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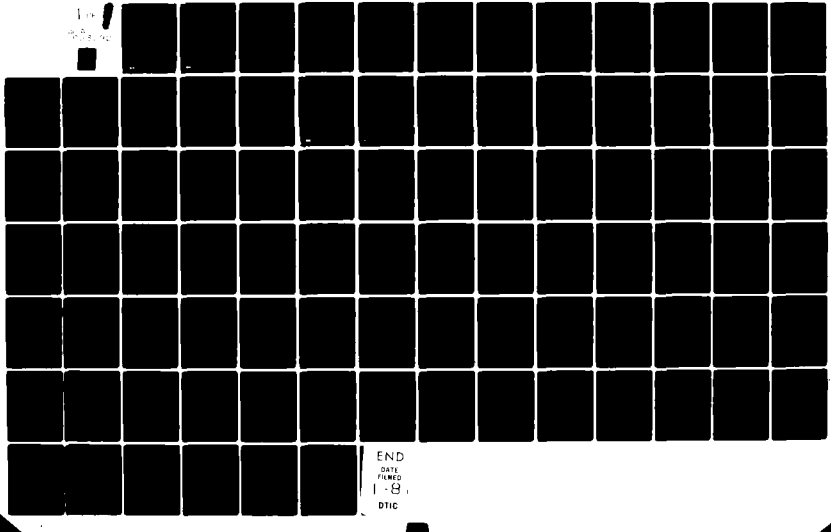

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AN APPROACH TO THE COMPARATIVE ANALYSIS OF THE US AND SOVIET ECONOMIES

Final Report

September 1980

Technical Note
CEPR-TN-7932-2

By: *Herbert S. Levine*
M. Mark Earle, Jr.

Prepared for:

Federal Emergency Management Agency
1725 Eye Street, N.W.
Washington, D.C. 20472

Contract DCPA01-78-C-0309
Work Unit 4341D

SRI Project 7932

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Arlington, Virginia 22209

CENTER FOR ECONOMIC POLICY RESEARCH

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AN APPROACH TO THE COMPARATIVE ANALYSIS OF THE US AND SOVIET ECONOMIES
SUMMARY

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ABSTRACT

This is a summary of a report which presents a method for conducting comparisons of US and Soviet economies during recovery from nuclear war. Comparative issues are identified and their general rationale discussed. The report suggests that previous comparative studies have been too limited in scope and did not employ a method for systematically isolating key differences between the two economies.

DISCLAIMER

The view and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the Federal Emergency Management Agency or other agencies of the United States Government.

CONTRACTUAL NOTE

Technical Note CEPR-TN-7932-2 and its summary were prepared in fulfillment of Task Two under Contract DCPA01-78-C-0309.

I. OBJECTIVE

The objective of the report is to develop an approach to and identify key issues in a comparative assessment of the ability of the US and USSR to recover from a major catastrophe, such as for example, a nuclear attack.

II. BACKGROUND

The analysis was undertaken as part of the Federal Emergency Management Agency's (then the Defense Civil Preparedness Agency) support to the Joint Chiefs of Staff's Comparative Recovery Study (COPRA). In the early stages of that effort it became clear that a socio-economic framework needed to be formulated to evaluate each country's potential to recover from various post-nuclear war situations. The majority of previously completed recovery analyses focused on just the economic portion of the total societal system, with particular attention given to the process by which productive capacity would be rebuilt for both defense and non-defense purposes.

III. ORGANIZATION OF THE REPORT

The report begins with a description of the factors which influence the development of an analytical framework. Next, important new approaches to the study of comparative economic systems now appearing in the literature are discussed. These involve a focus on the decision-making functions that have to be performed in all economies in order for economic activity to take place. The report then discusses some of the salient features of the US and Soviet economies within the categories of this structural-functional method. In its final section, the report identifies issues areas and within each a number of issues are thought to have effects on recovery capability. The next steps in the development of net assessments of US/USSR post-nuclear recovery potential are also outlined.

Stated simply, what is suggested is that the structural-functional approach provides the basis for isolating key differences between the US and USSR as assessments are conducted for each major recovery issue. The results of the systematic evaluation of the individual issues are then integrated to complete a net assessment of comparative recovery capability.

IV. FACTORS THAT INFLUENCE COMPARISON OF RECOVERY POTENTIAL

Five factors influence our ability to measure recovery capability. They are: (1) the stages of preparedness and recovery and the concept of continuity of economic processes; (2) uncertainties in the initial conditions; (3) distinguishing features of the recovery environment; (4) political and economic objectives, and; (5) the comparative time period.

A. Continuity of Economic Processes

Traditional analyses of recovery divide the phenomena into three stages: survival; reorganization, and; recovery. This tends to understate the basic continuity of economic processes which for all but the most severe cases of industrial damage, can be expected to characterize key aspects of the economy's functioning as it is transformed from a peacetime state, through mobilization and transwar stages and then into the three distinct components of the post-war environment. The continuity of economic process provides a bound on the uncertainties associated with measuring economic capability and performance.

B. Initial Conditions

While uncertainties exist regarding the probable damage to military forces and capital stock, as well as population fatalities from a given nuclear exchange, a major problem for recovery analysts is that numerous items of importance are not measured by existing damage assessment procedures. That is, models constructed to evaluate attack effects do not include variables which the recovery analyst considers critical to his or her assessments. What is needed is a method to develop a consistent, comprehensive description of the recovery environment.

C. Distinguishing Features of the Recovery Environment

Scenarios containing chronologically sequenced events have been the principal analytical technique for evaluating recovery capability in previous

government studies. Yet, scenario dependence of the comparative results has often limited ability to generalize the findings. A survey of a wide range of recovery scenarios led to the identification of a set of distinguishing features which can be used to describe alternative environments. These factors are: nature of political control; economic organization; threats and resources from the external world; nature of external relations, and the initial recovery base.

The second major finding of the survey of recovery scenarios was that key elements were often inconsistent. This led to the development of a method which has been used sucessfully to formulate comprehensive statements about alternative recovery environments. The major elements of this method are: selection of a theme which conditions all aspects of political-economic-military activities within the case study; development of national objectives and policy guidelines, and; development of economic targets (statements of desired performance over time). Once completed in this manner elements of the postulated environment can be tested to determine what makes a difference in achieving specific political-economic objectives. It is from a series of such analyses that one gains a better understanding of recovery phenomena.

D. The Difficult Problem of Setting Goals and Formulating Policy Guidelines

The national objectives which will provide the basis for preparing policy guidelines are formulated to be consistent with the theme of the particular recovery environment being examined. The national goals are broad in nature but are the source of subsequent assumptions regarding policy guidelines; plan formulation principles, and; behavioral characteristics relating to plan implementation.

E. Comparative Time Periods

Reemergence of power in political, military and economic terms and the willingness to use that power is the central comparative issue. Clearly this ability will change over time during the post-war period. It is therefore useful to examine the importance of particular recovery issues as they vary

within three time periods: The immediate period following termination of hostilities; the near-to-mid term period, perhaps two-to-six years following termination of hostilities (considered the most important in comparative recovery analysis, it is in this period that any major assymetries in the comparative ability to use effectively national power could significantly affect US national interests); and the mid-to-long term period, perhaps six-to-fifteen years following termination of hostilities. Of the three periods, the mid-to-long term is probably the least important.

V. COMPARATIVE ECONOMIC SYSTEMS

One of the important new trends in the study of comparative economic systems is the decision-making, functional approach. In this approach, the focus is placed on the major functions, related to decision-making, in an economic system, and the structures within a system for performing these functions. There are several ways in which the functional structures, affecting decison-making, can be delineated. One such scheme is as follows:

A. The system's objective structure;
B. Organizational structure;
C. Information structure;
D. Motivation and incentive structure;
E. Economic interaction, coordination structure.

This approach to the study of comparative economic systems views the economic system as a set of interrelated structures for the making of decisions in regard to the economic phenomena of production, distribution, and consumption. The process of decision-making is seen to involve the establishment of societal goals (the objectives structure), the distribution of authority and power to make decisions (the organizational structue), the provision of information to decision-makers to enable them to make meaningful decisions (the information structure), the mechanisms by which decision-makers can implement their decisions (the motivation structure), and the means for coordinating, on a system-wide basis, the decision of individual decision-makers (the coordination structure).

The report in Chapter III explains in detail each of the functional structures. The highlights of the descriptions are given in Table 1. Brief descriptions are presented in Chapter IV of the salient features of the US and Soviet economies in peacetime using a decision-making functional structures approach.

VI. KEY COMPARATIVE ISSUE AREAS

The final section of the report identifies key issues that would comprise major areas of study under a comparative recovery assessment. The major steps in conducting a comparative assessment are also outlined.

A. Issues Areas for Comparative Analysis

Comparative issues relate to a society's mobilization of resources and use of institutions to achieve both domestic and external goals. Most previously completed recovery analyses have been limited to evaluations of production possibilities for military hardware and expansion of economic output. The figure-of-merit, for example, for economic output has often been limited to simple criteria such as length of time to return to pre-war levels. Relative neglect of non-economic factors is a serious limitation of those analyses.

The process of reemergence of power in the near-to-mid term can be viewed as relating to three sets of goals, one external and two internal to a society. A society desires to develop the capability to deter and, when appropriate, coerce adversaries. Second, the principal focus of the political leadership during this period will be on a set of goals relating to domestic socio-economic welfare. Third, achievement of both the external goals and those relating to socio-economic welfare is dependent upon the leaders ability to maintain political control.

Using these three classes of goals, sub-issues or comparative issues have been identified. These issues relate to a recovery environment, that is, were we examining the functioning of the two societies in a peacetime condition then the specific comparison issues would be different. The suggested list of comparative issues are given in tables 2, 3 and 4.

TABLE 1

A STRUCTURAL-FUNCTIONAL APPROACH TO COMPARATIVE SYSTEMS ANALYSIS

Objectives Structure

- Determination of objectives, is, by and large, a political process
- Tends to be symmetric between centralization/decentralization nature of systems objectives and other structures
- Structure used to determine objectives may include elements of the economic sector, e.g., role of capital market in determining growth objective in a market economy

Organizational Structure

- Pertains to the distribution of decision-making power in an economic system
- Distinction between formal authority and actual power important. Under certain conditions, decision-making authority and power may diverge
- One major descriptive characteristic--degree of centralization. Most accurate when system's vertical organization is clear
- One can examine what role formal or informal plans play and the plan construction and implementation process as the means to scale centralization of decision-making authority
- Some recent US organizational theory has focused on the explanation of vertical hierarchies on the basis of:
  (1) the search, contracting and other costs of conducting transactions in open markets
  (2) advantages possessed by integrated firms in the face of uncertainty, bounded rationality and opportunistic behavior of agents dealing across markets
- Specific advantages for centralized/decentralized structures can be identified and related to decision-making during recovery (see Chapter III, p. 5,6.)

Information Structure

- Includes mechanisms and channels for collection, transmission, processing, storage, retrieval and analyses of economic data.
- Its function is to reduce the amount of uncertainty facing a decision-maker
- Elaborate formal systems exist in both societies. Their existence provides continuity in crises but there are distinct differences between status systems (damage, etc) and dynamic systems for economic management

Motivation and Incentive Structure

- Includes the mechanisms by which decision-makers implement their decisions
- Of interest is how decision-makers influence another's actions by:
  (1) limiting sets of alternative actions,
  (2) changing utlities attached to consequences, or by
  (3) influencing perceptions of sets of possible actions, consequences or utilities.
- Most societies use all of these means of motivation but in different combinations
- Decision-makers may be motivated by tradition, acquisitiveness and egocentrism, collectivism or coercion. The mix varies by type of economy and nature of the environment (peacetime, recovery, etc).

Coordination Structure

- All systems require structure for multi-level coordination
- The two major mechanisms for coordination are the market and the plan
- The coordination structure is central to the process for integrating needs of interest groups and relating expectations to reality

Table 2

EXTERNAL SOCIETAL GOALS: DETERRANCE AND COERCION

- Nature and Degree of Political Will
- Ability to Maintain Necessary Minimum Political Stability: Degree of Freedom from Coercion
- Military Strategy: Utility of Military Forces (Role of Forces in Achieving External Societal Goals)
- Military Capability: Stocks, Equipment and Manpower, Organization and Training
- Military Potential: Productive Capacity as it Relates to Deterrance and Coercion

Table 3

INTERNAL SOCIETAL GOALS: SOCIO-ECONOMIC WELFARE

- Provision of Goods and Services
  - Industry
  - Agriculture
  - Public Services (other than Health/Defense)
- Provision of Defense Services
- Provision of Health Services
  - Public/Private: Services/Resources
  - Preventative/Curative
- Distribution, Transportation, Communication
  - Trade Network (Flow of Goods)
  - Allocation of Consumer Goods (Equity, Priority, Rationing)
  - Information Flows (Social Mobilization, Political and Economic Stabilization and Growth)
- Effectiveness of Financial System: Ability to Transmit
  Control over Resources
- Use of Foreign Resources: Role in Achieving Objectives

Table 3
(Concluded)

INTERNAL SOCIETAL GOALS: SOCIO-ECONOMIC WELFARE

- Characteristics of Human Capital
  - Demographic Profiles: Age; Regional Distribution; Education; Skills
  - Psychological Factors: Ability to Cope; Degree of Self Reliance; Degree of Mobility
  - Participation in Personal Production of Essential Goods and Services

- Characteristics of Physical Capital
  - Equipment and Structures
  - Sectoral and Branch Composition
  - Regional Distribution
  - Domestic and Foreign Origin
  - Age Composition

- Mechanisms
  - Organize Labor: Allocate and Shift into High Priority Sectors and Regions; Maintain Desired Labor Utilization Levels and Allocations
  - Implement Plans: Effectiveness of Institutions; Role of Central vs. Regional Institutions

Table 4

INTERNAL SOCIETAL GOAL: POLITICAL CONTROL

- Ability to Maintain Domestic Order
  - MACRO: Prevent insurrection, subversion, riots
  - MICRO: Protection of citizens and property; crime prevention and control

- Ability to Maintain or Transform Political System Under Stress Conditions
  - Stress factors and responses
  - Interest groups and decision process

B. Steps in Conducting a Comparative Analysis

The essence of the suggested method is to analyze the US and USSR political-economic system using the structural-functional method as described in Chapter III of the report, in regard to each of these key issue areas for comparative analysis.

The analysis will be performed in two directions. For each issue areas a comparision (direct) will be made between the US and USSR, and secondly the effect of each issue area on the overall performance of each economy will be assessed. For each direction of the analysis, a composite "weighting" function will have to be derived. That is, not all of the issue areas have the same importance in the direct, issue by issue comparison of the ability of the US and the USSR to recover from the catastrophe of a nuclear attack. The same is true of the issues as they affect the recovery ability of each system. The derivation of these weighting systems presents great difficulties. Yet, it would be possible to develop judgemental ranking procedures that require experts to defend their rationale and thereby allow others to respond to their logic.

The major steps in the conduct of a comparative recovery study are as follows:

- Step One: Description of the Recovery Environment
  Under this task the theme for the environment is selected and assumptions made about its determining features. The initial conditions resulting from the nuclear exchange relating to military forces, capital stock and population are documented.
- Step Two: Formulation of Objectives and Policy Guidelines
  Under this task the broad national goals are formulated and a consistent set of political-economic and military guidelines developed. The principles relating to plan formulation and implementation, as well as the behavioral characteristics central to successful plan implementation, also are drafted.
- Step Three: Conduct of Comparisons by Key issue Areas
  Using the structural-functional method, the two directions (US-to-USSR and overall US and USSR) analyses are conducted.

- Step Four: Conduct of Selected Sensitivity Tests
  Based on the results of task three, selected sensitivity tests are conducted to isolate key factors or to examine key areas of uncertainty.

- Step Five: Development of Conclusions
  Based on the results of tasks three and four, conclusions are developed regarding the ability of the US and USSR to recover from a nuclear exchange. Key strengths and weaknesses would be identified and implications for US preparedness and recovery programs, as well as nuclear weapon employment policy, discussed.

In conclusion, use of the structural-functional approach provides a means to isolate and examine key political-economic differences between the US and Soviet Union during post-war recovery within major comparative issue areas. The systematic development of consistent assumption set for alternative recovery environments is an integral part of the method and provides the basis for ascertaining what makes a difference in achieving specific political-economic objectives.

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CENTER FOR ECONOMIC POLICY RESEARCH

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This report develops an approach to and identifies key issues in a comparative assessment of the ability of the US and USSR to recovery from a major catastrophe, such as a nuclear attack. Drawing on new approaches for the study of comparative economic systems now appearing in the literature, the analysis focuses on the decision-making functions that are required for economic activity to take place under any system. Salient features of the US and Soviet economies within the categories of this structural-functional method are discussed. Finally, major issues in comparative recovery analysis are identified and further steps in development of US/USSR net assessments of recovery potential are outlined.

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19. KEY WORDS (Continued)

20 ABSTRACT (Continued)

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FOREWORD

Acknowledgement is made of several inputs to our thinking regarding the development of a more rigorous methodology for comparing U.S. and Soviet economics under post-attack conditions. Comments provided by Holland Hunter, Robert Stuart, Vernon Aspaturian, Aron Katsenelinboigen, Jim Anderson and Don Anselm were of assistance as we examined the feasibility of adapting the theoretical comparative systems material to the comparative problems of evaluating the recovery potential of the two economies.

A critique of the draft report by Eugene Burbin, John Hardt, Holland Hunter and Vlad Treml helped in many ways establish a clearer picture of the problems that would be encountered in conducting a comparison using the approach developed under this FEMA project.

The report also benefited from comments provided by participants in a final in-process review workshop. Included in this group were Don Anselm, Dave Thomas, A.J. Driscoll, and Bob Parker.

Two others contributed significantly to the project. George Divine of FEMA, who was our technical monitor, made numerous good suggstions at various stages of the project. Charles Movit, as with many, if not most, of the studies conducted under SRI's Soviet and Comparative Economics Program, provided critical support to all phases of the project.

M. Mark Earle, Jr.
Herbert S. Levine

ABSTRACT

This report presents a method for conducting comparisons of U.S. and Soviet economies during recovery from nuclear war. It identifies comparative issues and discusses their general rationale. The report suggests that previous comparative studies have been too limited in scope, failing to employ a method for systematically isolating key differences between the two economies.

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CONTRACTUAL NOTE

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1. INTRODUCTION

The objective of this report is to develop an approach to and identify key issues in a comparative assessment of the ability of the United States and the USSR to recover from a major catastrophe such as, for example, a nuclear attack.

The analysis was undertaken as part of the Federal Emergency Management Agency's (then the Defense Civil Preparedness Agency) support to the Joint Chiefs of Staff's Comparative Recovery Study (COPRA). In the early stages of that effort it became clear that a socioeconomic framework was needed to support comprehensive evaluation of each country's potential to recover from various post-nuclear war situations. The majority of previously completed recovery analyses focused on just the economic portion of the total societal system, with particular attention given to the process by which productive capacity would be rebuilt for both defense and nondefense purposes. As a result the earlier studies were faulted both for the narrowing of their scope and because they lacked a theoretical or conceptual foundation.

The report begins with a description of the factors that influence the development of an analytical framework. Next, it discusses important new approaches to the study of comparative economic systems now appearing in the literature. These approaches involve a focus on the decision-making functions that have to be performed in all economies in order for economic activity to take place. The report then discusses some of the

salient features of the U.S. and Soviet economies within the categories of this structural-functional method. In its final section, the report identifies recovery issue areas and, within each, a number of major factors that are thought to have key effects on recovery capability. It also outlines the next steps in the development of net assessments of U.S./USSR post-nuclear recovery potential.

Stated simply, what is suggested is that the structural-functional approach provides the basis for isolating key differences between the United States and the USSR as assessments are conducted for each major recovery issue. The results of the systematic evaluation of the individual issues are then integrated to complete a net assessment of comparative recovery capability.

A second task of the study surveyed the analytical systems useful for the evaluation of economics under recovery. The results of that effort we presented in a companion report SRI CFPR-TR-7932-1, entitled, "Development of Analytical Systems for Evaluation of U.S. Reconstitution and Recovery Programs."

2. FACTORS THAT INFLUENCE COMPARISON OF RECOVERY POTENTIAL

Before developing the analytical framework for comparing the economic recovery potential of the U.S. and Sovient economies, it is necessary to discuss five factors that influence our ability to measure recovery capability. They are: the stages of preparedness and recovery and the concept of continuity of economic processes, uncertainties in the initial conditions, distinguishing features of the recovery environment, political and economic objectives, and the comparative time period.

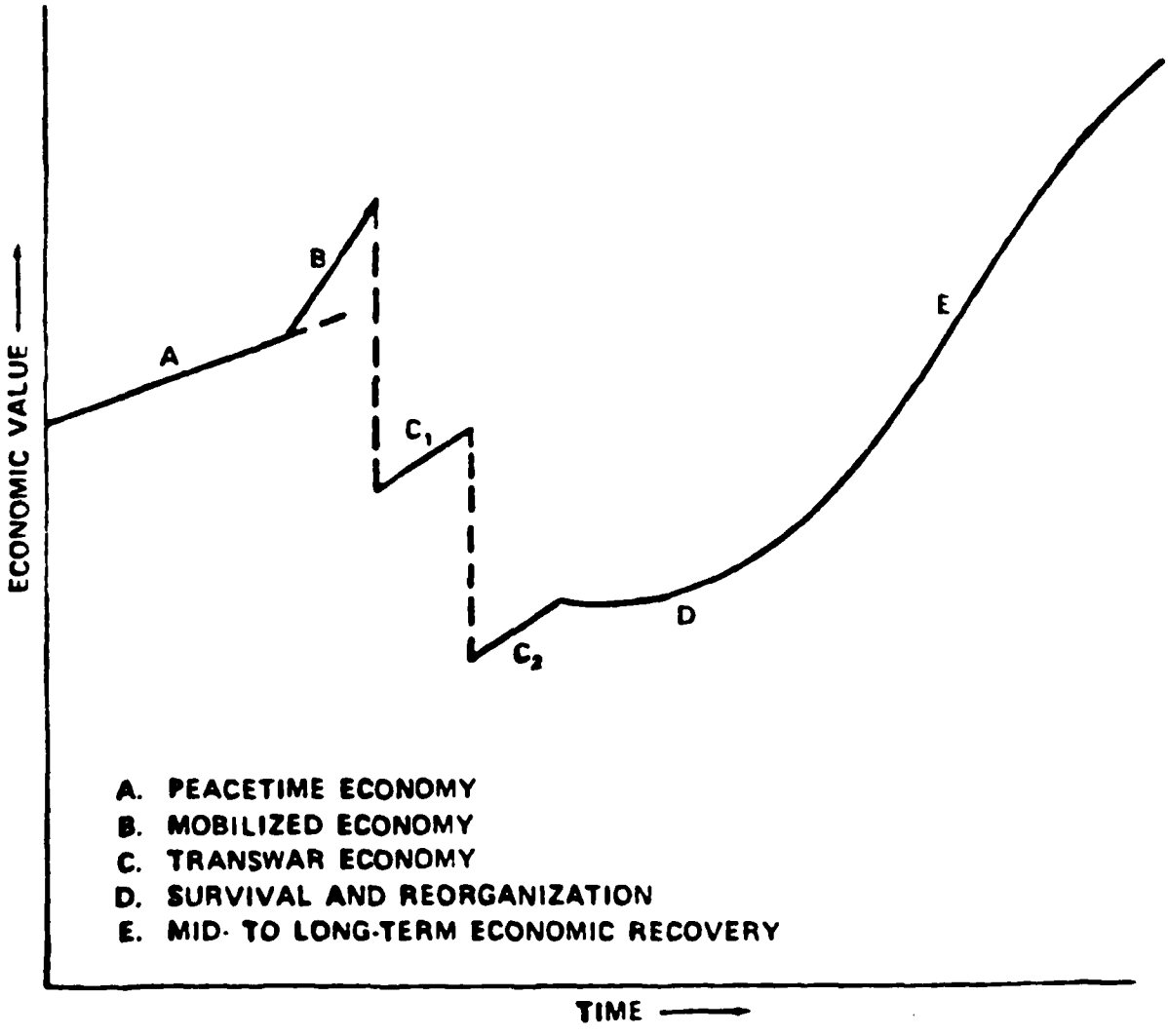
2.1 Continuity of Economic Processes

Traditional analyses of recovery divide the phenomenon into three stages: survival, reorganization, and recovery. This division tends to understate the basic continuity of economic processes, which--for all but the most severe cases of industrial damage--can be expected to characterize key aspects of the economy's functioning as it is transformed from a peacetime state, through mobilization and transwar stages, and then into the three distinct components of the postwar environment.(1) Figure II-1 illustrates the transformation process.

Obviously the scope and depth of the attack will be the central determinant of the nature of the recovery process. Other factors are also important--duration of mobilization, sequence of the nuclear exchange, and specific conditions of war termination are several of the important ones. The continuity of economic process provides a bound on the uncertainties associated with

Figure II-1

STAGES OF ECONOMIC PREPAREDNESS AND RECOVERY



measuring economic capability and performance. Of the various stages, our ability to handle with existing quantitative methods the transwar and survival phases is probably the most limited. Much more detailed analyses of behavioral factors is needed for these two periods, but little evidence (or theory) exists by which broader generalizations can be formulated and assessments conducted.

For a centrally planned economy, the ability to coordinate economic activity as the economy moves through the various stages is superior to that of a market-oriented economy. The centrally planned economy is thought in particular to be more effective in allocating and controlling resources in the immediate postwar period. However, the political-economic characteristics of our society are superior in coping with the challenges of personal survival. We hope the method developed later in this report extends our ability to integrate such differences to obtain a more "holistic" understanding of the two societies during a recovery process.

2.2 Initial Conditions

A recent Office of Technology Assessment report, The Effects of Nuclear War, concluded that "the effects of a nuclear war that cannot be calculated are at least as important as those for which calculations are attempted."(2) While uncertainties exist regarding the probable damage to military forces and capital stock as well as population fatalities from a given nuclear

exchange, a major problem for recovery analysts is that numerous items of importance are not measured by existing damage assessment procedures. That is, models constructed to evaluate attack effects do not include variables that the recovery analyst considers critical to his or her assessments. For example, the degree to which regional party apparatus remains a viable link in the execution of centrally formulated directives will influence achievement of economic targets, but little study has been conducted on how the Soviet political structure might respond to nuclear war. However, the fact that key elements needed for a comprehensive statement of initial conditions have not been included in previous exchange analyses does not mean that they cannot be included in future assessments. What is needed is a method to develop a consistent, comprehensive description of the recovery environment--one that goes considerably beyond that obtainable if the nuclear exchange is described only as damage to pre- war stocks of military forces, industrial capital, and population.

2.3 Distinguishing Features of the Recovery Environment

Scenarios containing chronologically sequenced events have been the principal analytical technique for evaluating recovery capability in previous government studies. Yet scenario dependence of the comparative results has often limited ability to generalize the findings. A review conducted by a team from SRI, RAND, Joint Strategic Target Planning Staff and the Defense Advanced Research Project Agency of a wide range of recovery

scenarios led to the identification of a set of distinguishing features that can be used to describe alternative environments. That is, it was possible to reduce all the descriptive material to essential assumptions regarding internal and external conditions. These factors are in Table II-1.

The second major finding of the survey of recovery scenarios was that key elements are often inconsistent. This finding led to the development of a method that has been used successfully to formulate comprehensive statements about alternative recovery environments. The major elements of this method are selection of a theme that conditions all aspects of political-economic-military activities within the case study, development of national objectives and policy guidelines, and development of economic targets (statements of desired performance over time). Once a framework has been completed in this manner, elements of the postulated environment can be tested to determine what makes a difference in achieving specific political-economic objectives. It is from a series of such analyses that one gains a better understanding of recovery phenomena. Table II-2 presents a conceptual framework for analyzing three possible Soviet recovery environments. Of interest in the particular study under which these developed were the differences in investment priorities that might result from three alternatives: the party remaining in control, the military's replacing the party, or the emergence of a more regionalized political structure.

Table II-1

DETERMININC FEATURES OF A POSTWAR ENVIRONMENT*

	Example for Soviet Union
1. Nature of Political Control	Party in firm control of Armed Forces and Republics.
2. Economic Organization	Centralized economic management and and priority for national needs.
3. External World: Threats and Resources	U.S./NATO a principal but not immediate threat; China a secondary threat. Modest access to non-West European resources; Council for Mutual Economic Assistance (CMEA) structure essentially intact.
4. Nature of External Relations	Hostile external world; Soviet Union somewhat isolationist and only selectively aggressive.
5. Initial Recovery Base	50 percent damage to total capital stock selected subsectors damaged to very high levels; 20 percent population fatalities.

*Prior research identified these five factors as the determining factors of postwar environments.

Table II-2

ALTERNATIVE SOVIET RECOVERY CASES

Determining Features	Case 1 Restored	Case 2 Militarized	Case 3 Regionalized
Nature of Party Control	Kremlin in firm control of Armed Forces and Republics	Armed Forces in control; operate in part through the Party machine	Major regions have significant autonomy within new regime
Economic Organization	Centralized economic management and priority for national needs	Centralized economic management; priority for military needs; management more flexible	Decentralized economic management and priority for regional needs
External World: Threats and Resources	Possible assumptions for all three cases: the Middle East and Europe yield some resources initially for Soviet recovery, then allow for "equitable" trade to develop gradually. Hostilities terminated; the People's Republic of China perceived as a threat. Western Europe's level of damage (hence level of threat to the USSR) moderate. U.S. retains significant strategic reserve force and remains principal threat. Significant military capability remains, but not enough to achieve Soviet military superiority relative to U.S. or Western Europe given requirements of domestic control, Eastern Europe, and China in immediate postwar period.		
Nature of External Relations	Hostile USSR foreign policy somewhat isolationist and nonaggressive initially	Hostile but more active economically and militarily aggressive	Accommodating; less hostile to West
Initial Recovery Base	50-55 percent damage to total industrial capital stock. Damage not uniformly distributed, geographically or by sector. Some subsectors suffer very high damage. Civil defense program effective: high levels of population survive in a dispersed configuration.		

2.4 The Difficult Problem of Setting Goals and Formulating Policy Guidelines

The national objectives that will provide the basis for preparing policy guidelines are formulated to be consistent with the theme of the particular recovery environment being examined. The national goals are broad in nature, but they are the source of subsequent assumptions regarding priorities. Table II-3 presents a possible set of Soviet national goals under conditions in which the objective is to restore the USSR to its prewar form. Three sets of additional assumptions must then be formulated: policy guidelines, plan formulation principles, and behavioral characteristics relating to plan implementation. In U.S. or Soviet contingency plans, all these elements would be explicitly or implicitly addressed. Examples, again for the Soviet case, are given in Appendix A. A comparable set can be developed for the United States for each recovery environment under study.

2.5 Comparative Time Periods

Reemergence of power in political, military, and economic terms and the willingness to use that power are the central comparative issues. Clearly, power will increase over time during the postwar period. It is useful to examine the importance of particular recovery issues as they vary within three time periods. First is the period immediately following termination of hostilities. This period is usually referred to as the survival period, but the term may be misleading if the attack is not severe in the total-system sense, or if the

TABLE II-3

NATIONAL OBJECTIVE: RESTORATION OF THE USSR TO ITS PREWAR FORM

The postwar environment is one in which decisionmaking, institutional roles, social organization, and goal formulation are dominated by the central theme of reconstituting all major aspects of the USSR in their prewar configuration. The National Objectives, therefore, are:

- To continue, even though interrupted by war, the process of socialist construction of the USSR based on Marxist-Leninist principles.
- To maintain the Party as the undisputed political authority.
- To restore regional, then worldwide soviet influence via military strength, growth of production capacity, and traditionally subversive and propaganda tactics.
- To ensure political and military integrity of borders.

effectiveness of preparedness programs is high. Second is the near- to mid-term period, perhaps 2 or 6 years following termination of hostilities. This period is evidently the most interesting for comparative recovery analysis. It is in this period that any major assymetries in the comparative ability to use national power effectively could significantly affect U.S. national interests. Third is the mid- to long-term period, perhaps 6 to 15 years following termination of hostilities. This period covers the expected transformation of the respective systems to more normal peacetime conditions--for example, less direct labor allocation in the Soviet Union and greater use of prices for resource allocation in the United States. Of the three periods, the mid- to long-term is probably the least decisive.

With this overview of the key factors that influence recovery, it is now possible to examine a method for isolating key differences between the United States and the USSR as assessments are conducted for each of the major recovery issue areas.

3. COMPARATIVE ECONOMIC SYSTEMS

One of the important new methods in the study of comparative economic systems is the decision-making, functional approach.(1) In this approach, the focus is on the major functions, related to decision making in an economic system, and the structures within a system for performing these functions. The ways in which the functional structures affecting decision-making can be delineated are several. One such scheme isolates the following elements of a system:

- Objectives structure
- Organizational structure
- Information structure
- Motivation and incentive structure
- Economic interaction, coordination structure

These compartments are not air tight. Their borders tend to be a bit fuzzy in the sense that the population of elements could, as stated above, be regrouped in other ways. Furthermore, the order in which the structures are listed is not unique. Although the ordering has some sequential or recursive sense, feedbacks and simultaneities are also within the analytical system.

This approach to the study of comparative economic systems views the economic system as a set of interrelated structures for making decisions about the economic phenomena of production, distribution, and consumption. The process of decision making

involves the establishment of societal goals (the objectives structure); the distribution of authority and power to make decisions (the organizational structure); the provision of information to decisionmakers to enable them to make meaningful decisions (the information structure); the mechanisms by which decisionmakers can implement their decisions (the motivation structure); and the means for coordinating, on a system-wide basis, the decisions of individual decisonmakers (the coordination structure).

3.1 Objectives Structure

In the analysis of an economic system, it is important to begin with the structure for determining the system's objectives and the content of the objectives themselves, because the overall objectives of a system strongly influence the form of the other functional structures. Generally speaking, a symmetry tends to exist between the centralization/decentralization nature of the system's objectives and the centralization/decentralization of the other structures. For example, if the objectives for the system are established by a small group of political leaders at the center and represent their preferences rather than those of the general population, then the other functional structures -- in particular decision making and information -- will also tend to be centralized. However, if the system's objectives represent those of the general mass of the population, then a tendency exists for the other functional structures to be decentralized.

The determination of a system's overall objectives is, of course, a political issue. However, the structure actually used for determining these objectives may include elements of the economic sector of society. An example of this fact is the role of the capital market in the determination of the growth objective in a market economy.

3.2 Organizational Structure

The organizational structure pertains to the distribution of decision-making power in an economic system--that is, where the authority and power to make decisions are located in the system. A useful analytical distinction can be made between the terms authority and power. Authority refers to the formal, constitutional decision-making right given to a decisionmaker by the formal organizational structure; power refers to the actual ability or capacity in practice to make that decision. Under certain conditions, decision-making authority and power may diverge. For example, people with the authority to make decisions in an economic organization may have their actual power to make those decisions severely constrained or even usurped by those who control the flow of relevant information to them.

The descriptive characteristic usually employed in the analysis of a system's organizational structure is its degree of centralization/ decentralization. Technically, these terms apply only to hierarchical systems (vertically organized systems, in which a superior has decision-making authority over

subordinates), a more general terminology being concentration/deconcentration. However, following general (if less precise practice, this report uses the centralization/decentralization terminology.

A major problem in the analysis of the organizational structure of an economy is the difficulty of measuring the degree of centralization of a system. For systems in general, difficulty of designing a calculus to compare authority exercised in different forms is basic. Designing such a measuring system necessitates development of a weighting system to measure the relative importance of different types of decisions. If this development could be accomplished, it might then be possible to portray the distribution of decision-making authority in a system through a Lorenz curve, in a manner similar to the way the distribution of income is portrayed. An economic system might be portrayed as one in which, for example, 10% of the people make 50% of the decisions.

In a less general way, one author of this report has made an attempt to develop a scheme for measuring the degree of centralization of decision-making authority in a planned economy (rather than in a general economic system).(2) The scheme isolates specific characteristics of the three primary elements in a planned economy: the plan itself, the construction of the plan, and the implementation of the plan. For each characteristic, a descriptive scale going from low degree of

centralization of authority to high degree of centralization was developed. For example, in the first scale (shown below) the argument is that the shorter the period covered by the plan and thus the more frequent the issuance of new plans, the more intensive is the exercise of authority by the center. A final step in the scheme was to derive an overall scaling of an economy in regard to centralization of decision-making authority, from an aggregation of the positions of an economy on each of the individual scales. The scheme consisted of a series of characteristics and scales under three general groupings as Table III-1 indicates.

An interesting and potentially important contribution to the analysis of organizational structure comes from the Coase-Williams work in the field of organization theory. In essence, this work explains the existence of firms and their expansion into vertical hierarchies on the basis of the search, contracting, and other costs of conducting transactions in open markets, and the advantages possessed by integrated firms in the face of uncertainty, bounded rationality (the limited ability of human beings to make complex calculations), and opportunistic behavior of agents dealing across markets.

This work can be extended to say that the expansion past small private hierarchies to governmental units in an economy is not a function of transaction costs or administrative costs but of the perceived need to fulfill overall objectives requiring

TABLE III-1

DEGREE OF CENTRALIZATION IN A PLANNED ECONOMY

1. The Plan
   A. Periodicity of the Plan
      Long Term _____ Short Term
   B. Scope of the Plan
      Small Part of Economy _____ Entire Economy
   C. Plan Coverage of Investment
      None _____ Entire
   D. Plan Coverage of Distribution of Materials
      None _____ Entire
   E. Level of Detail in the Plan
      Highly Aggregative _____ Very Specific
2. Construction of the Plan
   A. Extent of Participation by the Periphery
      High Participation _____ No Participation
   B. Extent of Participation by Periphery in the Construction of the Investment Plan
      High Participation _____ No Participation
   C. Type of Participation by Periphery
      Authority to Initiate Proposals _____ Provision of Information Only
3. Implementation of the Plan
   A. Attempt to Implement the Plan
      No Attempt _____ Strong Attempt
   B. Means of Implementation
      Manipulation of Parameters _____ Issuing of Directives
   C. Number and Detail of Directives/Parameters
      Low _____ High
   D. Center's Plan Adjustment Mechanisms
      Weak _____ Strong
   E. Implementation, Incentive Mechanism
      Low Pressure _____ High Pressure

major structural changes in the economy, or because of coordination deficiencies that might, for example, result from the existence of externalities.

Some of the frequently claimed advantages of centralization and decentralization of decision-making authority will conclude this discussion of the organizational structure of an economy. These perceived advantages influence how one should weigh the costs to political leaders coping with particular political-strategic issues, such as recovery from a modern war. That is, inherent in the organizational structure are comparative advantages for one system over another in responding to recovery problems.

The advantages claimed for a centralized decision-making structure are several. The system's leaders are better able to achieve their objectives, even if their objectives are not widely shared by the system's members. An increased possibility exists of rapidly imposing major structural transformations in the economy to meet some emergency or to bring about rapid economic change. The central authority is more likely to be able to take account of the costs and benefits of any decision over a period of many years, and not be limited to short-run costs or benefits. This last is an advantage if evaluation of the system is in terms of the leader's goals, or, for instance, if a higher rate of investment resulting from the longer time horizon brings about a more desirable result for consumers. It also entails a

subjective judgment about the expertise of the central authority. Moreover, a possibility exists of internalizing external economies and diseconomies, taking into account, for example, the benefit to the whole economy from the education of its youth, or the cost of pollution from an industrial plant, neither of which enters the accounts of a single firm. Better information is centrally available on the interactions of various decisions at the economy-wide level. The leaders are able to concentrate scarce resources, including scientifically and technically trained personnel in areas considered most important. Finally, greater uniformity and standardization of products is possible, thus avoiding the "wastes" of extreme product differentiation.

The advantages claimed for a greater degree of decentralization are also several. The dispersion of authority aids in protecting the individual's political, personal, and economic freedom. The economic system is protected from the dangers of very large errors on the part of central authorities. Greater flexibility and the ability to adjust more quickly and easily to certain types of changes in technology or demand are possible, although, as noted above, centralization is often considered an advantage when very large changes must be made rapidly. It is possible to base decisions more on economic than political considerations. Greater scope exists for the exercise of initiative and innovation, thus providing a better training ground for future decisionmakers. Finally, the cost of information and communication is likely to be lower and its

quality higher, because many decisions are made when the information is generated. Peripheral agents often base their subjective probabilities on information and impressions that would be difficult to capture in formal communication with a centralized agency.

Some of the claimed advantages of centralization and decentralization could benefit all members of the organization, as is the case with better use of information, flexibility in responding to changes in the environment, or the internalizing of external economies and diseconomies. Others will be viewed as advantages by the central planners or by the private agents, but not by both--for example, the ability of the system's leaders to achieve their objectives, or the provision of greater protection against limitations on the individual's political, personal, or economic freedom.

It should be obvious that some of the advantages and disadvantages associated with different degrees of centralization of the organizational structure are conditional upon the nature of the system's information, incentive, and coordination structures.

3.3 Information Structure

The information structure in an economy includes the mechanisms and channels for the collection, transmission, processing, storage, retrieval, and analysis of economic data. It plays a crucial role in the operation of an economy. Its

function is to reduce the amount of uncertainty facing a decision-maker. The success of decision-makers depends very much on the quality and timeliness of the information they receive and their evaluative skills. Thus, the real challenge in decision-making, whether by firms in market systems or central planning agencies, lies in identifying the relevant events and relationships, and in gathering and processing information to determine the probable consequences of different actions.

The subject of information structures is vast. Let it suffice to add on a general plane that the information structure of an economy must, in order to be successful, develop the channels and the language to carry many different types of information, including information on preferences, production technologies, available stocks of resources, inputs and outputs, and conditions and events in the economic environment.

3.4 Motivation and Incentive Structure

The motivation and incentive structure is the mechanism by which decisionmakers can implement their decisions--that is, the way in which they get others to comply with their wishes. One decisionmaker can influence another's action by limiting the set of alternative actions; by changing the utilities attached to these consequences; or by influencing the perceptions of the set of possible actions, consequences, or utilities. Most economic systems include the use of all these means of motivation, but in different combinations. The means of motivation that has

received the most attention in the economic systems literature has been the determination of the consequences of actions, which is what is meant by the incentive structure (the relating of rewards and penalties to actions).

Finally, the comparative economic systems literature views decision-makers as being motivated by:

- Tradition
- Acquisitiveness and egocentrism
- Collectivism
- Coercion

3.5 Coordination Structure

Very briefly, all economic systems require a structure for the coordination of decisions made by individual decision-makers. The two major mechanisms for the coordination of decisions are the market and the plan. The equilibrating mechanisms of markets bring consistency to the set of decisions, while in planned systems the achievement of consistency among decisions has to be accomplished consciously by planners. In theory, the coordination structure of an economy can be solely market or planned, but in reality all economic systems exhibit various combinations of both.

4. OBSERVATIONS ON THE FUNCTIONAL STRUCTURES OF U.S. AND USSR

This section presents brief descriptions of the salient features of the U.S. and Soviet economies in terms of the decision-making functional structures discussed above.

4.1 The U.S. Economy

4.1.1 Objectives Structure

The overall objectives of the U.S. economy are formed and changed primarily in the political sector, although as previously stated, the desired rate of growth is strongly influenced by the actions of decision-makers in the capital market. The broad objectives of the U.S. economy can be said to include high levels of employment of productive factors, low levels of price inflation, steady growth of economic welfare with limitation of economic fluctuations, and a fair distribution of income. It might also be said that other key features of the decision-making authority structure, such as consumer sovereignty, are also objectives, firmly rooted in the general ideology of the system.

4.1.2 Organizational Structure

In the theoretical model of a perfectly competitive market economy, authority is totally decentralized to the level of individual households and firms, which interact with each other through horizontal relationships. In the real U.S. economy, competition is imperfect. Decision-making authority has been centralized through internal growth of firms through expansion of capacity over time; horizontal and vertical integration of firms;

formation of conglomerates (the joining by merger or acquisition of companies in diverse fields of production); formation of multinational corporations; and the development of franchising, especially in regard to such services as travel, entertainment, food (restaurants), health, and education.

Furthermore, in the real U.S. economy, government exercises substantial authority through its regulatory and advisory powers, its fiscal powers to tax and directly purchase goods and services, and its powers in regard to the money supply.

4.1.3 Information Structure

Again, in the perfectly competitive model of the U.S. market economy, the information system among firms and households is totally decentralized and efficient. Firms and households exchange information about production costs and preferences through horizontal channels in the form of price and quantity bids and offers. Firms develop their own cost information about the full range of their production alternatives, calculating the minimum cost for producing each possible level of output from engineering information about their production functions and the market prices of input factors. And households develop their own information about their own preferences, presumably through a process of repeated self-interrogation.

This model presents two major problems. Even on a theoretical level pricing problems are created by externalities and public goods and the need for not only present prices but

future prices to use in the making of decisions regarding the future. In addition, when the perfectly competitive model is replaced by the imperfectly competitive one, the firm can no longer be assumed merely to react to the parametric prices ruling on the market, but must take into account the reaction of its competitors to any of its own decisions. It must also devote considerable effort and resources to gathering and analyzing information in regard to technological change, and to forecasting future demands, as well as supplies of competitive goods by other firms, and of resources by its suppliers. It is of interest to note the development of many business organizations in the U.S. economy that sell informtion to firms and households, thereby providing an indirect horizontal information channel.

In general, prices in the U.S. economy provide information of a relatively satisfactory quality because market prices generally adjust to changes in relative scarcities. However, this judgment should not be overstated, because one of the aspects of imperfect competition is the preference for forms of non-price competition and the desire to limit price flexibility (other than general inflation of the price level).

4.1.4 Motivation and Incentive Structure

The salient feature of the U.S. economy in regard to the incentive structure is the changing perception of managerial objectives. The traditional position of competitive theory views profit maximization as the dominant managerial objective. But

recent analyses differ from this position. First, it is sometimes argued that managers resolve decisions so as to earn a target rate of return on investment. This practice is in the nature of a strategy reflecting managers' motive of maximizing their own income and security by earning a level of profits high enough to satisfy the stockholders of the corporations.

Second, it is argued that managers attempt to maximize something other than profits, most notably sales or growth, subject to a constraint of profits high enough to keep stockholders happy. This position is based on the assumption that managers try to satisfy a complex of their own motives and needs, in particular the desire for social recognition.

A third position holds that some managers, especially of large corporations, make decisions in a way of guiding the "responsible corporation" in pursuit of some mix of stockholder, employees, and societal goals. While one may be skeptical of such a position, large corporations are subject to substantial public scrutiny, and in their own prosperity and survival interest might feel it necessary at times to pursue socially responsible policies.

4.1.5 Coordination Structure

In the U.S. system, the market acts as the main coordinating mechanism. Government intervenes to correct for market failures and imperfections, and to pursue societal objectives. In addition, inflation distorts the operation of market

coordination, while one of its cures--price controls--distorts it perhaps even more. Clearly in a post-nuclear environment the coordination structure would differ substantially from the present one.

4.2 The Soviet Economy

4.2.1 Objectives Structure

A significant distinguishing feature of the Soviet system is its objectives structure. Overall societal objectives are, to a high degree, established by political leaders. From the late 1920s until the 1960s the dominant objective was the rapid, forced industrialization and growth of the economy in order to catch up with the advanced capitalist nations of the West, and to build the military strength of the nation to its productive capacity. In the more recent period, the additional objective of consumer welfare has been established, and is now of substantial importance to Soviet political leaders.

4.2.2 Organizational Structure

The distribution of decision-making authority in the Soviet Union is severely constrained by the planned nature of the system: the role of the plan and the hierarchical form of the organizational structure. On any scale, it is a highly centralized system.

Though the Soviets construct plans of various periodicities, presently it is still the annual plan that plays the key role in

the Soviet "command economy,"(1) for it is the data from the annual plan that form the basis of output targets and input limits given to Soviet enterprises. And since the Soviet annual plan is promulgated in the form of a law, these targets and limits have the force of law.

Soviet producing units are administered in a vertical, hierarchical structure, by branch of the economy, from the enterprises within a branch at the bottom, up to intermediary branch organizations, up to the branch ministry, and then up to the executive body of the government, the council of ministers. In design, this hierarchy is a complete one in which all lines of authority flow within the vertical hierarchy. In practice, however, a rather substantial set of horizontal interactions exist within the system, which warrant some attention.(2)

The horizontal interactions in the Soviet economy, which loosely and without striving for precise definitions may be referred to as market relations, vary in a number of ways, including the degree of their legality. Not only legal markets and illegal black markets exist, but also an entire spectrum of multicolored markets. Following a scheme described by Katsenelinboigen,(3) the colors from bright to dark describe the range of markets from legal to illegal:

1. Legal Markets

   - Red Prices established centrally

- Pink -- Participants in transactions have some freedom to alter prices

- White -- Participants set prices

2. Semilegal Markets

- Gray -- Transactions illegal, but tolerated by the authorities

3. Illegal Markets

- Brown -- Transactions illegal, but penalty less severe than criminal prosecution

- Black -- Transactions illegal, penalty is criminal prosecution

Table IV presents a summary matrix of horizontal interactions among the three major groups of units in the Soviet economy: state enterprises, collective farms, and households. The columns receive goods and services from the rows. It is instructive to note the wide range of market type mechanisms in the Soviet economy. Even in the first cell--in the core element of Soviet command mechanisms, the centrally planned and controlled material supply system--there are elements of decision-making discretion in horizontal relations, even though a user state enterprise must have a rationing document in order to acquire input materials produced by other state enterprises. The indicators in Soviet plans are, to a substantial extent, aggregated with respect to product and time detail. The participants in these horizontal interactions have the decison-making power to decide this detail, so long as they stay

within the control aggregates established in the plan. Furthermore, in this centralized, rationing mechanism is an embryonic market element in the form of money exchange. Soviet enterprises, operating under a system of financial accountability (Khozrashchet), make monetary payments to producing enterprises for the goods they receive from these enterprises at centrally established prices. This system was introduced for its administrative rather than its economic decision-making contributions. Yet it does bring a touch of market atmosphere to the centrally planned, rationing interactions among state enterprises.

In the absence of an efficient system of intermediate goods distribution and in the face of supply unreliability and pressure to fulfill output plan targets, Soviet enterprises are staffed with expediters who scour the economy in search of needed supplies, and who employ a variety of monetary and non-monetary (including barter) means to acquire these supplies. This aspect of inter-enterprise relations is well detailed in the general literature on the Soviet economy; it has often been described as the grease in the horizontal relations that allows the Soviet command economy to function.

Finally, while this is not the place to discuss at length household to household relations, mention should be made of this part of the "black" market, which forms a major part of the growing "second economy" existing in the Soviet Union. Suffice

Table IV

MATRIX OF HORIZONTAL INTERACTIONS IN THE SOVIET ECONOMY

Producer \ User	State Enterprises	Collective Farms	Households
State Enterprises	a) Official state supply system (rationing) b) Limited redistribution of second-hand machinery and equipment (red market-primitive form, seller needs permission for sale) c) Unofficial redistribution of intermediate goods; extensive use of "expediters" (gray market)	a) Official state supply system (rationing) b) Illegal acquisition of spare parts, tools, etc. (brown market)	a) Most goods and services purchased from state stores at official prices (red market) b) Health and education services are primarily distributed free of charge (free goods) c) Housing and, during times of crises, other consumer goods, distributed through direct allocation (rationing) d) Second-hand goods sold on commission by state commission stores (pink market) e) Prevalence of "under-the-counter" sales of deficit goods (brown market) f) Strictly illegal sales (black market)
Collective Farms	a) Official state supply system for industrial crops, grain, meat; etc. (rationing) b) Sales, at negotiated prices, to the network of cooperative stores, mostly in countryside (white market) c) Unauthorized acquisition of industrial crops, etc. Brown market) d) Illegal acquisition of materials for production of black market goods (black market)	a) Redistribution of equipment and tools at freely negotiated prices (white market)	a) Food items sold through collective farm markets (similar to farmers' markets in the West); participants are (usually) free to set prices (white market)
Households	a) Workers normally sell labor services to state enterprises at established prices that vary with skills, occupation, industry (red market) b) Some direct allocation of labor through compulsory means (rationing) c) Under pressure of labor shortage some violation of established wage rates (gray market) d) Illegal kickbacks (black market)	a) A person born on a collective does not have right to leave without permission (rationing) b) Collectives sometimes purchase labor services from traveling, free-lance construction teams (white, gray markets)	a) Food items sold by individual collective farmers at collective farm markets (white market) b) A broad array of goods and services are sold semilegally: summer homes, building and repair services, tutoring private medical services (gray market) c) Extensive illegal sale of stolen or illegally produced goods, for private gain (black market)

it to say that it is composed of individuals who take state property and sell it for private profit, and of individuals who illegally produce consumer goods, usually with state property as inputs and, with use of state machinery, sell these goods for private profit. These producing units are often quite large and well organized. Furthermore, it is interesting to note that transactions in this black market in the Soviet Union usually involve legal goods that are in short supply, rather than illegal goods; little trade, for example, is in narcotics. Any assessment of Soviet economic recovery potential must address this complex and not well understood component of the economy.

Even this brief description of the terrain of horizontal interactions in the Soviet Union prompts the question why such use of market-type mechanisms in the Soviet economy is broad. Why are not all the horizontal interactions of the rationing type? A full response to this question is not possible here, but such a response could involve the following elements. The market mechanisms that are observed in the Soviet economy arise for three types of reasons. The first is related to the immense amount of information required for centralized planning in a large, developed economy. The Soviet leaders decided that, in regard to the distribution of goods among consumers with varying preferences, the computational costs involved in complete rationing vastly outweighed the benefits that might be gained from central control. In the producers' goods markets, the decision was the reverse. Yet current discussions of wholesale

trade in producers goods reflects the problem of computational costs. Markets, related to the diversity of needs and behavior of individual units in an economy, especialy within the consumer sector, are observed in all large, non-primitive economies. Therefore, they may be referred to as univeral markets. These markets include not only the "red and pink" markets, but also those "black" markets that deal in goods prohibited in a society, for which a demand exists.

A second group of markets has resulted from the soviet planning system itself and its operational deficiencies, especially the excessive tautness in Soviet plans and the resulting shortages and supply unreliability. Primary among these markets is the "gray" market in producers' goods. Furthermore, due to shortages of consumer goods caused by planning deficiencies and government policies (high rate of investment, artificially low prices on consumers goods), and due to irresponsible attitudes toward state property (high level of theft of state property), the "black" market in consumer goods is extensive. This group of markets may be called Soviet planning markets.

A third group is composed of the markets that have appeared in the Soviet Union in connection with the specific historical conditions in the development of an agrarian country with a low standard of living. In this group, called the low-level of development markets, are the "white" and "gray" markets for

consumer goods and others.

This discussion of horizontal relations in the Soviet economy is not intended to deny the assertion at the beginning of the section that the Soviet authority structure is highly centralized. Indeed, in relation to most other economies--market and planned--it is a highly centralized structure. The intention is to make clear, however, that it is not a "completely centralized" hierarchy. In reality, more extensive horizontal relations exist than are generally recognized.

4.2.3 Information Structure

The Soviets collect huge amounts of information constructing and controlling the implementation of plans (one large plant submitted 17,000 pages of data for the construction of its annual plan). Partly because of its huge volume and because of the interrelationship between the information structure and the incentive structure (those who report data have a stake in the data they report), the information system is beset with problems, as explained in the following passage from a survey article written over a decade ago by Richard Judy:

> From this survey of existing Soviet economic information systems, it seems obvious that a major information crisis faces Soviet economic management. Each of several parallel information systems imposes its own burden of reporting upon the enterprises. This requires repeated input of much primary data into each system, a costly redundancy. There is little standardization and collaboration among the parallel systems. Voluminous files are kept separately in each system in spite of great commonality of the data items contained in them. Proper file maintenance is difficult

> because of poor file organization, inadequately designed inflow of updating information, and manual methods of processing. For the same reason, information in the files can be retrieved for management use only with difficulty and after prolonged delay. Pertinent information is frequently not available to decision-makers even though managerial personnel spend most of their time in routine data processing activities. Lack of information and the delays in its availability diminish the system's ability to respond to change. In short, information is incomplete, insufficiently accurate, largely irrelevant, and slow. Furthermore, it is expensive. This means that models are built by intuitive guesswork, status information is inadequate and inaccurate, forecasting is nonexistent or unreliable, plan directives are inconsistent and ambiguous, and control is slack. Like the talking donkey, the wonder is not that the system works badly but that it works at all.

All the ills just mentioned have persuaded Soviet authorities that major improvements in the system of economic information are necessary if the centralized system of economic management is to be preserved. Academician N.P. Fedorenko stated in a recent report to the Presidium of the Soviet Academy of Sciences:

> The existing system of economic information, its methods of collecting, transmitting, and processing, can barely attain even a balanced plan for an aggregate group of products. The basis of that system is data collected by the Central Statistical Agency and by means of an enormous number of telephone conversations and meetings held in organs of planning and management. Of these data, collected with a great delay, no more than 10 percent are used for purposes of planning and management. The country essentially lacks a more or less unified, scientifically based coefficient base. An enormous amount of planning-managerial information is largely subjective in character. Relying on such a system of information, the organs of planning and management often cannot formulate scientifically based plans even when using computers and modern scientific methods; and the economic organs cannot guarantee their implementation.

Judy's comment about wondering how the system works at all should warn us against going too far in our negative assessments. The Soviet economic system does work. The question then is to figure out how, with this sort of information structure, it does work. The statement of Fedorenko suggest one possible answer: the system does not rely exclusively on this formal information structure. It also uses supplementary sources of information.

4.2.4 Motivation and Incentive Structure

The salient features of the Soviet incentive structure, well- documented in the literature on the Soviet economy,(6) include the relativity of the Soviet managerial bonus system, its intertemporal "ratchet" nature, and its negative consequences on managerial behavior. In short, Soviet managers are rewarded for performance relative to target. Up to the mid-1960s, the target was volume of output; since then it has been primarily a combination of volume of sales and profitability. But its relativity nature has remained. This condition, combined with the practice of making tomorrow's target greater than today's performance, and the practice of constantly applying strong pressure on Soviet managers to increase their output, has led to a number of dysfunctional consequences--that is, dysfunctional from the point of view of the growth objectives of the Soviet leaders. Primary among these dysfunctions is the Soviet manager's resistance to innovation in the process of production and even more in regard to the product produced. Soviet managers also produce low-quality goods, wrong assortment,

material-intensive goods, and hoard inputs. All this decreases the effectiveness of the Soviet economy.

4.2.5 Coordination Structure

The construction and implementation of the plan embodies the coordination structure of the Soviet economy. While the Soviet plan construction process does enable the political leaders to maintain the structure of resource allocation that it desires--that is, growth oriented--it is not an effective instrument for achieving internal consistency and coordination of the economy. This view is by now standard in both the Soviet and Western literature on the Soviet economy. The information gathering and processing requirements of running a modern economy the size of the Soviet Union's are way beyond the capacities of Soviet planners. In practice, their plans are usually poorly coordinated, which is one of the reasons for the large set of unplanned horizontal transactions described above. Yet the coordination structure is in place, and at times of stress--such as national mobilization and recovery, when the political directives would probably carry greater weight than at present--the rigid, formal structure would facilitate execution of national plans.

5. KEY COMPARATIVE ISSUE AREAS

The purpose of this final section is to identify key issues that would constitute major areas of study under a comparative assessment of the ability of the United States and the USSR to achieve their external and internal societal goals during recovery from a nuclear attack. The section also outlines the major steps in conducting the comparative assessment.

5.1 Issues Areas for Comparative Analysis

Comparative issues relate to a society's mobilization of resources and use of institutions to achieve both domestic and external goals. Most previously completed recovery analyses have been limited to evaluations of production possibilities for military hardware and expansion of economic output. The figure-of-merit, for example, for economic output has often been limited to simple criteria such as length of time to return to prewar levels. The limitations of these analyses are obvious.

One needs both comprehensive enumeration of a society's goals and weighted evaluation, in dynamic terms, of the achievement of intermediate and final objectives. Numerous taxonomies for political-economic objectives exist. One of the more interesting grew out of attempts to develop social indicators for evaluation of social programs. When developed, these indicators would play a role in social formulation equivalent to the roles that various measures of inflation and employment and per capital income distribution (among other

factors relating to economic well-being) play in assessing the effectiveness of the economic policies.

The process of re-emergence of power in the near- to mid-term relates to three sets of goals, one external and two internal to a society. A society desires to develop the capability to deter and, when appropriate, coerce adversaries. Second, the principal focus of the political leadership during this period will be on a set of goals relating to domestic socioeconomic welfare. Third, achievement of both the external goals and those relating to socioeconomic welfare is dependent upon the leaders' ability to maintain political control.

Using these three classes of goals, we identified sub-issues or comparative issues. These issues relate to a recovery environment. That is, were we examining the functioning of the two societies in a peacetime condition, the specific comparison issues would be different. The suggested list of comparative issues is in Tables V-1, V-2, and V-3.

The essence of the suggested method is to analyze the U.S. and USSR political-economic systems using the structural-functional method as described in Chapter III, in regard to each of these key issue areas for comparative analysis. The analysis will be performed in two directions. For each issue area a comparison (direct) will be made between the United States and the USSR, and second the effect of each issue area on the overall performance of economy will be assessed. For each

Table V-1

EXTERNAL SOCIETAL GOALS: DETERRENCE AND COERCION

- Nature and degree of political will
- Ability to maintain necessary minimum political stability: Degree of freedom from coercion
- Military strategy: Utility of military forces (role of forces in achieving external societal goals)
- Military capability: Stocks, equipment and manpower, organization and training
- Military potential: Productive capacity as it relates to deterrence and coercion

Table V-2

INTERNAL SOCIETAL GOALS: SOCIOECONOMIC WELFARE

- Provision of goods and services
  - Industry
  - Agriculture
  - Public services (other than health/defense)
- Provision of defense services
- Provision of health services
  - Public/private: Services/resources
  - Preventative/curative
- Distribution, transportation, communication
  - Trade network (flow of goods)
  - Allocation of consumer goods (equity, priority, rationing)
  - Information flows (social mobilization, political and economic stabilization and growth)
- Effectiveness of financial system: ability to transmit control over resources
- Use of foreign resources: Role in achieving objectives
- Characteristics of human capital
  - Demographic profiles: Age, regional distribution, education, skills
  - Psychological factors: Ability to cope, degree of self-reliance, degree of mobility
  - Participation in personal production of essential goods and services

Table V-2 (continued)

- Characteristics of physical capital
  - Equipment and structures
  - Sectoral and branch composition
  - Regional distribution
  - Domestic and foreign origin
  - Age composition
- Mechanisms
  - sectors and regions; maintain desired labor utilization levels and allocations
  - Implement plans: Effectiveness of institutions; role of central vs regional institutions

Table V-3

INTERNAL SOCIETAL GOAL: POLITICAL CONTROL

- Ability to maintain domestic order
  - MACRO: Prevent insurrection, subversion, riots
  - MICRO: Protection of citizens and property; crime prevention and control
- Ability to maintain or transform political system under stress conditions
  - Stress factors and responses
  - Interest groups and decision process

direction of the analysis, a composite "weighting" function will have to be derived. That is, not all of the issue areas have the same importance in the direct, issue-by-issue comparison of the ability of the United States and the USSR to recover from the catastrophe of a nuclear attack. The same is true of the issues as they affect the recovery ability of each system. The derivation of these weighting systems presents great difficulties. Yet it would be possible to develop judgmental ranking procedures that require experts to defend their rationale and thereby allow others to respond to their logic.

5.2 Steps in Conducting a Comparative Analysis

From the discussion of the factors influencing the conduct of recovery analyses--the structural-functional method and key issues--it is now possible to outline the major steps in the conduct of U.S.-USSR recovery comparisons.

- Step One: Description of the Recovery Environment Under this task the theme for the environment is selected and assumptions made about its determining features. The initial conditions resulting from the nuclear exchange relating to military forces, capital stock, and population are documented.

- Step Two: Formulation of Objectives and Policy Guidelines Under this task the broad national goals are formulated and a consistent set of political-economic and military guidelines developed. The principles relating to plan formulation and implementation, as well as the behavioral characteristics central to successful plan implementation, are also drafted.

- Step Three: Conduct of Comparisons by Key Issue Areas Using the structural-functional method, the two direction (U.S.-to USSR and over U.S. and USSR) analyses are conducted.

- Step Four: Conduct of Selected Sensitivity Tests Based on the results of task three, selected sensitivity tests are conducted to isolate key factors or to examine key areas of uncertainty.

- Step Five: Development of Conclusions Based on the results of tasks three and four, conclusions are developed regarding the ability of the United States and the USSR to recovery from a nuclear exchange. Key strengths and weaknesses would be identified and implications for U.S. preparedness and recover programs, as well as nuclear weapon employment policy, discussed.

FOOTNOTES

A. Section II

(1) See N. Earle, H. Levine, H. Hunter, Observations on Measurement of Soviet Economic Processes During Mobilization and Recovery. SRI International, SSC-IN-78-17, December 1978.

(2) Office of Technology Assessment, Congress of the United States, "The Effects of Nuclear War," OTA-NS-89, May 1979.

(3) See N. Earle, H. Hunter, H. Levine, C. Movit, Executive Summary: A Political-Economic Game Explaining Soviet Plan Formulation During Postattack Recovery, SRI International, SSC-TN-4986-2, December 1978.

B. Section III

(1) See, for example, D. Conn, "Economic Theory and Comparative Economic Systems," Journal of Comparative Economics, Vol. 2, No. 4 (December 1978), 355-81; E. Newberger and W. Duffy, Comparative Economic Systems: A Decision-Making Approach (Boston: Allyn & Bacon, 1976); J. M. Montias, The Structure of Economic Systems (New Haven: Yale University Press, 1976).

(2) See H. S. Levine, "On Comparing Planned Economies," in A. Eckstein, Comparison of Economic Systems (Berkeley: University of California Press, 1971).

C. Section IV

(1) The recent July 29, 1979 Resolution of the CPS on Improving Methods of Planning called for an increase in the role and importance of the Five Year Plan.

(2) See the two articles by A. Katsenelinboigen and H. S. Levine: "Market and Plan, Plan and Market: The Soviet Case," American Economic Review, Papers and Proceedings, 1977; and "Some Observations on the Plan-Market Relationship in Centrally Planned Economies, The Annals of the American Academy of Political and Social Science, November 1977.

(3) A. Katsenelinboigen, "Coloured Markets in the Soviet Union," Soviet Studies, XXIX, No. 1 (1977), 62-85.

(4) A. Katsenelinboigen, H. Levine, "Some Observations on the Plan-Market Relationship in Centrally Planned Economies," The Annals of the American Academy of Political and

Social Science, November 1977, p. 196.

(5) Richard Judy in J.P. Hardt, et al., Mathematics and Computers in Soviet Economic Planning (New Haven: Yale University Press, 1967), pp. 31-32.

(6) See, for example, P. K. Gregory and R. C. Stuart, Soviet Economic Structure and Performance (New York: Harper and Row, 1974), Chapters 5 and 6.

D. Appendix A

(1) M. M. Earle, H. Hunter, C. Movit, "The Interaction of Political/Military and Economic Factors in Soviet Post-attack Recovery Planning: Documentation of a Political/ Economic Game," SRI International, SSC-IN-78-6, October 1976.

APPENDIX A

EXAMPLE OF ASSUMPTIONS REGARDING POLICY GUIDELINES, PLAN FORMULATION, AND IMPLEMENTATION PRINCIPLES AND BEHAVIORAL CHARACTERISTICS OF PLAN IMPLEMENTATION

*Extracted from "The Interaction of Political/Military and Economic Factors in Soviet Post-attack Recovery Planning: Documentation of a Political/Economic Game", M. Earle, H. Hunter, C. Movit; SRI International: Informal Note SSC-IN-78-6, October 1978.

Table A-1

EXAMPLE POLICY GUIDELINES: ECONOMICS

SOVIET RECOVERY CASE: RESTORATION OF SYSTEM TO ITS PREWAR FORM

1. Restore, to the extent possible, the central direction of the national economy, and major interregional links.

2. Reconstitute the economic base for the desired military capability (durables and services).

3. Maintain the population at a standard of living enough above subsistence level to ensure productive participation in the labor force.

4. Restore the economy in such a manner as to minimize dependence on outside sources of supply.

5. Draw on friendly and occupied economies, but do not disable these economies. Instead, acquire an high proportion of their output and some of their labor, especially skilled labor and technologies.

6. Pursue restoration of established patterns in the economy; avert risks of innovative change.

TABLE A-2

EXAMPLE POLICY GUIDELINES: POLITICAL AND MILITARY

SOVIET RECOVERY CASE: RESTORATION OF SYSTEM TO ITS PREWAR FORM

1. Restore, as rapidly as possible, military capabilities along traditional lines, emphasizing ground forces.

2. Maintain dominance of party over military, while emphasizing the parallel military rank of high political leaders.

3. Ensure, to the extent practicable, maintenance of party-state and center-periphery party relations as in pre-attack. Reinforce by dispatching direct representatives of the Politburo and General Staff to regional administrative centers.

4. Suppress separatist tendencies.

5. Strengthen role and staff of the Council of Defense to ensure fulfillment of defense goals.

6. Maintain a nonagressive posture in foreign relations but assure defensive capabilities.

TABLE A-3

PLAN FORMULATION AND IMPLEMENTATION PRINCIPLES

SOVIET RECOVERY CASE: RESTORATION OF SYSTEM TO ITS PREWAR FOR

A. Economic Plan Construction

1. Enhances command: stronger central direction in economic decisionmaking than in pre-attack period, especially in regard to allocation and reallocation of labor and capital, rationing of key materials and consumer goods. This can give way to some decentralization as priority goals are met. Reorganize some union-republic and republican ministries to allow for more centralized controls.

2. The range of high-priority activities is narrowed from pre- attack to those strongly linked to military production.

3. The number of centrally-planned material balances is reduced, but includes those for critical defense materials at a disaggregated level.

4. Variance exists in input norms for material balances, since shortages, destruction, and technical change result in substitution and quality changes. Together with information problems, this variance results in a disruption of old material balance methods.

5. The dominant emphasis in plan construction, then, is not over- all balance. Significant amounts of materials will be maintained in the distribution category called Reserves of the Council of Ministries to be allocated by the central authorities during the course of the plan cycle as needs appear.

6. Selective tautness is introduced into input norms and ouput targets to relieve intense pressure on priority sectors. nonessential finishing tasks (for example, metal plating and painting) are dispensed with.

7. Allow slippage in the quality of output. Eliminate all "frills" on products.

8. Encourage some increase in enterprise self-sufficiency. A delicate balance exists, of course, between the complexity of the central planning task and central control over local economic activity.

9. Reconstruction: for high-priority establishments, use centralized control; campaigns initiated to restore urban centers using local materials and labor (this will reinforce preattack concentrations of economic activity) to restore structures within the framework of priority rankings. Mobilize construction labor and equipment internal to nonessential industry.

B. Economic Plan Implementation and Institutions

1. Heavy reliance on campaigns rather than smooth, balanced approach to recovery.

2. Managerial incentives:

   a. decrease in reliance on monetary incentives

   b. greater reliance on status/position rewards and punishments, material prerequisites of status (physical goods and services, special stores and health facilities, and the like).

   c. greater reliance on social and legal measures

3. Labor management

   a. use, when necessary, of mandatory labor assignments--place, occupation, hours, and ages

   b. reduced reliance on money-wage differentials.

   c. encourage high labor productivity via:
      (1) special rations
      (2) housing
      (3) cultural activities
      (4) health facilities.

4. Reassert security of stocks of materials, freeze use of critical materials.

5. Publicize range of substitute input relationships and maximum capacities (that is, relaxed safety standards) and minimum service requirements for machinery; prepare inventory of underutilized regional resources and capital facilities.

6. Strengthen centralized direction and functions of GOOSNAB (State Committee on Material-Technical Supply).

7. Maintain and strengthen centralized functions of financial system; all surpluses (taxes, profits) funneled through GOSBANK to be allocated at the center's discretion to the periphery; freeze savings accounts.

8. Regional considerations:

   a. reconstitute regional patterns of production and distribution

   b. due to information problems, strengthen the administrative role of regional bodies (Republic Councils of Ministers, Gosplans).

Mobilize means of transportation under local authority (for example, trucks in agriculture, inland fleets).

TABLE A-4

PRIMARY BEHAVIORAL CHARACTERISTICS OF PLAN IMPLEMENTATION

SOVIET RECOVERY CASE: RESTORATION OF SYSTEM TO ITS PREWAR FORM

1. The Party Pyramid dominates and infiltrates the goverment pyramid.

2. The decision of higher bodies is binding on lower bodies; the downward flow of orders dominates feedback of information and opinion from below.

3. Tautness of overcommitment drives the system.

4. Information is closely held. Secrecy and censorship are used to keep almost everyone on a need-to-know basis, thus impairing domestic decisionmaking and hampering foreign appraisal of Soviet developments.

5. The authorities will stress continuity, their knowledge of the laws of historical development, and the tactic of adapting to setbacks without a basic change of source.

6. Use strenuous campaigns in pursuit of major objectives, replacing them with fresh campaigns if results are not satisfactory.

7. People act on well-understood implicit priorities (ethnic rankings, nonrecognition of demand elasticities, and the like).

8. At the same time, any loss of communication is serious, since local people wait for orders.

9. Subject to limitations on export capacity, imports can be expected to make up for shortfalls in domestic production, or at least reduce their impact.

10. After disallocations, people can be expected to revert to familiar norms and behavior patterns.

11. A semi-legal "second economy" can be expected to spring up when shortages in consmer goods appear, reducing somewhat the extent of unmet needs.

APPENDIX B

State-of-the-Art

As indicated in the introduction to this report, the approach employed here to the comparative evaluation of economic potential is a departure from most of the previous work on postattack economic recovery. This is primarily because the interaction between the performance of the total socioeconomic system and the productive capacity of key industrial sectors was usually ignored in favor of more narrow considerations linking factors of production to output supporting defense and non-defense end-uses of interest.

The companion study to this report, which addresses analytical systems for the assessment of socio-economic performance in the context of the U.S. economy, emphasizes the requirement for a total system framework in order to provide for meaningful analysis of any system component. In the comparative context, the importance of asymmetries between economic systems for economic performance, particularly in a crisis environment, underlines the need for an analytical framework appropriate to assessing comparative economic potential. The approach here, then, reflects this need and draws on some rather innovative work on comparing economic systems.

Recently a series of articles and books have been published reflecting enhanced interest in the newly developing theory of economic systems. Perhaps the best survey of this literature is contained in an article by David Conn.

- "Economic Theory and Comparative Economic Systems," Journal of Comparative Economics, 355-381 (1978)

His article summarizes recent material on the component structures of economic systems -- the information, decision-making, and incentive structures -- and on the evaluation of the performance of economic systems.

The most commonly used text on comparative economic systems is one by Egon Neuberger and William Duffy.

- "Comparative Economic Systems: A Decision-Making Approach," Allan and Bacon, Inc., 1976.

The analytical approach of Neuberger and Duffy, as indicated in Chapter III, influenced our thinking regarding the comparison of the U.S. and Soviet economies under post-nuclear attack conditions.

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AN APPROACH TO THE COMPARATIVE ANALYSIS OF THE US AND SOVIET ECONOMIES (Unclassified)
SRI International, September, 1980
DCPA01-78-C-0309, W.U. 4341D

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