-Soviet periphery but also are perceived by the United States defense planners as facing serious communist threats, the possibility of this spurious relationship is especially strong in this case.

Again, by definition, brevity of independence is omitted when the Latin American nations are considered. As shown by Figure 21 on the following page, nearly all of the variance in DEFEXP/GNP (92%) can be attributed to the remaining three independent variables. And, when the beta weights are considered, the variance, in fact, appears to be solely the result of MILAID/GNP. Thus, with a partial r of .96, there

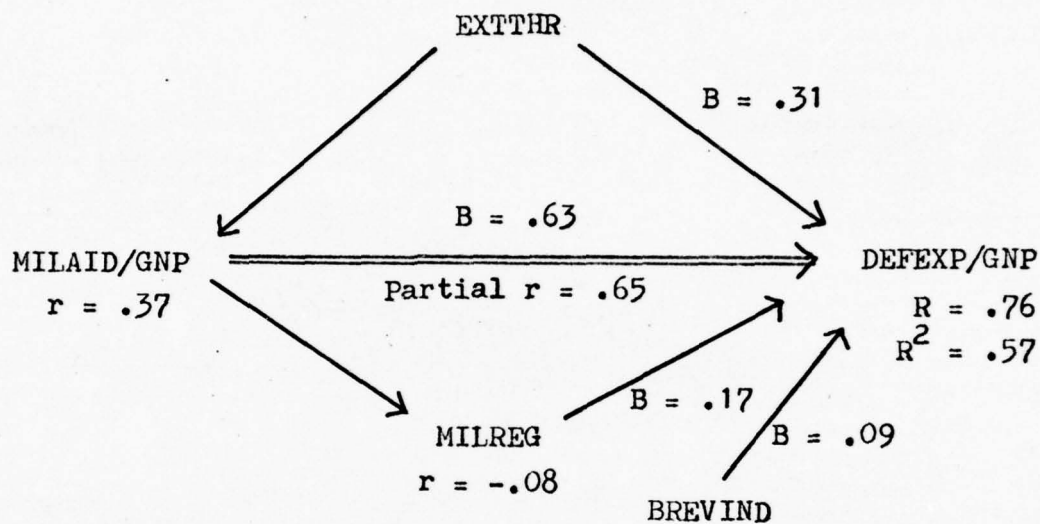
Figure 21. Statistical Results for the Latin American Nations for 1950 through 1972



there is an extremely strong statistical indication that over the last two decades those Latin American nations receiving larger amounts of United States military aid expressed as a percentage of GNP are the same nations which, for the same period of time, have tended to expend larger amounts on defense, again expressed as a percentage of GNP.

Not surprisingly, since all the external threats within this group consist of minor border altercations between Costa Rica, Nicaragua, Honduras, and El Salvador, the effect of this variable on both DEFEXP/GNP and MILAID/GNP is negligible. Of

Figure 22. Statistical Results for the Less Developed Nations for 1950 through 1972



more interest, in light of the fact that many of the Latin American nations have had a long history of military dominated regimes, there appears to be no relationship either between MILAID/GNP and MILREG or between MILREG and DEFEXP/GNP.

Turning to the last group of nations -- the remaining less developed countries -- a sizable amount of variance in DEFEXP/GNP (57%) seems to be explained by the combined effects of all four independent variables, as shown in Figure 22 above. A check of the beta weights indicates that the impact of both MILREG and BREVIND can be discounted. In the

case of the second of these two variables, this fact is of special interest since it is within this group of nations that most of the newly independent states are found. Of the remaining two variables, MILAID/GNP, with a partial r of .65 is by far the most significant. However, the slight effect of EXTTHR on both MILAID/GNP and DEFEXP/GNP, while only significant at the .05 level rather than the .01 level, suggests that a portion of the relationship between these latter two variables may be spurious.

Similar to exploring the interrelationships implied in the research model in terms of specific groups of related case nations, it also is possible to explore similar interrelationships in terms of specific years or groups of years within the 23 year time period under consideration. The results of such techniques can help to illuminate some of the possible secular trends that are not obvious when the average results for all 23 years are analyzed. The most exhaustive procedure in this case would be to conduct the multiple regressions, partial correlations, and bivariate correlations across all the case nations for each individual year. However, this methodology has two serious drawbacks. First, the 23 individual sets of statistical results constitute a large mass of information that becomes difficult to organize and confusing to analyze. Second, when individual years are considered, the problem of time lags is encountered.

The concept of a time lag between the receipt of United States military aid and subsequent recipient nation defense expenditures, assumedly effected by that aid, is intuitively

obvious. In addition, similar time lags between external threats or shifts in the military orientation of regimes and defense expenditure patterns also seem probable. However, little empirical evidence exists on which to base the specific length of such time lags. Fortunately, when these variables are averaged over a number of years, such as the 23 year averages presented earlier, the consideration of time lags can be ignored.

Therefore, the procedure which seems to be the most appropriate for exploring the possibility of secular trends in the results presented to this point is to conduct the various statistical tests with the five variables averaged over a limited number of different groups of years within the 23 year time period. Each group of years should be of sufficient duration to "washout" the effects of time lags, while the number of groups should be large enough to allow the results to be compared in terms of possible trends. Furthermore, the selection of the groups of years over which the variables are to be averaged should be based on theoretical considerations related to the shifting patterns of United States military aid discussed in Chapter III and illustrated in Chapter V.

In view of these considerations, the 23 year time period between 1950 and 1972 is divided into four subperiods. The first subperiod is from 1950 through 1953 and represents the initial phase of the post-war United States military aid program. The second subperiod is from 1954 through 1960.

During these seven years, the massive European aid program is rapidly reduced, while modest MILAID is initiated for many of the less developed nations. The third subperiod extends from 1961 through 1966. In this phase, NATO MILAID is completely terminated, increased MILAID to the Latin American nations is generated, and MILAID is extended to the relatively large number of newly independent Sub-Sahara African states. The fourth and final subperiod begins in 1967 and reaches until 1970. (1971 and 1972 are excluded from consideration due to the problem of missing data for these two years.) This period, being the most recent, possibly can indicate some general trends that continue to the present and thus may be of predictive value.

Table 19 on the following page presents the various results of the same statistical tests shown earlier as graphical representations for all 23 years. As can be seen, the number of case nations during the first two subperiods is less than 72 due to the fact that, for many of the newly independent states, the pre-independence years must be eliminated from consideration.

Looking first at the last column in Table 19, it can be seen that for the first three subperiods (or for the entire period from 1950 through 1966) the amount of explained variance (R^2) in DEFEXP/GNP that can be attributed to all five independent variables is slightly higher than when all 23 years are considered together. However, during the final subperiod, this explained variance drops below the 23 year average. This apparent trend parallels a similar trend in

Table 19. Statistical Results for All Case Nations for the Four Subperiods

Sub-period	Independent Nations	EXT-THR with MIL-AID/GNP	MIL-AID/GNP with MIL-REG	MIL-AID/GNP with DEFEXP/GNP		EXT-THR with DEF-EXP/GNP	MIL-REG with DEF-EXP/GNP	BREV-IND with DEF-EXP/GNP	DEFEXP/GNP	
		r	r	B	Partial r	B	B	B	R	R ²
1	57	.17	-.15	.42	.40	-.10	-.05	.18	.42	.17
2	62	.49	-.08	.43	.38	-.13	.05	-.11	.40	.16
3	72	.42	-.01	.42	.45	-.08	.10	-.12	.46	.21
4	72	.40	-.07	.24	.26	.03	.16	-.03	.31	.10

the direct relationship between MILAID/GNP and DEFEXP/GNP, as can be seen by the beta weights and the partial r's for the former variable for each subperiod. Since, as shown earlier, little relationship exists between any of the variables when the NATO countries are considered, this drop in explained variance cannot logically be attributed to the elimination of MILAID to this group of nations in the last subperiod. Thus, this downwards trend appears to be related to the remaining non-NATO case nations, most of whom are continuing to receive MILAID at the present time.

Table 19 also indicates that the lack of any significant relationship between EXTTHR, MILREG, BREVIND, and DEFEXP/GNP

remains constant for all four subperiods or for the entire 23 year period. However, the moderate positive relationship between EXTTHR and MILAID/GNP, discovered when all 23 years were considered, appears to be applicable only to the last three subperiods.

Once again, in view of the definition of the case nations, all 72 countries have received some amount of MILAID/GNP when this variable is averaged over all 23 years. However, when shorter time periods are considered, there are case nations which do not receive United States military aid for any of the years within a specific subperiod. Since Table 19 lists the results of the regressions and correlations for all the independent states, those nations within a specific subperiod which do not receive any MILAID have a value of 0 assigned to them for their average. That is, the lack of MILAID to a potential MILAID recipient is weighted equally with the actual receipt of MILAID by other case nations. Since this procedure is rather arbitrary in nature, a check of its validity can be made by repeating all of the statistical tests for each subperiod, but including as case nations only those countries which have received MILAID for at least one year within that subperiod. With the exception of the first subperiod, the results of such a check differ only slightly from the results shown in Table 19. The discrepancies in the first subperiod appear to be caused by missing data for some of the less developed nations. Accordingly, the procedure of including all independent recipients as case nations for each subperiod, regardless of whether they

receive MILAID during that specific subperiod, is followed for all subsequent analyses.

Just as possible trends in the 23 year average results for all the case nations can be explored by considering subperiods of time, similar trends in the 23 year average results for each of the four subgroups of case nations also can be analyzed by identical statistical procedures. Table 20 on the following page lists the results obtained when the multiple regression, partial correlation, and bivariate correlations are conducted within each of these four subgroups of nations for the same four subperiods as described above.

Turning first to the NATO nations, the lack of any significant correlations shown in Table 20 seems to indicate that the similar lack of relationships between all of the variables when all 23 years are considered is relatively constant over time. Even though not significant at the .01 level, the partial r between MILAID/GNP and DEFEXP/GNP for each subperiod indicates at least a general trend from a positive to a negative relationship, however. The fourth subperiod for this group of nations is omitted since all MILAID has been terminated by this time.

More variations are seen when the four subperiods for the forward defense nations are considered. In the first subperiod, for instance, nearly all of the explained variance in DEFEXP/GNP can be attributed to brevity of independence. This result is due to the fact that the largest amount of DEFEXP/GNP in this subperiod is recorded by South Korea, Laos, and Cambodia. Whether these large amounts of military

Table 20. Statistical Results for the Four Groups of Nations for the Four Subperiods

Sub-period	Independent Nations	EXT-THR with MIL-AID/GNP	MIL-AID/GNP with MIL-REG	MIL-AID/GNP with DEFEXP/GNP		EXT-THR with DEF-EXP/GNP	MIL-REG with DEF-EXP/GNP	BREV-IND with DEF-EXP/GNP	DEFEXP/GNP	
		r	r	B	Partial r	B	B	B	R	R ²
(NATO NATIONS)										
1	10	-.45		.25	.23	-.09			.30	.09
2	10	-.42		.03	.03	-.23			.25	.06
3	10	-.27		-.39	-.38	-.17			.38	.14
(FORWARD DEFENSE NATIONS)										
1	10	.12	-.23	.16	.24	-.25	.09	1.21	.94	.88
2	10	.60	-.32	.89	.84	.57	.01	.25	.90	.81
3	10	.55	-.03	.58	.65	.35	.01		.83	.69
4	10	.51	-.29	.55	.63	.32	-.13		.82	.68
(LATIN AMERICAN NATIONS)										
1	19		-.21	.85	.87		-.10		.88	.78
2	19	-.18	-.21	.93	.91	.01	.06		.92	.85
3	19		-.05	.95	.95		.03		.95	.91
4	19	-.20	-.13	.69	.72	.01	.24		.77	.58
(LESS DEVELOPED NATIONS)										
2	18	.20	.35	.58	.55	.49	-.12	.22	.69	.48
3	28	.38	-.05	.41	.47	.31	.38	-.01	.72	.51
4	28	.22	-.17	.20	.43	.42	.18	.05	.51	.26

expenditures can be attributed to a desire for national prestige is questionable, especially in the case of the first nation where the effects of the Korean War must be considered. This large, and probably overinflated, relationship during this subperiod seems to account for the sole instance of the significant correlation between BREVIND and DEFEXP/GNP seen earlier when all 23 years were considered.

The amount of explained variance in DEFEXP/GNP (R^2) and the partial r between MILAID/GNP and DEFEXP/GNP for the forward defense nations for the second subperiod is considerably higher than when these variables are averaged over all 23 years. However, the correlations between EXTTHR and both MILAID/GNP and DEFEXP/GNP also are greater during this same subperiod, thus increasing the possibility of a spurious relationship between the latter two variables. All of these relationships show a decrease in the last two subperiods; however, the direct relationship between MILAID/GNP and DEFEXP/GNP remains significantly higher than when all 23 years are considered.

When the Latin American nations are considered, a great deal of consistency between the four subperiod results and the overall 23 year period results is seen. MILAID/GNP remains as the only independent variable with any significant impact upon DEFEXP/GNP. Similar to the forward defense nations and all of the case nations combined, however, this relationship again shows a marked decline in the last subperiod where it drops considerably below the value obtained when all 23 years are considered.

Turning finally to the remaining less developed nations, the first subperiod is omitted since no MILAID was distributed to any of these countries during these first four years. For the remaining three subperiods, a decline in the apparent effect of MILAID/GNP upon DEFEXP/GNP (partial r) again can be seen. The third subperiod represents the era when 10 sub-Saharan African states gained their independence. As shown in Table 20, there is no apparent impact upon defense spending due to brevity of independence during this particular phase. There is, however, a slight but still insignificant increase in the relationship between MILREG and DEFEXP/GNP, which possibly could be attributed to the military form of government adopted by many of these new states.

Although the results of all of the previous statistical tests are not summarized until the next chapter, it is obvious at this point that the overall impact of EXTTHR, MILREG, and BREVIND upon DEFEXP/GNP is extremely slight for most of the case nations. This finding indicates that more reliance can be placed upon the simple bivariate correlation between MILAID/GNP and DEFEXP/GNP alone. Thus, one additional statistical technique not previously considered is suggested. Scattergrams of MILAID/GNP and DEFEXP/GNP averaged over all 23 years for each of the four groups of case nations possibly can aid in a more thorough analysis of the results obtained to this point. Gurr states that a scattergram "is more informative than a correlation coefficient along. From it we can usually see whether a relationship is approximately linear, and whether cases tend to cluster in one or another

part of the plot. Most usefully of all, we can see where each particular case is in relation to others, and we can pinpoint the 'deviant' or 'outlier' cases, those which deviate most from the relationship being studied."⁶ In the context of this study, scattergrams also can indicate if there are other possible groupings of case nations, in addition to the four already defined, with similarities of MILAID/GNP - DEFEXP/GNP patterns.

Figure 23 through Figure 26 on the following six pages indicate the four scattergrams for the four groups of case nations. Each figure also shows the line of regression and the linear regression equation. The regression coefficient from these equations can be of analytical interest by indicating the statistical effects of changes in MILAID/GNP upon DEFEXP/GNP. That is, a rough index of the changes in the latter variable due to similar changes in the former can be "predicted."⁷ The greater the correlation between the two variables, of course, the greater confidence can be placed in this "prediction index."

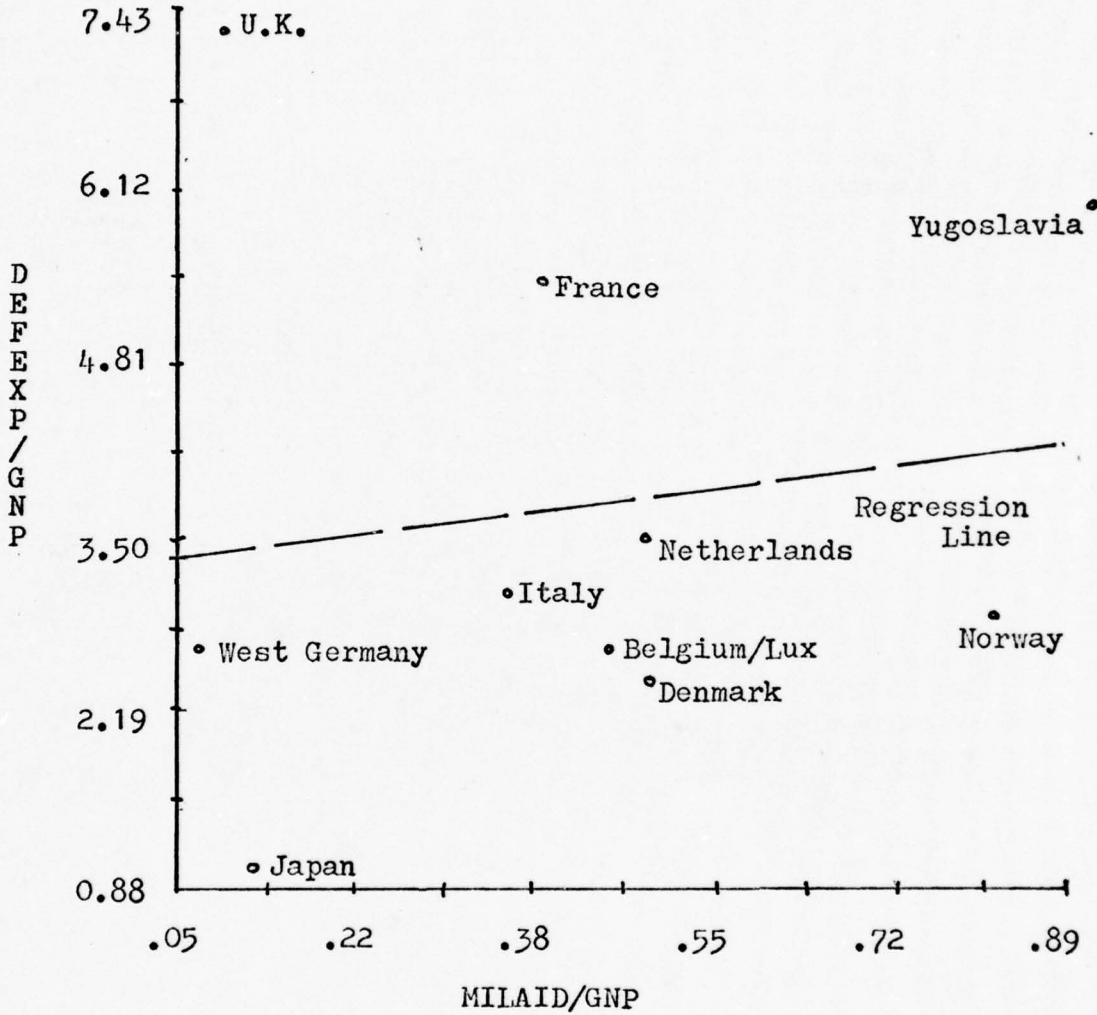
As expected by the low partial correlation results for the NATO nations, the scattergram shown in Figure 23 indicates a rather random distribution of these countries around the regression line. Due to this low correlation, the regression coefficient is of little interest here.

When the forward defense nations are observed, as shown in Figure 24, more useful information can be discerned. Laos and South Korea are obvious outlying cases; however, with the

⁶Ibid., p. 118.

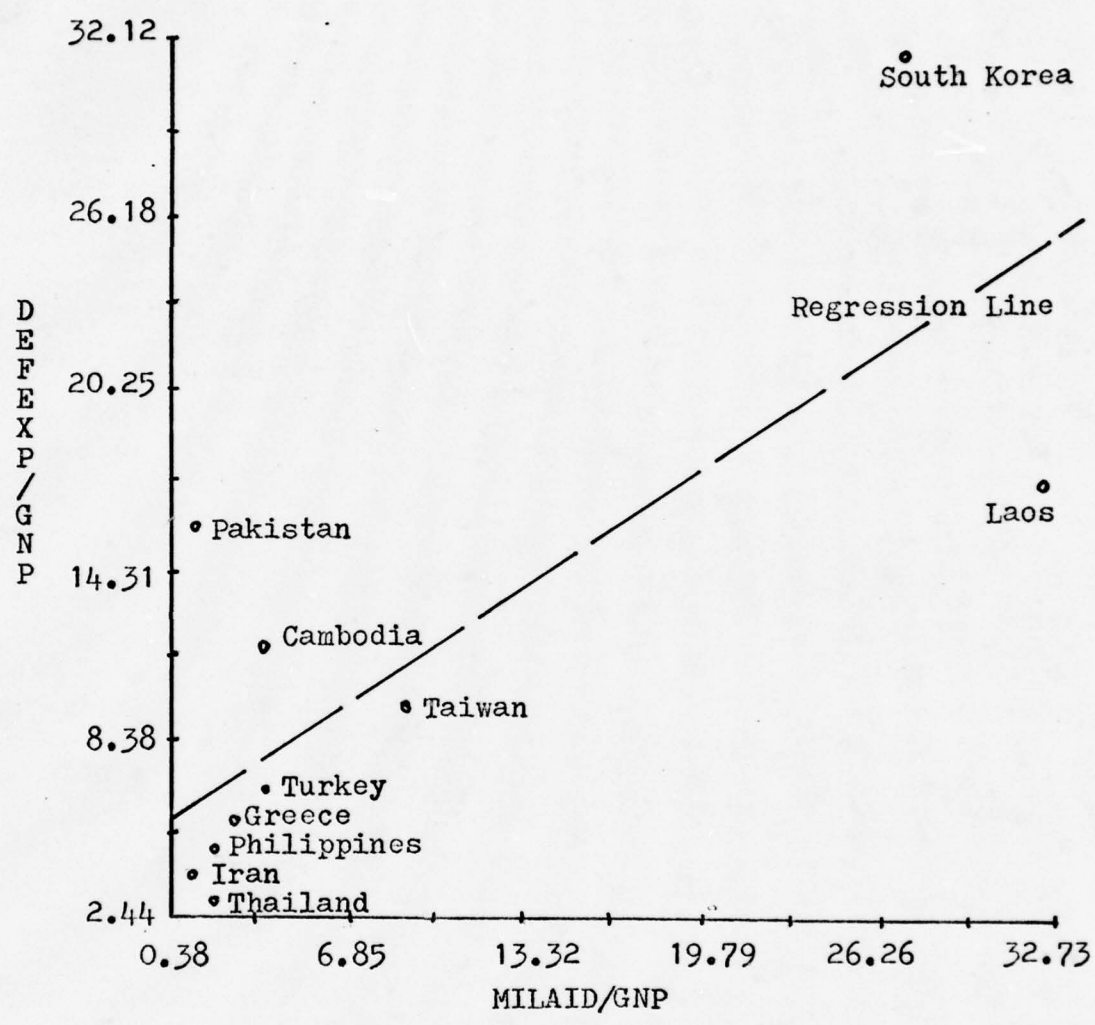
⁷Key, Primer, pp. 78-81; and Kerlinger, Foundations, pp. 604-608.

Figure 23. Scattergram of MILAID/GNP and DEFEXP/GNP for the NATO Nations



$$DEFEXP/GNP = 3.39 + .876MILAID/GNP$$

Figure 24. Scattergram of MILAID/GNP and DEFEXP/GNP for the Forward Defense Nations



$$DEFEXP/GNP = 6.26 + .582MILAID/GNP$$

Figure 25. Scattergram of MILAID/GNP and DEFEXP/GNP for the Latin American Nations

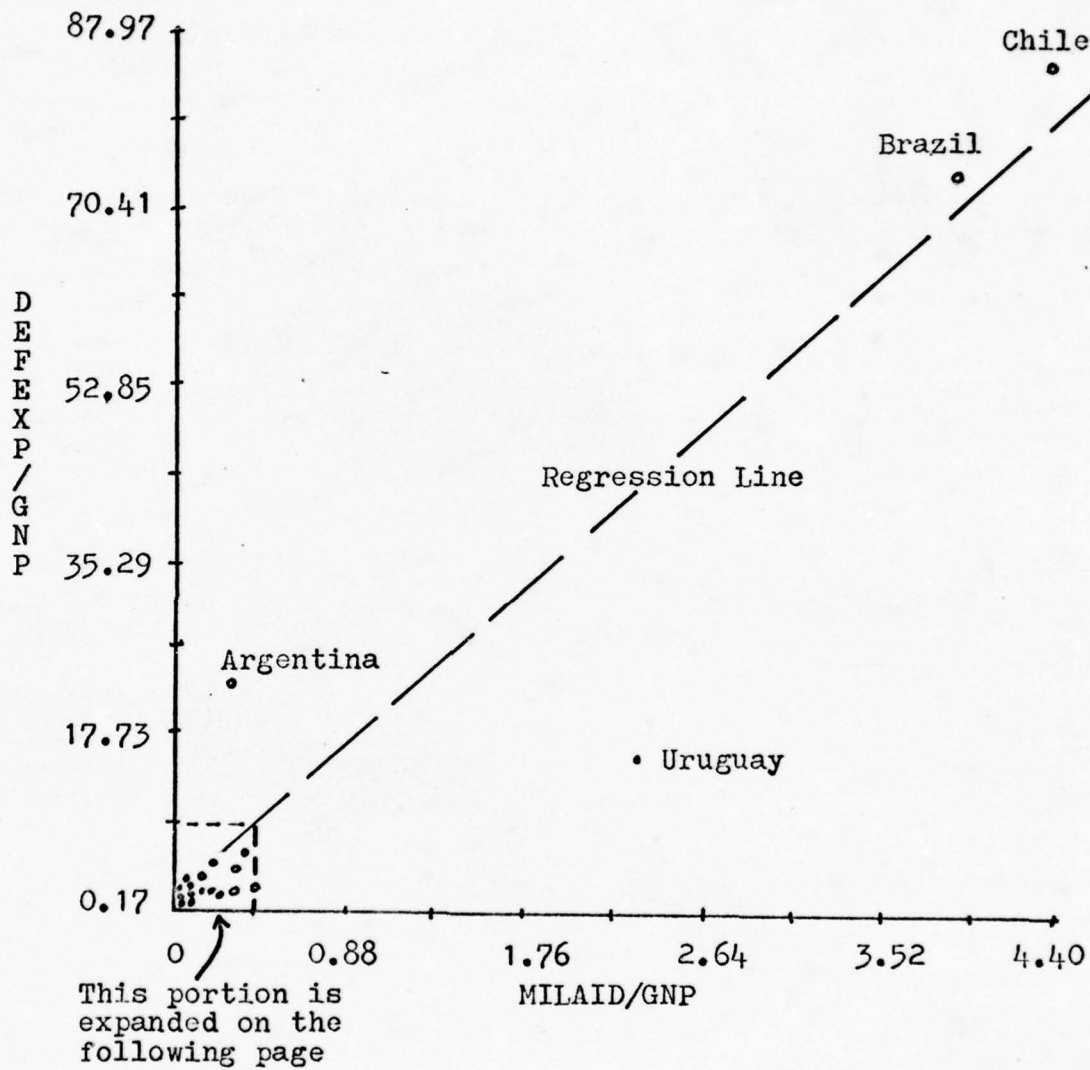
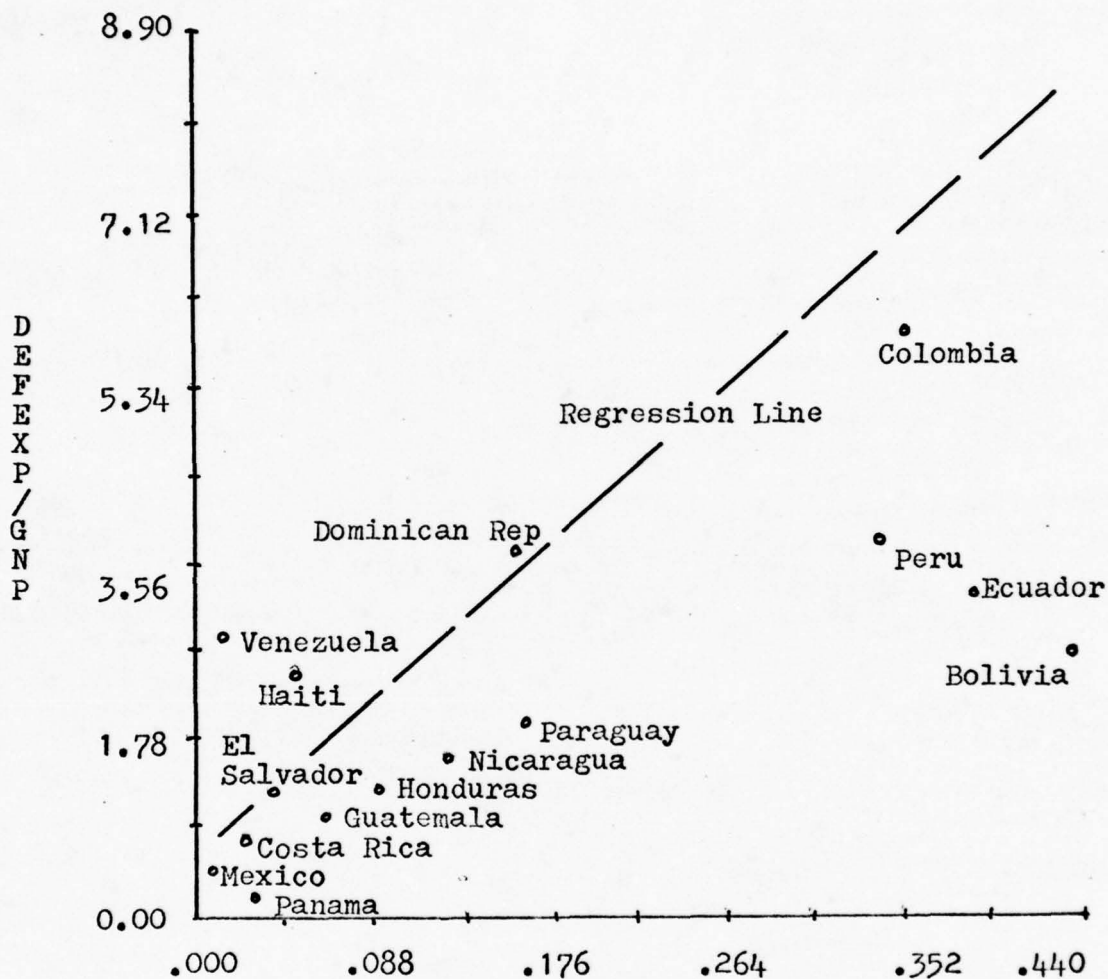
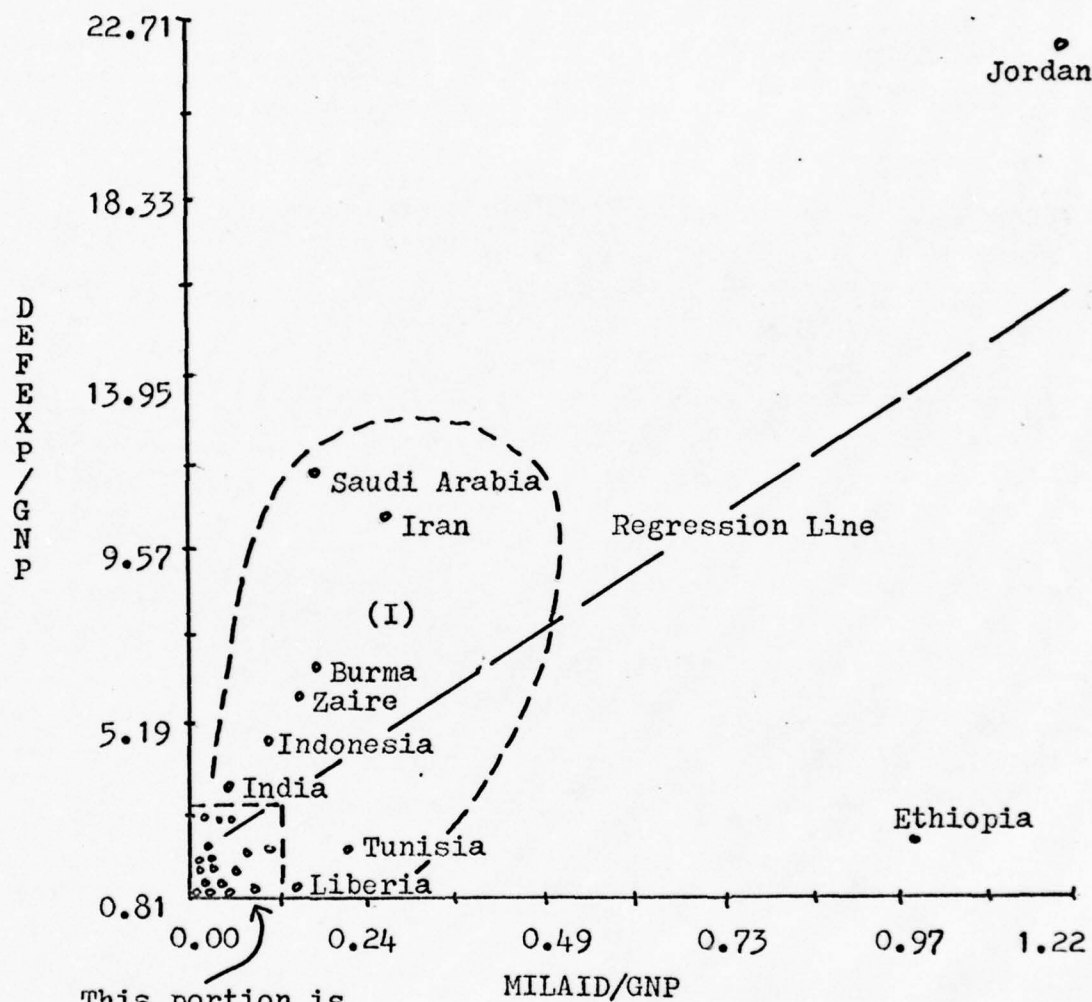


Figure 25. Scattergram of MILAID/GNP and DEFEXP/GNP for the Latin American Nations (Continued)



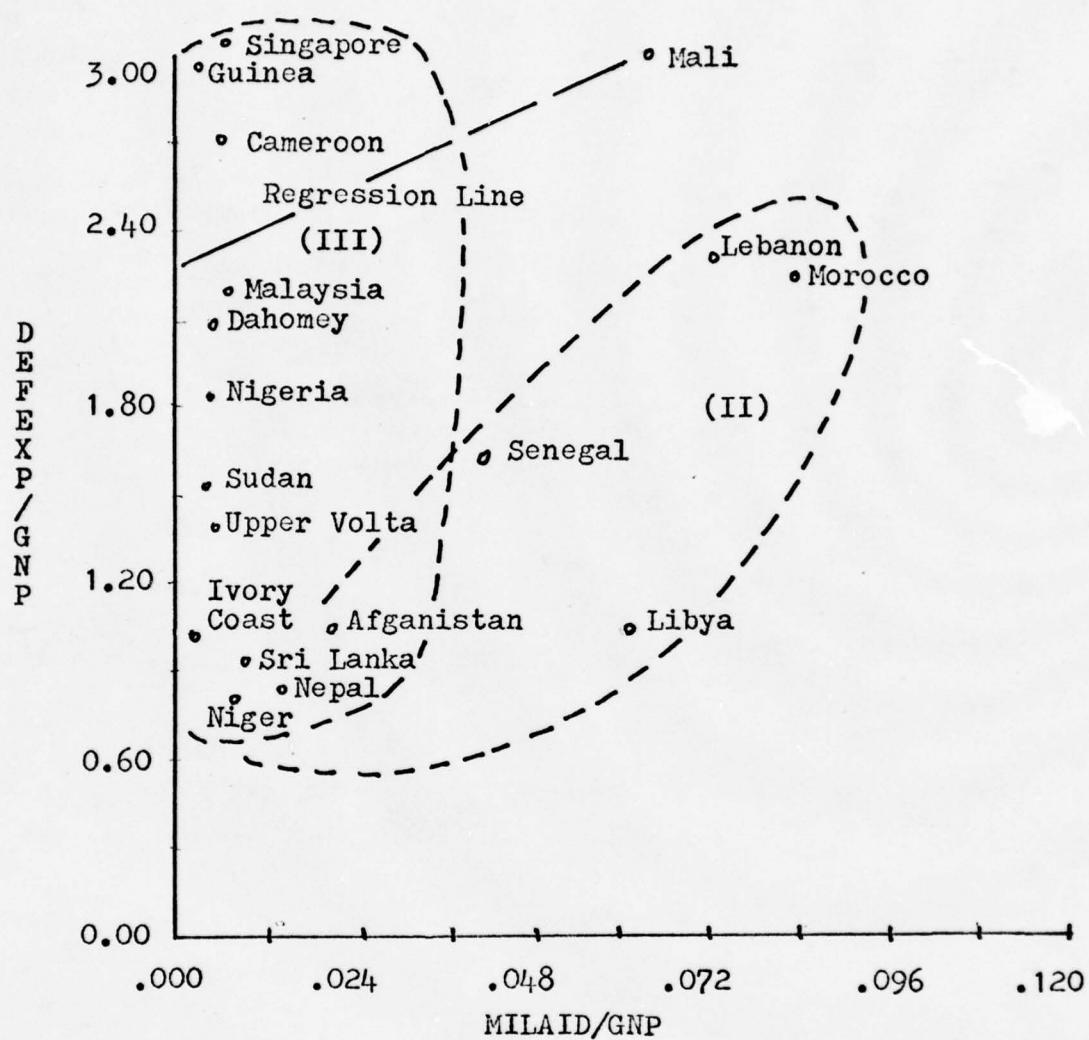
$$\text{DEFEXP/GNP} = 0.07 + 18.22\text{MILAID/GNP}$$

Figure 26. Scattergram of MILAID/GNP and DEFEXP/GNP for the Less Developed Nations



This portion is expanded on the following page

Figure 26. Scattergram of MILAID/GNP and DEFEXP/GNP for the Less Developed Nations (Continued)



$$\text{DEFEXP/GNP} = 2.32 + 11.14$$

exception of Pakistan, the remaining nations show a relatively good linear relationship. Due to the small number of case nations within this group, however, the deviation of these first three nations apparently are sufficient enough to reduce the overall correlation. The regression coefficient (.58) indicates that increase or decreases in MILAID/GNP tend to "produce" substantially smaller increases in DEFEXP/GNP. This fact is of special interest since, as shown earlier in Table 12, the total MILAID for the 23 years from 1950 to 1972, expressed as a percentage of the total DEFEXP for the same period, is greatest for this particular group of nations (45%).

Again, with the Latin American nations, as shown in Figure 25, two outlying cases -- Chile and Brazil -- can be observed. These two countries, along with Argentina and Uruguay, are faced with serious inflationary problems and thus have correspondingly greater values for MILAID/GNP and DEFEXP/GNP. However, with Chile and Brazil lying close to the regression line and with the remaining Latin American nations displaying a relatively strong linear relationship, a strong positive correlation is obtained. The regression coefficient (18.22) indicates that small changes in MILAID/GNP tend to "produce" substantially larger changes in DEFEXP/GNP. And, unlike the forward defense nations, this "multiplying effect" must be considered in view of the fact that total MILAID from 1950 to 1972 for these nations is only 4% of their total DEFEXP for the same period.

In the first three groups of nations, the number of cases is too small to consider further subgroupings along separate linear relationships. However, when the larger number of remaining less developed nations are observed, as shown in Figure 26, some individual clustering is suggested, as indicated by the dotted lines. The third linear relationship (III) can be discounted since there is little variance in MILAID/GNP to account for the variance in DEFEXP/GNP. The remaining two subgroups (I) and (II) seem to suggest definite linear relationships; however, the lack of any apparent geographical, ideological, ethnic, cultural, or historical similarity between the nations within each subgroup discourages any further statistical analyses along these lines. Similar to the previous two groups of nations, two extreme outlying cases -- Jordan and Ethiopia -- are shown in Figure 26. The extreme deviation of these two countries seems to account for much of the lack of correlation when all the nations in this group are considered. And, similar to the Latin American nations, the large regression coefficient (11.14) indicates that small changes in MILAID/GNP "produce" large changes in DEFEXP/GNP, even though total MILAID from 1950 to 1972 accounts for only 2% of the total DEFEXP for the same period for these nations.

CHAPTER VIII

SUMMARY

The last three chapters have presented a large number of diverse empirical findings. It is now necessary to attempt to establish some order among these findings and to summarize some of the more important quantitative results. This summary possibly can help to determine interrelationships between the various results as well as to point out the relevancy of the findings within the context of the theoretical propositions discussed earlier.

Several of the findings applicable to either MILAID or DEFEXP alone, as outlined in the univariate analyses of these two variables, are presented first. However, the majority of the results listed below are concerned with the relationship between MILAID and DEFEXP as well as with the role of the other independent variables. In addition to the overall relationship for all of the case nations for all of the years from 1950 through 1972, the results, when subgroupings of nations and subperiods of years are introduced, also are considered. For clarity of organization, all of the results are presented in outline format.

1. MILAID:

- 1.1. A large percentage of the total amount of MILAID distributed between 1950 and 1972 has gone to a small number of recipient nations. South Korea, France, Turkey,

Taiwan, and Italy have received over 50% of this total MILAID, while these five nations plus Greece, Belgium and Luxembourg, the Netherlands, Japan, the United Kingdom, Thailand, and West Germany have accounted for over 75% of the total. MILAID for the forward defense nations within this group of the top twelve recipients has been distributed over all of the 23 years between 1950 and 1972 as opposed to MILAID for the NATO nations which has been concentrated instead among the first ten years of this time period.

1.2. There is only a slight tendency for those nations that have received MILAID for longer periods of time to have received larger amounts of this MILAID. For the NATO and Latin American nations there is only a weak relationship between the number of years that MILAID has been received and the total amount of MILAID received; however, the variance between these nations of these number of years is quite small. There is more of a trend for the long-term MILAID recipients to receive larger total amounts of MILAID in the forward defense and less developed nations where there is more variance in the number of years that each has received MILAID. Thus, in the less developed nations, countries such as Ethiopia, Jordan, Lebanon, and Saudi Arabia which have received MILAID for 15 years or more are compared with countries such as the Sub-Sahara African nations which have received MILAID for only one year.

1.3. Among those nations that have received larger total amounts of MILAID, there is only a slight tendency for this MILAID to represent larger percentages of the recipient

nation's GNP. The lack of a stronger positive relationship between MILAID and MILAID/GNP indicates that, in many instances, larger amounts of MILAID are distributed to nations with larger gross national products. This last conclusion is especially true for the NATO nations, while not as apparent for the forward defense nations. However, in the Latin American and less developed nations, there is more of a tendency for larger amounts of MILAID to represent larger percentages of the gross national products of the recipient nations.

2. DEFEXP:

2.1. A large percentage of the total DEFEXP between 1950 and 1972 has been accounted for by a small number of nations. The United Kingdom, France, and West Germany have accounted for slightly more than 50% of the total amount of DEFEXP, while these three nations plus Canada, Italy, India, Japan, and the Netherlands have accounted for over 75% of the total. Six of these top eight nations, all from the NATO group, also are among the top twelve nations accounting for 75% of the total amount of MILAID distributed during this same period.

2.2. Among those nations spending larger amounts on defense, there is no apparent tendency for these amounts to represent larger percentages of these nations' gross national products. This finding is especially true for the forward defense and less developed nations. Among the NATO and Latin American nations, however, a stronger positive relationship between DEFEXP and DEFEXP/GNP suggests that

those nations engaging in larger military spending tend to devote more of their GNP towards defense expenditures.

2.3. Although both total and average DEFEXP for all the case nations has risen steadily over the 21 years from 1950 through 1970, this annual figure, when expressed as a percentage of each nation's GNP, has declined during this same period. This steady decline is especially apparent for the NATO and Latin American nations. In the case of the former group of nations, however, the extremely rapid rise of their gross national products over this same time period must be taken into consideration.

3. MILAID and DEFEXP -- All Case Nations:

3.1. 1950 through 1972:

3.1.1. EXTTHR, MILREG, BREVIND, and MILAID/GNP, averaged over all 23 years from 1950 through 1972 for all case nations, together account for only 14% of the variance in DEFEXP/GNP. Moreover, nearly all of this small amount of explained variance can be attributed to the direct effect of MILAID/GNP.

3.1.2. Again, when all case nations and all years are considered, there is only a weak positive relationship between MILAID/GNP and DEFEXP/GNP. That is, there is only a slight tendency for those nations receiving larger amounts of MILAID in proportion to their GNP to expend larger amounts of DEFEXP also in proportion to their GNP.

3.1.3. There is no apparent relationship between EXTHR and DEFEXP/GNP. Those nations facing more serious external threats, as defined in this study, do not

appear to devote larger proportions of their GNP towards defense expenditures. (As will be seen shortly, EXTTHR for the group of nations facing the most overt threats -- the forward defense countries -- has a moderate positive impact upon DEFEXP/GNP when these cases alone are considered. Since threat and defense expenditures seem to be so intuitively related, the validity of EXTTHR as defined in this study is somewhat questionable for the remaining case nations.) There is, however, a moderate positive relationship between EXTTHR and MILAID/GNP, suggesting that, while the perception of external threats by various nations has little impact upon their subsequent defense spending, the perception of these same threats by United States policy-makers has a significant effect upon MILAID distribution patterns.

3.1.4. There is no apparent relationship between MILREG and DEFEXP/GNP. Those nations with governments controlled by or strongly influenced by the military do not appear to devote larger percentages of their GNP towards defense expenditures. A similar lack of any relationship between MILAID/GNP and MILREG thus suggests that there is no indirect relationship between the former variable and DEFEXP/GNP.

3.1.5. There is no apparent relationship between BREVIND and DEFEXP/GNP. Newly independent nations do not appear to devote larger portions of their GNP towards defense expenditures when compared to those nations having existed longer as independent states.

3.2. The Four Subperiods:

3.2.1. The amount of explained variance in DEFEXP/GNP for the first three of the subperiods is slightly greater than when all the years are considered together; however, the amount of explained variance drops below the overall 23 year average when the last subperiod is considered. Again, nearly all of the explained variance for each subperiod can be attributed to the direct effect of MILAID/GNP.

3.2.2. A similar downwards trend is observed for the direct relationship between MILAID/GNP and DEFEXP/GNP for each subperiod. For the first three subperiods, the positive relationship between these two variables is greater than when all 23 years are considered together. Then, during the last period, the strength of this relationship again drops below the overall average result. This pattern suggests that the slight impact of MILAID upon DEFEXP has become even less substantial in recent years.

3.2.3. The lack of any relationship between EXTTHR, MILREG, and BREVIND and DEFEXP/GNP remains relatively consistent for each subperiod.

4. MILAID and DEFEXP -- NATO Nations:

4.1. 1950 through 1972:

4.1.1. When all 23 years from 1950 through 1972 are considered, none of the variance in DEFEXP/GNP can be explained by the combined effects of MILAID/GNP and EXTTHR. MILREG and BREVIND, as defined, are not applicable for this group of nations.

4.1.2. There is no apparent relationship between MILAID/GNP and DEFEXP/GNP. Those NATO nations

receiving larger amounts of MILAID in proportion to their GNP have not expended larger amounts of DEFEXP again in proportion to their GNP. This fact is especially significant since these ten nations have received 43% of the total MILAID distributed by the United States. The fact that this total MILAID represents only 4% of the 23 year combined defense spending for these nations possibly could suggest that the impact of this aid upon DEFEXP is too slight to cause any significant effects. However, as will be seen with the Latin American and less developed nations, substantially lesser amounts of MILAID, again representing only a small percentage of the combined DEFEXP for these two groups, does appear to have a significant impact upon defense spending.

4.1.3. There is no apparent relationship between EXTTHR and DEFEXP/GNP. Among the nations in this group, only West Germany is defined as facing external threats. The fact that this nation has received less MILAID in relation to its GNP than many of the other NATO countries leads to a moderate negative relationship between MILAID/GNP and EXTTHR. Thus, the possible positive influence of external threats upon MILAID distribution patterns suggested by the overall results when all the case nations are considered does not seem to apply to this group. This deviation can partially be explained by two factors. First, within Europe, the more sophisticated weapons of the Soviet Union can be directed at both contiguous and non-contiguous nations with nearly the same potential effects. Thus, the United States policy-makers do not necessarily consider West Germany in a

more precarious position than the other Western European nations. Second, the smaller amount of MILAID received by West Germany partially is due to the fact that, as a reaction to World War II, MILAID to this nation was not initiated until several years after the European military aid program was started.

4.2. The Four Subperiods:

4.2.1. None of the first three subperiods indicate any significant deviation from the overall 23 year results for this group. The fourth and last subperiod is not considered since MILAID was terminated prior to its first year.

4.2.2. A slight trend, from a weak positive to a weak negative relationship between MILAID/GNP and DEFEXP/GNP, is indicated across the three subperiods. With the small number of cases within the NATO group, little significance can be credited towards this downwards trend. This finding is listed here merely because it parallels similar, more significant patterns for the other groups of nations.

5. MILAID and DEFEXP -- Forward Defense Nations:

5.1. 1950 through 1972:

5.1.1. EXTTHR, MILREG, BREVIND, and MILAID/GNP, averaged over all 23 years from 1950 through 1972, together account for a large amount (75%) of the variance in DEFEXP/GNP. EXTTHR and MILAID/GNP contribute equally to this explained variance, closely followed by BREVIND.

5.1.2. There is a moderate positive relationship between MILAID/GNP and DEFEXP/GNP. Those nations

receiving larger amounts of MILAID in proportion to their GNP tend slightly to expend greater amounts of DEFEXP again in proportion to their GNP. This finding is of special theoretical significance since these ten nations have received the greatest share (49%) of the total MILAID distributed by the United States from 1950 through 1972. Furthermore, this total amount of MILAID represents 45% of the combined DEFEXP of the forward defense nations.

5.1.3. There is a moderate positive relationship between EXTTHR and MILAID/GNP and between EXTTHR and DEFEXP/GNP. Those nations facing more serious external threats not only tend to receive larger amounts of MILAID in proportion to their GNP, as seen when all the case nations are considered, but also appear to spend larger amounts of DEFEXP in proportion to their GNP. This finding raises the strong possibility that the direct relationship between MILAID/GNP and DEFEXP/GNP may be spurious. Thus, rather than MILAID/GNP influencing DEFEXP/GNP in these nations, it may well be possible that both of these variables are reacting in a similar manner to external threats. Again, this finding is of special theoretical interest since these forward defense nations are defined by the United States policymakers as those countries facing the most serious external threats from the communist world.

5.1.4. There is no apparent relationship between MILREG and DEFEXP/GNP. Similar to all the case nations combined, those forward defense nations with military dominated governments do not seem to devote larger

percentages of their GNP towards military spending. Likewise, since no relationship between MILAID/GNP and MILREG is indicated, the possibility of an indirect relationship between the former variable and DEFEXP/GNP appears to be remote.

5.1.5. There is a slight positive relationship between BREVIND and DEFEXP/GNP. This 23 year average relationship is a result of an extremely strong positive relationship between these two variables during the first subperiod and is discussed in greater detail below, when the four subperiods are considered.

5.1.6. The small number of forward defense nations precludes any meaningful subgrouping of cases when a scattergram of MILAID/GNP and DEFEXP/GNP is plotted. However, since there is a moderate "fit" of these countries along the regression line, the regression coefficient is of interest. The small value of this coefficient (.58) suggests that relatively large amounts of change in MILAID/GNP have relatively small effect upon DEFEXP/GNP.

5.2. The Four Subperiods:

5.2.1. In the first subperiod, 88% of the variance in DEFEXP/GNP is explained by the four independent variables. This amount of explained variance is considerably greater than when all 23 years are considered. However, BREVIND accounts for nearly all of this effect. This phenomenon is due to the fact that the three newly independent nations within this group, South Korea, Laos, and Cambodia, all devote large percentages of their GNP to defense spending

during this subperiod. Whether these nations expended these large amounts as a means of achieving "national military prestige," or whether in fact these expenditures really were the result of armed conflicts which may not have been weighted heavily enough when EXTTHR is considered, is difficult to determine in this case.

5.2.2. In the remaining three subperiods, a gradual decline in explained variance in DEFEXP is observed. The majority of the explained variance in each of these subperiods can be attributed to MILAID/GNP, followed by EXTTHR. The lack of any relationship between MILREG and DEFEXP/GNP is consistent for all periods.

5.2.3. In the remaining three subperiods, the positive relationship between MILAID/GNP and DEFEXP/GNP is stronger than when all 23 years are considered. This relationship shows a gradual decline, however, similar to when all of the case nations are considered and suggests that the effect of MILAID/GNP upon DEFEXP/GNP has been decreasing in recent years. Declines in the relationship between EXTTHR and both MILAID/GNP and DEFEXP/GNP indicate that the possibility of a spurious relationship between these latter two variables likewise is decreasing over time.

6. MILAID and DEFEXP -- Latin American Nations:

6.1. 1950 through 1972:

6.1.1. EXTTHR, MILREG, and MILAID/GNP together explain 92% or nearly all of the variance in DEFEXP/GNP. Nearly all of this explained variance can be attributed to MILAID/GNP. BREVIND is not applicable to this group.

6.1.2. There is an extremely strong positive relationship between MILAID/GNP and DEFEXP/GNP. More so than in any other group of case nations, the Latin American countries receiving larger amounts of MILAID in relation to their GNP tend to spend larger amounts of DEFEXP also in relation to their GNP. This relationship seems to exist in spite of the fact that these nations have received only 3% of the total 23 year amount of MILAID as well as the fact that this total amount of aid represents only 4% of their combined DEFEXP for the same period.

6.1.3. There is no apparent relationship between EXTTHR and either MILAID/GNP or DEFEXP/GNP. Although the EXTTHR for this group of nations is limited to a series of mild border skirmishes between a small number of Central American nations, the lack of any significant correlations involving this variable precludes any spurious relationship between MILAID/GNP and DEFEXP/GNP, thus strengthening even more the direct linkage between the two variables.

6.1.4. There is no apparent relationship either between MILAID/GNP and MILREG or between MILREG and DEFEXP/GNP. Thus, those Latin American nations with military regimes apparently have neither received greater amounts of MILAID in proportion to their GNP nor expended greater amounts of DEFEXP, again in proportion to their GNP. This fact is especially significant since it is among this group of nations that the largest number of military dominated regimes can be found.

6.1.5. No apparent subgroupings of case nations are identified when a scattergram of MILAID/GNP and DEFEXP/GNP is plotted. This finding is not surprising since most of the Latin American nations indicate little deviation from the regression line. The large regression coefficient (18.22) suggests that small amounts of change in MILAID/GNP achieve relatively large amounts of change in DEFEXP/GNP.

6.2. The Four Subperiods:

6.2.1. Little deviation in explained variance from that displayed when all 23 years are considered is indicated within each of the four subperiods. A decline in total explained variance is shown for the most recent subperiod, however.

6.2.2. The strong positive relationship between MILAID/GNP and DEFEXP/GNP remains relatively consistent for all four subperiods. Again, however, a decline is shown for the last subperiod, adding more support to the overall finding that any previous relationship between MILAID and DEFEXP has tended to weaken in recent years.

6.2.3. The lack of any significant correlation involving either EXTTHR or MILREG is consistent for each subperiod. Thus, any spurious relationship between MILAID/GNP and DEFEXP/GNP involving EXTTHR or any indirect relationship between the same two variables involving MILREG can be ruled out with relative certainty.

7. MILAID and DEFEXP -- Less Developed Nations:

7.1. 1950 through 1972:

7.1.1. EXTTHR, MILREG, BREVIND, and MILAID/GNP together account for a substantial amount (57%) of the variance in DEFEXP/GNP. The largest portion of this explained variance can be attributed to the effect of MILAID/GNP; however, EXTTHR also contributes significantly to this total amount.

7.1.2. There is a moderately strong positive relationship between MILAID/GNP and DEFEXP/GNP. Those less developed nations receiving larger amounts of MILAID in proportion to their GNP normally tend to spend greater amounts for defense again in proportion to their GNP. This relationship seems to exist despite the fact that the less developed countries have received only 2% of the total MILAID distributed from 1950 to 1972 as well as the fact that this small amount of MILAID represents only 2% of the total DEFEXP of these nations during this same 23 year time period.

7.1.3. There is a weak positive relationship between EXTTHR and both MILAID/GNP and DEFEXP/GNP. Thus, the slight possibility of a spurious relationship between MILAID/GNP and DEFEXP/GNP exists. However, the weak strengths of the correlations involving EXTTHR, especially when compared to the stronger correlation between MILAID/GNP and DEFEXP/GNP, greatly diminish the possible effect of this spurious relationship.

7.1.4. There is no apparent relationship either between MILAID/GNP and MILREG or between MILREG and DEFEXP/GNP. Similar to results when all the case nations are combined, there appears to be no indirect relationship between MILAID/GNP and DEFEXP/GNP through the intervening variable of MILREG.

7.1.5. There is no apparent relationship between BREVIND and DEFEXP/GNP. This finding is of special theoretical interest since it is among these less developed nations that most of the newly independent states are found.

7.1.6. When MILAID/GNP and DEFEXP/GNP are plotted in a scattergram, several distinct clusters of case nations are apparent. The nations within these clusters, however, fail to display any logical geographical, ethnic, cultural, political, or historical ties with each other. Similar to the Latin American nations, a large regression coefficient (11.24) suggests that small changes in the amount of MILAID distributed among these nations tend to produce substantially larger changes in DEFEXP.

7.2. The Four Subperiods:

7.2.1. During the second and third subperiods, the amount of explained variance in DEFEXP/GNP is greater than when all 23 years are considered; however, during the final subperiod, this amount of explained variance drops below this latter figure. The first subperiod is not applicable here since none of the less developed nations received MILAID during this time.

7.2.2. The positive relationship between MILAID/GNP and DEFEXP/GNP declines gradually over the last three subperiods. This apparent decline is similar to the same trend observed earlier for all the case nations combined as well as for each subgroup.

7.2.3. During the second and fourth subperiod, EXTTHR displays a relatively stronger positive

relationship with DEFEXP/GNP. However, for these same periods, EXTTHR has little effect upon MILAID/GNP and therefore fails to increase the possibility of a spurious relationship between the latter variable and DEFEXP/GNP.

7.2.4. During the third subperiod, a relatively stronger positive relationship between MILREG and DEFEXP/GNP is indicated. This finding seems to suggest that many of the military dominated Sub-Sahara African nations achieving independence during this period engaged in increased defense spending. The influx of MILAID during this same subperiod, however, does not appear to be related to the increase of military regimes among these nations.

7.2.5. The lack of any relationship between BREVIND and DEFEXP/GNP is consistent for all three subperiods. This finding is especially significant during the third subperiods when 10 new nations achieved independence.

The above summary, although in outline form, is still considerably lengthy. Its complexity is due to the relatively large number of variables involved as well as to the number of subgroups of case nations and subperiods of time. Table 21 on the following page, therefore, attempts to present the highlights of this summary in as brief a format as possible.

Table 21. Summary of Statistical Results

	Overall Result for 1950 through 1972	Trend Indicated by Results for the Four Subperiods
AMOUNT OF VARIANCE IN DEFEXP/GNP EXPLAINED BY ALL INDEPENDENT VARIABLES		
All Nations	14%	Declines after 1966
NATO	3%	None
Forward Defense	75%	Declines after 1960
Latin American	92%	Declines after 1966
Less Developed	57%	Declines after 1966

DIRECT RELATIONSHIP BETWEEN MILAID/GNP & DEFEXP/GNP

All Nations	Weak positive	Declines after 1966
NATO	None	None
Forward Defense	Moderate positive	Strong positive from 1954 to 1960
Latin American	Strong positive	Strong positive from 1954 to 1960
Less Developed	Moderately strong positive	Declines after 1966

RELATIONSHIP BETWEEN MILAID/GNP & MILREG
& BETWEEN MILREG & DEFEXP/GNP

All Nations	None	None
NATO	N/A	N/A
Forward Defense	None	None
Latin American	None	None
Less Developed	None	Weak positive between MILREG and DEFEXP/GNP from 1960 to 1966

Table 21. Summary of Statistical Results (Continued)

	Overall Result for 1950 through 1972	Trend Indicated by Results for the Four Subperiods
RELATIONSHIP BETWEEN EXTTHR & BOTH MILAIID/GNP & DEFEXP/GNP		
All Nations	Moderate positive with MILAIID/GNP, none with DEFEXP/GNP	None with MILAIID/GNP prior to 1954
NATO	Moderate negative with MILAIID/GNP, none with DEFEXP/GNP	Declines with MILAIID/ GNP after 1960
Forward Defense	Moderate positive with both MILAIID/GNP and DEFEXP/GNP	None either with MILAIID/GNP or DEFEXP/GNP prior to 1954, declines after 1960
Latin American	None with either MILAIID/GNP or DEFEXP/ GNP	None
Forward Defense	Weak positive with both MILAIID/GNP and DEFEXP/GNP	No overall trend
RELATIONSHIP BETWEEN BREVIND & DEFEXP/GNP		
All Nations	None	None
NATO	N/A	N/A
Forward Defense	Weak positive	Strong positive until 1953, none after that year
Latin American	N/A	N/A
Less Developed	None	None

CHAPTER IX

CONCLUSIONS

The empirical results summarized in the preceding chapter are subject to certain statistical shortcomings and to certain problems of theoretical validity. Before relating these findings to the original purposes of this study, a brief discussion of these shortcomings and problems is in order.

Turning first to the statistical methodology, two important technical limitations need to be considered. The first of these limitations concerns the frequency distribution of the five variables involved in the statistical tests. For parametric techniques, such as the Pearson product-moment correlation procedures employed here, the assumption of distributional normality, along with random sampling and independence of the cases, must be made.¹ The last two considerations have been discussed earlier; however, the problem of normality of frequency distribution for each of the variables has been ignored to this point. The extreme outlying cases shown in most of the scattergrams give a hint that both of the primary variables -- MILAID/GNP and DEFEXP/GNP -- do not

¹J. David Singer and Melvin Small, "Alliance Aggregation and the Onset of War, 1815-1945," in Quantitative International Politics: Insights and Evidence, ed. J. David Singer (New York: The Free Press, 1968), p. 275.

approach the frequency distribution of a normal curve. These same conditions also exist for most of the remaining variables.²

Two techniques can be utilized when a problem of this sort is encountered. The first approach is to employ data transformation procedures. Unfortunately, however, the resultant values, such as when logarithmic transformations are used to "normalize" highly skewed variables for example, become extremely artificial in nature and lose much of their validity to the empirical world. The second approach is to use nonparametric statistics. Again, however, the use of rank order techniques in lieu of product-moment correlations, for instance, forces the researcher to move from more sophisticated interval data to cruder ordinal measurements. In this study, the limitations of either data transformation or nonparametric statistics appear to outweigh the problem of frequency distribution non-normality. Therefore, neither of these techniques is employed. The various results presented earlier, especially when significance levels are included, must be considered in view of these statistical problems, however.

²The distributional statistics for the five variables are as follows:

VARIABLE	STANDARD DEVIATION	SKEWNESS	KURTOSIS
MILAIID/GNP	5.05	5.23	27.34
DEFEXP/GNP	14.06	4.46	21.03
EXTTHR	0.68	1.55	1.08
MILREG	0.30	2.07	3.84
BREVIND	0.68	0.86	-1.13

The second statistical shortcoming concerns the small number of cases involved when the NATO and forward defense nations are analyzed as separate groups. The quantitative results in these two instances cannot be viewed with the same amount of confidence as the results for the remaining two larger groups. This limitation, however, poses no serious problem as long as the results for these two subgroups of cases are considered in light of the overall results when all the nations are combined.

In addition to these statistical shortcomings, some theoretical validity problems also exist. Most of these problems have been touched upon earlier and need only to be briefly summarized. For instance, it is important to keep in mind that the MILAID variable is measuring only one facet of the United States military assistance program. Although grant aid constitutes the largest portion of the military assistance program, it is logical to assume that both military advisors and military sales have complementary or even contending effects upon recipient nation defense expenditures. Indeed it is possible even to infer some connection between the recent decreasing impact of MILAID upon DEFEXP, as shown in the statistical results, and the recent shift in emphasis by United States planners from the grant aid program to the military sales program.

The reliability of the defense expenditure data, especially for some of the less developed nations, also must be questioned. However, in lieu of any better information, the source utilized appears to be the best available. Hopefully,

in the future, more extensive research can be conducted in this worthwhile area of study. This same rationale can be applied to each of the other independent variables. And finally, as mentioned when the research model was first introduced, there obviously are other factors not included here, both international and domestic, that effect national patterns of defense spending. Military aid from sources other than the United States, internal security requirements, and sales by private multinational corporations engaged in defense related industries are just a few of these possible factors that come to mind.

In spite of these shortcomings and limitations, the empirical results obtained here possibly can be of value when the original purposes of the study are recalled. These purposes were to establish some order among the many theories relating to military aid, to suggest some quantitative methodology for governmental policy-making, and to gain some insight into the international impact of public policies.

The various theories presented in Chapter I were grouped into three schools of thought. Each of these schools can now be briefly examined more closely in light of the statistical results. The first group of theories contends that United States military assistance promotes excessive defense spending by the recipient nations.³ This proposition actually involves two considerations. First, military aid has a positive relationship with defense expenditures and, second,

³Hovey, United States Military Assistance; Lieuwen, Arms and Politics; Wolf, United States Policy; and Liska, The New Statecraft.

these military expenditures are excessive or otherwise detrimental to the financial health of the recipient country's economy.

The first of these considerations can be examined with relative ease based upon the statistical results of the study. When all of the case nations are considered together, these results appear to offer only slight support for a positive relationship between United States military aid and recipient nation defense spending. However, when the NATO, Western European, and other more developed nations are eliminated from consideration (keeping in mind that this also eliminates 43% of the total military aid distributed by the United States from 1950 through 1972), the strength of this positive relationship increases significantly. Much of this increased impact of military aid, in the case of the forward defense nations, must be suspect due to the possible spurious effect of external threats; however, for the remaining nations, especially the Latin American countries, the statistical results offer strong support for the initial premise of this group of theories.

The empirical support for the second premise of the "spiraling arms race" theory is more difficult to ascertain. What may be considered as excessive or inordinate military spending by a critic of the United States military aid program may be considered necessary and justified by a proponent of the program. Thus the final consideration is reduced to a normative judgement, which is far from the scope of this study. However, two conflicting statistical results were

obtained which at least should be touched upon. On one hand, the large regression coefficients for the Latin American nations and the other less developed countries -- the same two groups of cases where the MILAID-DEFEXP relationship was the strongest -- suggest that small amounts of change in United States military aid lead to substantially larger amounts of change in recipient nation defense expenditures. This "multiplying effect," in the case when military aid is increased, could be construed as producing excessive military spending. On the other hand, the lack of any significant correlation between defense expenditures and defense expenditures expressed as a percentage of GNP, especially for the less developed nations, suggests that increased military spending does not absorb a proportionally larger amount of a nation's resources. This latter argument, however, only considers the proportional change in military expenditures and fails to consider the necessity of any net change as well as the impact of this net change upon the social welfare programs of a country.

The second group of theories argues that United States military aid encourages military regimes, and that these military regimes are committed to excessive defense spending.⁴ In this case, the statistical results are both clearer and more conclusive. In no instance can any relationship be discovered between United States grant military aid and the establishment or strengthening of military-oriented or military-controlled regimes in the recipient nations. In

⁴Lieuwen, Arms and Politics; and Wolf, United States Policy.

addition, with the possible exception of the less developed group of nations during the period when the Sub-Saharan African countries initially were achieving their independence, no relationship between military regimes and increased defense spending can be observed. This finding, of course, must be limited to the context of the variables as defined in this study.

The third group of theories contends that United States military assistance has no impact upon the defense spending of the newly independent nations since these nations, regardless of aid, are engaged in "prestige seeking" programs of military development.⁵ Similar to the military regime school of thought, no statistical support can be found for this proposition. In the two groups of case nations which include newly independent states, a significant impact upon defense expenditures by military aid can be found, while in these same two groups, no relationship between brevity of independence and military spending can be observed. The only deviation to this finding is for the forward defense nations during the period from 1950 to 1953 -- a rather inconclusive exception that has been discussed earlier.

Another purpose of this dissertation was to suggest a quantitative methodology for policy-making. Military aid planning, similar to other United States policy planning, is based upon the diagnosis, study, and selection of various alternatives and consequences.⁶

⁵Walterhouse, Time to Build; SIPRI, The Arms Trade; Kemp, "Arms Traffic"; and Frank, The Arms Trade.

⁶John Friedman, Retracking America (Garden City, New York: Doubleday, 1973), p. 78.

political and economic, domestic and international, influence the direction and scope of this planning.⁷ In many instances, the defense expenditure patterns of the nations receiving military assistance have been included among these factors. For instance, as pointed out earlier, the decreasing share of the defense burden assumed by the NATO nations in proportion to their increasing economic wealth was the principal factor influencing the decision to phase out military aid to this group of recipients. However, in many other cases, recipient nation defense spending often is ignored in the planning process. Wolf points out that "recipient country operating costs" are not considered by the United States when grant aid alternatives are considered, but are computed only after the decisions have been made.⁸

As discussed in Chapter I, increases or decreases in recipient nation defense expenditures alone cannot indicate the effectiveness of military aid. However, these same trends, when analyzed in relation to the numerous other input factors, can be an important contribution towards the overall United States military assistance policy planning process. This dissertation has attempted to suggest some quantitative methodology that could be employed to generate much of this military aid-defense expenditure planning data. The results

⁷Gabriel Almond, "Public Opinion and National Security Policy," Public Opinion Quarterly 20 (1956): 371-378; Robert L. Rothstein, Planning, Prediction, and Policymaking in Foreign Affairs (Boston: Little, Brown and Company, 1970); and Samuel P. Huntington, "Strategic Planning and the Political Process," Foreign Affairs 38 (1960): 285-299.

⁸Wolf, United States Policy, pp. 171-172.

obtained indicate that, with sufficiently reliable measurements and with carefully chosen statistical techniques, empirical findings that are relevant to the applied field of policy-making, as well as to the theoretical field of international policy analysis, can be uncovered.

The last purpose of this study returns to the more theoretical level. In Chapter I, an international policy process model was introduced. In the following chapters, one specific linkage within this model -- the outcome of United States military aid as measured by the subsequent defense expenditures of the recipient nations -- was explored. Many of the empirical findings were inconclusive and much research remains to be conducted in this specific area. However, enough significant and reliable results were obtained to not only confirm this theoretical linkage, but also to gain some insight into its very nature.

The amount of variance in defense expenditures not explained by the variables employed here suggests that there are numerous other linkages that must be added to the international policy process model. Other research in other areas can help to uncover many of these variables. Perhaps then, over time, a clearer understanding of the numerous factors at work within the international environment can be obtained.

APPENDIX
DATA AND CODEBOOK

A. Description of Variables:

1. United States Military Aid (MILAID): Annual value, in United States dollars at constant 1960 United States prices, of all grant aid received by each case nation for each year from 1950 through 1972. Sources: United States Agency for International Development, United States Foreign Assistance and Assistance from International Organizations, Obligations and Loan Authorizations and United States Overseas Loans and Grants and Assistance from International Organizations, Obligations and Loan Authorizations, special reports prepared for the House Foreign Affairs Committee (Washington: Government Printing Office, 1961, 1967, and 1972). Values are converted to 1960 prices using a United States wholesale price index from Bureau of the Budget, Statistical Abstract of the United States (Washington: Government Printing Office, 1972).

2. Defense Expenditures (DEFEXP): Annual central government expenditures for national defense, in United States dollars at constant 1960 case nation prices and exchange rates, for each case nation for each year from 1950 through 1972. Source: Stockholm International Peace Research Institute, World Armaments and Disarmament: SIPRI Yearbook (New York: Humanities Press, 1972). Values have already been converted to 1960 prices by the SIPRI.

3. Gross National Product (GNP): Annual gross national product, in United States dollars at constant 1960 case nation prices, for each case nation for each year from 1950 through 1972. Sources: United States Agency for International Development, Gross National Product, Growth Rates, and Trend Data (Washington: Government Printing Office, annual reports from 1962 to 1972); and United Nations, Statistical Yearbook and Yearbook of National Accounts Statistics (annual reports from 1950 to 1972). USAID values already have been converted to 1960 prices. When UN values are utilized, a consumer price index for the case nation involved, obtained from the same two UN sources, is used to convert all data to 1960 prices.

4. External Threat (EXTTHR): Annual index of external threat faced by each case nation for each year from 1950 through 1972. Computed through the assigning of points as follows: contiguous border with Communist nation = 1 point, contiguous border with traditional long-term enemy = 1 point, active hostile border = 1 point, and actual engagement in hostility = 1 point. Sources: Rand McNally New Cosmopolitan World Atlas (Chicago: Rand McNally, 1972); T.N. Dupuy and Wendell Blanchard, The Almanac of World Military Power (New York: R.R. Bowker, 1972); Kjell Goldmann, International Norms and War Between States (Stockholm: Laromedelsforlagen, 1971); and Charles Taylor and Michael C. Hudson, World Handbook of Political and Social Indicators, 2nd ed. (New Haven, Connecticut: Yale University Press, 1972).

5. Military Orientation of Regime (MILREG): Annual index of the nature of regime for each case nation for each year from 1950 through 1972. Computed as follows: 2 = strong military regime, 1 = government subject to strong military influence, 0 = civilian controlled regime. Sources: Arthur S. Banks, Cross-Polity Time-Series Data (Cambridge, Massachusetts: The MIT Press, 1971); and Keesing's Contemporary Archives (London: Keesing's Publications, annually from 1965 to 1972).

6. Brevity of Independence (BREVIND): Annual index of the length of independence for each case nation for each year from 1950 through 1972. A value of 8 is assigned for the first year of independence, a value of 7 for the second year, a value of 6 for the third year, and so forth until a value of 0 is reached for the ninth year of independence. Source: New York Times Encyclopedic Almanac, 1970 (New York: New York Times, 1969).

7. Years of Independence (YRSIND): Total number of years between 1950 and 1972 that each case nation has existed as an independent state. Source: See BREVIND above.

8. Years of United States Military Aid (YRSAID): Total number of years between 1950 and 1972 that each case nation has received MILAID. Source: See MILAID above.

B. Computational Formulas:

1. Total MILAID for each case nation (TOTMILAID) = sum of annual MILAID
2. Average MILAID for each case nation for years received = $TOTMILAID/YRSAID$
3. Average MILAID for each case nation for years independent = $TOTMILAID/YRSIND$
4. Total MILAID for all case nations = sum of each case nation's TOTMILAID.
5. Annual total MILAID for all recipient case nations for each year (ANNUALMILAID) = sum of each recipient case nation's MILAID for that year.
6. Annual average MILAID for all recipient case nations for each year = $ANNUALMILAID$ for that year/number of recipient case nations for that year.
7. Annual MILAID expressed as a percentage of gross national product for each case nation ($MILAID/GNP$) = $annual\ MILAID/annual\ GNP$
8. Average MILAID/GNP for each case nation for years received = $(sum\ of\ annual\ MILAID/GNP)/YRSAID$
9. Average MILAID/GNP for each case nation for years independent = $(sum\ of\ annual\ MILAID/GNP)/YRSIND$
10. Annual average MILAID/GNP for all recipient case nations for each year = $(sum\ of\ each\ recipient\ case\ nation's\ MILAID/GNP)/number\ of\ recipient\ case\ nations\ for\ that\ year$
11. Average DEFEXP for each case nation (AVGDEFEXP) = $sum\ of\ available\ annual\ DEFEXP/number\ of\ years\ for\ which\ DEFEXP\ data\ is\ available.$
12. Total DEFEXP for each case nation (TOTDEFEXP) = $AVGDEFEXP \times YRSIND$

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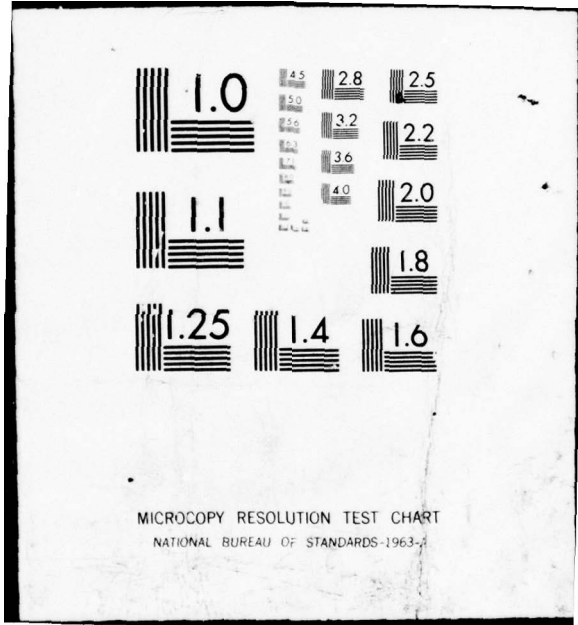
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13. Total DEFEXP for all case nations = sum of each case nation's TOTDEFEXP
14. Annual total DEFEXP for all independent case nations for each year (ANNUALDEFEXP) = sum of each independent case nation's DEFEXP for that year
15. Annual average DEFEXP for all independent case nations for each year = ANNUALDEFEXP/number of independent nations for that year
16. Annual DEFEXP expressed as a percentage of gross national product for each case nation (DEFEXP/GNP) = annual DEFEXP/annual GNP
17. Average DEFEXP/GNP for each case nation = (sum of available annual DEFEXP/GNP)/number of years for which DEFEXP data is available
18. Annual average DEFEXP/GNP for all independent case nations for each year = (sum of each independent case nation's DEFEXP/GNP when available for that year)/number of independent case nations with available DEFEXP data for that year.
19. Average EXTTHR for each case nation = sum of annual EXTTHR/YRSIND
20. Average MILREG for each case nation = sum of annual MILREG/YRSIND
21. Average BREVIND for each case nation = sum of annual BREVIND/23

C. Case Nations and Nation Code:

AFGA Afganistan	IRAQ Iraq	SING Singapore
ARGE Argentina	ITAL Italy	SPAI Spain
AUST Austria	IVOR Ivory Coast	SRIL Sri Lanka
BELG Belgium/Lux.	JAPA Japan	SUDA Sudan
BOLI Bolivia	JORD Jordan	TAIW Taiwan
BRAZ Brazil	KORE South Korea	THAI Thailand
BURM Burma	LAOS Laos	TUNI Tunisia
CAMB Cambodia	LEBA Lebanon	TURK Turkey
CAME Cameroon	LIBE Liberia	UNKI United Kingdom
CANA Canada	LIBY Libya	UPPE Upper Volta
CHIL Chile	MALA Malaysia	URUG Uruguay
COLO Colombia	MALI Mali	VENE Venezuela
COST Costa Rica	MEXI Mexico	YUGO Yugoslavia
DAHO Dahomey	MORO Morocco	ZAIR Zaire
DENM Denmark	NEPA Nepal	
DOMI Dominican Rep.	NETH Netherlands	
ECUA Ecuador	NEWZ New Zealand	
ELSA El Salvador	NICA Nicaragua	
ETHI Ethiopia	NIGR Niger	
FRAN France	NIGA Nigeria	
GERM West Germany	NORW Norway	
GREE Greece	PAKI Pakistan	
GUAT Guatemala	PANA Panama	
GUIN Guinea	PARA Paraguay	
HAIT Haiti	PERU Peru	
HOND Honduras	PHIL Philippines	
INDI India	PORT Portugal	
INDO Indonesia	SAUD Saudi Arabia	
IRAN Iran	SENE Senegal	

D Codebook Format:

1. The data is recorded on 9 punchcards per case nation. The format for the first 6 columns of each card for each case nation is identical and is coded as follows:

Column 1: Variable Code (1 = MILAID, 2 = DEFEXP, 3 = DEFEXP/GNP, 4 = MILAID/GNP, and 5 = remaining variables).

Column 2: Card number for that variable.

Column 3-6: Nation code.

2. The remaining columns of each card for each case nation are coded as follows:

Card 1: Column 7-78: Annual MILAID x 100,000 for 1950 through 1967 (4 columns per year).

Card 2: Column 7-26: Annual MILAID x 100,000 for 1968 through 1972 (4 columns per year).

Card 3: Column 7-78: Annual DEFEXP x 1 million for 1950 through 1967 (4 columns per year, 0 = missing data).

Card 4: Column 7-26: Annual DEFEXP x 1 million for 1968 through 1972 (4 columns per year, 0 = missing data).

Card 5: Column 7-76: Annual DEFEXP/GNP x .01 for 1950 through 1963 (5 columns per year, 0 = missing data).

Card 6: Column 7-51 Annual DEFEXP/GNP x .01 for 1964 through 1972 (5 columns per year, 0 = missing data).

Card 7: Column 7-76: Annual MILAID/GNP x .001 for 1950 through 1963 (5 columns per year).

Card 8: Column 7-51: Annual MILAID/GNP x .001 for 1964 through 1972 (5 columns per year).

Card 9: Column 7-29: Annual BREVIND for 1950 through 1972 (1 column per year).

Column 30-52: Annual EXTTHR for 1950 through 1972 (1 column per year).

Column 53-75: Annual MILREG for 1950 through 1972 (1 column per year).

Column 76-77: Years of independence.

Column 78-79: Years of MILAID.

11COST	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	7	5	2	2	0
12COST	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21COST	1	2	2	2	2	2	2	2	2	6	6	6	6	6	6	6	5	6	6	6
22COST	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31COST	25	50	50	50	50	50	50	50	50	50	50	50	150	150	150	150	150	150	120	
32COST	100	120	100	100	100	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0
41COST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	25	140	
42COST	100	40	33	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0
51COST	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11DAHO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
12DAHO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21DAHO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22DAHO	5	4	4	0	0	0	0	0	0	0	0	2	3	4	5	5	5	5	5	5
31DAHO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	150	200	
32DAHO	250	250	250	250	200	200	200	0	0	0	0	0	0	0	0	0	0	0	50	0
41DAHO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42DAHO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51DAHO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11DENM	53	323	490	864	877	798	358	446	239	276	443	361	154	132	122	476	5	5	1	
12DENM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21DENM	72	86	118	155	153	150	145	152	140	144	161	164	200	203	209	220	217	218	218	
22DENM	233	230	225	234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31DENM	153	183	246	310	294	288	274	271	246	271	246	236	248	238	274	274	278	278	278	
32DENM	261	262	252	242	248	228	214	217	0	0	0	0	0	0	0	0	0	0	0	0
41DENM	113	687	1021	1728	1687	1535	675	796	419	452	682	523	211	181	181	181	181	181	181	
42DENM	152	567	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51DENM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11DOMI	0	0	0	0	0	24	15	15	17	10	2	0	2	21	27	13	30	27	27	
12DOMI	23	23	17	9	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21DOMI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22DOMI	30	28	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31DOMI	0	0	0	0	0	0	0	0	0	0	486	600	471	486	412	344	344	344	344	
32DOMI	367	387	333	311	300	255	233	0	0	0	0	0	0	0	0	0	0	0	0	0
41DOMI	0	0	0	0	0	480	250	243	143	29	0	25	233	233	233	233	233	233	233	
42DOMI	300	162	333	300	230	209	142	69	107	107	107	107	107	107	107	107	107	107	107	
51DOMI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

11ECUA	0	0	1	22	25	21	21	19	37	19	28	23	28	45	32	37	35	64
12ECUA	15	20	19	3	0													
21ECUA	0	0	8	12	0	18	20	19	18	16	22	21	20	17	20	22	24	22
22ECUA	24	24	25	0	0													
31ECUA	0	0	200	300	0	450	400	380	360	320	360	320	367	350	333	283		
32ECUA	286	314	343	275	300	300	278	0	0									
41ECUA	0	0	25	550	625	525	420	380	740	380	467	383	467	383	467	750		
42ECUA	457	529	500	800	187	250	211	30	0									
51ECUA	0	0	0	0	0	0	0	0	0	0	0	2	6	12	10	10	8	
11ELSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
12ELSA	4	4	5	3	3													
21ELSA	5	5	7	7	7	7	7	8	8	6	6	6	9	9	8	9	9	
22ELSA	9	9	10	10	0													
31ELSA	125	125	175	140	140	140	140	140	160	160	160	100	100	100	100	129	129	
32ELSA	114	129	112	100	100	100	100	100	100	0	0	0	0	0	33	86	171	
41ELSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
42ELSA	143	143	100	33	44	44	44	50	30	30								
51ELSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11ETHI	0	0	0	0	44	10	43	51	97	56	82	107	191	118	133	89	147	
12ETHI	108	107	97	103	90													
21ETHI	0	0	0	0	0	0	0	0	0	10	15	18	19	21	23	28	30	
22ETHI	30	27	24	23	0													
31ETHI	0	0	0	0	0	0	0	0	0	0	0	143	214	257	237	262		
32ETHI	287	350	333	344	333	270	240	209	0									
41ETHI	0	0	0	0	0	880	200	717	850	1617	800	1171	1529	2387	1475			
42ETHI	1662	1112	1633	1833	1200	1070	970	936	818									
51ETHI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11FRAN	309500262329998746654914722242414911098704148342845333000																	
12FRAN	0	0	0	0	0													
21FRAN	198726513394379632062977387640283718379339083876418241104225429344154651																	
22FRAN	46454582456045914725																	
31FRAN	472	593	736	803	649	572	705	697	626	621	597	562	567	528				
32FRAN	508	493	480	482	459	420	394	376	368									
41FRAN	73	1119	1352	2114	1511	1056	859	419	251	180	107	21	46	11				
42FRAN	6	4	0	0	0	0	0	0	0	0	0	0	0	0				
51FRAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

11IRAN	0	120	64	303	407	233	258	448	755	979	961	599	347	735	316	504	629	349
12IRAN	206	214	23	18	109													
21IRAN	66	63	60	57	65	90	106	127	203	227	183	181	180	183	201	250	286	366
22IRAN	466	537	620	687	0													
31IRAN	165	154	143	133	133	162	220	259	295	451	528	416	393	367	359			
32IRAN	359	403	409	475	475	555	577	602	592	0								
41IRAN	0	293	152	705	1017	568	629	1042	1678	2277	2184	1302	708	1441				
42IRAN	564	813	899	453	245	22	16	83										
51IRAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11IRAG	0	0	0	0	0	59	64	152	225	6	1	0	0	0	0	2	2	1
12IRAG	0	0	0	0	0													
21IRAG	22	22	32	47	53	53	75	82	88	103	119	124	132	154	181	218	224	231
22IRAG	272	251	202	0	0													
31IRAG	733	733	800	940	1060	662	938	911	978	1144	1082	1033	1015	1283				
32IRAG	1293	1557	1493	1359	1511	1195	962	0	0									
41IRAG	0	0	0	0	0	0	737	800	1689	2500	67	9	0	0	0	0	0	0
42IRAG	0	14	13	6	6	0	0	0	0									
51IRAG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11ITAL	3011231082455438552352298716371045100010941377	8891683	749	806	98	0												
12ITAL	0	0	0	0	0													
21ITAL	767	908	994	897	981	974100010361064109711441182129814471482153716621623												
22ITAL	16541622171017151885																	
31ITAL	350	385	404	338	358	334	326	321	314	304	298	284	294	311				
32ITAL	309	309	315	289	277	256	258	254	271									
41ITAL	14	476	440	1718	1407	805	973	507	308	277	285	331	201	361				
42ITAL	156	163	19	0	0	0	0	0	0									
51ITAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11IVOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12IVOR	0	0	0	0	0													
21IVOR	0	0	0	0	0	0	0	0	0	0	2	5	8	7	10	11	11	14
22IVOR	13	12	15	0	0													
31IVOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	83	133	100
32IVOR	125	122	122	156	130	120	150	0	0	0	0	0	0	0	0	0	0	0
41IVOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42IVOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51IVOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

11URUG	0	0	0	4	17	33	50	77	47	16	34	36	27	21	27	49	15
12URUG	13	14	18	13	18												
21URUG	0	0	0	0	0	0	0	0	9	11	15	15	20	20	22	22	24
22URUG	18	18	18	0	0												
31URUG	0	0	0	0	0	0	0	0	0	0	900	1100	1500	1500	2000		
32URUG	2000	2200	2200	2400	1800	1800	1800	1800	0	0							
41URUG	0	0	0	0	400	1700	3300	5000	7700	4700	1600	3400	3600	2700			
42URUG	2100	2700	4900	1500	1300	1400	1800	1300	1800								
51URUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11VENE	0	0	0	0	0	0	0	0	0	0	3	64	28	55	13	19	9
12VENE	9	7	7	8	18												
21VENE	64	64	70	71	70	111	139	118	186	195	175	152	158	188	198	219	232
22VENE	257	243	248	257	0												
31VENE	278	237	241	229	206	300	347	268	396	382	330	276	268	294			
32VENE	275	288	297	316	299	273	258	260	0	0	0	0	0	5	108	44	
41VENE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42VENE	76	17	24	11	10	8	7	8	17								
51VENE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11YUGO	0	0	801176925581539	624	174	336	0	0	0	0	0	0	0	0	6	3	0
12YUGO	0	0	0	0													
21YUGO	73	79	435	381	374	328	305	297	316	341	329	365	359	362	376	363	349
22YUGO	392	392	401	405	485												
31YUGO	487	376	1673	1155	912	763	649	582	527	480	445	468	443	431			
32YUGO	453	534	572	532	544	478	446	382	441								
41YUGO	0	0	3081	5361	6239	3579	1328	341	560	0	0	0	0	0	0	0	0
42YUGO	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51YUGO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11ZAIR	0	0	0	0	0	0	0	0	0	0	0	0	0	1	53	57	32
12ZAIR	20	21	16	3	3												
21ZAIR	0	0	0	0	0	0	0	0	0	0	40	40	44	61	98	137	117
22ZAIR	91	88	106	121	0												
31ZAIR	0	0	0	0	0	0	0	0	0	0	0	0	0	500	444	440	
32ZAIR	555	817	979	836	607	587	624	672	0	0	0	0	0	0	0	0	0
41ZAIR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
42ZAIR	482	475	229	243	133	140	94	17	15								
51ZAIR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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BIOGRAPHICAL DATA

Name: David Lee Pearce, Major, United States Army

Date and Place of Birth: April 18, 1938
Glen Ridge, New Jersey

Elementary School: Oak Street School
Basking Ridge, New Jersey
Graduated 1952

High School: Bernards High School
Bernardsville, New Jersey
Graduated 1956

College: Princeton University
Princeton, New Jersey
B. A. 1960

Other Schools: United States Army Command and General Staff
College
Fort Leavenworth, Kansas
Graduated 1971

Graduate Work: Syracuse University
Syracuse, New York
M. A. 1975

Syracuse University
Syracuse, New York