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THE IMPACT OF ALTERNATIVE INTERNATIONAL ECONOMIC
POLICIES ON U.S. DEFENSE INTERESTS ABROAD

CACI, INCORPORATED

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The evolving international economic environment poses as yet unanswered questions concerning the implications of newly adopted international economic policies for U.S. defense interests abroad. To begin to answer these questions, this study has been designed to identify international economic policies which, if adopted by the United States, would adversely affect foreign economies and induce policy responses detrimental to U.S. defense policies and defense posture. The goal of the research effort is the construction of an empirically based model that can quantitatively assess impacts on U.S. defense posture.

Three intermediate-level problems are discussed within this Interim Technical Report. (1) An economic model must be developed to determine the nature and magnitude of changes in foreign economies induced by U.S. international economic policies; (2) A decision-analysis framework to identify likely policy responses of foreign governments must be specified; (3) The components of U.S. defense interests and military posture must be identified and quantitative indicators of those components must be developed.

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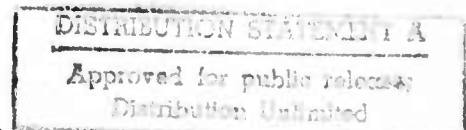
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REPORT SUMMARY

This Interim Technical Report describes research progress during the six-month period June through November 1974 for the study of "The Impact of Alternative International Economic Policies on U.S. Defense Interests Abroad." This chapter, the Report Summary, provides a concise, non-technical discussion of subjects presented at greater length in other sections.

GENERAL RESEARCH PROBLEM AND ACCOMPLISHMENTS

Recent, rapid changes in the international economy have been accompanied by a number of new international economic policies adopted by the United States and other countries. The evolving international economic environment poses as yet unanswered questions concerning the implications of these policies for U.S. defense interests. To begin to answer these questions, this study has been designed to identify international economic policies which, if adopted by the United States, would adversely affect foreign economies and induce policy responses detrimental to U.S. defense policies and defense posture. The goal of the research effort is the construction of an empirically based model that can quantitatively assess impacts on U.S. defense posture. To accomplish this objective, three intermediate research problems must be solved:

- An economic model must be developed to determine the nature and magnitude of changes in foreign economies induced by U.S. international economic policies.
- A decision-analysis framework to identify likely policy responses of foreign governments must be specified.
- The components of U.S. defense interests and military posture must be identified and quantitative indicators of those components must be developed.

Research efforts during this reporting period have been directed toward these intermediate problems. Specific results are reported below. In addition to contributing to the progress of the study, the interim findings also have applications beyond the study per se:

- An empirical analysis of quantitative measures of U.S. interests abroad was conducted in cooperation with the Concepts Analysis Agency of the U.S. Army. The quantitative indicators developed in the analysis are currently being employed by the Long-Range Forecasting Division of the U.S. Marine Corps, Quantico, Virginia.
- The economic and decision-system models that have been devised are directly applicable to the analysis of the influence of international economic policies on international alignment patterns. Such an analysis permits more accurate estimation of force structure requirements, a problem currently of interest to the Regional Programs, Office of the Office of the Secretary of Defense, Program Analysis and Evaluation.

INTRODUCTION

RESEARCH TASKS

To achieve the goal of the study, six research tasks have been identified. All are listed below. Of these, the first three constitute the intermediate steps of the study; these three were to be and have been accomplished during the current period.

Task I. An Historical Survey of Linkages Between Economic and Defense Interests. The historical survey is intended to provide information concerning the types of responses engendered by the economic policies of other nations.

Task II. Measurement of U.S. Military Posture. Conceptual measures of U.S. military posture are to be developed. These measures are to be formulated in a manner conducive to the construction of quantitative indicators.

Task III. Measurement of the Effects of U.S. Economic Policies. An economic model appropriate to the empirical measurement of the nature and magnitude of the impacts of U.S. economic policies on foreign economies is to be developed. Additionally, the model should allow a similar evaluation of alternative economic policy responses available to the foreign government.

Task IV. Data Collection and Model Estimation. Data appropriate to the economic model are to be gathered and the parameters of the model are to be estimated. The indicators of U.S. defense posture are to be similarly developed.

Task V. Interpretation of Empirical Findings. The empirical model is to be evaluated to assess its consistency with the theoretical forms.

Attention will be given to identifying those economic policies having more substantial influences on U.S. defense interests. Further, generalizations will be sought which allow identification of countries believed likely to respond to U.S. economic policies.

Task VI. Preparation of the Final Report. This task includes the responsibility to disseminate the major findings of the study to interested users in the national security community.

TASK DISCUSSIONS

I. An Historical Survey of Linkages Between Coercive Economic Actions and the Responses of Target Nations

Research Problem 1. An historical survey was performed to identify likely responses to restrictive international economic policies. Particular emphasis was placed on determining military-related retaliations. Referring to Figure 1, the determinants of the right-most path between foreign governments and U.S. defense interests -- those responses directly affecting military interests -- were to be identified.

Methodology. The historical survey was accomplished by reviewing the literature of political science devoted to the analysis of situations of interstate economic conflict.

Results. The results of the survey were essentially negative. Very little evidence could be found to support the identification of direct military-related responses to international economic policies. There are several reasons for this. The most important is paucity of systematic examinations of international economic policies by students of international relations. Substantive efforts to integrate economic policies with other aspects of interstate behavior have not been satisfactory because economic policies adopted for "economic" reasons have been explicitly excluded from consideration. Compounding the problem, efforts to distinguish "normal" economic policies from economic instruments of foreign policy have

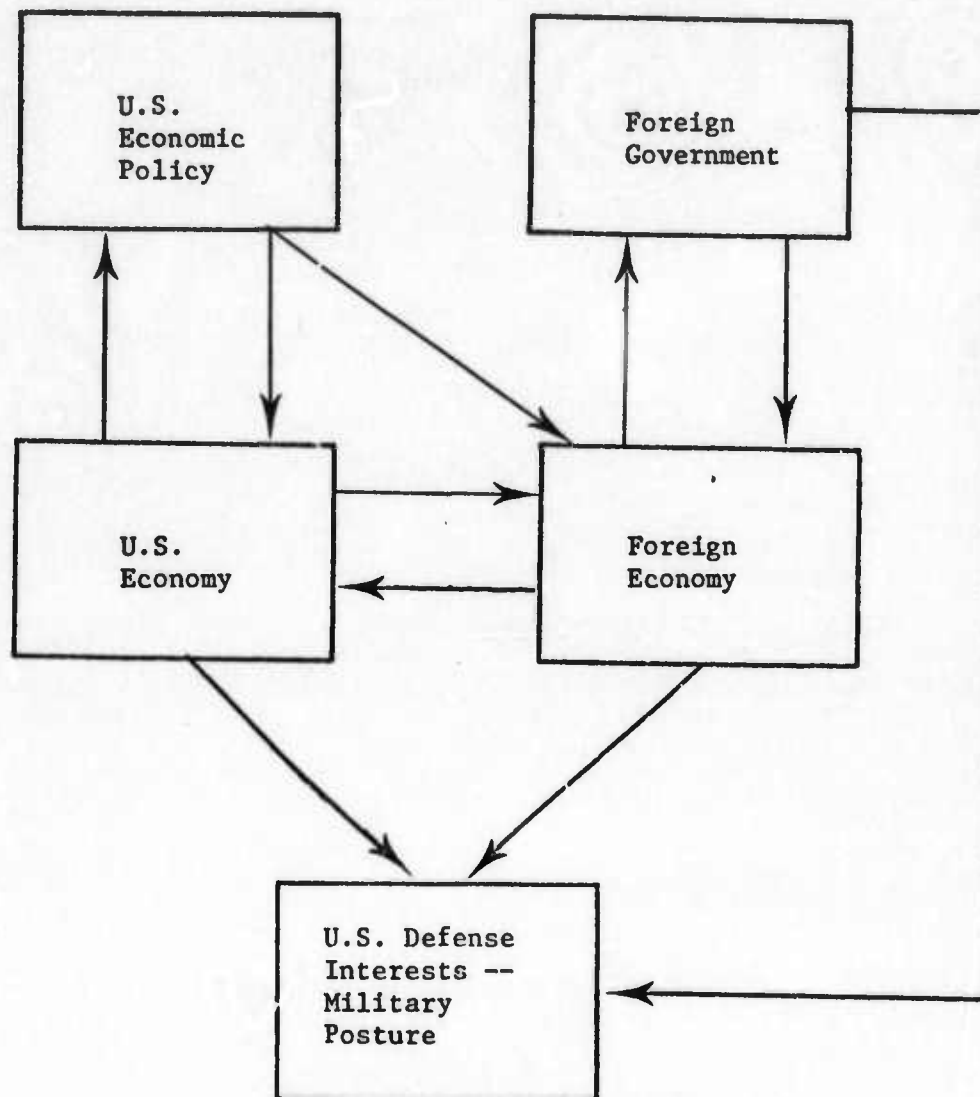


Figure 1. The Relations Among Economic Policies, Foreign Responses and U.S. Defense Interests -- Military Posture

not produced consistent definitions. The single most important generalization qualifies itself: for an economic policy to be an instrument of foreign policy, it must have at least a perceptual impact on the target country's decision-makers. Other observations emphasize that the success or failure of coercive economic action depends crucially upon uneven economic power and upon the two nations' relative dependence on international trade.

Empirical studies of instances of interstate economic conflict have begun to appear in recent journal issues. While these studies do not all follow a similar analytic method, they do suggest a few substantive generalizations:

- Interstate economic conflict is highly escalatory. Once a pattern of punitive action and reaction sets in, it easily runs out of control of the parties involved.
- Engaging in interstate economic conflict is usually self-defeating. Except under uncommon circumstances, economic sanctions seem to be ineffective and often lead to further costly conflicts.
- The success of economic sanctions depends on situational factors that determine the impact of the sanctions on the target country, including (1) alternative trading opportunities, (2) severity of sanctions on the target, and (3) the limit of the demands of the sanctioning power.
- The response of the target country to the economic sanctions of another country can take several forms: (1) military or economic retaliation against the sanctioning power, (2) domestic economic adjustments, (3) no response, or (4) capitulation to the demands of the sanctioning power.

These studies suggest that a variety of factors influence a nation's policy response to the imposition of a sanction. However, no systematic discussion of the problem of choice of policy response is presented -- the factors are never simultaneously evaluated. Finally, cross-sectional studies of interstate economic conflict are less successful than studies that concentrate upon a particular instance of such conflict. The beginnings of analytic model development of the type required for the project are found only in particular case studies.

Implications of Findings. Although the literature survey was not as helpful as was expected, it did serve to confirm the decision to concentrate the analysis on particular countries rather than attempt a cross-sectional treatment. (The countries chosen were Japan and Saudi Arabia.) Because the historical survey was expected to identify patterns of responses to restrictive international economic policies, it was decided that the project would benefit from an examination of selected historical cases of economic conflict.

Research Problem 2. The literature survey showed the necessity of case-by-case treatment if economic conflict is to be successfully modeled. However, it is extremely difficult, if not impossible, to construct a detailed model of a particular situation without having at least a rudimentary understanding of the nature of the process. Six historical instances were selected for more detailed study. The identification of situational factors influencing the responses of target nations was emphasized in order to recognize historical regularities that might contain the complex model within reasonable bounds.

Methodology. The selection of particular cases of economic sanctions to be studied posed the most important methodological questions. First, it was decided to consider only cases occurring since 1945. Second, to control for the importance of uneven levels of economic development, at least one case in each of the following categories was included: a developed versus a developed country; a developed versus a less developed country; and a less developed versus a less developed country. Third, a variety of relative sizes in actor and target states was sought. And finally, sanctions with differing durations were included. Six instances were selected: Iran, 1950-53; Finland, 1958; Berlin, 1948-49; Cuba, 1958-present; Rhodesia, 1965-present; and South Africa, 1947-present.

Results. The six case studies provided an appreciation of the complexity involved in the specification of important situational factors. Each case was considered independently and then a comparative evaluation of

all cases was performed. While there was significant variation across the cases, it was possible to identify features to be included in the analysis of Japan and Saudi Arabia. These include the historical pattern of relations between the countries involved, the relations of both countries to "third party" countries, the pattern of prior international economic conditions between the countries, the economic conditions within the responding country, the domestic political conditions of the responding country, and the nature of the particular restrictions initially imposed. For convenience, a table appearing in Chapter 3 which visually summarizes the analysis is reproduced here as Table 1.

Having accomplished the comparison of the six cases, an abstract framework for the analysis of a target country's choice of response was developed. Essentially, the framework presents the choice among responses as a problem of constrained maximization. Each possible response is evaluated in light of its expected benefits and costs. The situational factors are then viewed as constraints on the problem of choice availability.

II. Measurement of U.S. Military Posture

Research Problem. The development of quantitative indicators of U.S. defense interests abroad is the overall goal of this research topic. Efforts to achieve this goal have identified three related requirements. First, the concept of military posture must be unambiguously defined; second, the major U.S. defense objectives abroad must be identified; and third, quantitative measures for the indicators of major U.S. military interests in other countries must be developed.

Methodology. Defining military posture is difficult for two reasons. First, it is inappropriate to relate military posture to any absolute standard. In any application a relative comparison is implied. Second, the general notion of the concept contains within it a variety of more specific ideas. Any one version of the concept may produce a different perception of military posture than would any other version if both are

	Finland	Iran	South Africa	Rhodesia	Cuba	Berlin
I. Relevant Background Condition						
1. Historical	X	X			X	
2. Current						
a. Geographic	X			X	X	
b. Level of Development-- Self Sufficiency		X	X	X	X	X
c. Internal Political Conditions	X	X			X	X
d. International Conditions	X		X	X	X	X
e. Third Party Influences			X	X	X	X
f. Power Differential	X	X			X	X
II. Nature and Scope of Sanctions						
1. Selectivity or Completeness	S	S	C	C	C	S
2. Unilaterally Escalated	yes	no	no	yes	yes	no
3. Retaliatory(bi-or multi- laterally escalated).	no	yes	no	yes	yes	yes
4. Range (unilateral, bilateral or multilateral).	U	B	M	M	M	B
5. Rate of Implementation (gradual or abrupt).	A	G	G	G	G	A
6. Ancillary Sanctions	no	no	yes	yes	yes	no
7. Costs to Sanctioning Nation	low	low	low	high	low	low
8. Costs to Target Nation.	high	mod.	low	mod.	low	high
III. Responses of the Target Nation						
1. Resistance	X	X	X	X	X	X
2. Retaliation		X		X	X	
3. Political and/or Realignment			X	X	X	
4. Negotiation	X	X	X	X	X	X
5. Concession and Capitulation	X					
6. Violence		X			X	
7. Domestic Restructuring		X	X	X	X	X
IV. Impact of Sanction on Target Nations						
1. Domestic Political Stability						
2. Domestic Economic Stability	X	X		X	X	
3. Nationalism		X	X	X	X	
4. National Cohesion			X	X	X	X
V. Final Outcome						
1. Concession Capitulation	X					
2. Realignment				X		
3. Isolation			X			
4. No Apparent Effect		X				
5. Stalemate			X	X	X	X

Table 1. Comparative Characteristics of Six Cases of Sanctions

applied in the same situation. Examples of the variety of ideas implied by "military posture" include: strategic standing, military strength or power, military capability, military influence, military presence and military weaknesses and threats. Additional conceptual problems include the association of military posture with particular weapons systems and the variations of assessments of posture (under any of the previous sub-topical ideas) due to changing military goals.

The important dependence of posture on goals suggests that an unambiguous identification of military posture must depend upon the set of major U.S. military objectives. Major objectives are emphasized. If the specific mechanisms employed to achieve the objectives are the basis for the identification of posture, the analysis is returned to the assessment of inconsistencies previously discussed.

Results. The major U.S. military goals relating to other countries are not constant across countries or even geographic regions of the world and are therefore not precisely identifiable with abstract analytic efforts. However, the concept of posture related to goals becomes more tangible in specific situations recognizing environmental constraints. To identify conceptual dimensions of U.S. interests abroad, factor analysis was performed on two data sets. Political, commercial, military, and socio-cultural dimensions of U.S. interests were identified. Further, the indicators (derived from the factor analyses) of U.S. military interests tend to cluster into a few sets of theoretically meaningful structures; the clusters of military and commercial influences seem to be the more stable. The results of the factor analyses also provide indicators which can be empirically implemented.

III. Measuring the Effects of U.S. Economic Policies

Research Problem. A theoretically consistent, empirically estimable economic model capable of determining the nature and magnitude of effects on other economies of alternative international economic policies must be

derived. Additionally, the model should incorporate economic policy instruments the foreign government might employ in response to U.S. policies.

Methodology. Generally, theoretical economic models are employed to determine the qualitative effects of policies while econometric models are used to determine the magnitude of the effects. This general strategy is partially frustrated by the economic theory of international trade. The theoretical policy recommendation to maximize world benefits from trade is to allow unrestricted trade. Yet the welfare of any one country can be increased by restricting trade. Additionally, as long as trading activities are not completely unrestricted, it cannot be easily determined whether further restriction of trade is harmful or beneficial in a welfare sense. The precise evaluation depends upon the model structure used to address the question. Consequently, the evaluation of both the nature and magnitude of economic effects is best attempted in an empirical context.

Results. The model chosen for the study displays a mixed Leontief-Keynesian treatment. Elements of input-output analysis are used to identify sectors of the economy and the tools of aggregate demand management constitute the response options available to the policy authorities. The effects of alternative international economic policies may be traced through the structure of the economy and measured as variations in industry-specific and economy-wide prices, outputs, and employment. Similar evaluations of economic policy responses are possible. The model is designed to be empirically based; estimation is reasonably straightforward.

Ongoing Activities - Tasks IV, V, and VI

Task IV. The data collection efforts associated with Research Task IV are well underway. All information necessary for the economic model has been collected and estimation of the model has started. All data needed for the quantitative indicators of military posture have not yet been gathered, but no difficulty in completing the data files is expected.

Task V. Although this task has not formally started, preliminary plans have been formulated. The method of applying the models, the economic models and the models of foreign response choice for Japan and Saudi Arabia, can be briefly summarized. Individual U.S. international economic policies will be evaluated by running the economic models to determine the effects on industry-specific features of the economy. Measures of output losses, employment declines, and price increases then become the costs of each policy. The response choice models incorporate these costs directly. Available economic policy responses are then assessed using the economic models to determine the costs and benefits of each possible response. The cost-benefit framework is then used to determine the preferred policy response (or perhaps a preferred group of policies). Finally, the impact of the original U.S. international economic policy and the foreign policy response of Japan and Saudi Arabia will be evaluated to estimate the effects on U.S. military posture with respect to the country. Additionally, case-specific factors representing constraints on the foreign decision process will be implemented.

Finally, the study will create a ranking of U.S. international economic policies most damaging to U.S. military posture. The ranking will be developed using the above process of evaluating each policy. Countries other than Japan and Saudi Arabia will be considered to identify those most vulnerable to harm by U.S. international economic policies, and where possible, those most likely to respond in a manner harmful to U.S. defense interests.

Task VI. This task has not started.

I. INTRODUCTION TO THE ANALYTIC STRATEGY

The study has been undertaken to assess the potential and actual impacts of international economic policies on U.S. defense interests abroad. The conceptualization of linkages between international economic policies and defense interests is accomplished by assuming a causal sequence involving U.S. economic policies, induced responses of foreign governments and subsequent impacts on U.S. defense interests abroad. Any international economic policy adopted by the United States will affect the nature and level of economic activity in other countries. The governments of those countries will evaluate the actual and expected magnitude of the economic effects of each policy and select a policy response. Depending upon the particular response and the nature of U.S. defense interests, the response may directly or indirectly influence U.S. defense interests. The fundamental research problems for the study are derived from the elements of this causal sequence. They can be stated as four specific goals:

- The study must determine the nature and magnitude of the effects on foreign economies that result from alternative international economic policies available to the United States.
- The determinants of foreign responses must be analyzed to identify the types of economic effects likely to engender a foreign response and to identify the most likely responses of foreign governments.
- U.S. defense interests must be described to assess those elements of military posture that enable implementation of overall U.S. policy.
- The responses available to foreign governments must be examined to determine whether and how those responses are related to defense interests.

While the causal sequence identifies research problems, it is not sufficient to identify an analytic strategy that is consistent with the goal of an empirically based investigation. Further structure must be provided

for possible variations within and across the items of the sequence. Consider the responses of foreign governments: some responses may directly influence U.S. defense interests, while the effects of others may be indirect. As an example of the latter type, a foreign government may alter its political relations toward the United States or adopt an economic policy unfavorable to the United States--either of which may indirectly influence U.S. defense interests, or military posture, within the country or within the country's geographic region. Furthermore, the presumption that the government responds to economic harm, caused by economic policy, does not restrict the range of motives influencing the selection of a policy response.

Introducing a range of motives influencing policy responses does not require that each policy be assigned a specific motive. In fact, it is likely that no precisely described motive can ever be identified empirically. However, to insure that this empirical difficulty does not cause the analysis to ignore important factors, three basic intentions are specified. First, the government may choose a retaliatory response. The expected effects of U.S. economic policies may be such that the government's sole desire is to choose a response harmful to the United States. Second, the government may adopt a policy designed to persuade the United States to modify the economic policy adversely affecting the economy of its country. And finally, the response may be protective. The government may tacitly accept the U.S. policy and seek only to minimize the adverse effects on its economy. Of course, there is substantial latitude to allow elements of any two, or even all three, of these intentions to be incorporated in the selection of any particular policy response.

U.S. defense interests may be influenced by a response fitting any one of the intention types. Obviously, a retaliatory response need not be limited to economic retaliation. U.S. defense interests may provide a convenient (and vulnerable) target for retaliation. Similarly, the foreign government may select the defense interests of the United States as the leverage point to "persuade" a policy change. Military rather than economic leverage may be chosen because the exertion of economic leverage would require adjustments

within the domestic economy that are slow to develop and once achieved, equally slow to reverse. By implication, military-related leverage is either more quickly effected or more quickly reversed, or both. Finally, a fundamentally protective policy response can be expected (in combination with the U.S. policy) to alter the pattern of activity between the United States and foreign economies. The resulting pattern of economic interaction may influence defense interests in both the short and long run.

Figure 1 conveniently depicts the basic features of the process linking international economic policy and U.S. defense posture. The analytic strategy developed for the study is designed to investigate particular patterns in the flows of influence and causation. However, the patterns

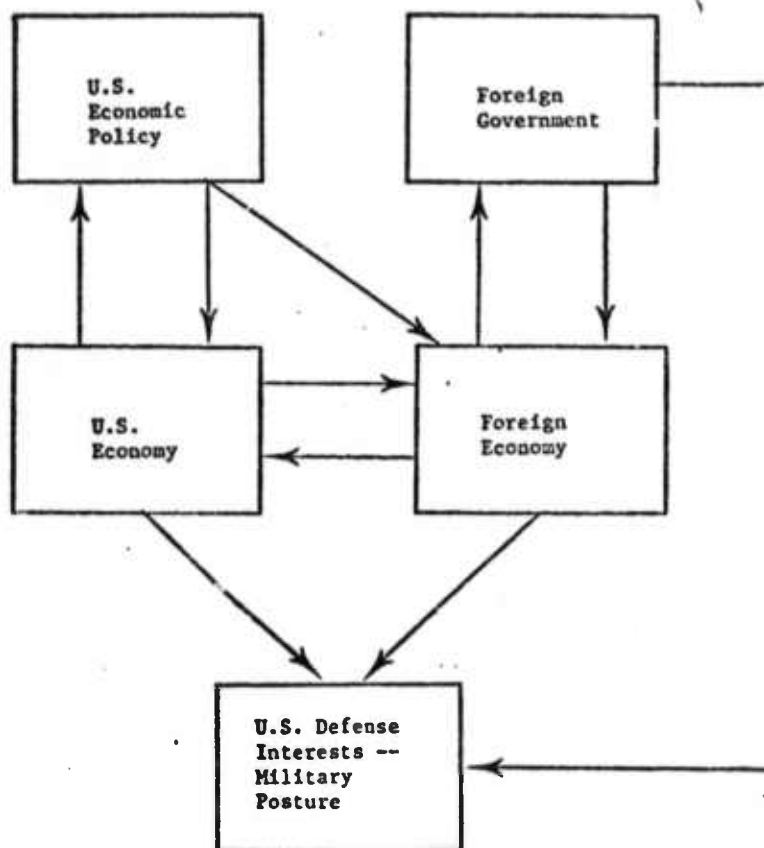


Figure 1. The Relations Among Economic Policies, Foreign Responses and U.S. Defense Interests -- Military Posture

of the interrelationships to be investigated do not bear a one-to-one resemblance to the patterns appropriate to separable analytic treatment. For example, work could proceed by developing an analytic framework to determine the nature of the impact on a foreign economy of alternative international economic policies. The magnitude of the effects could be determined by constructing an econometric model of the economy and estimating its parameters. But later stages of the sequence require a model capable of assessing the nature and magnitude of the effects of economic policies adopted by the foreign government as it "evaluates" policy alternatives. Generally, a model sufficient for one of these tasks is inappropriate for the other. Therefore, the economic aspects of the study are more efficiently treated simultaneously rather than sequentially. Similar situations exist in other portions of the study.

The structuring of analytic tasks must also recognize an inherent difficulty in any modeling process that is empirically based. It is unfortunate, but nevertheless true, that data often demand models. Crudely stated, a rough-and-ready causal sequence, developed without sufficient rigor, can lead research efforts from one "variable" to another, governed only by how well the numbers fit together. For the investigation of linkages between policies and defense interests/posture, the "problem" is more subtle, but still present. The danger is that the basic conceptualizations of economic effects and indicators of U.S. defense interests may be inextricably intertwined if jointly developed. To guard against even inadvertent lapses of this sort, the analytic efforts in these two areas have been firmly separated.

In the early stages of the project it became apparent that the complexity of the problem would preclude a strictly cross-sectional treatment. Modeling the process for all countries influenced by U.S. economic policies is simply not feasible. Consequently, the applications of the analysis have been limited to Japan and Saudi Arabia. However, the basic concept of the models are sufficiently general to facilitate subsequent applications and to allow useful inferences about other countries.

II. AN HISTORICAL SURVEY OF LINKAGES BETWEEN COERCIVE ECONOMIC ACTIONS AND THE RESPONSES OF TARGET NATIONS

INTRODUCTION

The goal of this analysis is to determine what military-related retaliations are likely to be undertaken in response to economic restrictions of other states. This topic, however, is too broad, making detailed analysis difficult. First, it can be argued that any response in the long run may have "military-related" characteristics. Second, for different goals and under different conditions (situations), different military-related responses may be undertaken. Third, military-related responses are generally a series of events that are part of a larger process of many actions and reactions between international actors. Thus, if we were to make generalizations about what military-related action would be undertaken in response to a particular economic policy, we would have to make hundreds of conditional statements about the situation, goals, and characteristics of the actors. Furthermore, since at any point in time any pair of nations may be interacting on a large number of interrelated issues, it would be impossible to determine which situations would be appropriate for our analysis. It would be nearly impossible to separate purely military-related or economic actions from other types of actions.

As a result of these considerations, a decision was made to simplify the problem by breaking it down into a series of simpler but more specific questions:

- What are the inputs that would go into the decision-making process when a nation perceives it has become the target of economic restrictions? In other words, what considerations does the nation take into account before responding?
- What are the available instruments for response to an economic threat?

- What are the instruments that have been used? Why were they selected? Specifically, why did (or did not) the nation use military responses?

These questions are used as the framework for the survey. Note, however, that while they are essentially equivalent to the original problem, they are far more precise and analytically manageable. Organizationally, the survey has three stages. First, it presents an overview of the quality and content of the literature on interstate economic conflict. Second, it briefly describes some recent empirical studies. Third, it summarizes the findings within the framework of the questions outlined above. Particular attention is paid to answering the questions on the basis of the literature survey.

AN OVERVIEW OF THE LITERATURE

The political science literature on conflictual economic interactions of nations is very poor. An examination of five major journals¹ in political science and international relations for the 1960-74 period showed that in this 14-year period, economic interactions of nation states were seldom the major topic of articles. In fact, in only 30 instances was international economic conflict the main subject of an article. Furthermore, of these 30 articles, more than half appeared in one journal: the Journal of Peace Research, an Oslo-based publication. The other journals are all published in the United States.

This lack of attention to international economic conflict is also evident in international relations (or politics) texts. Among the popularly used texts, only K.J. Holsti's International Politics (1967) discusses economic conflict and describes economic instruments of foreign policy.

¹ These were American Political Science Review, Journal of Conflict Resolution, Journal of Peace Research, International Studies Quarterly, and Comparative Political Studies.

Even Holsti's descriptions are very superficial. For example, he fails to discuss the form of the linkage between the use of economic instruments and their impact or causes.

Nevertheless, Holsti's work is a reflection of the state of the art in political science and the attitude of the political scientists. Traditionally, political scientists have been reluctant to deal with economic interactions. Hans J. Morgenthau (1973), in his classical treatise on power, Politics Among Nations, does not deal with economic instruments of foreign policy. Klaus Knorr, another well-known political scientist, is on record as stating that among over 100 conflict cases he had studied, economic instruments had shown little or no effectiveness.²

In the last few years, however, as a result of a number of events (e.g., the food and energy crisis) and developments (e.g., growth of multinational corporations) a growing interest has been shown in economic issues. The Arab oil embargo and production cutbacks, Iran's threats against the Netherlands, and the growing dependence of many countries on U.S. food production have clearly demonstrated that economic policies can be powerful instruments for changing the behavior of other nations. At a more general level, since the late sixties the power of multinational corporations and international financial institutions has generated a growing interest in these organizations. These developments have led to an increasing number of articles and unpublished papers on these subjects. Thus far, however, the cumulative effort has not been enough to generate a coherent literature. Most research efforts in this area have been progressing independently of each other. Their net contribution, therefore, has been very small.

² Klaus Knorr (1974) at Inter-University Seminar on Armed Forces and Society, Chicago, Illinois.

SUBSTANTIVE CONTRIBUTIONS OF THE LITERATURE

Holsti's (1967) analysis is one of the best-known works in political science dealing with economic instruments of foreign policy. Holsti distinguishes between economic actions which have purely economic objectives (such as "normal" trade between any pair of nations) and those actions which have "political" goals (such as increased influence in other states). Unfortunately, however, in the real world this distinction is seldom obvious. For instance, Japanese trade with the Middle East has a mixture of political and economic motives. Similarly, the motives for U.S. and Soviet trade with other countries vary from a mixture of pure politics (e.g., Soviet-Cuba, and U.S.-Vietnam trade) to more or less pure economics (e.g., U.S.-Swiss trade).

In reality, trade is seldom determined by purely economic motives. Most nations employ economic instruments to protect their strategic and "infant" industries, to protect domestic interest groups, or to prevent the depletion of their foreign exchange reserves by restricting imports. The use of these instruments is so common that they could be considered part of the normal pattern of international trade. Holsti, however, is not clear on whether these are in fact part of his concept of "normal" economic activity. At one point he states that instruments of foreign policy can be used to increase a state's relative capabilities. But at another point he states: "Economic instruments of foreign policy are most often used for purposes of persuasion, reward, or punishment in order to influence the behavior of another state" (Holsti, 1967: 282). "Persuasion, reward, or punishment" do not seem to be part of the "normal" trade motives of nations, whereas increasing "a state's relative capabilities" is commonly the goal of nations in trading with other nations. Thus, the distinction between economic and political motives does not seem to be a useful one.

Holsti goes on to list the techniques of economic reward and punishment. These include tariffs, import quotas, boycotts, embargos, and the

manipulation of loans, credits and currency. The 1973 Arab "general production cuts" of petroleum, nowever, would suggest that such production or export cutbacks (at least in the case of a limited commodity supply or oligopolistic market) also are effective means of influencing an opponent.³

According to Holsti, the success of an economic instrument depends on at least two conditions:

1. The instrument must have at least a perceptual impact on the target country's decision-makers.
2. The market for the affected commodity must have oligopolistic or oligopsonistic characteristics.

Holsti distinguishes instruments of "economic warfare" from instruments of economic reward and punishment. Blockading, blacklisting, preemptive buying, and rewarding are listed as the instruments of economic warfare. But Holsti is very vague about the success of economic warfare. He merely states that during World War II the economic warfare of the allies had mixed results. Moreover, is not clear whether it is correct to separate economic warfare from economic reward and punishment. Holsti mentions that the former is "an adjunct" to wartime military operations. But economic warfare has been used by many countries during peacetime. Finally, Holsti mentions foreign aid as another economic instrument of foreign policy, but he does not list it under either economic warfare or economic reward and punishment.

All the economic instruments discussed by Holsti could be placed under the label of economic instruments of reward and punishment. Their use probably depends more on the costs and benefits of using them than on the label normally assigned to them. This is the approach used by Lerche

³ A "general production cut" is different from an embargo to the extent that it involves no direct target. In 1973 the Arab production cuts were used to force industrial countries to withdraw their support from Israel, but the cuts affected all importers.

and Said (1970) in their analysis of economic techniques of foreign policy. They divide economic instruments into persuasive and coercive categories and explicitly state that the choice and success of such techniques depend entirely on the particular situation (e.g., the degree of asymmetry in economic dependence). Lerche and Said make another generalization which is highly relevant: "...economic techniques are productive of generous amounts of resentment, resistance, and retaliation by the target state" (Lerche and Said, 1970: 85). They further note that purely economic policies are highly limited in effectiveness and that policy-makers have learned to take into account the resistance to economic coercion that is normally generated.

The works of Coplin (1971), Russett (1967), Wright (1955) and Singer (1972) represent a typical sample of treatments of economic interaction in international politics. They all look at economic interaction as a source of power and dependence. However, there are some differences. For instance, Coplin emphasizes the importance of the balance of payments as a source of national strength. Russett points to the degree of relative dependence on trade as one source of a state's relative power potential. Wright emphasizes the relationship between the domestic and international economic sectors. Singer chooses to describe the nature of asymmetric economic relationships in great detail.

These studies, like those mentioned earlier, all have some basic weaknesses:

- They are too general. That is, their discussions are generally focused on describing the foreign policy behavior of states, but none has been able to make a meaningful definition of "state behavior" while maintaining the usefulness of the concept.
- Because of the generality of their discussion, they are unable to produce any useful models for analysis. Instead they all tend toward producing superficial descriptions that reflect no change in our existing knowledge.

As a consequence of these major weaknesses, the literature has not been cumulative and has not generated any path-breaking empirical studies. In fact, the recent empirical studies that have gone beyond the limitations of the traditional single case study approach have either lacked a theoretical foundation or have been based on theories from other disciplines (e.g., economics). As noted earlier, this state of affairs is probably largely due to a lingering lack of interest on the part of most political scientists in studying economic actions of states. It was also mentioned that, as a result of relatively recent international events and developments, this trend has been gradually changing. In the last few years, in particular, a number of independent attempts at various approaches to the analysis of international economic interactions have been made. The next section selectively examines the most important of these studies.

A SURVEY OF EMPIRICAL STUDIES

The results of the empirical studies to be examined here should, in most cases, be considered tentative. In some of these studies, however, interesting results have been found. Others have used interesting approaches that are worth including in our survey, even though their results are, as yet, of little substantive interest.

Michael Nicholson's (1967) study of tariff wars is one of the few studies analyzing the process of interstate economic "wars." He cross-sectionally compared five nineteenth century tariff wars and derived generalizations which he used to construct a simple model of such conflicts and to compare tariff wars with other types of conflict. Some of his most interesting findings were:

- Tariff wars tend to escalate quickly through an action-reaction process in which the countries involved each raise their tariffs in order to force the other side to comply.

- After the escalatory period, the tariffs are maintained at a high level while each side tries to outlast the other.
- Tariff wars have striking similarities to violent wars and industrial strikes in that they all are viewed as temporary situations "in which the parties carry out actions with the aim of securing satisfactory permanent end positions" (Nicholson, 1967: 33).
- Tariff wars could be viewed as bargaining games which are unlike the threatening conflicts, such as arms races, in which "there is no clear-cut definition of a winner nor is there a clear-cut notion of forcing the opponent into a bargain after which the armaments can be reduced again" (Nicholson, 1967: 34).

Thus, tariff wars seem to be highly escalatory forms of conflict which often force the opponents into undesirable, costly situations and which are often maintained for long periods. According to Nicholson these conflicts often end in compromise. But Nicholson studied pure tariff wars in which the major instruments of conflict were tariff increases and diplomatic communications. Tariff increases, however, can be countered by other types of foreign policy instruments (such as military threats) or other forms of economic sanctions (which could include both reward and punishment). It seems that one reason why the tariff wars studied by Nicholson did not escalate into military conflict was that in most cases the powers involved were either major powers (France, Italy, Germany, Russia) or powers relatively strong enough to make a military threat against them not credible (Canada, Spain, and Switzerland). That is, the reasons for the absence of military threat may have been that the parties in conflict knew that military action would be impractical or that it would be too costly to be a credible threat in a bargaining situation.

Peter Wallensteen (1968) used 18 historical cases of economic sanctions (1933-67) to derive a number of generalizations. His major findings were:

- Economic sanctions are seldom successful. Even in cases where a "successful" outcome is observed, the cause and

effect linkage is difficult to establish. However, sanction situations are more likely to result in a compromise if the goals of the sanctioning power are relatively limited.

- Economic sanctions tend to strengthen the target nations by increasing domestic popular support and contributing to a siege mentality.
- Economic sanction often means "throwing away a set of possible instruments of influence..." since, after the economic break, the state imposing the sanction will have less influence on the developments inside the target country (Wallensteen, 1968: 264-5).
- Economic sanctions often seem to be followed by a break in diplomatic relations and periods of little or no interaction between the disputing parties.⁴

Roy Licklider (1974) conducted a study that is very similar in approach to the Wallensteen study. Licklider used 20 historical cases of "resource deprivation" (1971-74) to study the effectiveness of economic sanctions. Similar to Wallensteen, he found that limited goals are likely to increase the chances of "success" of economic sanctions. He also found some relationship between the political structure of the target country and the effectiveness of sanctions; but this result was based on a very small subsample of his 20 cases. Finally, Licklider also found that in most cases economic sanctions tend to be unsuccessful.

The above studies have generally shown that the success of economic sanctions tends to be related to a number of factors; but in the majority of cases economic sanctions tend to lead to prolonged conflict, escalation, or compromises at preference levels much lower than were originally possible. Thus, in most economic conflicts (unless one side yields quickly and long-run economic disruptions are avoided) both sides lose.

⁴ This seems to be inconsistent with our earlier statement about tariff wars. But a closer examination of Wallensteen's cases showed that in at least half of the cases, the two sides involved in the sanctions were in violent conflict with each other less than five years after the sanctions.

Most of these studies have at least implied that one of the major factors that determine the behavior of participants in an economic conflict situation is their economic interdependence.⁵ But none of these studies tries to construct a reasonable measure of economic interdependence. Economic interdependence is a complex concept with several interacting dimensions which are not easy to separate. The study of interdependence, therefore, requires a great deal of research effort. Before the energy and agricultural crises of the early seventies, there seemed little incentive for such an effort.

The last few years, however, have witnessed a growing interest in interdependence studies. Caporaso (1974), Ezzati (1970), Choucri (1973), Howard (1972), Thomason (1974), Jackman (1973), Bobrow and Kudrle (1974), Hveem (1974), Hveem, et al. (1974), Park, et al. (1974), and Stallings (1972), among others, have tried to measure or analyze economic dependency. Among these, Thomason's work is probably the most promising because it includes most of the known dimensions of economic interdependence: (1) substitutability of export or import commodity, (2) concentration of the commodities in the export or import market, (3) concentration of exporting or importing partners, (4) impact of exports or imports on the national economy, and (5) relative dependence of each trading partner on the other partner. Thomason ignored one aspect of the dependence problem which, in some cases, is a major factor in economic dependence -- perception of the long-term strategic value of the commodity. In the case of petroleum, this perception has at times played a major role in the history of the twentieth century. The perceived dependence of Britain on Middle East oil, for instance, was a major obstacle to British diplomacy in the 1951-53

⁵ There is a vast body of studies in political science that deals with the concept of "interdependence" from the perspective of political integration between regions. In this report, however, the concept of interdependence is used to refer to a more specific phenomenon -- the dependence of one or more individual nations on other individual nations. This type of dependence can be used by nations as an instrument of foreign policy to obtain political concessions from other nations. The integration literature, however, for the most part does not treat interdependence as an instrument of foreign policy.

Iranian oil crisis. Similarly, the "dependence" of Britain on its two billion dollar investment in the Union of South Africa has been a major obstacle to its foreign policy in the rest of Africa.

Some of the works in the area of dependency (such as those by Howard, Ezzati, Choucri, Bobrow and Kudrle, Hveem, and Park, et al.) have been largely a response to the oil crisis. These studies have generally focused on the interdependence of oil-exporting and importing countries and the multinational oil companies.

The complexity of the concept of dependence is clearly reflected in these studies. Even though the problem under study was narrowed down to the major actors in only a single industry (e.g., the international oil industry), the necessary analyses were still very complex. As a result of the complexity of constructing models of dependence, a growing number of analysts have abandoned their traditional cross-sectional analytical framework and adopted the case-study approach. The resulting studies are qualitatively different from the case studies of historians, which were little more than descriptive accounts. The new case studies usually involve building detailed models that can either analytically (e.g., Bobrow and Kudrle) or operationally (e.g., Choucri) show the degree of interdependence of two economies or the degree of dependence of one economy on a particular commodity (e.g., petroleum).

These case-specific approaches to the problem of interdependence are very promising. In the case of petroleum imports of the United States, for instance, a model can be constructed that indicates the damage that the U.S. economy would suffer at various levels of oil export cutbacks by the petroleum-exporting countries. The model can deal with specific questions: how many people would become unemployed? by how much would GNP growth decrease? by how much would exports drop? and so on. Based on these indicators, an analyst can then estimate the impact of oil embargoes on the United States.

Such case-specific models are not yet developed enough to enable direct prediction of the responses of nations to oil crises. But as long as it is possible to forecast changes in the environments of nations, reasonable models of national responses based on only a few assumptions can be constructed. Later in this report one such model for explaining the response of any country to economic sanctions imposed by another country is described.

CONCLUSIONS

This brief survey of the political science literature on interstate economic conflict can be summarized as follows. First, the literature, as it stands, is not well-developed. Specifically, it lacks good general models and has few well-accepted concepts and generalizations. Second, in recent years, in response to a series of international economic crises, a number of promising approaches have emerged. There now seems to be enough evidence to indicate that economic sanctions are too complex for cross-sectional analysis. The best analytical or empirical analyses have usually been either single-case or single-commodity approaches.

A subject that as yet has no integrated literature does not lend itself to many general conclusions. However, the best substantive generalizations that we can make about interstate economic conflict are:

- Interstate economic conflict is highly escalatory. Once a pattern of punitive action and reaction sets in, it easily runs out of control of the parties involved.
- Engaging in interstate economic conflict is usually self-defeating. Except under uncommon circumstances, economic sanctions seem to be ineffective and often lead to further costly conflicts.
- The success of economic sanctions depends on a number of situational factors which determine the impact of the sanctions on the target country. These include (1) alternative trading opportunities, (2) severity of sanctions on the target, and (3) the limit of the demands of the sanctioning power.

- The response of the target country to the economic sanctions of another country can take several forms: (1) military or economic retaliation against the sanctioning power, (2) domestic economic adjustment, (3) no response, or (4) capitulation to the demands of the sanctioning power. The literature, however, is too vague on how the target country chooses between these alternatives. This is understandable, because the weight or value of these alternatives varies and depends on many situational factors.

The following chapter contains a descriptive presentation of many of these situational factors that influence the choice between alternative responses to an economic sanction.

Based on this survey several broad nonsubstantive generalizations can also be made:

- The traditional historical/qualitative approach (e.g., Holsti, 1967) has proved of little value in the analysis of the problem of interstate economic conflict.
- The comparative cross-sectional approach has also proved of little value because it is incapable of incorporating the numerous intervening variables that determine the pattern of interactions in interstate economic conflicts.
- Case-specific and commodity-specific models have proved valuable in explaining at least some aspects of the behavior of nations in interstate economic conflict. This has been made possible by the relative ease with which it is possible to either control for, or incorporate, intervening variables in types of models.

Based on the above considerations, the approach taken in this study is case-specific. It involves detailed analyses of the economies of Japan and Saudi Arabia and their interactions with the United States so that the impact of potential U.S. economic actions on each of these nations can be measured. The result of these analyses is being used to study the responses of these nations to the United States.

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III. SIX CASE STUDIES OF INTERSTATE ECONOMIC CONFLICT

INTRODUCTION

The literature survey presented in the previous chapter does not provide adequate guidance for the construction of a complex model of the process of interstate economic conflict. In order to make the intensive analysis of the economic relations of Japan and Saudi Arabia more productive, it was decided that six historical instances of interstate economic interactions should be examined in more detail. This chapter reports results of these additional investigations.

The analytic focus for the investigation of these particular cases was developed from the generalizations derived from the literature survey. The works consulted in the literature survey were generally unable to identify military-related implications associated with the policy responses of the target nations. Instead, the authors emphasized the complexity of the sanctioning process and the vital importance of situational factors influencing the responses of target nations and the outcomes of the confrontations. Consequently, the focus of the analysis of these six cases was shifted to the investigation of plausible preconditions important to the overall sanctioning process and important to the policy responses of the target nations.

These situations are designed to identify historical regularities that will allow the work for Japan and Saudi Arabia to be contained within reasonable bounds. Specifically, if the studies reveal that particular forms of sanctions typically engender an identifiable pattern of policy responses, then subsequent work can be focused on that pattern. Additionally, the studies can identify conditions or constraints that limit the range of policy options available to the responding country. Plausible conditions of interest, or situational factors, include the historical pattern of relations between the contending parties, the

relations of both parties to "third party" countries, the previous pattern of international economic conditions between the countries, the economic conditions within the responding country, and the domestic political conditions of the responding country.

Before describing the particular cases, one further point should be mentioned. Instances of economic sanctions are studied because only such overt economic confrontations are historically identifiable. The reluctance of students of international relations to consider the "normal" economic interactions of countries and the equivocal identification of "normal" economic activity preclude case studies of ongoing international economic relations. The sanctioning process is therefore the only subject available. Investigating the sanctioning process is useful because it can provide inferences about policy instruments and situational factors which should be included in models of normal economic activity.

The instances of economic sanctions selected for investigation have all occurred since World War II. This time period was intentionally chosen. International relations and patterns of international economic activity have changed substantially even during this period. Moving the time reference backward would only make the usefulness of any study problematic. The six cases chosen are: Berlin, 1948-49; Iran, 1950-53; Finland, 1958; Cuba, 1958-present; Rhodesia, 1965-present; and South Africa, 1947-present. These six cases were not arbitrarily selected from recorded instances of sanctioning but were selected on the basis of relative levels of economic development of the parties to the sanctions and the outcome of the sanctions.

Situations involving countries of differing degrees of economic development were selected to capture three basic patterns of dyadic conflict: developed versus less developed; less developed versus less developed; and developed versus developed. Additionally, variations in the outcome of the sanctions were emphasized. But to include an instance of successful, unsuccessful, and indeterminate outcomes for each development category would require nine

studies. To reduce the number of studies, elimination of outcome types in each category was necessary. To compensate for possible bias introduced in the elimination process, it was decided to introduce the further criterion that the length of the sanctioning process vary across selected situations. The final selections considered all three requirements.

The actual investigation of the particular situations was guided by a relatively small number of considerations. To the extent possible each situation is assessed in terms of the following features: the background conditions relevant to the sanctioning process; the nature of the economic sanctions and the scope of their imposition; the responses of the target nation, including resistance, retaliation, political realignment, concession or capitulation; and domestic adaptation to the imposed sanctions. A summary of each of these case studies is presented within this chapter; expanded treatments shall be contained in appendixes to the Final Report. Following the summaries is a comparative evaluation of the information discovered about each case study. The final section of this chapter presents an analytic framework to guide the evaluation of responses to economic sanctions under different situations. Essentially, the framework has been created by abstracting from the detail of the comparative discussion of the six historical studies.

FINLAND

Background

The Soviet-Finnish dispute of 1958 must be analyzed from a number of perspectives: (1) the historical importance of Finland to Soviet military strategy; (2) Finnish foreign policy orientation toward neutrality resulting from this history; (3) Finnish trade policy; (4) Finnish internal politics in 1958; and (5) the international political situation in 1958. The major factor in Finnish foreign policy has been their dependence on the Soviet Union since their military defeat by the Russians in 1940.

Geographical Conditions

Finland's geographical location has made its foreign policy orientation strategically important to Russia. Traditionally, Finland was the battleground for wars between Russia and Sweden. It was annexed by Russia in 1809 and heavily fortified to provide a buffer zone against invasion from the north. In modern times Finland has retained its strategic significance. In addition, the geographical proximity of Finland to the Soviet Union has made complete independence of the Finnish economy and politics impractical.

Alignment

Finnish foreign policy strives to retain a staunch neutral position, especially regarding East-West relations. Finnish foreign policy since World War II has been based on the hypothesis that if Finland maintains friendly relations with the Soviet Union, the latter will respect Finnish independence. Neutrality and the desire to avoid involvement in conflicts between the Soviet Union and the United States has formed the basis of the contemporary foreign policy of Finland.

In 1958, apparently as a move to offset a worsening balance of payments situation, Finland began to shift its trade toward the West. As this shift materialized, Finland's affiliation with the European Free Trade Association (EFTA) became a possibility. This economic realignment would have presented difficulties for trade relations with the Soviet Union. The political implications of such a move notwithstanding, there were specific economic reasons (preferential tariff treatment, for example) deriving from most-favored-nation principles required by EFTA which would have been detrimental to the relationship.

Domestic Political Conditions

The Finnish domestic political environment in the pre-sanction period was unstable -- during 1957 and 1958 the government changed hands four times.

During this period Finnish politics were highly polarized. The cabinet that emerged in 1958 was not a coalition that included all parties; those most ideologically aligned with the Soviet Union were excluded.

International Political Conditions

The overall international situation in 1958 was characterized by Cold War confrontations between the Soviet Union and the United States. The resulting international political tensions, the apparent Finnish shift away from the Soviet Union, and Finnish internal political instability all apparently contributed to the Russian perception that Soviet-Finnish relations were deteriorating. Hence, the Soviet Union took action to rectify what they interpreted to be unhealthy political and economical developments.

Sanctions and Responses

The Soviet leadership apparently perceived the political and economic development in Finland as unfriendly and took measures to force the realignment of that nation with the Soviet Union. The sanctions, which began with the suspension of diplomatic relations, were escalated unilaterally by the Soviet suspension of trade talks. The escalation continued and eventually led to the complete suspension of trade relations.

Effectiveness of the Sanctions

The sanctions against Finland were successful in part because of their selective nature. However, the rapidity with which the Soviets escalated their sanctions to the economic arena appears to have ensured their success as well. In essence, the measures began with diplomatic sanctions and were escalated in the space of two months to a limited economic boycott. The effect was to place a temporary "freeze" on relations between the two countries. The costs to Finland were obviously high enough to force accession. These costs continued and exacerbated domestic political

instability, unemployment, industrial activity, and general economic slowdown. These developments contributed to the dissolution of the anti-Soviet government and the subsequent formation of a regime more responsive to the Soviet Union. The outcome of the sanctions was essentially the restoration of the pre-sanction status quo.

IRAN

Background

The economic conflict between Iran and Great Britain during the early 1950's erupted as a result of the Anglo-Iranian Oil Company's (A.I.O.C.) unwillingness to renegotiate the terms of their concession to correspond to the demands of the Iranian Government. The issues that led to the nationalization of the A.I.O.C. surfaced in 1947 when Iran proposed the commencement of negotiations with the A.I.O.C. to discuss bilateral participation in the management of the oil company and the distribution of oil profits. At that time, the oil company controlled 100,000 square miles of territory in Iran but had exploited only a fraction of that area. The Iranian Government desired to reduce the area controlled by the A.I.O.C. and to open the unused area for petroleum exploration and extraction. The contract under which the A.I.O.C. was operating had been signed in 1933 and was to continue over 50 years. The Iranian Government wanted to renegotiate on the following issues: (1) the reduction of the contract period to 30 years; (2) government representation on the board of directors to acquire a voice in the A.I.O.C.'s management and the right to inspect the transactions and accounts of the company; (3) an increase in the number of Iranians in senior positions in the company; and (4) the reduction of the price of petroleum products resold to Iran. The A.I.O.C. refused to accept the major provisions of the proposal, declining to discuss the proposed profit sharing system or to allow Iranian representation in management.

In effect, the dispute revealed traditional power considerations at work. The Iranian Government desired the power to control directly the oil industry and to increase their share of profits. The British oil company simply refused to relinquish any authority or additional revenue.

Sanctions and Responses

Iranian opposition to the nationalization movement collapsed with the assassination of Prime Minister Razmara in 1951 and the accession of Mosaddaq to power. After the formation of the new government, the parliament unanimously voted to nationalize the oil industry. The events following nationalization -- the ensuing sanctions and responses -- can be viewed in phases delineated by attempts to negotiate the dispute. Each phase followed a similar pattern. Initially, proposals and counter-proposals were submitted for negotiation, a stalemate was reached, and finally, sanctions were maintained or intensified. There were five major attempts to negotiate a settlement: (1) in April 1951 the British Government joined the A.I.O.C. in initiating negotiations, but neither would accept nationalization; (2) in the beginning of June the controversy was advanced to the international level when the British brought the dispute before the International Court of Justice; (3) the third phase began in late July and sanctions were increased by both parties with the British extending their sanctions to anyone who continued to purchase Iranian oil; (4) on December 8, 1951 the International Bank (I.B.R.D.) began an unsuccessful attempt to negotiate a settlement; (5) the dispute was finally settled in 1954 by an agreement negotiated with an international petroleum consortium.

In general, the British response to nationalization of the A.I.O.C. was to issue warnings to the Iranian Government against proceeding with nationalization and back up their admonitions with implicit or explicit military threats, troop movements, or shows of force. British policy fluctuated from desiring to renegotiate the 1933 concession to agreeing to nationalization as long as an "efficient" oil industry was maintained and

"sufficient" compensation to the A.I.O.C. was made. There were perceptible shifts in British strategy toward the dispute as the Iranian Government remained adamant in its nationalization policy.

Settlement

The dispute was not settled until almost a year after the Shah returned to political power. Shortly afterward, in August 1953, the United States resumed its aid to Iran. In December 1953, an international petroleum marketing consortium was established in London to negotiate with Iran for the reopening of the Abadan refinery. An agreement was finally negotiated whereby an international consortium of oil companies bought out part of the A.I.O.C.'s concession rights and improved the terms of payment to the Iranian Government which would thereafter receive 50 percent of the profits. Control of production and marketing was vested in the consortium, which effectively acquired some of the A.I.O.C.'s status. Iran, however, became the legal owner of its petroleum resources and, in practice, enjoyed greater control over the new consortium than over the former A.I.O.C. The A.I.O.C., on the other hand, lost its prominence in Iranian oil operations. In theory, it maintained 50 percent control in the new consortium, but in practice the major U.S. oil companies were now in control. Thus, in the long run, neither Iran nor the A.I.O.C. (or Britain) were able to gain all they wished. By escalating the conflict they both demonstrated their resolve but eventually both sides had to compromise.

Impact of Sanctions on Iran

The sanctions applied by Britain against Iran included an effective embargo on over 95 percent of Iranian petroleum exports and the embargo of most British exports to Iran. Implicit military threats were also made but were never carried out. The economic and military sanctions applied by Great Britain against Iran had a great impact on the conditions within that country for the following reasons: (1) the universality of the oil embargo, (2) the economic disruption caused by the measures, and (3) the

ensuing political disorder. These factors combined to effect the overthrow of Prime Minister Mosaddaq, the leader of the nationalization movement.

The results of the loss of Iranian oil to the world were not too great. Due to the sanctions, the world oil trade daily lost about 485,000 barrels of petroleum that had been refined at Abadan. The loss of Iranian refined oil did have some worldwide repercussions: aviation gasoline was rationed in India, Pakistan, and Malaya; fuel stocks were reduced; and the United States and Canadian refineries lost some Iranian oil that had previously been shipped there. But these were relatively minor and short-term problems that were quickly solved.

The loss of Iranian crude oil had even less impact on the world economy than the loss of Iranian refined petroleum. Production increases in other countries, particularly Kuwait and Iraq, easily compensated for the loss resulting from the British sanctions. Thus, in the 1950's, the world could easily do without Iranian oil whereas the Iranian economy could not do without the export of its oil. The Iranians, in fact, were aware of the asymmetric nature of this relationship. But, at that time, nationalism and anti-British sentiments were running so strong that they consistently opted for rejecting British demands. Even after the nationalist movement was crushed by the Army and Mosaddaq was overthrown, the Iranian Government refused to deal directly with the British. It took many months to find the complex compromise that would satisfy the Iranians.

RHODESIA

Background

On November 11, 1965, the Rhodesian Front Government unilaterally declared its independence from the jurisdiction of Great Britain. Having eschewed the use of force, the British resorted to a policy of economic sanctions

to undermine what they interpreted to be a Rhodesian "rebellion." The sanctions were intended to affect incomes, employment, and general economic activity which, it was hoped, would generate sufficient dissent among the Rhodesian white population to bring about the termination of the Rhodesian Government.

The background conditions which produced the sanctions were, for the most part, the interplay between Rhodesia's desire for independence from Great Britain and its discriminatory treatment of the native black population. In addition, Rhodesia's geographical location has played an important role in determining the effectiveness of the economic sanctions.

Sanctions

The economic sanctions applied against Rhodesia were first limited to strategic goods, such as Rhodesian import of oil, but were eventually expanded to include all imports and exports.

Impact of Sanctions

In general, the impact of the sanctions on Rhodesia was far-reaching, extending to all major sectors of the economy. However, because of the counter-measures applied by the Smith government, the effects of the negative economic measures were mitigated to some degree. Although economic growth declined, no sector of the economy faced complete collapse. Politically, the white minority has remained unified. Indeed, they have been successful in making the black population absorb the main burden of the sanctions. Consequently, the propensity of the black population to revolt against the white government has increased over time. The numbers of guerrillas and their activities have been steadily expanding. In response, the Rhodesian Government has had to increase the level of state security expenditures.

Rhodesian Response to Sanctions

The Rhodesian Government's first response to the economic sanctions was the initiation of protective measures intended to counter the impacts of the sanctions on the economy. These measures were directed toward controlling inflation and unemployment and Rhodesia's balance of payments deficit.

Impact of Sanctions on Britain

In general, the sanctions policy has had an adverse impact on the British economy. The negative economic impacts of the sanctions upon Great Britain have been fourfold: (1) the loss of export markets for British goods; (2) the loss of imported Rhodesian products; (3) the loss of profits by British firms with investments in Rhodesia; and (4) the damage to the British balance of payments.

Impact of Sanctions Against Rhodesia

Thus far, the sanctions being applied against Rhodesia have been somewhat ineffective in achieving their vaguely defined goals. Although the Rhodesian economy appeared to the British to be extremely vulnerable to economic pressure, it has survived for several reasons: (1) the sanctions were applied too gradually to have a disruptive impact; (2) the Rhodesian Government was able to find alternate markets in South Africa, Mozambique, and Portugal; (3) Rhodesia was able to apply countermeasures to offset the negative impact of the sanctions; (4) the protectionist measures taken prior to independence helped prevent economic disaster; and (5) racial fears strengthened white determination not to submit to coercion. The Rhodesian case also reveals that the possession of strategically important materials can undermine sanctions and prevent international cooperation. In addition, the lack of decisiveness on the part of the British prevented the successful application of the sanctions. A gradualist approach appears to have provided enough time for the highly unified Rhodesian Government to counter the effects of the sanctions.

BERLIN

Background

The termination of World War II left Germany, as well as the entire continent of Europe, divided by an "Iron Curtain" demarcating Soviet controlled Europe from Western Europe. In addition to the numerous problems concerning Germany's immediate post-armistice future that were discussed by the United States, Great Britain, and the Soviet Union during the war there was the issue of the city of Berlin. During these meetings it was agreed that Berlin would be divided into three zones, one British, one Soviet, and one American.

However, as soon as the Allies began occupying the agreed-upon sectors of Berlin, difficulties between Soviet and Western officials arose. Soviet officials waged a campaign of delay and obfuscation against the establishment of centralized German agencies and German economic reconstruction in the hope of eventual Communist control over the entire city. Also, they refused to allow interzonal travel by Germans and refused to contribute promised manufactured products of East Germany to a common pool to meet Germany's import costs.

Sanctions and Responses

In 1948, the Soviet Union and the Western Allies employed economic and political controls and countermeasures to achieve their respective goals vis-a-vis Berlin's (and Germany's) future. The dispute can be divided into four phases: (1) January 1948 to June 1948, characterized by minor challenges by the Soviets to the Western Allies; (2) mid-June to late July, during which the blockade and concomitant economic sanctions were initiated; (3) late July to mid-November, a period of stability during which initial sanctions were continued without escalation; and (4) mid-December to May 1949, when the continuing airlift increased economic pressure on the East German economy, the administrations of East and West Berlin were

consolidated, and an agreement was reached to end the blockade and counter-blockade and lift earlier restrictions.

During the first period of the U.S.-Soviet dispute, the Soviets placed restrictions on access to Berlin. The Allies countered this Soviet action by initiating a limited airlift to supply occupation forces in Berlin. The Soviets further countered by closing freight routes to Berlin from Munich and Hamburg and by imposing limitations on barge traffic to and from Berlin.

The second phase of the Berlin crisis began with the Allied announcement of a currency reform. The Soviets retaliated by increasing travel restrictions, denying entry to the Soviet zone to all transportation. Finally the Soviets implemented a complete blockade of Berlin in late June 1948. This measure precipitated the Allied airlift to Berlin.

During the fourth phase, as the blockade and the airlift continued, negotiations between the Western Allies and the Soviets were eventually deadlocked by disagreement over the formation of a West German Government. Meanwhile, the airlift continued and economic pressures increased. The West began to take the initiative in exerting political pressure. The blockade, a tactic to force Russian control over West Berlin, had more harmful effects on conditions in East Berlin. Ultimately, the Soviets were forced to end the blockade without receiving concessions in return. The foremost purpose of the sanctions (preventing the formation of a West-German-oriented government in place of a Communist-dominated one) was not realized. All phases of the dispute and each escalation were designed to effect this outcome. The Soviet intent was eventually thwarted in May 1949 when a new West German Government officially proclaimed its constitution and confirmed its non-Communist orientation.

Impact on Berlin

The effect of the Soviet blockade added to the economic damage caused by World War II, and made East Berlin's economic recovery slow when compared

to West Germany. Lacking raw materials, industries remained idle, businesses were deprived of normal commercial contacts with the surrounding area, and transportation costs were increased. As a result of the blockade, West Berlin was denied participation in the 1948 currency revisions that returned a stable deutsche mark to West Germany. And unemployment remained a significant problem in West Berlin.

In many respects these effects were incidental since the real confrontation was between the United States (and its allies) and the Soviet Union, with Berlin and its inhabitants caught in between. However, the pressures that were brought to bear on Berlin should not be ignored as they were instrumental in solidifying popular attitudes in the Western sectors and undermining Russian efforts to secure Communist control of the entire city. At the time of the blockade, Berlin was really little more than a focal point for the emerging Cold War. Its peoples were caught up in the maneuverings of the Soviets and the Western Allies. Berlin had become a testing ground. The Soviets were clearly testing U.S.-British resolve to support Berlin. The extent of that resolve, in the face of Soviet pressure, was demonstrated by the Berlin airlift. Berliners themselves were involved because the Soviet actions were also intended to convince residents of the western sectors of Russian strength and the viability of the eastern sector. The intention was clearly frustrated by the assistance offered by Britain and the United States.

CUBA

Background

When Fidel Castro came to power in Cuba on January 1, 1959, he expressed discontent with the extent of U.S. involvement in the Cuban economy. He apparently viewed this involvement as preventing the complete independence of Cuba and harmful to the social and economic development in the country. The U.S. involvement in and control of the Cuban economy was indeed considerable. It was clear that any systematic effort to alter existing

economic relations between the two countries would have had immediate effects on American interests.

Castro's first move toward regulating trade was to tighten international controls to reduce imports of luxury items from the United States and to promote increased sugar purchases by other countries. At the same time, the level of sugar exports to the United States remained stable, resulting in an improved balance of payments.

Relations between the United States and Cuba were further strained by Castro's increasingly frequent anti-American pronouncements throughout 1959. The periodic bombing flights over Cuba by exiled Batistianos and a growing refugee problem further aggravated the situation.

U.S. concern over Castro's continued hostility increased throughout 1959, as members of the revolutionary government were gradually replaced by Communists. The pro-Soviet shift in Cuban policy orientation heightened U.S. anxiety over Castro's attempts to export his revolution through Latin America. The climax of this trend occurred in February 1960 when a trade agreement between Cuba and the Soviet Union was signed guaranteeing Soviet purchases of one million tons of Cuban sugar in each of the following five years. The percentage, volume, price, and credit differences between the Cuban-Soviet and Cuban-U.S. sugar agreements notwithstanding, the Cuban-Soviet trade agreement provided Cuba with an alternate market for sugar, a market that became increasingly important as U.S.-Cuban relations deteriorated.

Sanctions

The sanctions imposed by the U.S. Government against Cuba included the reduction of the Cuban sugar quota, a trade ban on imports from and exports to Cuba, restrictions on Cuban financial dealings, and restrictions against countries that continued to trade with Cuba. The Cuban Government's response to these sanctions was the nationalization of U.S.-owned

industries and property on the island and the establishment of multi-lateral trade agreements with the Soviet bloc.

The United States attempted to ensure the success of the economic sanctions first by trying to convince other countries to ban trade with Cuba. When that failed, coercive measures were used to try to gain their compliance. The U.S. Government first sought Latin American participation in the sanctions against Cuba through the Organization of American States (OAS). Throughout 1960 and 1961, the members of the OAS refused to condemn Castro's actions or to apply economic sanctions against Cuba, despite the urging of the U.S. representative. However, as a result of the discovery in July 1964 of a Cuban arms cache intended for Venezuelan guerrillas, the OAS voted to suspend diplomatic relations, sea transport, and trade with Cuba. Chile, Bolivia, and Uruguay dissented from these recommendations, and Mexico refused to comply with the decision to sever diplomatic relations.

Effectiveness of Sanctions

The sanctions were not successful instruments to regain U.S. interests. Four factors contributed to the failure of the economic sanctions imposed upon Cuba: the gradualism with which the measures were applied, the availability of alternate markets, the ability of Cuba to restructure its economy, and Cuban nationalism. The gradual application of sanctions against Cuba diminished the economic as well as the psychological impact of the measures of the Cuban population. The sanctions could only be applied gradually due to constraints placed on the U.S. Government by the 1960 election, the independent role played by the Cuban refugees, Soviet-American relations, and world opinion.

Because the United States was the major purchaser of Cuban sugar as well as the prime supplier of imported commodities, the sanctions were expected to be effective. However, the availability of markets in countries unsympathetic to the U.S. cause and the success of smuggling undermined the

the sanctions. The Soviet Union and the Soviet bloc filled a substantial portion of the gap in Cuba's sugar export market created by the boycott. Cuban-Soviet trade was generally a barter arrangement, payment in Soviet goods rather than cash. This denied Cuba the foreign exchange necessary to import goods from other countries and tied the Cuban economy more closely to the Soviet Union.

The Cuban Government was able to restructure its economy to overcome some of the adverse economic effects of the sanctions. Some of the most noticeable economic effects of the sanctions on Cuba included: the disappearance of durable consumer items from stores; the rationing of basic consumer items such as soap, toothpaste, and clothing; food rationing; sharply reduced supplies of fertilizer, fodder, and agricultural machinery; and a critical spare parts shortage. However, because adequate warning had been given by the U.S. Government that sanctions might be imposed on Cuba, precautions were taken to offset the more severe effects of the embargo.

Cuban nationalism was a major obstacle to the success of the U.S. sanctions policy. The United States underestimated the strength of increasing nationalism in Cuba, which was opposed to economic domination by foreign countries and the influence exerted by the U.S. Government to protect their interests. Nationalism made the Cubans willing to pay the price of the sanctions. Anti-Americanism, augmented by Communist ideology, provided them with a scapegoat for the shortages, rationings, breakdowns, inefficiencies, and incompetencies of the past 14 years.

The vulnerability of Cuba to complete naval blockade and the failure of the United States to employ such a tactic is indicative of the U.S. restraint. This, and the gradual escalatory nature of the sanctions, contributed significantly to the failure of the U.S. effort. In addition, the ability of Castro to mobilize the Cuban people was a key factor in overcoming the potential economic disaster. Finally, the Cold War situation, which Castro exploited by opting for Soviet orientation, contributed to the failure of the sanctions as Cuba was able to use its ideological shift to gain

alternative markets for sugar. Short of a blockade, which in the context of the times might have resulted in a major war, the United States could do little to influence Castro's behavior and his subsequent alignment with the Soviet bloc.

SOUTH AFRICA

Background

The initial sanctions imposed on South Africa were implemented by India in response to South Africa's "Natal Ordinances" which denied South Africans of Indian origin the right to occupy and acquire land in the Union. The sanctions banned all trade with South Africa. In 1963, the United Nations General Assembly passed a resolution to internationalize the initial sanctions by requiring its membership to ostracize South Africa for its policy of apartheid.

International Sanctions

The first attempt to alter the domestic policy of apartheid by applying international economic measures came in November 1962 when the General Assembly recommended that comprehensive measures be taken by member states. The recommended sanctions included closing ports to South African flag vessels, prohibiting their ships from entering South African ports, boycotting all South African goods, banning exports to South Africa, refusing landing and overflight privileges to South African aircraft or aircraft registered under South African laws, and suspending diplomatic relations with the government of the Republic of South Africa or refraining from establishing such relations.

In 1963, additional recommendations concerning restrictions against South Africa were passed in the General Assembly and for the first time the Security Council began to debate the issue. The General Assembly recommended the proscription of sales of petroleum and petroleum products

to South Africa. The Security Council discussions concerned whether or not the situation in South Africa constituted a threat to peace, a breach of peace, or an act of aggression. Members opposed to action against South Africa argued that none of these conditions applied to South Africa. A motion was adopted (with France and the United States abstaining) recognizing "that the situation in South Africa is one that has led to international friction and if continued might endanger international peace and security." The resolution called upon South Africa to "abandon the policies of apartheid and discrimination" and urged the member states "to cease forthwith the sale and shipment of arms, ammunition of all types, and military vehicles" to South Africa (U.N. Document S/5386, Resolution of August 7, 1963). On July 22, 1964, 66 members reported compliance with the Security Council resolution, and 2 reported partial compliance. The restrictions were extended on December 4, 1963 when the Security Council banned the sale and shipment of "equipment and materials for the manufacture and maintenance of arms and ammunition in South Africa" (U.N. Document S/5471, Resolution of December 4, 1963).

Impact of the U.N. Sanctions

The extent of the imposition of economic sanctions against South Africa has been very limited and the possibility of universal application remains extremely unlikely. However, in spite of their relative ineffectiveness, the threat of future success has apparently caused South Africa to undertake precautionary measures to reduce the effect of future developments. Stockpiling and the development of alternative sources of supply, development of industrial substitutes, and the generation of mass support for government actions by a systematic propaganda campaign have all been carried out.

The South African response to the sanctions is in part enhanced by the general viability of its economy; it is relatively invulnerable to sanctions. The following conditions enhance South Africa's ability to resist: (1) self-sufficiency in food; (2) gold and mineral reserves; (3) a highly

developed industrial sector; (4) declining reliance on imported capital; and (5) strong military defense forces. Each of these conditions contributes to continued South African resistance to the sanctions. However, the sanctions themselves are defused by lack of universal support.

In general, during U.N. debates, intervention in South African affairs has been opposed by the United States, the United Kingdom, and France. The members consistently favoring U.N. action have been the Soviet Union, and the majority of Asian, African, and Latin American countries.

At the same time, despite their condemnations, South African trade with the various blocs of countries seems to have grown. Those countries and blocs that have maintained the highest volume of trade with South Africa are the United Kingdom, the United States, Japan, and Western Europe and Africa. Although most African countries favor economic measures against South Africa, continued trade with South Africa appears to have been in their interests.

Other factors inhibited the involvement of some nations in actions against South Africa. The first factor is a basic unwillingness of the industrialized countries to interfere in South Africa's domestic affairs. Countries such as the United Kingdom, the United States, Japan, France, and West Germany have considerable interests at stake in preserving the present economic arrangements, and are unwilling to forfeit their trade, investments, or access to strategic minerals provided by South Africa. A second factor that has inhibited both the Soviet Union and the United States from pressing the issue in the United Nations has been the desire to avoid disrupting the current detente. A third factor has been the unwillingness of independent African states, many of whom are riven with their own social problems, to elevate the issue of liberation of the black South Africans to a priority item.

In summary, South Africa's limited vulnerability to economic sanctions, and the lack of universal application of the U.N. "mandatory" resolutions have rendered collective measures against South Africa ineffective. The

Indian experience with economic sanctions showed that without universal application the measures could not be successful. Pakistan's entry into direct trade with South Africa in 1952 and the continued growth of trade between Africa and South Africa further reveal that the lure of monetary profits makes it difficult for countries that morally condemn South Africa's policies to apply sanctions.

As this study reveals, the two factors apparently determining the ineffectiveness of the economic sanctions against South Africa are the economic viability (including the availability of resources, relative industrialization, established markets, and international economic autonomy) and the absence of international support for the sanctions (as exemplified by the complicity of third party nations in ignoring the U.N. sanctions). Either of these conditions would suffice to undermine the imposition of economic sanctions -- together they virtually assure failure.

COMPARATIVE REVIEW OF SIX HISTORICAL CASES

This section compares and contrasts the six case studies along several dimensions: the background conditions which played a role in the sanction situation, the type and nature of the sanctions themselves, the reaction of the target nation to the sanctions imposed, the impact of the sanctions on the target nation, and the overall outcome of the sanctions. In addition, conclusions are drawn about the impact of economic sanctions on the military posture and capabilities of the sanctioning nation (see Table 1).

These six characteristics are used for simplification and clarity. The classification scheme elaborated below is provided to organize information about six very complex events in international relations all having to do with the imposition of economic sanctions. Consequently, only the truly salient aspects of each issue as they pertain to the study of the impact of economic sanctions on defense capability are considered.

	Finland	Iran	South Africa	Rhodesia	Cuba	Berlin
I. Relevant Background Condition						
1. Historical	X	X			X	
2. Current						
a. Geographic	X			X	X	
b. Level of Development-- Self Sufficiency		X	X	X	X	X
c. Internal Political Conditions	X	X			X	X
d. International Conditions	X		X	X	X	X
e. Third Party Influences			X	X	X	X
f. Power Differential	X	X			X	X
II. Nature and Scope of Sanctions						
1. Selectivity or Completeness	S	S	C	C	C	S
2. Unilaterally Escalated	yes	no	no	yes	yes	no
3. Retaliatory (bi- or multi- laterally escalated).	no	yes	no	yes	yes	yes
4. Range (unilateral, bilateral or multilateral).	U	B	M	M	M	B
5. Rate of Implementation (gradual or abrupt).	A	G	G	G	G	A
6. Ancillary Sanctions						
7. Costs to Sanctioning Nation	no low	no low	yes low	yes high	yes low	no low
8. Costs to Target Nation.	high	mod.	low	mod.	low	high
III. Responses of the Target Nation						
1. Resistance	X	X	X	X	X	X
2. Retaliation		X		X	X	
3. Political and/or Realignment			X	X	X	
4. Negotiation	X	X	X	X	X	X
5. Concession and Capitulation	X					
6. Violence		X			X	
7. Domestic Restructuring		X	X	X	X	X
IV. Impact of Sanction on Target Nations						
1. Domestic Political Stability						
2. Domestic Economic Stability	X	X		X	X	
3. Nationalism		X	X	X	X	
4. National Cohesion			X	X	X	X
V. Final Outcome						
1. Concession Capitulation	X					
2. Realignment				X		
3. Isolation			X			
4. No Apparent Effect		X				
5. Stalemate			X	X	X	X

Table 1. Comparative Characteristics of Six Cases of Sanctions

Relevant Background Conditions

In each study it is apparent that both historical and current conditions affected the outcome. However, in some cases the former was less important than the latter. Neither here nor in the sections that follow is each case reviewed in detail; but each section attempts to present enough substantive material for the reader to grasp the importance of each of the conditions and to direct the analytic scheme to the remaining case studies or to others not dealt with here.

Background conditions refer to two broad categories of factors that may have an impact on sanction situations. First, there are historical conditions that underlie the relationship between the sanctioning nation and the target of the sanctions. What is the history of their political alignment of their economic relationship? Is, or was, one nation economically dependent on, or a major trading partner of, another nation? Did the target nation have any military importance to the sanctioning nation? Each of these questions is appropriate for evaluating the importance of historical conditions on economic sanctions.

Other background conditions concern situations within or between the nations involved in the sanctioning process. Are they geographically proximate, contiguous, or remote? What are their comparative levels of economic development (that is, is one a developed nation and the other a less developed nation?). Are, or were, indigenous resources available in the target nation to sustain it during the sanctions? Is the target country politically stable -- is its government viewed as a legitimate spokesman for the people of the object nation? What were the international conditions at the time of the sanctions? This category includes the international political and economic contexts in which the sanctions are employed, such as the Cold War, colonialism, commonwealth membership, and international economic penetration. All of these appear at one time or another in the six case studies. Finally, military (or power) considerations may play a role. In this case attention focuses on whether or not military strength

determined the kind of sanctions used, their scope or comprehensiveness, their range (bilateral or multilateral), and ultimately, their success.

Historical Conditions. The historical conditions that led to Russia's sanctioning of Finland are easily recognized. The strategic importance of Finland as a buffer between Russia's northwestern flank clearly influenced the Russian decision. A Finland friendly to Western Europe to the extent that it was interested in joining the European Free Trade Association (EFTA) was not in Russia's best interest. The traditional ties between the two countries were strained by Finland's unilateral action. Thus, the Soviets acted to curtail such action.

The Cuban situation reveals another kind of history, one that has truly economic overtones. For many years, American commercial interests had been active in Cuba to such an extent that Americans controlled a major portion of the Cuban economy. Clearly, this situation was much more tolerable to the Americans than it was to the Cubans. The conflict that erupted between the Anglo-Iranian Oil Company and the Iranian Government was similar to the Cuban-U.S. situation in that a long history of penetration into a major commercial interest is evidenced. In both of these cases there was a great deal of popular resentment against foreign economic interests which worked against the sanctioning powers.

History played a smaller role in the Rhodesian and South African cases. In these two situations domestic political and social conditions were more important. However, both are former colonies. They are contiguous and have long-standing commercial linkages and cultural similarities, each of which has historical implications that have influenced decisions of the two nations to support one another in the face of multilateral economic sanctions.

Current Conditions. With regard to conditions that prevailed at the time of imposition, it is possible to look at the domestic situation in the target nation and the international context during the period of sanctions.

Most of the target nations in the sample were relatively less developed than the nations imposing the sanctions. Iran, Cuba, and Rhodesia can be cited here. South Africa and Finland were moderately more developed than India and Russia respectively. The level of development of the actor country relative to the target country in the latter case was far less important than the relative power of the two nations. Finally, it should be mentioned that Berlin is an anomaly from the perspective of economic sanctions since it is a city and not a nation. Also, the sanctions that were employed in the Berlin crisis were Cold War tactics designed to test allied resolve with regard to Berlin. Thus, the test was between the Russians and the allies, not between the Russians and the Berliners.

1. Geographical Conditions. Geography seems to play an important part in determining the effectiveness of economic sanctions. If the two principal nations involved in the sanctions are remote from one another, the sanctions seem to lose much of their impact -- distance hindered the implementation and enforcement of the sanctions. Distance appears to have affected the outcome of sanctions against Rhodesia and South Africa (in part, forcing the gradual implementation of the sanctions) in a negative way. The contiguity of Russia and Finland no doubt enabled the Russians to keep the situation under their control. However, the proximity of Cuba to the United States failed to provide the latter with any distinct advantage. Finally, distance does not appear to have been a strong factor in the British-Iranian situations.

2. Level of Development -- Self-Sufficiency. A nation's level of development is important because sanctions invariably test a nation's ability to survive economically. Two factors are important determinants of economic survival in this regard. The first involves the availability of indigenous resources that can be used to ensure domestic economic viability. The second involves the extent to which the indigenous resources are in demand in the international market. Cuba's dependency on sugar exports demanded that Castro locate alternative markets for the Cuban sugar or suffer grave economic and political consequences. The ability of the world

to survive without Iranian oil exacerbated the effects of the British sanctions on Iran. Rhodesia's and South Africa's mineral wealth enabled both countries to avoid major economic repercussions as a result of the sanctions.

3. Internal Political Conditions. Domestic political conditions are a critical factor in determining the success or failure of economic sanctions. The Finnish case demonstrates this as does the Iranian situation. In both cases, political instability created a climate in which domestic support for the governments in power was eroded. In contrast, the South African and Rhodesian situations exemplify the importance of relative political stability. Finally, the Berlin and Cuban situations are interesting because they demonstrate the effect that sanctions can have in increasing the cohesion of target nations. The impact of the domestic political conditions on economic sanctions appears to be mixed. It can lead to either increased political disorder or to increased cohesion within the target country.

4. International Conditions. The international context, referring to the general international political and economic climate in the international system at the time of sanctions, is likewise an important variable to be considered. Here, of course, contexts such as the Cold War become crucial. The obvious case in point in this regard is the Cuban situation which nearly erupted into a global nuclear confrontation. Other international issues such as economic penetration (Cuba, Iran), the movement toward independence and anti-colonialism (Rhodesia), and superpower politics (Berlin) are typical international contexts that mix with domestic conditions and affect decisions to employ sanctions (rather than other influence mechanisms), the nature and scope of those sanctions (that is, the U.S. choice not to employ a naval blockade against Cuba), and the ultimate outcome of the sanctions.

5. Third Party Influences. One aspect of the international context which appears to have particular relevance to the sanctioning process is the

participation of either one or more "third parties." Russia was the critical third party in the Cuban situation, South Africa is Rhodesia's crucial ally; Australia and others have been important in ensuring South Africa's survival. By contrast, Iran and Finland had no help and appear to have suffered as a result. The Berlin incident, again, is an anomalous one because it involved the allies and Russia in a Cold War context. One might go so far as to say that there were no "third parties" willing to commit themselves to that situation. This may have contributed to the stalemate.

6. Power Differentials. The confrontation over Berlin brings us to the issue of power differentials between the actor and the target nations in a sanctioning situation. That the power of nations is relative and can manifest itself in numerous ways makes the analysis of this area difficult. However, we sense its importance when we contrast the Berlin case with that of Finland. The other situations fall somewhere between these two. The Finnish situation resulted in capitulation to Russia's wishes whereas the Berlin crisis ended in a deadlock between the two superpowers. The massive size and power of the United States had little effect on Cuba, however. The "universal" sanctions that have been imposed on South Africa and Rhodesia have had only a limited effect.

The Nature and Scope of Economic Sanctions

Each of the selected case studies is particularly revealing with regard to the kind of economic sanctions employed, their scope, specific focus, timing, and the costs and benefits of their use. In this section, some of the more obvious characteristics of the sanctions imposed in the case studies reviewed earlier are identified. In this regard, the following questions were asked:

- Were the sanctions selective or complete?
- Were the sanctions unilaterally escalated?

- Were they of a retaliatory nature?
- Was their range unilateral, bilateral, multilateral?
- Was the rate of application gradual or abrupt?
- Were there ancillary sanctions that accompanied the economic sanctions, such as diplomatic or military sanctions?
- What were the costs and benefits involved for the sanctioning nation and target nation?

Again, the interrelationships between these questions and their implications must be emphasized. The intricacies of the sanctioning process become increasingly apparent as the nature and scope of the economic sanctions are described. These analytic questions serve only to direct attention to some of the critical variables that describe the sanctioning process.

Selectivity or Completeness. It appears, upon looking at the six case studies, that sanctions directed at specific, key economic sectors are more successful than embargoes or boycotts. This statement should be somewhat qualified. In most cases, sanctions began as selective attempts to influence one particular aspect of a target nation's economy in an effort to influence that nation's behavior. The economic focal point of the sanctions was often related to the particular goal, or goals, that the sanctioning nation wished to achieve. In the Iranian case, the British boycott of Iranian oil was intimately related to the goals sought. The sanctions against Rhodesia and Cuba began as selective sanctions and were escalated to complete boycotts by the sanctioning nation(s). In the Finnish case, the sanctions were highly selective. When the Soviets saw the effect of their initial sanctions on Finland they continued to apply pressure in the areas where its economy was most sensitive.

The selectivity and/or completeness of economic sanctions, therefore, may or may not force a target nation to alter its behavior. In the Finnish case, the Russians were clearly successful in obtaining the desired response.

The complete boycott that the United States imposed on Cuba failed to achieve its goals and, in fact, forced Cuba to embrace the Sino-Soviet bloc instead. The ostracism of South Africa and Rhodesia has had little effect on those nations, despite its ostensible completeness. This is due in part to the general economic self-sufficiency of the two nations and in part to the unwillingness of all nations to support the U.N. sanctions. Although the selectivity or completeness of economic sanctions is an important determinant of their success or failure, our case studies do not conform to one general pattern.

The Escalatory and/or Retaliatory Nature of Economic Sanctions. Sometimes sanctions are unilaterally imposed and escalated until the sanctioning nation achieves its ends. This is clearly what happened in the Russo-Finnish case. Pressure was increasingly applied until domestic conditions forced a change in government and the realignment of Finland. On other occasions, escalation involves the expansion of the number of sanctioning nations. The United States was eventually able to convince the members of the Organization of American States to boycott Cuba. In this case, the sanctions were at first selective, more complete, and eventually expanded to include more nations. The sanctions against South Africa and Rhodesia have followed a similar pattern.

The unilateral escalation of sanctions, however, seems to be the exception rather than the rule. More often, one finds that the target nation will retaliate against the interests of the sanctioning nation if it feels this is possible. In Cuba, Rhodesia, Berlin, and Iran the sanctioning process was characterized by retaliatory behavior which at each turn resulted in more severe restrictions being imposed by both the initiator and the target nation. In some instances, the retaliation takes the form of expanding the range of the sanctions to include more nations; in other instances it takes the form of imposing complete controls where selective controls were being used (Cuba, for example); and in still others, other kinds of sanctions (military or diplomatic) may be used. Retaliation by the target nations involved nationalization, land reform, freezing of

assets, monetary controls, and even violence, as in the cases of Iran and Cuba.

The Range of Economic Sanctions. The intermingling of the analytic situation characteristics has so far been unavoidable. The range of the sanctions (that is, the number of nations involved as sanctioning nations), was previously discussed in connection with the escalatory nature of sanctions. It should be readily apparent that the range of economic sanctions does vary -- from one sanctioner in the Finnish case, to the majority of nations in the Rhodesian case. It appears that the range of economic sanctions is, in part, determined by the degree of success that a single nation has in applying its initial sanctions: India sought support from the U.N. community and Britain did the same; the United States sought Latin American support of its sanctions against Cuba. It is interesting to note, however, that increasing the range of economic sanctions to include more nations has usually failed to force the target nation to capitulate.

Rate of Implementation. Social time (versus chronological time) is a highly relative phenomenon. The rate at which sanctions are applied may appear to one nation to be rather rapid while to another slow. For example, the sanctioning nation may see events unfolding at a fast pace while the target nation may interpret the situation as less abrupt. For analysis, one must view the six studies from the perspective of calendar time. Thus, the Finnish case appears to have escalated rather rapidly. That the sanctions against that nation were selective and abrupt may explain Soviet success. On the other hand, the Berlin confrontation escalated rather rapidly but resulted in a stalemate. Gradualism seems to undermine the effectiveness of economic sanctions. There are no doubt many reasons for the gradual implementation of sanctions; domestic politics in the sanctioning nation (e.g., the United States during the Cuban crisis and Britain at the beginning of the Rhodesian situation), distance (Britain-Rhodesia, but not U.S.-Cuba), international context (the Cold War), and so on. But the case studies suggest that an inability to move quickly blunts the effectiveness of sanctions.

Ancillary Sanctions. Since we are dealing here with economic sanctions, ancillary sanctions refer to sanctions that are specifically non-economic, particularly diplomatic and military sanctions. Both forms were present in the case studies. Military sanctions, when they were employed, usually involved only troop movements, verbal threats, or shows of force. In the Cuban situation, for instance, guerrilla activity did take place with American complicity, but U.S. forces were not directly engaged. The British shifted their forces around the Mediterranean to reinforce their intentions to make their sanctions viable and to be prepared to protect British lives in Iran; but no military forces were engaged. In the Berlin crisis, U.S., British, and Russian troops were involved in enforcing certain sanction-related actions but none were actually engaged in combat. Diplomatic sanctions of two kinds appear in the case studies. The first involves the severing, or downgrading, of diplomatic relations in the Finnish, Cuban, Rhodesian, and South African cases. The second form involves the marshalling of multilateral support for sanctions, particularly in the United Nations. This form of diplomatic sanctioning occurred in the Rhodesian, South African, and Cuban cases.

Costs and Benefits of Sanctioning. In every sanctioning process there are costs and benefits to both the sanctioning nation and the target nation. The sanctioning nation must weigh the costs of imposing sanctions while the target nation must weigh the costs of either resisting the sanctions or capitulating. Since benefits and costs are inextricably linked, benefits must also be evaluated. Castro apparently decided that despite the short-run costs involved in reducing American presence in Cuba, the long-run benefits for his people and his country exceeded the costs. South Africa and Rhodesia have apparently decided that the costs of capitulating to the more or less universal sanctions against them are far greater than the costs of restructuring their economies, maintaining domestic policies, and resisting the sanctions in general. In some instances, as in the Finnish case, the costs do outweigh the benefits. The costs to the Iranian Government appear to have been overwhelmed by the nationalistic spirit that prevailed in the country at the time of the British sanctions. The

fervent anti-British feeling appears to have balanced the costs and benefits -- the domestic economy was suffering but greater Iranian control of the oil industry was an equally important issue. Weighing of costs and benefits requires a complex assessment, both for the sanctioner and the target nation. For example, the British had to weigh the costs of confronting the Iranians on the nationalization of the Anglo-Iranian Oil Company and of discounting trade with Rhodesia. In the latter case, British interests appear to have suffered almost as much as Rhodesian ones. The Russians, in confronting the allies over Berlin, apparently assessed the benefits of such a confrontation incorrectly and emerged from the situation with no tangible gains.

The siege mentality that appears in target nations as a result of sanctions seems to have played an important role in all of the case studies except Finland. In each of the others, the collective will to resist invariably raised the costs to the sanctioning nation and concomitantly indicated to the leadership in the target nation that the sanctions had actually decreased the risk of resisting.

It is readily apparent that the variation in the sanctioning process makes analysis extremely difficult. The myriad of background conditions in both the sanctioning and the target nations interplay with the nature, scope, range, costs, and benefits of the sanctions themselves to produce a wide spectrum of possible outcomes. These outcomes, in addition to being influenced by background conditions and the nature of the sanctions, are partially determined by the response of the target nation to the economic sanctions.

Responses of the Target Nation

The many options available to the nation being sanctioned are in part determined by background conditions and the sanctions themselves. These analyses have identified the following actions that may be taken in response to economic sanctions: resistance, retaliation, political or

economic realignment, negotiation, concession or capitulation, and domestic economic restructuring. These six activities may be pursued singly or simultaneously. A nation may simply resist at the outset and capitulate a short time later. Their separation here is for analytic purposes only.

Resistance. In every case study, the target nation demonstrated, at least for a time, its resolve to resist the sanctions being imposed. Even Finland, which capitulated to the Russian demands shortly after the imposition of sanctions, initially resisted. The Berliners were able to withstand the various blockades which severed all traffic into their city because the United States was willing to confront the Russians and begin the airlift.

Retaliation. Perhaps the most obvious instances of retaliation by a target nation against the sanctioning nations are Cuba and Rhodesia. Both nations reacted to the sanctions by imposing their own restrictions on either facilities, finances, or other interests of the sanctioning nation. In the case of Cuba, Castro eventually gained complete control over all American commercial interests (oil facilities, land, etc.) by either nationalization or land reform. The Iranian Government also used nationalization as a way of demonstrating to the British their unwillingness to capitulate.

Political and Economic Realignment. The role of "third parties" in international sanctions is a particularly important condition which impinges on the target nation's ability to resist economic boycotts and embargoes. The Cuban situation is probably the most obvious case in point. Without the Russian market for its sugar, Cuba would have been unable to survive economically. In this instance, both political and economic reorientation occurred. In the Rhodesian case, the reorientation was mostly economic and resulted in the redirection of international economic activities toward South Africa. After the Indian sanctions were imposed against the Union of South Africa, the Union simply focused its interests on the countries that would be willing to continue their trade.

Pakistan's desire to trade jute with the Union sufficed to offset much of the impact of the Indian sanctions, as did Australia's willingness to re-export Indian products to South Africa. As a consequence, the sanctions were undermined by the economic reorientation away from traditional partners.

Negotiation. Negotiations between the sanctioning and sanctioned parties took place in every case. In some cases (Iran, Berlin, Cuba, and Rhodesia) the negotiations were intermittently interrupted. In the Iranian case, negotiations began and ended in stalemates four times. The Russians walked out of negotiations on Berlin, but eventually resumed them to no avail. Negotiations between the British and Rhodesian governments produced much the same result and ended finally with Rhodesia unilaterally declaring its independence from Great Britain. Castro's adamancy with regard to U.S. presence in Cuba eventually resulted in the termination of all negotiations and the imposition of complete sanctions.

Concession or Capitulation. Although these outcomes are no doubt the two most desired by nations who employ economic sanctions, they are the most elusive. Only in the Russian-Finnish case were the desired ends achieved by the sanctioning nation. In all other situations, some form of resistance appears to have been successful, at least to the extent that the nation on whom the sanctions were imposed was able to survive economically.

Violence. Violence and excessive nationalistic fervor appear to frequently coincide. In the Iranian and Cuban cases, violence against British and American interests respectively occurred periodically during the sanctions. However, because of the ability of most of the sanctioned nations to resort either to effective retaliatory measures of the economic variety, or to realign politically, violence appears to be the exception rather than the rule in situations in which economic sanctions are used.

Domestic Economic Restructuring. One final response of the target nation needs to be mentioned. The above-mentioned responses are international responses in that they describe the behavior of the target nation toward the sanctioning power. Other responses may occur that pertain to the domestic conditions resulting from the imposition of sanctions. These have a common purpose -- the restructuring of the nation's economy to withstand the impact of sanctions. Restructuring involves controls on employment, rebudgeting, anti-inflation policies, and possibly complete government control of industry. The Cuban and Rhodesian cases are excellent examples of extensive economic restructuring in the face of economic sanctions. Iran was forced to restructure its entire budget to survive economically. Finland, on the other hand, because of a certain degree of domestic instability (political and economic) and because of an inflexible economic structure, was unable to counter the impact of the Russian sanctions.

Usually, resistance to sanctions involves more than one kind of response. A nation can restructure its domestic economy, realign its international economic linkages, and negotiate all at the same time. The choice as to which course it takes depends on the background conditions, the nature of the sanctions, and the domestic and international responses that the target feels it can effectively engage in after weighing the costs. Much of the decision-making as to responses to economic sanctions depends on the extent of the disruption caused in the target nation by the sanctions. The impact of the sanctions can be mitigated by distance, advance warning, or precautionary measures. The impact also varies with the complexity of conditions and processes that abound in each case, making analysis difficult.

Impact of Sanctions on the Target Nation

Here we are interested in understanding only the impact of economic sanctions on the domestic situation of the target nation. The impact is usually a function of background conditions -- a nation with domestic

political turmoil may experience even greater disruption, for example. Exceptions do occur. Clearly, the U.S. sanctions against Cuba had the opposite effect. We have identified four specific areas where sanctions appear to have produced changes in the domestic situation in the target nation. They are:

- Domestic political situation
- Domestic economic situation
- Nationalism
- National Cohesion

Domestic Political Situation. We are referring here to the extent of governmental stability or instability that results from the imposition of sanctions on a nation. Two of our cases, Iran and Finland, experienced varying degrees of governmental instability as a result of the sanctions imposed on them. Two nations, Rhodesia and South Africa, appear to have experienced little government instability as a result of the "universal" sanctions imposed on them, and in fact there is some evidence that their governments were strengthened. The remaining two cases, Cuba and Berlin, clearly indicate the strengthening of governmental control as a result of sanctions. The most impressive case, of course, is Cuba. U.S. sanctions contributed substantially to the solidification of national support for Castro's regime. Once the siege mentality had been cultivated, little could be done to undermine it. Efforts to use increased sanctions produced even greater solidarity.

Economic Disruption. Economic disruption appears to have resulted to a degree in each of the cases. But, in most instances (Finland being the exception) the target nation seems to have coped economically. Certain background conditions (such as the nature of the sanctions, restraint on the part of the sanctioning nation, the role of third parties and sympathetic neighbors, and the availability of indigenous resources on which to rely) can lessen the economic disruption that a nation will

experience. Even though economic sanctions are directed specifically at the economies of a target nation, the multitude of factors that influence the sanctioning process mitigate their impacts and decrease the predictability of the overall outcome.

Nationalistic Reaction and National Cohesion. These two impacts are so closely linked that it is almost impossible to consider one without the other. In all of the cases except Rhodesia and South Africa, the general reaction to the imposition of sanctions was the generation of some sense of national spirit in reaction to the pressure. Even in Finland, a certain amount of nationalism was generated in response to the Russian restrictions. At the other end of the spectrum is Cuba, whose nationalism was highly instrumental in thwarting the U.S. efforts. The two remaining cases, Rhodesia and South Africa, involve nations in which domestic social differences play a major role. In Rhodesia, for example, the brunt of the sanctions' impact was channeled by the white-dominated government to the black population. This polarized the white and black populations. Thus, the sanctions produced internal social conditions which eventually could erupt into grave violence. Rather than forcing the Rhodesian whites to recognize the black majority, the sanctions have exacerbated the racial situation in that country. A siege mentality has developed but not necessarily against the sanctioning nations. This outcome, of course, was not anticipated by the British.

Overall Outcome of Economic Sanctions

The six cases studies selected for review were chosen because they represented six significant incidents in which economic sanctions were employed. We have tried to identify several dimensions across which each study could be compared with the others. The final dimension is outcomes. Of the six cases, two have been resolved. Four (Berlin, Cuba, Rhodesia, and South Africa) continue as important international issues and are best described as stalemated.

The complexities of the economic sanctioning process are clearly illustrated in the above review. That the six studies used here as examples reveal the presence of many varied forces at work in this ostensibly limited area of international economic relations is readily apparent. Not so apparent, however, is any systematic or regular pattern underlying the six cases. In fact, although we have attempted to organize our information along several dimensions that appear to make theoretical sense, the six cases appear to be more different than similar. The chart that follows is an attempt to summarize the preceding discursive analysis and to allow the reader to view all of the cases simultaneously.

There is one major methodological conclusion that can be drawn from the comparative analysis of the case studies. That is, the comparative analysis has shown that the factors involved in interstate economic conflict are very complex. It is therefore impractical to construct a single model for explaining the behavior of states involved in interstate economic conflict. The strategy should be to construct case-specific models of specific situations. The cases selected for model construction in this project are Japan and Saudi Arabia. The historical case studies presented here have provided little generalization for model building but they have provided another type of information which has proved of value. They have generated a great deal of background information that enables the development of some boundaries for the case-specific models. Furthermore, as will be shown in the next section, they proved useful in the construction of a framework for the analysis of responses of target nations to economic sanctions.

A FRAMEWORK TO GUIDE THE ANALYSIS OF ECONOMIC SANCTIONS

The striking feature of the comparative analysis of the historical instances of interstate economic conflict is the proliferation of situational differences among even six specific situations. While ongoing analytic efforts have been aided significantly by the identification of particular circum-

stances which should be incorporated within a more complex treatment, an organizing framework is required to facilitate the implementation of the myriad details.

The most useful conceptualization for the analysis of situations of economic sanctioning is to imagine that both the target and sanctioning country face a basic problem of constrained maximization. Each attempts to consider the available policy options in light of the expected benefits and costs deriving from each option. The specific features of any given situation are then interpreted as relating to the benefits or to the costs, or, as constraints on the choices actually available to each country.

The benefits accruing to the country following the adoption of any particular policy are not necessarily the benefits the country considers. The country's perception of the benefits to be derived from (or expected from) any particular policy may well be dependent upon the country's perception of the other country's motives. Given the perception that a hostile act is directed toward it, a country will generally attempt to retaliate. The reaction may be motivated by a perceived need for revenge, perhaps to satisfy public emotion. At other times it is merely a demonstration of nationhood, or sovereignty of the country -- a behavior which is expected of all truly independent countries and is perceived as necessary for deterring further sanctions. A third reason for the action may be to force the sanctioning power to withdraw its sanction.

Thus, the motive behind a retaliatory response to an economic sanction can be based on (1) emotions and revenge, (2) national prestige and sovereignty, or (3) forcing the removal of the sanctions. These in general could be viewed as the desired "benefits" of the response to economic sanctions.

Any action, however, has costs and may involve risks. Hostile responses to economic sanctions involve the cost of undertaking them and the risk

of receiving further sanctions. A rational actor is expected to choose the strategy which either maximizes total benefits or minimizes total costs and risks and has marginal benefits greater than its marginal costs. The direct cost of responding to economic sanctions is relatively easy to calculate, whereas the indirect costs of responding, the risk of provoking further sanctions, and the expected benefits of responding to sanctions are far more difficult to enumerate.

These points can be illustrated by an example. Assume one country (A) imposes sanctions on another country (B) which will have an operating cost of C_a for the sanctioning power (A) and will have a damage value of C_b (per month) on the target B. As long as B makes no response and A maintains its sanctions, B will pay the price C_b and A will pay a cost, C_a . Now suppose the purpose of A's sanctions is not merely to force a cost of C_b on B, but to force the latter to agree to a demand (D). If the compliance of B to demand D entails a cost of C_d , then B has at least two choices:

- Pay the cost C_d of complying with A's demand so that the sanction will be lifted.
- Ignore A's demands and bear the cost C_b inflicted by the sanctions.

These two alternatives do not usually exhaust the options of the target country. There is generally a third option, retaliation:

- Ignore A's demands, bear the cost C_b and retaliate at a cost of R_b .

We assume that the purpose of B's retaliation is simply to force a cost R_a on the opponent A so that the latter will lift its sanctions. This means that B will undergo a cost R_b in order to make A pay an additional cost R_a for its sanctions. After B's retaliation, the cost of sanctions to the sanctioning power becomes $C_a + R_a$, and the cost of retaliation to B is $C_b + R_b$.

However, by retaliating, B risks further sanctions from A. If additional sanctions impose a further cost C'_b on B and a further sacrifice C'_a to A, then the total cost of noncompliance to B becomes $C_b + R_b + C'_b$. The total cost to A of continuing the sanctions will be $C_a + R_a + C'_a$. But A does not have to continue the sanctions. After each response by B, A has at least three distinct choices:

- Lift the sanctions and spare their operations cost C_a .
- Continue the sanctions and pay the price C_a plus retaliation cost R_a .
- Increase the sanctions and pay a total price of $C_a + R_a + C'_a$.

The choice of any option by A or B depends on (1) the costs inflicted by both parties on each other and (2) their expectations of each other's future behavior. For each country the decision involves three considerations:

- The immediate costs of various alternatives.
- The most likely responses of the opponent to each of the alternatives.
- The expected costs of each of the opponent's alternatives.

Figure 1 illustrates the options and the costs associated with the choice of each option for A and B in a three-stage interaction process. At the inception of the sanctioning process, country A must undertake a very complex evaluation. First, it must consider the costs, independent of sanctions, of B not behaving in accordance with the contemplated demand, D. Similarly, the benefits to A generated by B's compliance to the demand D must be considered. Having accomplished this initial computation, the possibilities facing A are depicted in the figure. For each action which A undertakes, three possible responses have been shown for country B. And, in turn, A is shown to have three counter responses associated with each of the options available to B. As presented in the figure, the

A's Initial Action

B's First Response

A's Second

Country A imposes sanctions on B in order to force B to comply with demand D.

B complies with A's demand (D)
cost to B $\leq (C_d + C_b)$
cost to A $\leq C_a$

A lifts its sanctions
cost to B $\leq (C_b + C_d)$
cost to A $\leq C_a$

A continues its sanctions
cost to B $= C_d + C_b$
cost to A $= C_a$

A increases its sanctions
cost to B $= C_d + C_b + C'_b$
cost to A $= C_a + C'_a$

B does not comply to D
cost to B $\leq C_b$
cost to A $\leq C_a$

A lifts its sanctions
cost to B $\leq C_b$
Cost to A $\leq C_a$

A continues its sanctions
cost to B $= C_b$
cost to A $= C_a$

A increases its sanctions
cost to B $= C_b + C'_b$
cost to A $= C_a + C'_a$

B retaliates against A
cost to B $\leq C_b + R_b$
cost to A $\leq C_a + R_a$

A lifts its sanctions
cost to B $\leq (C_b + R_b)$
cost to A $\leq (C_a + R_a)$

A continues its sanctions
cost to B $= C_b + R_b$
cost to A $= C_a + R_a$

A increases its sanctions
cost to B $= C_b + R_b + C'_b$
cost to A $= C_a + R_a + C'_a$

NOTE: The inequalities are used to show what happens when an action (such as a sanction or a retaliation) is not continued for a full period.

Figure 1. A Simple Pattern of Action and Reaction in Interstate Economic Conflict.

multiple outcomes have different costs. Though the figure appears to be complex, it has already been substantially simplified. For example, there can be any number of distinct retaliatory responses available to B that have not been separately identified.

In reality, the evaluation of costs and benefits goes well beyond the requirements of identifying particular policy responses within any given category. Additional complexity is introduced by distortions resulting from poor information and different preference schedules of the actors. These distortions often result in misperceptions and uncertainty about the behavior of opponents. For instance, poor information may result in overestimating the amount of damage that can be inflicted on the target country. This frequently happens in the real world. The U.S. embargoes against Japan in the 1930's and against Cuba in the 1960's are examples of this type of overestimation.

Misperception of the behavior of other countries may also lead to erroneous policy choices. British misperception of the Iranian response to the oil crisis of 1951 was based on British ignorance of the strength of Iranian public opinion. The value of nationalization as an act of national pride was sufficiently important for Iranians to justify a substantial loss of economic well-being. Thus, overestimation of the impact of sanctions on an opponent and uncertainty or misperception of the opponent's expected behavior leads to distortion of the simple model of Figure 1 and may result in choices by the parties involved which do not fit the simple model presented here.

Additional assumptions which can be incorporated within the basic conceptualization are:

- As the cost of sanctions to the target country increases, the tendency to retaliate increases. This is justifiable if the need for revenge is assumed to be correlated with the damage from the sanctions.

- The greater the power of the sanctioning power relative to the target country, the lower the likelihood of retaliation. This is because the "hopelessness" of retaliation increases with power discrepancy of the rivals.
- The higher the existing hostility levels between the sanctioning country and the target country, the higher the probability of retaliation. It is expected that existing hostility aggravates conflict situations.
- The higher the price of compliance with the demands of the sanctioning country for the target country, the more likely the retaliation of the target country. In other words, unreasonable demands make compliance of the target less probable.
- The greater the relative capability of the sanctioning power for increasing the sanctions (escalating), the less likely the retaliation by the target nation.

This framework will be employed in the evaluation of potential responses of Japan and Saudi Arabia to the international economic policies of the United States. As earlier stated, the advantage of the framework is the facility with which constraints on the choice of responses may be incorporated. Further, because the framework makes very explicit the simplifying assumptions and the method of introducing constraints on the behavior of governments, it facilitates the application of the model to other cases and permits generalizations without detailed application by systematically investigating the importance of each assumption.

IV. MEASUREMENT OF U.S. MILITARY POSTURE

The major purposes of this chapter are to (1) review the variety of different meanings of military posture at a conceptual level, (2) identify major U.S. defense objectives abroad, and (3) develop quantitative measures or indicators of major U.S. military interests in other countries.

More specifically, this chapter attempts to determine whether there is an identifiable dimension in the U.S. relationship with other nations that could be labeled "U.S. military posture abroad." A cross-section of U.S. ties with (or stakes and interests in) other nations will be statistically analyzed in order to determine whether there is an empirically identifiable cluster of military ties or other distinct non-military clusters of U.S. ties. However, because of the structural complexity of the problem, the linkages between U.S. military posture and its military determinants will not be specified in detail in this report. The Final Report will contain a more detailed specification of the linkages.

CONCEPTUAL PROBLEMS

Military posture is a difficult concept to define and operationalize clearly. First, the difficulty stems from an implied comparison and the lack of a clear standard for the comparisons. It is too often used as a catch-all term in place of a wide range of other ideas:

- Strategic standing
- Military strength or power
- Military capability
- Military structure
- Military influence

- Military presence
- Military interests or stakes
- Military (short and long term) goals
- Military weaknesses
- Military threats
- Military alliances

Second, military posture is sometimes associated with specific military activities and weapons systems. It is possible, for instance, to relate U.S. military posture in the Atlantic Ocean to potential constraints placed upon its anti-submarine warfare (ASW) capability. Such a constraint might arise from a leftist regime gaining power in Iceland. The regime could impose restrictions on or terminate U.S. military operations in, or from, Iceland. Generally, when any specific military activity or weapons system is perceived as vital to the overall military capability of a country, it becomes associated with the word posture.

Third, the complexity of the concept of military posture is compounded by the ambiguity of its determinants. For instance, it is unclear whether the military posture of the United States in the Middle East is in part determined by Arab public opinion. This point is important because public opinion creates the environment within which governmental attitudes are formed and governmental decision latitudes are set. Furthermore, the operational capability of U.S. military forces in most regions is partially determined by the attitudes of the local governments. During the October war in the Middle East, this point was clearly illustrated by the refusal of all NATO countries, except Portugal, to grant overflight permission for U.S. airlifts to Israel. This event showed how U.S. military capability was constrained by the attitude of the European governments, which reflected the attitudes of Arab governments, which in turn reflected Arab public opinion.

The same event also illustrates a fourth difficulty in assessing the concept of military posture: the variability of the concept according to the military goals of the actors. The U.S. military forces and the NATO alliance, for instance, are certainly adequate to respond to a variety of situations. But there are limits and exceptions to this capability which vary with the goals and context of each situation. In the October war, the European countries were unwilling to support Israel or aid U.S. efforts to that end. Thus, the NATO allies which would normally complement U.S. military power instead became a constraint on U.S. military capability. Hence, military posture (or capability) varies according to its goals and the expected environment within which these goals are to be achieved.

However, as the example of the 1973 Middle East war shows, this does not necessarily mean that military capability is directly affected by its goals. After all, U.S. physical capability for the airlift did not change just because the country of destination was Israel rather than another country, say Turkey. It was the European dependence on Arab oil, the implications of aiding Israel to the European governments, and European domestic politics that led them to close their airspace to the U.S. airlift, thus curtailing U.S. military capability for aiding Israel. If the object of the U.S. airlift had been any attacked country other than Israel, it is almost certain that the European powers would have been far more helpful, and hence the effective capability of the U.S. military to deal with the problem would have been greater. Therefore, the impact of military goals on military capability can be indirect -- through factors that act in the operational environment of military capability.

Finally, one of the often implied meanings of military posture is the assessment of military capability for achieving known military objectives. That is, given a set of military goals (X), can the existing military capability (Y) achieve them? This type of analysis usually includes an accounting of military goals, security problems, alliances,

geopolitical factors, and military hardware and manpower of a nation (and its opponent). Traditionally, in assessing a nation's military capability, such analyses included the morale of, and the popular support for, the military of the country. It did not, however, include the attitudes of governments and the public opinions of other countries. For instance, in calculating the late nineteenth century military power of Britain in the Persian Gulf, most historians ignored the constraining influence of the governmental attitude and the public opinion of Persia. These factors were clearly important and were, in fact, implicitly taken into account by many of the British decision-makers in the field who were charged with implementing the policies of the Whitehall. Today, however, most political analysts agree that U.S. military capability in the Middle East is hampered by the negative image of the United States in Arab public opinion which is created by U.S. aid to Israel. Similarly, the U.S. military capability in Southern Africa is hampered by constraints placed on the U.S.-South African relationship by world public opinion which, for the most part, views South Africa as an outcast among the community of nations.

Therefore, the idea that the effectiveness of military capability is affected by world and national public opinion has gained some acceptance among analysts. But the inclusion of public opinion as a factor affecting military posture or capability has not yet been made analytically explicit. Most analysts include public opinion as a factor that affects military capability in very specific situations (such as the impact of Arab opinion on U.S. capability). But there are very few generalizations as to how the public opinion of one nation would affect the military capability of another nation.

Because of the existing confusion in the literature, a decision was made to adopt the following assumptions with respect to U.S. military capability

in this analysis:

- The total military capability of the United States is directly proportional to its military hardware inventory and military manpower size.
- The effectiveness of U.S. military capability in any specific geographical area is a function of the concentration of the capability in the area, its distance from other centers of U.S. capability and the environmental factors which affect that capability at the regional level (e.g., Arab public opinion) as well as at the international level (e.g., Soviet attitude).
- The environmental factors affecting U.S. capability may be affected by the specific goals which the capability is to achieve.

The relationships of these assumptions to U.S. military posture are illustrated in Figure 1. Briefly, it is assumed that U.S. military posture in any region is determined by U.S. military capability in that region. But this capability may itself be constrained through its interactions with environmental factors (e.g., public opinion) which are, in turn, often affected by U.S. military objectives in that region.

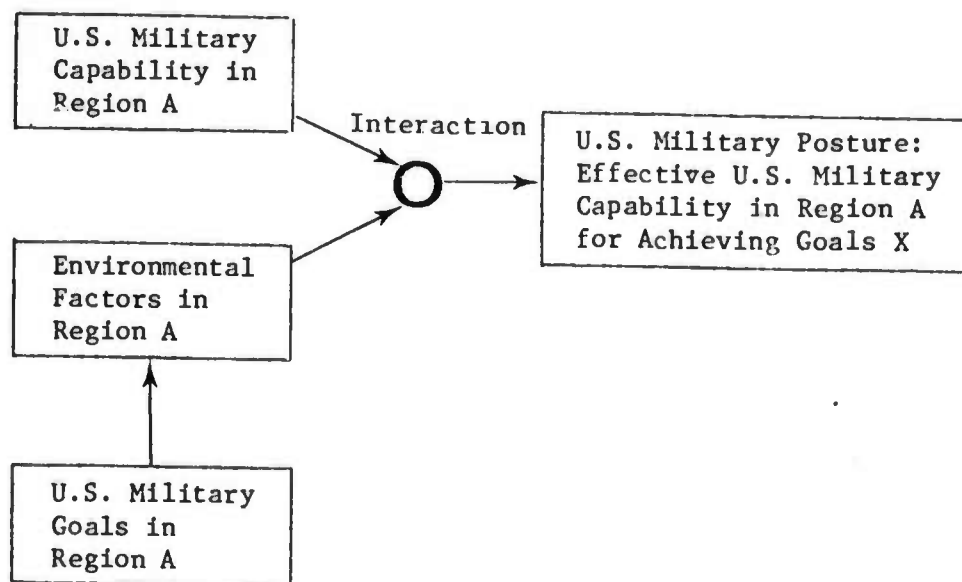


Figure 1. A Simple Model of Determinants of U.S. Military Posture Abroad

It is clear that the analysis of U.S. military posture in each region requires a consideration of U.S. goals, military capability, and environmental factors in each region. The complexity of the interactions of these factors does not allow the construction of a general model of their linkages. These linkages, however, can be analyzed on a case-by-case basis which would allow the inclusion or control of the situational factors. The Final Report will include case-specific analyses of U.S. military postures in Japan and Saudi Arabia.

MAJOR U.S. MILITARY OBJECTIVES

A great deal has been written about the nature of U.S. military goals. The major generalizations that emerge from this literature are:

- Military objectives are best understood if they are viewed as the means for achieving or pursuing the more general foreign policy goals.
- Foreign policy goals are often ambiguous, though certain major goals are easily identifiable.
- Military policies sometimes become ends in themselves after having served their purpose in the pursuit of some former foreign policy objectives.

The main theme of these generalizations is that there are certain national goals around which a sequence of military and non-military policies evolve designed to achieve these goals. Military (and non-military) policies may in due time become goals in themselves even after their original purpose is served or is no longer relevant. For instance, the maintenance of a military base in a foreign land sometimes becomes an end in itself after the conditions which led to its establishment have disappeared.

In the case of the United States, there are a number of national goals which have obvious relevance to U.S. military goals. The most important of these are:

- The national security of the territory of the United States and U.S. overseas possessions. It is well-accepted that this is the major U.S. military goal.
- The safety of U.S. citizens and the security of U.S.-owned properties abroad.
- The protection of U.S. commercial activities on the high seas (e.g., fishing and shipping).

There are also some U.S. national goals which are of secondary importance, such as:

- The stability of governments friendly to the United States;
- Cooperation with the military allies of the United States;
- Cooperation with the governments of countries that are strategically of value to U.S. security.

There are also certain major national policies with military relevance that have a transient nature. In the nineteenth century, a major U.S. policy was to maintain an equal opportunity and "open door" for U.S. merchants in international commerce. In the more recent past, the containment of Communism and the deterrence of a Soviet nuclear first strike have been among the major U.S. military policies.

If the focus of the study shifts to a regional basis, however, such general goals and policies lose most of their analytical value. At the regional (versus the global) level there are too many intervening factors for the global strategies by themselves to explain specific U.S. policies. The U.S. policy toward Israel, for instance, cannot be explained by any of the global factors. It requires the inclusion of a number of situational

and historical factors that are seldom salient in the formation of U.S. policy toward other nations. Such factors, however, are difficult to analyze abstractly and in each case require reference to the specific situation. Consequently, it was decided to adopt a case-specific approach in this project. The cases selected for analysis are Japan and Saudi Arabia. The Final Report will include an analysis of the specific U.S. military goals in relation to these cases. These goals will then be used to analyze the military posture of the United States in Japan and Saudi Arabia and to define the relationships of these postures to the U.S. economic policy toward these countries.

INDICATORS OF U.S. MILITARY CAPABILITY/POSTURE

As explained previously, U.S. military posture as a general concept is difficult to operationalize. The concept becomes more manageable when the focus shifts to specific goals and environmental constraints in each particular situation. In other words, U.S. military posture in each country is part of a more general U.S. presence in that country. U.S. military capability in Japan, for instance, is part of the overall U.S. economic, cultural, diplomatic, and military presence in the Far East.

Therefore, in measuring U.S. military posture in any country, the analyst must consider U.S. non-military ties with each country. This type of analysis can best be done on a case-by-case basis. Such an approach would enable the analyst to account for the complex, interacting regional factors.

A case study approach, however, has a number of weaknesses. The most serious of these is the difficulty of producing generalizable statements about relationships between variables. It is therefore often very fruitful, at least initially, to examine proposed concepts or relationships through cross-sectional studies. This provides a broader view of the problem at the empirical level. In the case of the concept of military posture in particular, a cross-sectional analysis of its basic elements and dimensions should prove of value.

Cross-Sectional Analyses

This section examines two cross-sectional studies of U.S. military and non-military relationships with other nations. It also presents the results of a reanalysis of one of these studies.

CASA Study of U.S. Interests/Stakes Abroad. The Center for Advanced Studies and Analysis (CASA) has performed a cross-sectional factor analysis of U.S. interests or stakes in all non-Communist countries (CASA, 1974). The data used were generally from the period 1950-1970. Another important characteristic of the data was its strict national-dyadic nature. That is, the attributes measured by the data were in all cases limited to the direct relationships between the United States and other non-Communist countries. No indirect, triadic, or regional relationships were considered. In measuring U.S. interests in Japan, for instance, no consideration was given to the strategic significance or the regional economic role of Japan. This implies that the interests of the United States in strategically significant countries (such as Japan, Iceland, and South Africa) and in indirectly important countries (such as oil-exporting countries on whose oil the security of Western Europe and Japan depends) could not be represented in the data. Thus the relationships studied in the analysis are direct, national-dyadic relationships.

The technique applied by CASA to the data set was factor analysis. It was hoped that this technique would delineate a set of hypothesized dimensions of U.S. stakes abroad: political, commercial, military, and socio-cultural. In addition, the analysis included a set of variables that were normed (generally by dividing by population of each country). These variables were to represent the "visibility" of U.S. presence in other countries. They were also subdivided into political, commercial, military, and socio-cultural categories.

The factor analysis of the data led CASA to conclude that there are six dimensions to "the various manifestations of U.S. involvement abroad."

These dimensions were perceived to represent:

- International commerce
- Foreign assistance
- U.S. political-military activity
- U.S. political-military visibility
- Visibility of U.S. residents and military hardware
- U.S. trade penetration

These empirically derived dimensions, however, do not fit the original conceptual dimensions (which were hypothesized to be political, commercial, military, and socio-cultural). There are two possible reasons for this discrepancy between the conceptually hypothesized and the empirically derived dimensions:

- First, it is possible that the hypothesized concepts cannot be empirically separated through cross-sectional analysis. In fact, the measurable indicators of the dimensions may be statistically multicollinear to the extent that the dimensions cannot possibly be separated by nonexperimental techniques.
- Second, the selection of indicators for the hypothesized dimensions may have been improper. For instance, if data availability was used as one of the criteria for the selection of indicators, then the resulting dimensions would be severely distorted in favor of those dimensions that have the largest number of measurable indicators.

The CASA analysis, in fact, suffers from both of these problems. It is quite obvious that it suffers from the collinearity of indicators across dimensions. Furthermore, the indicators used to represent different dimensions are obviously unbalanced (i.e., those dimensions that have the largest number of measurable indicators tend to be the strongest). It should also be noted that the statistical multicollinearity of the

indicators produced a highly unstable factor structure (i.e., the structure of its dimensions could vary from sample to sample by sampling variability alone).

A Reanalysis of CASA Data. In order to eliminate or reduce some of the problems encountered in the CASA study, the data were reexamined and the selection of the indicators was done on a more systematic basis. A number of factor analyses were performed on the data set in order to test the stability of the factor structure in the absence of specific indicators that were deliberately omitted from each analysis.

Three criteria were used for the elimination of variables. These were:

- Conceptual Relevance. Variables, whose conceptual relevance to the dimensions of U.S. stakes or interests was dubious, were eliminated. This led to the wholesale exclusion of all indicators of U.S. "visibility."
- Statistical Relevance. Variables that had zero or near-zero loadings in the CASA study were eliminated.
- Noncolinearity. In order to reduce the structural instability of the factor matrices (i.e., prevent the determinant of the covariance matrix from approaching zero) the number of highly colinear variables was substantially reduced by dropping some variables.

The result of the factor analysis, as shown in Table 1, is a far more stable factor structure with factors that are quite distinct. (For a description of the variables see Table 2.) The factors can be broken down into distinct diplomatic, foreign assistance, commercial, and military dimensions. This finding has greater correspondence with the original theoretically derived dimensions of the CASA study, namely, diplomatic, commercial, military, and socio-cultural dimensions.

TABLE 1
The Varimax Rotated Orthogonal Factor
Structure of the U.S. Interests/Stakes Abroad

Variables	Factor Loadings			
	Factor 1	Factor 2	Factor 3	Factor 4
CULT MON	.90			
CULT PEO	.67			
STATE DF	.80			..62
USIA STR	.89			
AID		.92		
AID STRG		.95		
DEF ASST		.95		
INVESTMT				
U.S. EXPT			-.97	
U.S. RESID			-.96	
			-.96	
MIL SALE				
TOTL MIL				-.89
				-.86
% Variance				
Explained	24	2	24	18

Note: 1. All communalities were greater than .90.
2. Factor loadings less than .50 are not reported.

In this reanalysis the military dimension seems to be dominated by the other dimensions. This result is largely an artifact, however, which was caused by the elimination of all except two of the indicators of military influence. This elimination was necessary because of the presence of severe multicollinearity among the indicators. It is worth noting that in numerous analyses it was found that the military factor was the most stable among all the factors, even when the number of variables loading on it was small.

Comparison of CASA Data Set with an Independently Collected Set. In order to check the CASA list of variables for representativeness of the totality of U.S. interests abroad, the results of the original CASA

Table 2

Explanation of CASA Variables Used in Table 1

Variable	Explanation
1. U.S. EXPT	Total annual dollar values of U.S. exports abroad
2. INVESTMT	Total dollar book value of U.S. privately owned or controlled direct investments
3. U.S. RESID	Total number of U.S. nationals residing abroad
4. STATE DE	Total number of U.S. and foreign nationals employed by U.S. embassies abroad
5. USIA STR	Total number of U.S. and foreign nationals employed by USIA abroad
6. TOTL MIL	Total number of uniformed U.S. military personnel abroad
7. MIL SALE	Annual delivered dollar value of military equipment transferred under Military Sales Program and Commercial Sales Program
8. DEF ASST	Annual delivered dollar value under Military Assistance (and excess stock) programs plus annual <u>programmed</u> value of equipment and service transferred under Defense Assistance Services and other programs and loans
9. AID	Dollar value of AID projects (deliveries)
10. AID STRG	Number of AID personnel
11. CULT MON	Dollar value of U.S. cultural and educational exchange programs
12. CULT PEO	Number of people exchanged in U.S. cultural exchange programs

Note: Further detail about these variables can be found in CASA (1974).

factor analysis were compared with the results of a similar study but with an independently collected data set.¹

Abolfathi (1974), in a study of U.S. and Soviet ties with other countries, used indicators of U.S. ties that are very similar to indicators of U.S. interests/stakes used in the CASA study. There are, however, some notable differences between the two data sets. Abolfathi's study includes a number of variables not included in the CASA study such as U.S. hotels, number of U.S. multinational corporations, and U.S. police aid to other countries. On the other hand, the CASA study has certain variables, such as immigration and investment, that are not present in Abolfathi's analysis. Also, the Abolfathi study includes all nations whereas CASA excluded Communist countries.

The result of a principal component factor analysis with varimax orthogonal rotation in Abolfathi's study showed great resemblance to the result obtained by the CASA study. That is, it was found that the major "dimensions" of the structure (in terms of the percentage of total variance explained) are military and commercial ties. In addition, in the case of the CASA study, a "U.S. trade penetration" and several mixed factors were found; but these factors did not explain much of the total variance.

In addition to analyzing U.S. ties, Abolfathi analyzed the Soviet ties with other countries. Interestingly, the factor structure that emerged for the Soviet analysis is essentially the same as that found for the United States, that is, a structure largely dominated by military and commercial ties. This finding supports the assertion of some analysts that the structural patterns of ties, interests, or presence of the two superpowers with other countries are very similar. In both cases military ties seem to be very strong but their relative strength is difficult to determine due to the presence of extreme multicollinearity among the indicators of military ties.

¹ Abolfathi's data generally covered the period about 1969-1971 and consisted largely of annual aggregates.

Conclusions. Methodological and conceptual problems do not allow many definitive conclusions based on the empirical findings. The following points, however, can be made with confidence:

- The indicators of the U.S. (or Soviet) military interests tend to group empirically into a few sets that have theoretically meaningful structures.
- Among these clusters, military and commercial clusters (or dimensions) seem to be the most stable.

One implication of these findings is that there are independent dimensions to the U.S. presence (influence or stake) in other countries which differ from the purely military presence. Furthermore, at least two of these, the commercial and military dimensions, are very strong. This implies that U.S. interests in other countries can to some degree be separated into military and non-military issue areas. At the beginning of this chapter, however, we argued that the U.S. military posture abroad is determined by both military and non-military relationships of the United States with other nations. The complexity of situational factors makes it impossible to analyze the interrelationships of these linkages of military posture in a cross-sectional analysis. In the Final Report, therefore, we shall present these linkages for the specific cases of Japan and Saudi Arabia. Such a case-specific approach should enable us to represent the impact of situational factors (such as goals and environmental variables) with far greater accuracy.

REFERENCES

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V. MEASURING THE EFFECTS OF U.S. ECONOMIC POLICIES

Measuring the impact of U.S. international economic policies on foreign governments is an important part of the overall research effort. The basic presumption of the study is that foreign governments react to the expected and actual impacts of U.S. policy positions on the economies of their countries. Because the precise process by which foreign governments evaluate different types of economic impacts is not known, it is most important that the particular economic model chosen for the study be capable of representing a variety of economic conditions. As an example, a model capable of distinguishing the effects of a U.S. tariff on traded versus non-traded goods might be very misleading if total employment were the concern of the foreign government. And of course the reverse situation would be equally unfortunate. The additional requirement the study imposes on model selection is that of empirical implementation. This chapter discusses the particular model chosen for the study in light of these two criteria.

As will become evident, the model chosen is not an international trade model in the sense economists apply the term. It is a model that draws upon international trade theory to identify structures within a given economy. Therefore, the model per se is more aptly described as a model of the domestic economy. It is a hybrid model in another sense also. At times, the niceties of theoretical elegance have been sacrificed for empirical implementation, not necessarily for ease of implementation but rather to permit it.

The discussion that follows is divided into three major parts. The first part considers the relation of international trade theory to the current study within a heuristic discussion of the economic view of trade. The second part provides a review of the basic model structures that have been employed in the analysis of international trade and concludes by evaluating

the potential contribution of each structural type to the current study. Finally, a reasonably detailed statement of the model selected is provided.

ECONOMIC THEORY AND INTERNATIONAL TRADE

Students of economics have long sought to provide an explanation of international trade. As the range of questions that an "acceptable" trade theory "should" be able to answer has increased, so has the complexity of the formal statement of the theory. This review of the conceptual problems that have stimulated most, if not all, analyses of international trade is intended to provide an intuitive understanding of the conceptualizations of economics, not an itemized discussion of particular theories. Such a review is useful because the specific questions, and the sophisticated theoretic models necessary to resolve them, have all derived from attempts to answer one question: "To what extent should a country participate in international trade?"

Autarky or Trade

In its simplest form, the question of participation in trade was viewed as an either/or proposition. Trade either was to be allowed or it was not. The first proposed answers to the policy question favored participation in trade, and additionally, favored free trade. The "analytic device" buttressing the answer came essentially from Adam Smith. The argument is easily stated in two parts. (1) Total output in the economy is increased as the division of labor is extended. If the division of labor is spatially extended across national boundaries, then total world production can be increased. Hence, nations should participate in trade. (2) The beneficial effects of unfettered market forces, Smith's "invisible hand," could best be realized if governments removed themselves from trade. Hence, free trade should become governmental policy.

It is important to reemphasize the two points of the argument. First, trade allows increased world production. In modern parlance, potential

real income for the world can be increased through trade. Second, free trade is to be preferred to restricted trade because the unfettered operation of market forces will result in the "most beneficial" distribution of the additional production. Actually, another argument in favor of free trade was also present. Governmental interference in trade would frustrate the potential division of labor and limit the potential gain in world production. The conclusion was that free trade is the preferred policy to maximize world production and to achieve the most beneficial distribution of the fruits of increased production.

Attacks on the free trade policy were numerous. Selecting any one as the most important is difficult. It is not difficult, however, to select the most influential for economic analysis of trade questions. While the argument itself is seldom discussed except in very abstract terms, the counter argument has become famous in its own right and survives today as one plausible explanation of international trade. The Ricardian theory of comparative advantage is a masterful, abstract construction. In essence, Ricardo was able to show that a country would benefit from trade even if it were the most efficient producer of every commodity in the world. The argument he answered was of the form: "Why should a country purchase a commodity from abroad when that commodity can be more cheaply produced at home?" In effect, the argument constituted an attack on two fronts. First, it contained a general questioning of whether trade can increase world production; and second, it questioned whether or not free trade would benefit every country.

Ricardo's answer to the challenge was first to suppose world production conditions cannot be increased by trade alone. If he could show that the benefits of trade did not depend upon increased world production capabilities, then the trade argument would be reinforced if in fact production capabilities could be so increased. The Ricardian emphasis on relative costs of production compared across countries was sufficient for the argument. In a simple, two-country and two-commodity world, each country can benefit by trade compared to the autarkic situation -- benefit in the sense that both countries can have more of both commodities. Further, each country must benefit from trade or it will not trade.

Trade or Free Trade -- Verse One

The implications of Ricardo's analysis for economic theorists were profound. Note that the two parts of the earlier arguments over trade had been separated. "Whether to trade?" was answered. The question to be resolved concerned free versus fettered trade. For the purposes of this exposition the detailed argument, replete with assumptions and conditions, in favor of free trade is unnecessary. Yet it is important to capture the spirit or tenor of the reasoning; hence a paraphrase is provided. Having established the argument that trade could benefit every country, economists had also discovered the logical possibility that trade could harm any given country. The problem, then, is to insure that participation in trade results in benefit, not harm. Because the presumptions of market analysis insure that each person participating in the market is never made worse off for his participation, the "natural" recommendation was for government not to attempt any centralized decision-making effort concerning trade. Each individual could determine for himself whether he benefitted from purchasing foreign compared to domestically produced goods and whether he could benefit from selling the product of his efforts in foreign compared to domestic markets. If governments were to intervene in markets, be they domestic or international, then government would be interfering with the decisions of individuals. Since individual market decisions provide protection from "harm through trade," government might well induce conditions leading to a harmful trading pattern. Hence the conclusion, free trade is preferable to no trade and to limited or fettered trade.

Trade or Free Trade -- Verse Two

The argument that free trade provided protection from harmful trade implied that a country would never be worse off than it would be under autarky. The analysis did admit that "never be worse off" could take a variety of forms. Consider a country that does not trade and has a known level of economic welfare. If that country now participates in trade, the protection provided by a free trade policy does not insure that the country

will attain a higher level of economic welfare than before. Further, there is no presumption that the failure to attain a higher welfare level implies the country will cease trading. In fact, the presumption in this case is that the country is indifferent between trading and autarky. As trade has been introduced and currently exists, trade will continue even though the country realizes no benefits.

The Ricardian theory had conclusively demonstrated that "benefits" are created from trade. If, for conceptual purposes, one considers a two-country world in which one of the countries has realized no trade benefits, then the other must have "captured" all the benefits. The policy question may be stated in any number of ways but the simplest is: "What policy may the government follow to ensure that the country captures the largest portion (including possibly all) of the benefit created by trade?" The response of economic theory followed a line of reasoning much like that discussed earlier. It concluded that a country could not improve upon the distribution of trade benefits that would result from a policy of free trade. It was thought that the argument had been conclusively settled. Free trade had been shown, this time definitively, to be superior to a policy of restricted trade.

Trade or Free Trade -- Verse Three

Depending upon the source one reads, the economics profession was guilty either of a cover-up or an oversight because the argument that no policy could improve upon the welfare position of free trade contained a logical flaw. It is indeed possible to follow a policy other than free trade and improve economic welfare. A heuristic explanation of the possibility that a country can "do better" than the free trade situation is not difficult to grasp. Loosely stated, the free trade argument overlooked the possibility that a country may be able to exert something like "monopoly influence" in its international economic relations. More accurately, if a

country can alter the terms of trade¹ in its favor, then it can improve upon the free trade situation. To insure that the allusion to "monopoly" is not misleading it must be added that actual monopoly is not required. It is only necessary that the country not be small compared to world markets. Neither is attention restricted to world markets for a country's exports as leverage may be gained in import commodity markets as well.

The particular policy instrument that can be employed to influence the terms of trade depends in part on the conditions established for the analytic investigation. Generally, the classic commercial policy instrument, the tariff, is chosen as an example. The attention devoted to tariffs is not as limiting as it might seem. If results may be derived for tariffs and other policy instruments can be shown to be formally equivalent to tariffs, then there is no loss of generality. Lerner's famous demonstration (1936) of the symmetry between tariffs and export taxes -- for every export tax, there is a tariff which will create exactly the same position in production, consumption, and the terms of trade -- is one equivalence investigation. Bhagwati's work on quotas (1965) is another. The latter work also shows that computing the equivalent tariff may well be an arduous task.

The ability of one country to increase its economic welfare is not without limits. Raising (or imposing) a tariff on imports can raise welfare, but it is possible to go too far. In other words, there is an optimum tariff rate that maximizes welfare. Deviations in either direction from the optimum rate reduce the country's welfare below the maximum attainable. And, imposing a high tariff rate (beyond the optimum) may reduce welfare below the free trade level. In the extreme, a sufficiently high tariff rate can be prohibitive to trade, returning the country to autarky and the associated welfare level. Additionally, the imposition of a tariff

¹ "Terms of trade" refers to the price of exports relative to the price of imports. An improvement in the terms of trade would mean an increase in the relative price of exports (or, equivalently, a decrease in the relative price of imports).

on imports carries with it no guarantee against retaliation. With retaliation, the country may well be at a lower welfare level than if a free trade policy had been followed (Johnson, 1953-4).

The "final" argument in favor of free trade changes the focus of the analysis. If world welfare, rather than the welfare of one country, is used as the reference criterion, free trade is the preferred policy. The introduction of a tariff by a country able to influence its terms of trade does not just redistribute the benefits of trade away from its trading partner(s) toward itself. Total benefits accruing to the world are reduced. Put another way, tariffs are an inefficient device to redistribute world income. Two factors contribute to the reduction in world welfare resulting from a tariff. The world's production levels are reduced so that a smaller bundle of commodities is generated. And given the smaller bundle of commodities available, the tariff-induced distribution of the commodities between countries does not maximize the welfare of either country (assuming, for convenience, only two countries). There is at least one other distribution that would be preferred by both countries to the tariff-induced distribution. This distribution would allow the "losing" country (losing because the other has employed a tariff) to increase its welfare while simultaneously bribing the "winning" country such that both countries are better off. The combination of both production and distribution effects of tariff-ridden trade is the basis for the current argument favoring the policy of free trade.

Even though the world policy argument favors free trade, there are some serious questions concerning the analysis of situations involving at least one preexisting trade distortion (e.g., a tariff). The general theory of second-best does not allow any broad statements to the effect that the introduction of an additional trade-distorting policy will reduce welfare. The force of the argument is generally directed toward efforts to reduce impediments to trade. Removing any one impediment does not guarantee that either world welfare or the welfare of any given country will increase. Efforts to reduce all obstacles to trade, such as the "Kennedy round"

negotiations, are defended by the plausible (if not analytically rigorous) argument that the closer the world is to free trade, the better off are all countries, and the closer to free trade, the more likely is free trade to be actually achieved.

Trade and Domestic Issues

In addition to the treatment of a trading economy taken as a whole, it is possible to examine the distribution of trade benefits within the economy. (Historically, the within and between country questions were pursued simultaneously.) For analytical purposes, the interrelation of trade and the domestic economy may be presented in two parts. One part concerns the identification of economic interest groups who gain from or are harmed by trade. The second part represents the study of the differential impact on domestic economic groups as the country deviates from a policy of free trade.

At a very simple level, the identification of economic interest groups who benefit from trade may be accomplished by dividing trade into its component activities, importing and exporting. A country will import commodities if foreign-produced goods are cheaper than similar products produced domestically. (The special case in which a given product cannot be produced domestically may be treated by presuming the price of the non-existent domestic product to be indefinitely high.) Given a level of money income, persons within the economy will achieve a higher consumption level, in real terms, by being able to buy imports. Acting as producers, persons in the economy will export if higher prices will be paid by foreign consumers than by domestic consumers of their product. This basic identification of consuming-importing and producing-exporting interests remains valid throughout the literature of trade analysis.

Nevertheless, two additional points destroy the neatness of the argument. First, consider the domestic consumers of the export product. Prior to

or in the absence of trade, the domestic price of the product is lower than the price with trade. In truth, what was being consumed at home is now being shipped abroad. The analytic problem is to compare the two consumption effects of trade: a lower price for imported products, implying increased real income; and a higher price for exported products, implying decreased real income.

Next, consider the producers of the product competing with imports. Imports are selling at a price lower than the price of their products. Simply put, import-competing producers are losing income. The analytic problem is again a comparison -- which is the stronger effect, the income lost to imports or the income gained by export producers? The answer to these questions is contained within the answer to the general trade question. The sum of consumption and production effects of trade is favorable. In general, it is not possible to state categorically that either effect, considered separately, represents a net benefit or a net cost to the economy. Particular conditions may be specified to insure that the effects of either are zero. Similarly, it is possible to create situations in which the "benefits from importing" exactly offset the "costs of exporting." The interesting feature of such a situation is that although the "economy" achieves the same level of economic welfare, the impact is not uniform across members of the economy.

Particular features of the non-uniform effects of trade are frequently examined by considering the effects within the country of an autonomous change in the terms of trade. The analysis of the effects of a tariff uses substantially the same analytic model, adding only the assumption that the government redistributes the tariff proceeds to the members of the economy.² Beginning from a free trade position, suppose a tariff is

² Another possible assumption is that the government uses the proceeds to purchase commodities directly. Although this does introduce a complication that can be tedious to resolve, there is no significant "surprise" introduced by the complication.

introduced. In the standard case, the domestic price of imports rises.³ Producers of import-competing products will experience an increased demand for their products, and will reap the benefits of that increase, including sales and profits. Also, the same producers will be able to pay higher prices for the inputs needed in their production processes. In particular, workers associated with import-competing industries will benefit from the "protection" afforded by the tariff. Within the context of the Heckscher-Ohlin trade theory,⁴ Stolper and Samuelson (1941) were able to demonstrate that if labor is used intensively in the production of the import-competing product, the real wage paid to all workers will rise. However, the Stolper-Samuelson theorem requires an elaborate specification of economic conditions within the country. To determine the importance of this set of conditions, theorists have examined the implications of relaxing any one of the set of assumptions. The most important general result, for this project, is that even though trade-distorting devices (policy tools) do redistribute income within the country, and as such can be used by governments to "help" interest groups, the same degree of help can be provided by domestic policy instruments (sometimes a combination is necessary) at less cost to other members of the economy. This generalization is an example of the problems induced by the theory of second best. One market distortion, a tariff, is not as good in a welfare sense as two distortions, a tax and a subsidy.

Implications of the Review for the Study

This brief discussion was designed to illustrate a few of the important economic conceptualizations pertinent to the study. As we are concerned with measuring the nature and magnitude of the impact of U.S. international economic policies on foreign economies, it is possible to employ the

³ The implication of the "standard" case is a non-trivial requirement. The possibility of a reduced domestic price of imports following the imposition of a tariff was first explored by Metzler (1949). For a discussion of conditions which make the Metzler paradox less likely, see Jones (1974).

⁴ See discussion of the Heckscher-Ohlin theory in a subsequent section of this chapter.

general theoretical results to guide the measurement. Distortions to free trade will generally reduce the level of economic welfare in the foreign country. The distribution of the welfare loss, however, cannot be assumed to be uniform within the country. In order to assess the impacts on particular interest groups, those groups must be separately identified.

There are also implications for the manner in which foreign countries respond to U.S. economic policy. The most important suggestion is that there is no requirement for the foreign government to limit the consideration of economic responses to international economic policies. It can easily be the case that the welfare of the country and of each interest group can be better "protected" from the impacts of U.S. international economic policies by domestic economic responses rather than international ones.

ALTERNATIVE INTERNATIONAL ECONOMIC MODELS

The available models treating international economic phenomena may be divided into two types. The two model types represent two different but complementary analytic approaches. The convenient, extant labels for the two approaches are microeconomic and macroeconomic analysis. The review in the first section of this chapter treated the microeconomic approach to trade and to the evaluation of gains and losses from trade.

Macroeconomic analysis, largely Keynesian in approach, is concerned not so much with the detail of trade but instead with the manner in which trade affects the level of economic activity within the economy. The analysis dispenses with all notions of identifiable product types in order to concentrate (in simpler versions) on the motives for product purchases according to final use. The economy is imagined to produce one commodity (or a bundle of commodities) which can be used for consumption, investment, public sector, or export purposes. The tremendous advantage of the Keynesian conceptualization is the ability to treat effectively

situations involving unemployment. The popularized economic policy problem, demand management, is the problem, within a Keynesian conception, of maintaining that level of aggregate demand just sufficient to maintain full employment. The usual tools available to the policy authorities are fiscal policy (public sector purchases and taxation) and monetary policy. The introduction of trade presents another problem for the policy authorities -- the achievement of balance of payments equilibrium. The joint problems, internal and external balance, are then addressed to determine which policy tool can be used most effectively to treat which problem. Additional policy instruments, such as tariffs, border tax adjustment schemes, exchange rates and quotas, can be introduced into the analysis. However, because product types are not identified, these tools apply to all imports or all exports uniformly. Effectively, the analysis maintains only the identification of import-consumer and export-producer interests vis-a-vis trade. The richness of the microeconomic analysis is lost by aggregating across product types.

Micro-Macro and Aggregation

The traditional explanation that macroeconomic analysis treats "aggregates" in the economy while microeconomic analysis does not is somewhat misleading. The tendency is to assume that "macro" simply avoids the tedious detail of microeconomic theory by "aggregating" the microanalytic subsystems of the economy. Differentiation of the two analytic schemes requires a more complex argument. Within the context of international economics, a microeconomic analysis is one that examines a trading economy by specifying the particular commodities produced and traded by the economy. Presumably, micro-techniques are chosen to study those features of an economy that can be treated only by identifying commodity classes. The macro-analytic strategy is differentiated from the micro strategy not so much by the level of aggregation as by the type of abstraction involved. Both schemes can result in highly aggregated models, but the rules of aggregation are quite different.

For example, consider an economy consisting of three basic types of industries: import-competing industries, export industries, and industries that do not produce internationally traded goods. An analysis that attempts to explain why any given industry is an export rather than an import-competing industry employs a microeconomic model. Another microeconomic issue would be the differential effects within and across the industry groups in response to changing conditions in the international economy. However, if there is reason to believe that changes within the industry groups are likely to be less important than shifts between the first two, jointly considered, and the last, then a macroeconomic strategy is useful. By lumping together the first two types, preserving only the distinction between the "foreign sector" and non-traded goods, the analytic focus is shifted to identifiable uses of the goods produced by the economy. Commonly identified uses are consumption, investment, public sector purchases, imports and exports, that is, the familiar "aggregates" of macroeconomic theory.

Microeconomic Trade Models

As previously argued, micro-analytic techniques are appropriate for explaining the commodity composition of a country's trade. The most exhaustively analyzed theory purporting to explain the pattern of trade, the Heckscher-Ohlin theory, is a highly aggregated, microeconomic theory. The basic model employed in the Heckscher-Ohlin thesis⁵ is also used to prove formally propositions concerning the benefits deriving from trade; it is the model type to be discussed.

The Heckscher-Ohlin Theory. The easiest description of the theory is accomplished by restricting attention to a very stylized world made up of only two countries, two commodities, and two non-produced factors of production. The theory argues that a country's export commodity is that

⁵ The basic work is by Ohlin (1933). Bhagwati (1964) provides a convenient survey of more recent contributions. Chacholiades (1973) has written a systematic introduction to the modern pure theory of international trade.

commodity whose production uses intensively (compared to the other commodity) the country's relatively abundant (compared to the other country) factor. A somewhat technical set of sufficient conditions for the theorem are: complete international immobility of the factors of production, free trade, no transport costs, perfect markets, identical production functions for any one commodity across countries, linearly homogeneous production functions exhibiting diminishing marginal productivity, no factor intensity reversals, and identical consumption preferences across countries.

The conditions required for the theory are stringent. Further, the empirical implementation of the model is currently impossible. What has been done is to conduct two types of tests of the model. One of these tests is primarily theoretic. By relaxing the assumptions of the model and the simple two-of-everything world, the "robustness" of the theory has been investigated. The idea is to determine whether the conclusions of the model are "destroyed," modified, or left unchanged under different conditions. Paralleling the theoretic analysis, empirical research has sought to determine whether the crucial assumptions of the model do hold in reality.

A second test of the model attempts to assess empirically the validity of the theory rather than its assumptions. The major investigation of this sort (Leontief, 1956, 1953) suggested that the Heckscher-Ohlin theorem does not forecast the commodity structure of U.S. exports. The theory has, however, adequately accounted for the commodity structure of other countries' trade. Continuing empirical investigations have produced the important conclusion that "it is necessary to discard simple, single-factor (e.g., capital per worker) trade theories in favor of multi-factor trade models" (Baldwin, 1971).

Investigations of the Heckscher-Ohlin theory provide several important implications for the assessment of the impact of international economic policies. First, because the simple form of the model has not held up

well under empirical analysis, the model adopted in this project must identify multiple inputs to production processes. Second, because the complete structure of the theory requires an extremely detailed empirical specification, the adopted model should be designed to "skip over" the requirements of the theory, logically stated, yet capture "enough" of the structure to guide testing of estimated versions. Third, to the extent possible, the adopted model should not preclude a structure consistent with alternative trade theories. And finally, the most fruitful approach to selecting a model might well be one that takes the commodity structure of trade as given and seeks to explain only changes in trade.

Macroeconomic Trade Models

Macroeconomic analysis of international economic questions abstracts from considerations of the commodity structure of trade. The focus is directed toward the influence of trade on the level of economic activity and the influence of the level of economic activity on trade. Although macroeconomic models are traditionally employed to investigate a rather broad set of questions, the common feature of the issues is an explicit policy orientation. It is assumed that the basic goals of economic policy-makers are full employment, stable prices, and avoidance of "problems" with the balance of payments. The policy tools generally used to achieve these goals are monetary policy, fiscal policy, and policies directly affecting the external sector of the economy. This last group includes exchange rate programs, tariffs, quotas, tax adjustments occurring at the country's borders, and so forth.

While it would seem to be the case that macro-models are able to capture directly the issues being studied here -- international economic policies -- there are substantial limitations. First, the most readily analyzed macroeconomic models abstract from prices. The models require substantial modifications to include prices, modifications that require conditions reminiscent of micro-models to be theoretically complete. Even when these modifications are introduced, the range of prices that can be

examined is limited. Specifically, the models identify only one price, a price level, representing all commodities.⁶ Price levels in different countries can be treated, but prices for different commodities cannot. The implication for international considerations is severe. Rarely are tariffs applied uniformly to all imports; yet that is the only case a macro-model can consider.

Additional limitations can be listed, but the essence of all such issues has been stated -- particular commodities are not identified. In some respects, "limitations" is not an entirely appropriate characterization. Macro-theory was not developed to answer commodity-specific questions. The contribution of macro-theory is the ability to explain the general pattern of economic phenomena. The forte of macro-modeling related to international issues concerns the interdependence of trading economies. The "aggregated" approach dramatically illustrates the influences of "domestic" economic policy on international economic forces and the influence of those forces on other economies. (And, of course, macro-models do not in general utilize the assumption of full employment found in most microeconomic treatments.)

THE ADOPTED MODEL -- A HYBRID

The particular model discussed below is an attempt to bridge the gap between micro and macro approaches to the discussion of trade. The model does identify types of products in the microeconomic sense. In addition, it captures the macroeconomic identification of types of demand for products in general. The model is adequately described as mixed Leontief-Keynesian. The fundamental departure from the usual Leontief, or input-output, framework is the adoption of Klein's (1952-53) interpretation of the constancy of intermediate input requirements. The development of models exhibiting the chosen features owes a great deal to M. Saito (1971).

⁶ See Morley (1971) for an introductory statement of the theory in this form.

Interindustry Analysis -- The Point of Departure

The theoretical construction which provides the basis for the model is the input-output analysis developed by Leontief (1951). In many respects, the contribution of input-output analysis to the understanding of economic phenomena may be summarized by saying the technique emphasizes the simultaneity of production requirements. The representation of the interrelations of production within an economy is dramatically conveyed by an input-output table. However, the theoretic requirements necessary for the construction of an input-output table are quite stringent.

The Input-Output Conceptualization. The fundamental contribution of Leontief is twofold -- at once providing a unique view of economic processes and developing the empirical realization of that view. The conceptualization is best described using illustrations. Imagine that a product requires two additional products as inputs in its production. To provide an identification system, call these three products A, B, and C. Further suppose that to produce B, inputs of A and C are necessary. Leontief's contribution was the recognition that A is indirectly required to produce itself. Similarly, the amount of C necessary to produce A includes the C used directly to produce A and the C used to produce B, which in turn is used to produce A. The verbal tracing of the complete requirements to produce A is tedious (and conceptually, never ending). Leontief proposed and proved that the analysis can be accomplished without reference to indirect input requirements. The statement of the conceptualization is quite simple and requires only that direct input requirements be known.

Let the commodities produced by the economy be of an arbitrary number, say n . Arrange the commodities, measured as quantities of each commodity, in a vector denoted $\underline{x}$. Because each commodity can be directly used in the production of any other commodity, let a_{ij} represent the amount of the i^{th} commodity directly needed to produce one unit of the j^{th} commodity. The collection of a_{ij} 's for the entire economy is called the set of direct

input coefficients. Place these coefficients in a matrix, denoted A , such that the subscript "i" (the first) identifies a row of the matrix and "j" represents the column. With this preparation, the basic question can be addressed: How much of each commodity must be produced to realize a desired net output, net of all direct and indirect input requirements?

The answer to the question is easily derived. Consider the product Ax . The result is a statement of the total amount of each of the goods used directly to produce themselves and all other goods. Let x be the total amounts produced, the answer to the question. The quantities $x - Ax$ are the amounts "left over" after meeting all input requirements. Then calling the "net outputs" c , the following equation holds:

$$x - Ax = c$$

Straightforward operations in matrix algebra produce:

$$(I - A)x = c$$

$$x = (I - A)^{-1} (I - A)x = (I - A)^{-1} c$$

The elements of the matrix $(I - A)^{-1}$ are the total direct and indirect input requirements for the entire economy. Two further points should be noted: there is no theoretic requirement that the a_{ij} 's be constant -- substitution of inputs in response to changing relative prices is allowed -- and the a_{ij} 's are expressed in quantity terms.

Empirical Input-Output Considerations. The last-mentioned point is the deviling aspect of empirical implementation of input-output analysis. Measurement of the value of inputs purchased by one industry from another is difficult, but trivial, compared to the measurement of quantities of inputs purchased. The second part of Leontief's contribution was the resolution of this empirical problem. If the direct input requirements in quantity terms are assumed to be constant then, then each a_{ij} may be measured as the ratio of the value of purchases by the j^{th} industry from the i^{th} industry to the value of total production of the j^{th} industry.

The assumption of stable, or constant, direct input coefficients, expressed in quantity terms, does provide the necessary step for empirical estimation, but not without drawbacks. Having constructed an A matrix, it may be used to trace the repercussions throughout the economy of a change in any one price provided all quantities are held constant. Similarly, a drop in the total output of one industry can be traced through the entire economy to determine the total output loss provided all prices are held constant. In neither case can the joint assessment of quantity and price changes be accomplished. A sequential analysis -- first price and then quantity -- is frustrated because each step in the sequence requires the original position as a starting point.

Most applications of input-output analysis have accepted the assumption of fixed production coefficients. Some comfort has been provided by the Samuelson non-substitution theorem (1951) which identifies a theoretical explanation for no substitution in the general Leontief model (with one primary input) even if it were possible.

The Klein Contribution. The previously mentioned contribution of Klein relates directly to the issue of substitution, the joint price-quantity problem. To enable its application, Leontief had expressed the input-output model in value terms after assuming no physical substitution possibilities. Samuelson provided a theoretic condition, peculiar to the input-output model, which transformed Leontief's assumption to a conclusion. Klein followed a drastically different strategy. Rather than emphasize quantities of inputs, he examined the value of input purchases. The goal was to show how the ratios of input values to output values could remain constant while the input coefficients in quantity terms are free to change in response to changes in relative prices induced by changes in final demand. Production functions of the Cobb-Douglas form are sufficient but not necessary conditions for the desired result.

The Adopted Model - A Brief Statement

The model treats simultaneous changes in prices and quantities within a general equilibrium framework. The major equation systems of the model are presented and, where appropriate, are accompanied by a brief discussion.

Production. Each industry may be viewed as the prime unit of analysis. Alternatively, each industry may be assumed to be composed of identical firms such that competitive activity is maintained within the industry. In either case, each industry's production function displays the multiple input, Cobb-Douglas form:

$$\ln X_j = \ln A_j + \gamma_j t + \sum_{i=1}^n \alpha_{ij} \ln X_{ij} + \epsilon_j \ln Z_j + \lambda_j \ln L_j + \theta_j \ln K_j,$$

where:

X_j = units of output of the j^{th} industry ($j=1,2,\dots,n$),

A_j = an efficiency parameter,

γ_j = neutral technical change,

t = time,

α_{ij} = partial output elasticity for the i^{th} input ($i=1,2,\dots,n$),

X_{ij} = quantity of the i^{th} good used to produce the j^{th} good,

$\epsilon_j, \lambda_j, \theta_j$ = partial output elasticities of imported inputs, labor, and capital respectively,

Z_j = non-competitive imported inputs,

L_j = labor input,

K_j = capital stock of the j^{th} industry, and

$\ln$ = the natural logarithm.

The most convenient assumption concerning returns to scale,⁷ constant returns to scale, will be adopted for this exposition. Empirical implementation of the model can either maintain the assumption or posit a particular value (magnitude) for increasing or decreasing returns for each particular industry. Existing econometric investigations will be the source of industry-specific information of this sort. Assuming constant returns to scale with respect to the inputs X_{ij} , Z_j , L_j , and K_j :

$$1 = \sum_{i=1}^n \alpha_{ij} + \epsilon_j + \lambda_j + \theta_j^8$$

By focusing the model on the Marshallian short period, profits for each industry are given by total revenues less indirect taxes and the sum of payments to inputs other than capital. First-order conditions for profit maximization follow directly by equating the partial derivatives of the profit function to zero. Profits are written:

$$\pi_j = P_j(1-t_j)X_j - \sum_{i=1}^n P_i X_{ij} - P_j^Z Z_j - w_j L_j \quad (j=1,2,\dots,n),$$

where:

π_j = profits for the j^{th} industry,

P_j = price of the j^{th} product,

P_j^Z = price of non-competitive imports used in the j^{th} industry,

w_j = wage rate in the j^{th} industry,

t_j = rate of indirect taxation in the j^{th} industry.

⁷ The concept refers to a proportionality relation between output and inputs. If the quantities of all inputs are increased in the same proportion, say doubled, and output also increases in the same proportion, then returns to scale are constant. Should output expand more (less) than proportionately, production displays increasing (decreasing) returns to scale.

⁸ Implementing another specification concerning returns to scale leaves unaltered the terms on the right-hand side of the equation. Econometric estimates of the scale factor replace 1 as the constant on the left.

The first order conditions for the profit maximization problem are:

$$\alpha_{ij} = (P_i X_{ij}) / P_j (1-t_j) X_j \quad (i, j=1, 2, \dots, n),$$

$$\lambda_j = (w_j L_j) / P_j (1-t_j) X_j \quad (j=1, 2, \dots, n),$$

$$\epsilon_j = (P_j^Z Z_j) / P_j (1-t_j) X_j \quad (j=1, 2, \dots, n).$$

Using the production functions, profit functions and first order conditions, output supply functions and input demand functions may be written as explicit functions of prices and wages.

$$\begin{aligned} \ln X_j = & Q_j - D_j - \ln(1-t_j) - (1/\theta_j)(\theta_j-1)\ln\delta_j - (\epsilon_j/\theta_j)\ln\delta_j^Z - (\lambda_j/\theta_j)\ln\omega_j \\ & + \ln K_j \quad (j=1, 2, \dots, n), \end{aligned}$$

$$\begin{aligned} \ln X_{ij} = & Q_j - D_j + \ln\alpha_{ij} + (1/\theta_j)\ln\delta_j - \ln\delta_i - (\epsilon_j/\theta_j)\ln\delta_j^Z - (\lambda_j/\theta_j)\ln\omega_j \\ & + \ln K_j \quad (i, j=1, 2, \dots, n), \end{aligned}$$

$$\begin{aligned} \ln Z_j = & Q_j - D_j + \ln\epsilon_j + (1/\theta_j)\ln\delta_j - (\lambda_j/\theta_j)\ln\omega_j - (1 + \epsilon_j/\theta_j)\ln\delta_j^Z \\ & + \ln K_j \quad (j=1, 2, \dots, n), \end{aligned}$$

$$\begin{aligned} \ln L_j = & Q_j - D_j + \ln\lambda_j + (1/\theta_j)\ln\delta_j - (\epsilon_j/\theta_j)\ln\delta_j^Z - (1 + \lambda_j/\theta_j)\ln\omega_j \\ & + \ln K_j \quad (j=1, 2, \dots, n), \end{aligned}$$

$$\begin{aligned} \ln \pi_j = & Q_j - D_j + \ln\theta_j + \ln\omega + (1/\theta_j)\ln\delta_j - (\epsilon_j/\theta_j)\ln\delta_j^Z - (\lambda_j/\theta_j)\ln\omega_j \\ & + \ln K_j \quad (j=1, 2, \dots, n), \end{aligned}$$

where:

$$\begin{aligned} Q_j = & (1/\theta_j) \left[\ln\Lambda_j + \gamma_j t + \ln(1-t_j) + \epsilon_j \ln\epsilon_j + \lambda_j \ln\lambda_j \right. \\ & \left. + \sum_{i=1}^n \alpha_{ij} \ln\alpha_{ij} \right] \quad (j=1, 2, \dots, n), \end{aligned}$$

$$D_j = \sum_{i=1}^n (\alpha_{ij}/\theta_j) \ln \delta_i,$$

$$\delta_j = P_j/\omega,$$

$$\delta_1 = P_1/\omega,$$

$$\delta_1^Z = P_1^Z/\omega,$$

$$\omega_j = w_j/\omega,$$

and ω is the economy-wide average wage.

The empirical estimation of the parameters of the production functions is fairly straightforward. The α_{ij} 's are the direct input coefficients of an input-output table. The data concerning value added that accompany the input-output material require only arithmetic manipulation to represent the λ_j 's, t_j 's, and ϵ_j 's. The returns to scale equations are then used to derive the θ_j 's. This comparatively easy empirical implementation is the benefit provided by Klein's suggested interpretation of input-output analysis. Were the suggestion not adopted, a full parameter set for each industry would require estimation from original data.⁹ The difficulty of the task has forced such estimation attempts, even the more sophisticated (Berndt, 1972), to consider at most three production inputs.¹⁰

Consumption. The consumers' problem is treated in two stages. First, the total expenditure for consumption purposes is determined by real income and the previous period's consumption expenditure. Then, expenditures on each good are determined by relative prices and the previously identified expenditure level. Population is introduced in order to approximate the problem of the individual consumer by using per capita forms of the variables. The consumer price index, rather than the implicit GNP deflator, is chosen to create real variables. An exponential form of the consumption function is specified in order to estimate directly

⁹ See Grimm (1969) for an attempt to estimate parameters for manufacturing industries in the United States.

¹⁰ Recall the earlier evaluation by Baldwin (1971) of trade-related models not identifying multiple inputs.

the elasticities of the consumption variables. The form of the total expenditure relation is:

$$\ln(C/N) = \ln E + \beta \ln(Y/NP) + \phi \ln(C/N)_{-1},$$

where:

C = consumption expenditures (in constant prices),

Y = disposable income (in current prices),

P = consumer price index,

N = population,

and the subscript indicates a one-period lag. Using total consumption expenditures as an independent variable, expenditures on particular goods are given by:

$$\ln(C_r/N) = \ln E_r + \beta_r \ln(C/N) + \phi_r \ln(P_r/P),$$

where the subscript $r=1,2,\dots,R$, identifies particular goods. Substituting the previous equation into the one immediately above yields one equation for each of the consumer goods in the model.

As it is rarely the case that the commodity classification for consumer expenditures conforms to the input-output commodity classification, a "mapping matrix" relating the two classifications is necessary. A formal statement of the general process used to accomplish the integration is omitted as little is gained by writing out the equation set. The empirical problem, while tedious, requires little more than the construction of a concordance.

The estimation of the parameters of the set of consumption equations is essentially a regression problem. Probably, ordinary least squares will provide adequate estimates. However, "seemingly unrelated estimation" will also be performed as will available data-pooling techniques to exploit time series and cross section information.

Imports. The demand for imports depends upon previous-period imports and the price of imports relative to domestic goods. Admittedly, specifying a one-period lag and introducing the dependent variable as an independent variable creates estimation bias. Conceptually, however, the lagged term represents the adjustment delay necessary to realize the previous period's import decision. Additionally, the lag compensates for familiar inaccuracies in the data, imports occurring in one period but reported in the next period's figures. Finally, imports relative to domestic production are the preferred forms for the equations:

$$(M_j/X_j) = a_0 + a_1(M_j/X_j)_{-1} + a_2(\delta_j^m/\delta_j) \quad (j=1,2,\dots,n),$$

where M_j represents imports of the j^{th} good (industry type).

The import equations may be augmented to include monetary influences on the balance of payments; the ratio of foreign exchange reserves to the value of total imports can be another independent variable. While a term of this sort "captures" monetary influence, monetary policy (and changes in policy) can only be added by changing the parameter values appropriate to the term. Changes in the variable only adjust the "intensity" of the policy.

Labor Market. The labor market specification is a Phillips curve relation between changes in prices and changes in wages, conditioned by the level of unemployment.

$$\Delta w/w_{-1} = b_0 + b_1(\Delta P/P_{-1}) + b_2\left(\sum_{j=1}^n L_j/L\right)$$

L represents the labor force and " Δ " denotes changes.

Wage differentials are not explicitly incorporated within the model. For most economies, these differentials change relatively slowly. With this in mind, the pattern of differentials across the time period of model implementation can be assumed constant. Should such an assumption not be adequate in any particular case, equations relating the changing patterns of wage differentials can be appended to the model.

Additional Requirements. To complete the model, the remaining sources of final demand and equilibrium conditions must be added. The components of final demand not yet discussed are investment, the public sector, and exports. Investment criteria can either be ignored, treating investment purchases exogenously, or investment may be incorporated within the model as a function of profits and capacity utilization rates. The latter strategy is something of a retreat from analytic rigor but it is an empirically tractable way to make investment spending exogenously determined.

Government expenditures are intentionally exogenous to the model. Because such expenditures constitute an important policy instrument which can be used to offset the impacts of foreign (and domestic) international economic policies, the ability to specify the details of these expenditures in a variety of situations allows individual evaluation of responses available to the government.

Exports are also exogenous, at least in a strict sense, to the model. The determination of export demand for particular products is accomplished by adjusting entries in a world trade matrix to conform to changes in the international economic policies of other countries and economic conditions domestic to other economies. Econometric studies of the elasticities of import demand with respect to prices and incomes provide useful guides for this work.¹¹

The equilibrium conditions for the model are excess demand equations for each of the goods (and therefore industries). Total demand must equal total available supply for each good, i.e.,

$$E_j = X_j + M_j - \sum_{i=1}^n X_{ij} - C_j - F_j = 0 \quad (j=1,2,\dots,n),$$

where F_j is the total final demand, excluding consumption, for the j^{th} good.

¹¹ Leamer and Stern (1970) summarize the details of the techniques and provide a substantial bibliography. CACI (1974) has also produced a study estimating income elasticities for many countries.

Application of the Model

The advantages of the mixed Keynesian and micro-analytic approaches seem to be well worth the trouble of linking the two together. By specifying a rather detailed production sector, the determination of benefits or costs to any given industry group is possible. If U.S. international economic policies adversely affect particular interests groups within the foreign country, and foreign policy-makers react to such differential impacts, the model can reproduce those effects. If it is true that foreign governments are more concerned with national aggregates, employment for example, the national figures are easily obtained by aggregating across industries. The specification of demand along usual Keynesian lines introduces another dimension the model can consider. The explicit recognition of the public sector allows the examination of governmental policies to counter the effects of foreign international economic policies.

The single most discomforting aspect of the model in its current form is the inability to consistently introduce a monetary sector. The implied bias of the omission is that a tool of government policy, the money supply, is not available. To some extent, ad hoc appendages to the model can compensate for the omitted monetary sector but cannot be employed to introduce a monetary policy under governmental control.

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