THE U.S.-SOVIET LONG-TERM MILITARY COMPETITION VOLUME I - CONCEPTS

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This three-volume report examines the nature of the U.S.-Soviet long-term military competition and sets forth improved means for developing and implementing strategies for this competition. This research encompasses broad national strategy as well as specific military missions and is directed at planning concepts and methods, rather than at devising specific strategies. Volume I describes the rationale for continuing to compete with the USSR in a time of reduced tensions with the USSR and defines planning concepts that are essential for strategy development. This volume then reviews U.S. and Soviet competitive actions. It concludes with a discussion of Soviet economic, technological, and operational planning weaknesses and the implications for the role of technology in U.S. competition planning.

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SUMMARY

Volume I describes planning concepts that are needed for development of U.S. competition strategies, illustrates these concepts with examples of U.S. and Soviet competition actions, and develops an approach to technology applications that can exploit Soviet economic, technological, and operational planning weaknesses.

During the last few years, East-West tensions have virtually disappeared as Mikhail Gorbachev seeks to make major political, economic, and social reforms in the USSR. The Soviet Union appears to be retrenching in the military competition, at least for a time, and the form and venue of the competition is shifting, with public diplomacy, arms control, and R&D elements playing a stronger role relative to weapon system production, forward-deployment of troops, and large active-duty forces.

The Soviet threat is seriously reduced compared to that at the height of the cold war and the USSR would need many years, if not decades, to pose a threat of that magnitude again. But the Soviet Union is still a major military competitor of the United States. Moreover, even as a reduced threat the Soviet Union is capable of military actions that are contrary to U.S. interests and could become a more powerful threat in the future.

Chapter 1 discusses why competition planning is more important than ever for the United States, coming to three conclusions:

- The United States should maintain an effective competitive posture toward the Soviet Union, emphasizing research and development and arms control. Doing so does not necessarily mean large overseas forces, high defense spending, or jeopardizing improved relations with the USSR. But keeping the

Soviets aware of U.S. strength as a military competitor will promote cooperative behavior. Further, maintaining the U.S. competitive posture will keep pace with the Soviets in areas where they are still competing (e.g., strategic forces, research on advanced technology weapons, and perhaps naval forces) and will hedge against a resurgence of the Soviet threat.

- The United States should also protect its competitive position in the multipolar security environment of the 1990s and beyond, where a U.S. balance of power strategy probably will supplant containment of communist states. America needs to be concerned with states that now compete militarily against its interests (e.g., North Korea), with those that in the future could become military competitors with the United States (e.g., India), with those that can affect the U.S.-Soviet military competition (e.g., Germany), and with military competitions between other countries like the Arab states and Israel that could affect U.S. interests.

- Explicit U.S. competition planning is needed in order to realize these objectives in a period of shrinking defense resources and security problems that are becoming more complex and assuming a longer-term character.

The U.S.-Soviet competition fundamentally is a contest for power and influence in world affairs. The competition has political, ideological, economic, technological, and military dimensions, but currently the military dimension dominates the competition. Through the 1960s, the U.S.-Soviet competition was primarily a two-sided vying for power. Now, however, this contest is played out in a multipolar world, as the postwar alliances on both sides are wearing thin and new challenges from elsewhere are confronting the United States and the USSR. Chapter 2 examines the nature of the military competition and its relation with Western security.

The essential concept in the peacetime military competition is to safeguard or restore U.S. and allied military

advantages over the USSR by building on U.S. and allied strengths and exploiting Soviet weaknesses in more explicit, systematic, and institutionalized ways than in the past. Competing effectively involves looking forward several moves, making past Soviet military investments obsolete, and influencing future Soviet military investments in ways that improve the balance of power and enhance stability. This is to be done through a variety of means, including technology developments, weapon system developments and production, improvements in force deployments and support, changes to operational concepts for force employment, public diplomacy, and arms control negotiations.

Broad U.S. objectives in competition planning are the same as in more traditional planning approaches: deterrence, reassurance of allies, peaceful resolution of crises, and defense of U.S. and allied territory and interests should deterrence fail. In addition to supporting these traditional objectives, U.S. competition planning should use available DoD resources to improve both the military balance and America's military competitive position, to steer the competition in less threatening directions, and to ensure that the current extended era of peace continues. This entails explicit consideration of how the USSR plans its force posture in order to influence that planning; use of a planning horizon of two or more decades to consider U.S. and Soviet moves and countermoves; and evaluation of alternative military investments in terms of U.S. and Soviet strengths and weaknesses.

Chapter 3 discusses key concepts for U.S. planners to use in support of competition strategy development. These concepts are used throughout this report to help describe the military competition.

The totality of the U.S.-Soviet military competition is too large and complicated to be addressed as a whole. One key

planning concept is to break the competition down into more manageable subareas. We favor a predominantly regional approach to defining subareas of the military competition (e.g., the intercontinental region, Europe, East Asia, and the Middle East/Southwest Asian area). At least one "business area" (to use a term from corporate strategic planning) should, however, be included among the subareas of the competition: technology, which is a particularly important area of military competition in the 1990s.

Within each subarea, several concepts are important for competition planning and analysis:

- Prizes and goals: For what ultimate objectives is each side competing? What are the more immediate competition goals that each side is pursuing as they seek these ultimate prizes?
- Rivals and other actors: Who are the contending parties? What other parties affect the way the U.S.-Soviet military competition is carried out?
- Means: Through what specific means do the United States and the Soviet Union compete militarily?
- Rules and referees: What determines "legitimate" behavior in the peacetime military competition? What mechanisms enforce these behavioral norms?
- Centrality of moves and countermoves: How best to think about the dynamic interactions of the contending parties?
- Time horizon: What is the proper time horizon to use in military competition planning?

Determining competition goals and strategies -- i.e., where one should try to move in the military competition -- requires an understanding of what the current state of the competition is and what future states are feasible, which states the United States prefers, and who is ahead in the current state.

Therefore, chapter 3 concludes by developing three concepts to structure this understanding:

- States of the competition: How does one describe where the military competition stands today or what it might be like in the future? Here we develop the concept of describing the state of the military competition in terms of the military balance, the competitive positions of each side, and the state of achievement of more traditional U.S. objectives such as deterrence.

- Preferences for states: Which states are preferred by each side? How are preferences determined?

- Score: How does one assess which side is ahead in the military competition? We introduce the concepts of competitive advantage, competitive leverage, and competitive initiative to assist in determining who is ahead in various subareas of the competition.

Chapter 4 illustrates these planning concepts by applying them to the intercontinental, or strategic forces, subarea of the U.S.-Soviet military competition.

Chapter 5 further illustrates these planning concepts with historical examples from the U.S.-Soviet military competition. The chapter summarizes U.S. and Soviet strengths and weaknesses and describes examples of ways that each side has invested resources to convert strengths and weaknesses to actual competitive advantages (e.g., the Tomahawk Land-Attack Missile program, the B-2 bomber, Soviet submarine quieting, Soviet ICBM improvements, and Soviet Operational Maneuver Groups). Also important are U.S. and Soviet actions to improve their competitive positions (e.g., U.S. stealth R&D, the Strategic Defense Initiative, Soviet ballistic missile defense R&D and deployments, and increased Soviet access to airspace and bases outside the USSR).

To assist further in understanding competition planning concepts, chapter 5 goes on to discuss several examples of U.S. and Soviet competitive successes and failures:

- U.S. successes: ASW programs in the 1960s and 1970s, land-attack cruise missiles, tactical air capabilities, nuclear-powered submarine investments, theater nuclear forces in the 1960s and 1970s, the B-52 program, and development of satellite reconnaissance capabilities.

- U.S. failures: failure to understand until the late 1970s that the Soviet Union did not adhere to the doctrine of mutual assured destruction, failure to continue in the 1970s and 1980s to make strategic targets in the United States difficult for the USSR to attack, failure to reduce NATO's dependence on theater nuclear forces in the 1970s, and failure to make the sustained investments in armored force infrastructure necessary to challenge the Soviet lead in this area.

- Soviet successes: the combined arms ground and air force buildup in Europe, the reversal of the theater nuclear balance in Europe in the 1970s, armor and anti-armor programs, the anticarrier warfare program, the sustained Soviet program to make strategic targets in the USSR difficult for the United States to attack, the partitioning of Germany after World War II, and the high rate of military investment in the 1970s (a military success, but ultimately an economic failure).

- Soviet failures: the inability to develop effective ASW capabilities against U.S. SSBNs despite a large investment, the continued occupation of the Japanese northern territories (a political failure), the efforts to prevent U.S. deployment of Pershing II and GLCM in Europe, and the debilitating economic effects of high military spending.

Our review of U.S. and Soviet competitive successes and failures provides several lessons for competition planners. Perhaps the most important lesson is that one cannot achieve permanent advantages in the military competition. It takes continued planning and actions to sustain advantages once they are

gained. A related lesson is the importance of watching closely what the adversary is doing. Systematic observation of Soviet actions is needed, with analysis and feedback to U.S. competition planners. Further, it is important to examine the competitive environment periodically, to understand how trends outside the U.S.-Soviet military competition can affect U.S. and Soviet advantages and positions. Finally, policy makers must ensure that competition goals and strategies are consistent with the resources likely to be available to implement them.

Chapter 6 builds on these examples and lessons by analyzing Soviet economic, technological, and operational planning weaknesses, identifying connections among these weaknesses that the United States can exploit, and developing implications for U.S. applications of advanced technology in the military competition.

Historically, the Soviet Union has obtained most of its new technology from Western sources rather than from internal developments; this dependence on Western technology is as strong today as it ever was. This means that Soviet technology levels inherently lag behind those of the West in most areas. There are, however, important exceptions to this general finding, especially in technology areas that have high national priority for the USSR, such as some weapons programs and the space program.

Several factors account for the Soviet lag in technology:

- The lack of incentives for technological innovation in the centrally directed Soviet political, economic, and social system.
- The political and organizational barriers to diffusion of technology in the USSR.
- The risk-adverse approach of Soviet design bureaus to weapon system development.

- Western barriers to transfer of critical military technologies to the Soviet bloc.

Despite these limitations, the Soviet Union has built a large, modern military force that has gained superpower status for the USSR and that has seriously challenged the United States in the military competition. The USSR has been able to accomplish this feat by devoting a much higher percentage of its GNP to military spending than do Western nations; by according high priority to the military in allocating other economic resources; by tailoring its military research and development, production, and operational planning to achieve Soviet competition goals within the constraints of Soviet technology, industrial plant, and manpower; and by a large, centrally directed program to acquire Western technology to support Soviet military programs.

Nevertheless, the USSR is falling behind the West in most of the technologies that appear to be critical for the military competition in the 1990s. Earlier Soviet successes in the military competition were based on their strengths in heavy industries, complemented by adroit use of technology derived from the West. In some cases, the United States contributed to Soviet successes by failing to take full competitive advantage of Soviet limitations. But the military competition appears to be shifting into areas where heavy industry is less of an advantage and technologies of information, surveillance, signature control, and smart weapons are increasingly important.

The United States and its allies are strong in these areas and the Soviet Union is weak. Serious and systemic Soviet deficiencies in computers and microelectronics are a key limitation that affects many other areas of Soviet development and production of advanced weapons systems. The poor state of Soviet computer and microelectronics technology also retards their efforts to bring the

civilian economy up to Western standards. Gorbachev and other Soviet leaders recognize these problems. They are trying to reform the Soviet system to substantially upgrade its technology levels and economic performance without abandoning the fundamental precepts of Marxism and Leninism, and without losing political control over the country in the process. Whether they can accomplish this goal remains to be seen.

It cannot be assumed that a shift of the military competition into areas of advanced technology will automatically convey major advantages on the United States. The Soviet Union is trying to use arms control and public diplomacy to channel the competition in directions that favor the USSR, so trends in the competition could change. Even if the competitive environment continues to move in the direction of advanced technology, the combination of even modest improvements in the Soviet economic system, Soviet spotlighting of weapons developments for high resource priority, and relaxed Western restrictions on technology transfer in a time of declining threat perceptions may allow the Soviet Union to be competitive on an advanced technology playing field.

This analysis suggests that the general U.S. approach to military competition with the USSR in the 1990s should be through a "leapfrog" strategy -- described in chapter 7 -- that works within the tight DoD budget constraints that are likely to prevail over the next decade and that takes advantage of the breathing space that Gorbachev is achieving in this competition. In a leapfrog approach, the United States would forego a certain amount of near-term force modernization and perhaps even readiness, but would invest heavily in military research and development (with limited production) in order to be in a strong position if the Soviet Union successfully upgraded its technology and production bases and heightened the pace of the military competition in the

early twenty-first century. This approach to competition strategies would also serve to discourage the Soviet Union from actually returning to increased military competition by making clear that the United States can and will sustain its advantages and superior competitive position in the technologies that are important for modern combat operations. Further, it would also serve U.S. interests in future military competition with lesser powers.

Within this general leapfrog approach, the United States should plan skillfully and with vision for applications of advanced technology in the military competition of the 1990s. These applications should be selected to exploit Soviet economic, technological, and operational planning weaknesses, following these criteria:

- Apply technology in ways that influence Soviet views about the nature of future wars, with the goal of causing the Soviets to conclude that critical missions are becoming more difficult for them to carry out.
- Pose fundamental threats to the Soviet ability to maintain control over military situations in wartime.
- Emphasize combinations of technologies and military operational concepts that require Soviet counters to draw extensively upon advanced technologies that their system is especially poor in fostering (e.g., computers or microelectronics).
- Pursue technology applications that impose delays on Soviet counters by, for example, requiring them to enter into new weapons production or to develop new production processes, rather than to improve or scale up existing production means.
- Continue to seek restrictions on transfer of technologies to the Soviet Union that would materially enhance the Soviet position in the military competition in the 1990s.

Following these criteria would probably result in strong U.S. competitive emphasis in the 1990s in stealth technology; the technologies emerging from the SDI program; the combination of advanced surveillance technologies and smart weapons that underpins the Follow-On Forces Attack program; highly accurate, long-range cruise missiles; advanced conventional munitions that have tactical effects comparable to those of nuclear weapons; and laser and other directed energy weapons.

PREFACE

The term "competition" is commonly used to characterize the relation between the United States and the Soviet Union. Despite the recognition that the two superpowers compete in all the major dimensions of international relations -- political, military, economic, technological, and ideological -- there has been relatively little research on the nature of this competition and on systematic ways for the United States to improve its competitive position in this complex vying for power and influence.

There are many examples of effective U.S. competitive actions, but little attention has been given to explicit planning processes and strategies to help the U.S. Government compete more effectively with the USSR over a long period. In the late 1940s and early 1950s there were discussions of broad national strategies for the competition, especially at the RAND Corporation. But this line of questioning gradually died out by the mid-1950s. In 1969-1970, Andrew Marshall worked on a framework for analyzing the U.S.-Soviet long-term competition, concentrating on strategic forces. Under Marshall's leadership, the Department of Defense began in the mid-1970s to carry out studies of more general strategies for the military competition, drawing on business concepts for strategic planning. In 1986, the Secretary of Defense established the Competitive Strategies Initiative, which addresses specific military missions or tasks.

As part of the DoD examination of how to compete more effectively with the Soviet Union, Science Applications International Corporation (SAIC) has been under contract since 1985 to carry out research on the nature of the U.S.-Soviet long-term military competition and on improved means for developing and implementing strategies for this competition. While the focus of our research is on the military dimension of the competition, it

also takes into account the political, economic, technological, and ideological dimensions. Moreover, our effort encompasses broad national strategy as well as specific military missions or tasks and is directed at planning concepts and methods, rather than at devising specific strategies. Thus, the SAIC work has sought to improve the context and methods for DoD competitive strategies development, but does not duplicate planning efforts being carried out by the Department of Defense.

SAIC's research on the U.S.-Soviet long-term military competition was funded and guided by the Director of Net Assessment in the Office of the Secretary of Defense. The contract was administered by the Defense Nuclear Agency.

The results of SAIC's research are contained in three volumes:

- Volume I describes the general nature of the U.S.-Soviet long-term military competition, including concepts useful for understanding what is important in this competition and for developing strategies to compete effectively.
- Volume II describes a structured process for devising and implementing strategies for the long-term military competition, evaluates current analysis tools in terms of their adequacy to support competitive strategy development, and recommends improvements.
- Volume III contains case studies and other background papers that supplement volumes I and II.

Although these three volumes collectively describe the SAIC research, each is designed to be read independently of the others.

Dr. J. J. Martin was the Principal Investigator for SAIC's research on the U.S.-Soviet long-term military competition,

and is the primary author of this volume. Gregory Weaver drafted an earlier version of parts of volume I. Christopher Makins was a contributing author of chapter 2.

Conversion factors for U.S. Customary to metric (SI) units of measurement

MULTIPLY → TO GET	BY	TO GET ← DIVIDE
angstrom	1.000 000 X E -10	meters (m)
atmosphere (normal)	1.013 25 X E +2	kilo pascal (kPa)
bar	1.000 000 X E +2	kilo pascal (kPa)
barn	1.000 000 X E -28	meter² (m²)
British thermal unit (thermochemical)	1.054 350 X E +3	joule (J)
calorie (thermochemical)	4.184 000	joule (J)
cal (thermochemical)/cm²	4.184 000 X E -2	mega joule/m² (MJ/m²)
curie	3.700 000 X E +1	giga becquerel (GBq)*
degree (angle)	1.745 329 X E -2	radian (rad)
degree Fahrenheit	t_k= (t°f + 459.67)/1.8	degree kelvin (K)
electron volt	1.602 19 X E -19	joule (j)
erg	1.000 000 X E -7	joule (J)
erg/second	1.000 000 X E -7	watt (W)
foot	3.048 000 X E -1	meter (m)
foot-pound-force	1.355 818	joule (J)
gallon (U.S. liquid)	3.785 412 X E -3	meter³ (m³)
inch	2.540 000 X E -2	meter (m)
jerk	1.000 000 X E +9	joule (J)
joule/kilogram (J/kg) (radiation dose absorbed)	1.000 000	Gray (Gy)
kilotons	4.183	terajoules
kip (1000 lbf)	4.448 222 X E +3	newton (N)
kip/inch² (ksi)	6.894 757 X E +3	kilo pascal (kPa)
ktap	1.000 000 X E +2	newton-second/m² (N-s/m²)
micron	1.000 000 X E -6	meter (m)
mil	2.540 000 X E -5	meter (m)
mile (international)	1.609 344 X E +3	meter (m)
ounce	2.834 952 X E -2	kilogram (kg)
pound-force (lbf avoirdupois)	4.448 222	newton (N)
pound-force inch	1.129 848 X E -1	newton-meter (N·m)
pound-force/inch	1.751 268 X E +2	newton/meter (N/m)
pound-force/foot²	4.788 026 X E -2	kilo pascal (kPa)
pound-force/inch² (psi)	6.894 757	kilo pascal (kPa)
pound-mass (lbm avoirdupois)	4.535 924 X E -1	kilogram (kg)
pound-mass-foot² (moment of inertia)	4.214 011 X E -2	kilogram-meter² (kg·m²)
pound-mass/foot³	1.601 846 X E +1	kilogram-meter³ (kg/m³)
rad (radiation dose absorbed)	1.000 000 X E -2	Gray (Gy)**
roentgen	2.579 760 X E -4	coulomb/kilogram (C/kg)
shake	1.000 000 X E -8	second (s)
slug	1.459 390 X E +1	kilogram (kg)
torr (mm Hg, 0° C)	1.333 22 X E -1	kilo pascal (kPa)

* The becquerel (Bq) is the SI unit of radioactivity; 1 Bq = 1 event/s.

** The Gray (Gy) is the SI unit of absorbed radiation.

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1. IS THE MILITARY COMPETITION OVER?

The image of competition frequently has been used to characterize the postwar relationship of the United States and the Soviet Union, to the point where, until recently, it has been a truism among journalists and academics. Some of these authors simply took note of the ongoing competition; others disapproved of it and urged diplomatic initiatives or arms control negotiations to reduce it; a few recommended ways for the United States to gain advantages; and recently it is being asserted that the Soviets have dropped out of the global competition with America, that the contest is over. This chapter examines the question of whether military competition should concern the United States in the security environment of the 1990s.

1.1 THE CHANGING SECURITY ENVIRONMENT

There always has been an element of cooperation between the United States and the Soviet Union in the postwar competition. Now, at the start of the final decade of the twentieth century, events present the opportunity to resolve the problems of two world wars and over four decades of East-West tensions. The profound economic, political, and social difficulties of the USSR, Gorbachev's reform policies, the dramatic changes in Eastern Europe, and the great reduction in East-West tensions mean that U.S.-Soviet military competition has markedly diminished.

There is a pronounced tendency in the academic literature and the media to extrapolate these trends further and to conclude that the military competition is in fact over. Soviet initiation of the unilateral force reductions promised by Gorbachev, internal discussions of a shift in Soviet military doctrine toward defensive sufficiency, progress in the Conventional Forces in Europe (CFE) arms control negotiations, and the likelihood of bringing the

Strategic Arms Reduction Talks (START) to a successful conclusion are all somehow translated into accomplished fact, with the conclusion that U.S.-Soviet relations are almost certain to continue to evolve in the direction of cooperation, provided only that the United States does nothing to jeopardize this trend.

Indeed, even some U.S. government officials have concluded that the Soviet military threat has greatly diminished and that reform in the Soviet Union is largely irreversible. The Director of Central Intelligence testified before Congress that even a major change in Soviet leaders and policies would be unlikely to return the Soviet power structure to the threat it once was. The Joint Chiefs of Staff and the Defense Intelligence Agency reportedly agree with this assessment.[1]

The Soviet threat is seriously reduced compared to that at the height of the cold war and the USSR would need many years, if not decades, to pose a threat of that magnitude once again. But this does not preclude Soviet military actions that are contrary to U.S. interests, even in the near future. It does not mean the United States can forgo concerns about major increases in the Soviet threat over the next two decades. And it does not mean that military competition is of no interest to the United States.

To the contrary, we come to the following conclusions, based on arguments developed below:

- The United States should maintain an effective competitive posture toward the Soviet Union, emphasizing research and development (R&D) and arms control means for competing. Doing so does not necessarily mean large overseas forces, high defense spending, or jeopardizing improved relations with the USSR, although it does involve at least limited production of advanced systems to prove technologies and sustain the military production base. Keeping the Soviets aware of U.S. strength as a military competitor will promote cooperative behavior. And

maintaining the U. S. competitive posture will keep pace with the Soviets in areas where they still appear to be competing (e.g., strategic forces, research on advanced technology weapons, and perhaps naval forces) and will hedge against a resurgence of the Soviet threat.

- The United States should also protect its competitive position in the multipolar security environment of the 1990s and beyond, where a balance of power strategy probably will supplant containment of communist states. America needs to be concerned with states that are now military competitors (e.g., North Korea), with those that in the future could become military competitors with the United States (e.g., India), with those that can affect the U.S.-Soviet competition (e.g., Germany), and with military competitions between other countries like the Arab states and Israel that could affect U.S. interests.

- Explicit U.S. competition planning is needed now more than ever in order to realize these objectives in a period of shrinking defense resources and of security problems that are becoming more complex and assuming a longer-term character.

The distinction between threats and competitors is important in connection with these conclusions, since we are arguing that, while the Soviet threat is declining, the USSR is still a military competitor and that some nations which do not threaten the United States now could choose to become competitors in the future. In order to be a <u>threat</u> to the United States, a nation must have interests opposed to those of America and its allies, must have a current military capability to endanger U.S. interests, and must have the willingness to use military force for this purpose if the circumstances are appropriate. To be a <u>military competitor</u> with the United States, a nation must also have opposed interests. But its military capability to jeopardize U.S. interests may currently exist or may only be emerging. Similarly, the willingness to use this force in wars that affect U.S. interests may not currently exist, although there must be the clear potential for the country to use its military capability in

peactime in ways that are contrary to U.S. interests in order to qualify as a competitor, as well as the future possibility that it would be willing to use its forces in wars that adversely affect the United States.

Thus, competitor is the more inclusive concept: a military competitor can also be a current threat, like the Soviet Union, or it may not be a current threat, like the People's Republic of China. The difference lies in both the military ability to harm U.S. interests and in the intent to use force against America or its allies. The United States is concerned about current competitors or countries that may choose to compete in the future to the extent that they may become actual threats; effective U.S. competition with such adversaries can, in fact, keep them from becoming threats.

1.2 MAINTAINING AN EFFECTIVE COMPETITIVE POSTURE TOWARD THE USSR

Much of the rationale for the continued importance of military competition for U.S. security interests has to do with the Soviet Union.

The key question is whether the Soviet Union really is on a path along which at some point it gives up the military competition with the United States and its allies or is merely seeking a breathing space in the competition. The evidence at this stage is conflicting, suggesting that the USSR is seeking a breathing space while continuing to compete militarily with the United States, but in different ways and at lower intensity than in the past. The Soviets have let go of Eastern Europe and show many signs of reducing the size of their armed forces, but even after the CFE and START agreements are implemented the Soviet Union will have formidable military forces, and it continues to pursue advanced weapons research and development. The answer may well be

that, at this stage, the Soviet leadership itself has not determined the degree to which it wants to continue to compete militarily with the United States.

Perhaps the USSR is on a course that will lead to permanently cooperative relations with the West. Perhaps Soviet leaders are currently pursuing this course, but will find themselves compelled in the future by domestic conditions or by the state of the multipolar security environment to adopt policies that increase the military competition with the United States. They may find that circumstances demand a mixture of cooperative and antagonistic relations with the West. Or perhaps the current leaders will be replaced by Slavic nationalists or other authoritarians who will more actively pursue the military competition. It may be that the Soviets are not on a track to abandoning the military competition, but are seeking to regulate and direct it in order to make it more predictable for their planners. Yet another possibility is that the current leaders are following a breathing-space strategy, forsaking immediate competitive advantages in order to improve the Soviet economy, lull the United States into a state of substantially reduced competitive activity, gain greater access to Western technology, and emerge at some time in the future in a superior competitive position to that of the United States. Given these possibilities and the record of Soviet return to greater competition with and hostility toward the West after periods of accommodation in the 1920s and the 1950s, we cannot conclude that the USSR has ceased competing. Nevertheless, changes are taking place.

1.2.1 Changing Nature of Military Competition with the USSR

While there is considerable uncertainty about whether the USSR will cease competing in the future, it is clear that the pace of the military competition has slowed markedly and that its

nature is changing. The political, economic, and ethnic problems of the USSR seriously undercut its ability to compete at high intensity with the West, and this is likely to remain so for some time to come. The movement of Eastern Europe out of the Soviet camp seems virtually irreversible and materially increases the difficulty of a Soviet invasion of Western Europe. Moreover, several factors are reducing the level and pace of U.S. competition actions, most notably the rising pressures to finally reap a "peace dividend" and to encourage the safe passage of the USSR through its sea of troubles to become a cooperative state that is fully integrated into the modern world.

The U.S.-Soviet military competition already is concentrated more heavily on arms control, public diplomacy, and R&D programs than on large active-duty forces, forward deployment of troops, and production of new weapon systems. The competition is still active in the areas of intercontinental forces, strategic defenses, military uses of space, and research on advanced technology weapons; it is slackening in the areas of Europe, security assistance, and other forms of support in the Third World.[2] These trends in the competition are likely to continue for the next several years, and perhaps longer. The competition may moderate even further by the mid-1990s.

One reason for uncertainty about the pace of the military competition in the future is that, even after conclusion of CFE and START, the Soviet Union will have a formidable military force, as summarized in Table 1. Should Soviet leaders choose to increase the military competition, this force will provide an important means for doing so.

Table 1. Soviet global general purpose force levels before and after CFE agreement.

	BEFORE CFE (1989)	AFTER CFE	
		UNDER NATO PROPOSAL[a]	UNDER WTO PROPOSAL[b]
TANKS	53,000	32,000	36,000
ARMORED TROOP CARRIERS	65,000	35,000	41,000
ARTILLERY	53,000	39,000	45,000
COMBAT AIRCRAFT	9,300[c]	5,600	8,700

a. NATO's CFE proposal includes a "sufficiency rule" that would limit the forces of any one nation to no more than 30 percent of the total allowed all nations in a category of equipment.
b. WTO's CFE proposal sets the sufficiency rule percentage at 35-40 percent. These figures reflect potential Soviet forces at the 40 percent level.
c. Includes fighter-interceptors for strategic defense and training aircraft.

Soviet strategic force levels before and after START agreement.

	BEFORE START (1988)	CEILINGS AFTER START[a]
STRATEGIC NUCLEAR DELIVERY SYSTEMS	2,500	1,600
DEPLOYED NUCLEAR WARHEADS	10,800	6,000
BALLISTIC MISSILE RVs	6,900	4,900
HEAVY ICBM RVs	3,080	1,540

a. Note that the 6,000 cap on deployed nuclear warheads counts only ballistic missile warheads at a one-to-one rate. Bomber warheads are discounted, with two ALCMs counting as one warhead and sixteen gravity bombs counting as one warhead. A legal Soviet START force could reach as high as 9,900 nuclear warheads.

Another reason for uncertainty is the change taking place in Soviet military doctrine. In a major departure from the offensively oriented approach to military operations that characterized the Red Army for much of the postwar period, the Soviet Union has announced a shift to a defensive doctrine. What this means in detail, however, is far from clear. Soviet leaders and staffs are involved in what may be a protracted process of elaborating the concept of defensive sufficiency. It is possible that this concept (and the acceptance by the Soviet military of numerical parity in the CFE negotiations) reflects changing perceptions about the nature of a future war in Europe rather than a fundamental change in Soviet military objectives in such a war.[3] In particular, the Soviets may see force quality, mobility, and the massing of precise, long-range conventional fires as replacing to some extent massed troops on the ground. In this case, the loss of Eastern Europe may not be an insurmountable barrier to future Soviet threats to Western Europe.

Further, it is not clear whether, in the context of advanced technology weaponry, the Soviet concept of defensive sufficiency is really analogous to NATO's doctrine of defending one's territory without offensive operations on the opponent's soil or whether the doctrine of "defensive" operations would be used to mask Soviet capabilities for an invasion, to lull the West into reducing its military capabilities and readiness. It would, therefore, be incorrect to conclude that this doctrinal shift means the Soviet Union has given up the military competition. Rather, it would appear, the Soviet military is seeking to develop a new doctrine around which to build future Soviet forces.[4] Whether this effort will be tempered by the course of reform in the USSR remains to be seen.

Despite these uncertainties, events appear to be imposing change on the paradigm underlying the U.S.-Soviet military balance,

change that will affect the military competition. Both the United States and the Soviet Union are moving in the direction of needing more time to prepare for large-scale military operations, in the future perhaps even years. Thus, the military paradigm is beginning to move away from one of high readiness in forward-deployed forces to one of mobilization. This means that less-publicly visible components of the military balance such as naval forces, reserves, strategic mobility, technology bases, industrial bases, and mobilization capabilities are becoming more important in the military competition, with forward-deployed ground and air forces, high production rates for new weapons, and perhaps even overseas bases becoming less important.

To use our earlier distinction between threats and competitors, the Soviet threat is declining in terms both of the apparent intent of Soviet leaders to use force and in the immediate ability of Soviet military forces to endanger U.S. and allied interests. Avoidance of war is an essential part of the Soviet strategy of perestroika at this time, but not necessarily in the future. The decline in immediate Soviet capabilities to jeopardize U.S. interests is not irreversible. Soviet military officers, in their writings and discussions with Westerners, still sound like they are competing with the West. Moreover, many Soviet interests remain opposed to those of the West. There is still a fundamental difference between the U.S.-Soviet relationship and that of the United States with Western countries such as Britain and France. The relationship between the United States and its allies has elements of competition and tension, but America does not feel threatened by West European nations, even though many of them are heavily armed and some are nuclear powers. Our basic interests are not opposed and, therefore, the United States does not feel the need to negotiate arms control agreements with Britain and France. Until there is a fundamental change of this sort in the

relationship of the Soviet Union with Western States we cannot dismiss the USSR as a military competitor.

But what of the possibilities that the civilian leadership will rein in the competitive tendencies of the Soviet military? Or that political change in the Soviet Union will eliminate the opposition of U.S. and Soviet interests or reduce them to the point where differences between U.S. and Soviet interests are no greater than those between the United States and its allies? Is it even possible that trends in the multipolar security environment could result in commonality among some U.S. and Soviet interests? To understand the relevance of military competition to U.S. policy, we must look beyond conditions today and examine alternative future courses for the USSR.

1.2.2 Alternative Soviet Futures

There is an astonishingly wide range of political, economic, social, and military possibilities for the Soviet Union over the next two decades. Which of these alternative futures actually comes to pass will have important influence on the extent to which the USSR is a military competitor of the United States in the 1990s and beyond, as well as on the possibilities for the Soviet Union once again to be a major threat to U.S. interests. Thus, consideration must be given to alternative Soviet futures in order to understand how seriously the United States should regard the matter of military competition and to develop specific U.S. competition strategies.

Three different periods in future Soviet developments are important in this regard: the next several years, when survival of the current Soviet state may be the dominant issue; a period of restructuring, which could last one to two decades or more; and the postrestructuring period.

During the next several years conditions in the Soviet Union may become so extreme that survival of the Slavic core of the USSR would be the goal dominating the decisions of the Soviet leadership. The degenerating economy, the lack of an adequate distribution system for food and other basic needs, increasing ethnic unrest and separatist movements, growing dissatisfaction among various factions of the Soviet power structure, and a general and deep despair in the Soviet common man could bring about a crisis or succession of crises in the USSR. Under such conditions the overriding goal of the leadership probably would be to hold the Slavic republics of Russia, Byelorussia, and the Ukraine together. The general strategy would be one of survival, designed to avoid civil war; to try to keep the border republics, but not if doing so put the Russian state in serious risk of collapsing; to prevent foreign exploitation of Soviet internal vulnerabilities; and to seek massive external assistance from the West, but not at the cost of permanent foreign dependencies.

Soviet maintenance of a strong military institution, even if smaller, probably would be a key element in a survival strategy, as well as an important part of the longer-term program to restore the power of the nation. During the next several years, Soviet military forces could be used to put down insurrections and to suppress separatist movements. Soviet leaders could see the need for a variety of moves to strengthen their nuclear or conventional forces as a form of competitive action to fend off perceived foreign exploitation of the USSR or to put pressure on the West for increased economic assistance. Soviet leaders might even consider threats of military operations outside the USSR -- or actual use of force -- in an effort to restore some sense of national unity or to deal with perceived foreign exploitation of such problems as Muslim unrest.

Under such conditions the Soviet Union might change its policy by reestablishing a full command economy and seeking to reverse the decline in its military power by restoring the military's high claim on national resources. This could even help the consumer goods situation, since Gorbachev's vacillations and halfway reform measures have caused the economy to perform even more badly than before perestroika was introduced. While such changes would not remove the massive impediments to innovation and technological progress inherent in the Soviet command economy, it could result in a significant increase in the Soviet military threat in the near term.

A Soviet Union that sees its very survival threatened in this way could be dangerous. U.S. policy should seek to avoid this extreme, should respect the legitimate interests of the USSR, and should not even appear to be trying to take advantage of the situation. There is, however, little the West can do to solve the internal problems of the Soviet Union. Therefore, U.S. policy should also seek to dissuade Soviet leaders from taking dangerous or destabilizing actions, in part through U.S. competition strategies that keep the Soviets aware that America will be a determined military competitor if Moscow's policies move once again in the direction of confrontation.

Assuming some form of Soviet state persists through the next several years and settles into prolonged reform, the period of restructuring would pose a somewhat different set of problems for the USSR. Survival of the Soviet state, or at least the Slavic core, would still be a major objective, but a restructuring period would differ from the earlier survival period by the reduced likelihood of internal crises and a shift from survival as the basis for national decisions to restoration of Soviet power through political, economic, and social reform.

This period probably would be characterized by a marked Soviet reluctance to use military force (although the military would still be an important institution), a strategy designed to secure maximum external economic assistance over the short term, and an attempt to forge more extensive global political, economic, and technological links over the longer term. While less likely than in the immediate future, internal crises would still be possible during the restructuring period, including, for instance, a dramatic reversal of Gorbachev's initiatives through his removal; civil war; or dissolution of the USSR into a smaller Russian-based nation or a loose confederacy of republics. Also possible would be a transition of the Soviet Union to a less authoritarian state, to a stronger economy, or to substantially more cooperation and interdependence with the West.

U.S. policy in a period of Soviet restructuring should encourage movement of the Soviet system toward stable and cooperative relationships with the West, but should also hedge against the possibility of destabilizing crises in the USSR and against a return of the USSR as a more intense military competitor, if not as a threat, after restructuring is completed.

The postrestructuring period could be as much as several decades away and may never arrive if the USSR is unable to achieve fundamental reforms. But current U.S. policy generally, and U.S. competition efforts specifically, should take into account the long-term possibility that the USSR emerges from its troubles as a stronger, more cohesive nation. Soviet decisions in a post-restructuring period would proceed from quite a different basis than in the earlier periods. Soviet goals, strategy, and dominant policy concerns would depend on what kind of country the USSR had become and on the state of the world at the time, but presumably would be more concerned with Soviet power and influence in the world at large than in the earlier periods. There are many

alternatives. A globally-interdependent USSR primarily concerned with trade and prosperity is one. Another is an economically strong USSR with modernized military forces sitting astride the heartland of Eurasia, opposed by Germany and Japan. A third is a strong, stable Slavic state motivated by traditional Russian objectives and fears.

The alternatives in the postrestructuring period are too varied and too distant to make even general statements about what direction U.S. policy should take at that time. But U.S. policy today should take into account the possibility that the Soviet Union could return to more intense military competition with America in the future.

Thus, several quite different lines of Soviet political, economic, social, and military development are possible. One not unlikely extrapolation from today's situation is a path in which conditions inside the USSR deteriorate so seriously that the leadership is focused strongly on survival of the Slavic state, with dangerous possibilities for the West. Another not unlikely line of development is that Gorbachev succeeds in staving off the worst crises and that the USSR moves gradually, but haltingly, along the path of reform, with serious failures in executing reformist policies -- a kind of prolonged muddling through. This path is perhaps least dangerous for the West.

Yet a third kind of future development is a path in which reform succeeds, with eventual improvement in the Soviet economy. This might be accompanied by major political reform as well, in what has been characterized by sovietologist Jerry Hough as a renewal of the process of democratization in the USSR that was halted when the Bolsheviks came to power in 1917.[5] Alternatively, the economy might be reformed by a regime or succession of regimes that retained an authoritarian character or that reverted to

authoritarianism after a period of liberal rule. This alternative could include a strong and modern Soviet military force and aggressive propensities by the early twenty-first century. Numerous variants are, of course, also possible, but these alternatives encompass the range of futures that bears on the issue of whether the military competition is over. Obviously, more intense competition could occur in a number of the alternatives.

1.2.3 Maintaining the U.S. Competitive Posture

Based on the above analysis, the military competition with the Soviet Union should continue to be of concern to the United States, in part because -- while Soviet competition efforts have become less visible -- they have not vanished and in part because the USSR could become a more intense and effective military competitor in the future. There are precedents in Soviet history for such reversals. When Soviet leaders felt their country was weak and under stress in the past they became less aggressive in their foreign policy and less dogmatic internally. When the USSR regained its strength, Soviet leaders took a much harder line, both internally and externally. These weak-strong (cooperative-aggressive) cycles generally lasted about thirty years, with the cooperative stage being less than a decade. Previous periods of Soviet openness and greater accommodation occurred in the 1920s and the 1950s. In both these periods there were major reductions in the Soviet armed forces and substantial changes in military doctrine to adapt to new conditions, followed by significant increases in the size and capabilities of the Soviet military.

Today, rather than phasing out of the competition, the Soviets may be pursuing a more subtle strategy, one in which they retrench for some years while seeking to reduce U.S. competitive advantages through a process of improved international relations and arms control negotiations; to strengthen the Soviet economy

through internal reforms, divestiture of the external empire, and increased access to Western capital and technology; and to emerge eventually as a more powerful military competitor to the United States. While Gorbachev himself may be too much of a short-term pragmatist to pursue such a Machiavellian strategy, it may well be an approach that motivates Soviet military leaders and hard-line civilians in the Soviet government.

The Soviet Union recognizes the importance of manipulating Western threat perceptions and already is making this a stronger part of its competition approach in the 1990s though arms control proposals and public diplomacy. The USSR can sustain its advantages in the military competition or achieve new ones by increasing its military strength, by facilitating decreases in Western military strength, or by a combination of the two approaches. The tendency in the West is now to emphasize Soviet military retrenchment. There is less attention given to the parallel phenomenon of Western military retrenchment, which also affects the military balance and tends to negate the beneficial effects of what the Soviets are doing. Foreign Minister Shevardnadze has, in fact, been quite explicit on the point that successful competition with the West involves reducing Western threat perceptions, which would have the effect of reducing the cost to the Soviet Union of competing militarily.

A U.S. military establishment that is postured to expand its competitive activities should the Soviets do so is the most effective way to discourage the USSR from such a course of action. U.S. strategy should be designed to encourage a Soviet outlook in which avoidance of war becomes a permanent objective, not merely a tactic to advance perestroika, to promote Soviet progress toward cooperative behavior, and to both discourage reversals and cope with them should they occur, recognizing that it may be decades

before we can be confident of the enduring transformation of the Soviet Union.

Therefore U.S. competition planning should be directed toward the following goals related to the USSR:

- Reinforce Soviet incentives to forego military competition.
- Encourage the Soviet Union to move in the direction of permanently cooperative relations with the West.
- Protect U.S. interests in those areas of military competition that the Soviets continue to pursue.
- Hedge against Soviet reversion to more intense military competition in the future.

This is not to say that the peacetime competition must be characterized by high tensions and belligerency or that U.S. maintenance of its competitive position will jeopardize reform in the Soviet Union or stimulate an arms race. New leaders, effective diplomacy, arms control negotiations, and improved economic, scientific, and cultural ties already are changing the shape of the military competition and mitigating its intensity. A U.S. approach to the military competition that emphasizes research and development (R&D), diplomacy, and arms control can protect U.S. interests within lower defense budgets and without acting at cross purposes with the NATO allies. What is needed is rational spending of reduced defense funds, skillful crafting of U.S. arms control positions, and actions that have low public visibility, all guided by an explicit long-range competition planning process.

While the U.S.-Soviet rivalry is still the most prominent military competition of concern to America, it increasingly is being carried out in a multipolar arena. Moreover, U.S. strategy

must also pay attention to other nations who may in the future be military competitors or affect the military competition.

1.3 PROTECTING THE U.S. COMPETITIVE POSITION IN THE MULTIPOLAR WORLD

U.S. policy makers and planners have relatively little experience with multipolar security issues because the four decades after World War II were largely dominated by the historical anomaly of the bipolar superpower competition. Now the security environment is returning to its normal multipolar condition and military competition will do the same. Hence, U.S. policy should not only address U.S.-Soviet military competition in the multipolar arena, but should also consider the likelihood that U.S. interests will be affected in the 1990s by some forms of military competition from or between nations other than the USSR.[6]

Some countries increasingly will affect the U.S.-Soviet competition, not necessarily in ways favoring U.S. interests. Notable examples are China, Japan, and the unified Germany, who, for example, can help the United States balance the Soviet threat (all three countries), can undercut U.S. force modernization moves (e.g., Germany in regard to theater nuclear force modernization), or can provide advanced weapons technology to the Soviet Union (Japan or Germany). Some countries will be direct military competitors to the United States and its allies. North Korea has been a direct competitor for some time; China has been a competitor in the past, it now competes with U.S. interests through its arms sales, and it could become a more active military competitor in the future. The future could even see India or a unified Korea competing in some ways with the United States in the military field. And other countries compete with one another in ways that affect U.S. security interests positively or negatively. Examples

are China and the Soviet Union, India and Pakistan, the Arab states and Israel, and North Korea and South Korea.

U.S. competition planning for the 1990s and beyond should consider the possibilities of military competition from countries other than the USSR, in part because reducing U.S. force levels and changing the structure and deployments of U.S. forces in response to reductions in the Soviet threat could leave America vulnerable to other competitors and threats that may emerge in the future. In the past, U.S. military forces that were able to meet Soviet threats also provided substantial capability against other threats, although not completely. We have begun to understand the fallacy of the "lesser included threat," to wit: being prepared for a large war in Central Europe does not guarantee that the United States is also prepared for smaller wars on NATO's flanks, in Southwest Asia, or in East Asia, or for low intensity conflict in various regions of concern to America.[7] Even when they were larger and deployed more widely around the globe than is likely to be the case in the 1990s, U.S. forces designed only to counter Soviet threats were not well suited to deal with many "lesser" threats. As the Soviet threat weakens, it is even more important that U.S. long-range security planning consider explicitly other potential adversaries.

Because we have relatively little experience with multipolar security issues, it is not clear that we even know what the right questions are, let alone have the definitive answers. For example, the identification of adversaries is more difficult and ephemeral than in the days of the cold war. Economic competition will be more closely mingled with military competition than was the case in the 1960s and 1970s. And it is more difficult to define even broad U.S. security goals in the multipolar context than in the bipolar superpower competition. Is stability, defined as the absence of major wars, the dominant goal? Is it the maintenance of U.S. freedom of action in key regions, the ability

to exert strong influence on political-military affairs? Is it prestige? Economic well-being? Will some power balances in the multipolar world be dangerously unstable unless the United States is prepared to weigh in? The fundamental character of these unresolved issues signifies the importance of systematic competition planning for U.S. interests in the security environment of the next several decades.

1.4 U.S. COMPETITION PLANNING NEEDED MORE THAN EVER

To sum up, the United States should continue to regard seriously the military competition with the Soviet Union. It should develop strategies and carry out actions to protect its interests and positions in areas of the military competition where the USSR is still active, should promote Soviet movement toward permanently cooperative relations by making clear that America can and will compete effectively if the USSR returns to more intense military competition with the West, and should hedge against a future reversion to greater military competition by a more powerful USSR. Further, the United States should give increasing attention to other countries in the military competition: to their roles in the U.S.-Soviet competition, to their capabilities for direct military competition with the United States, and to the effects on U.S. interests of their military competition among themselves.

It is, however, not enough for U.S. officials merely to take note of the military competition. As we show in subsequent chapters, competing effectively is sufficiently different from more traditional DoD planning approaches that special efforts focused on the military competition are needed.[8] In fact, explicit planning for the military competition is needed for the 1990s, even more than in the past, for two reasons. First, U.S. defense budgets, force levels, and forward deployments will be substantially lower in the 1990s than in the past, requiring

difficult decisions about resource allocations and a host of other matters. These decisions should be guided by a vision for the future that takes the military competition seriously into account. Second, while DoD budgets and force levels are declining, the security problems and opportunities facing the United States are becoming more complex and taking on a longer-term character: the shift to a multipolar security environment as Soviet power declines, the nature of the contingencies the United States will have to deal with in the future, the closer and more detailed relationship between economic competition and military competition, and the prospects for seriously advancing Western security interests through arms control. Many of these problems and opportunities will be related to the ongoing military competition involving the Soviet Union and other countries, and explicit competition strategies and planning are needed to help understand U.S. security interests and goals in this new environment and how best to use available resources to advance them.

Several objections to this line of argument may be raised, objections that we believe are ill-founded or misunderstand what we are recommending. We already have noted that U.S. strategies and actions in the military competition need not be confrontational or destabilizing, need not result in a renewed arms race, need not be counter to arms control goals, do not necessarily require the high levels of defense spending and forces that we have had in the past, and do not have to put Soviet internal reforms in jeopardy. What we spend, what we seek to accomplish in the military competition, and what instruments we use are all matters to be worked out in the development of specific competition strategies and plans, in coordination with other elements of U.S. and allied policies and within the constraints of the environment of the 1900s.

It may, however, be asked why the United States should do military competition planning now, when it won the cold war without explicit competition planning. The answer is that we are moving into a more complex security environment than the cold war, one in which there are fewer defense resources, less coherence in U.S. alliances, and less public support for a strong military. Moreover, in this environment the United States could lose the competitive advantages it gained in the cold war if it is not careful to protect its competitive position. A chess-like approach to security, which is the essence of competition planning, is more important than ever.

Or it may be argued that the Soviet capacity for military competition will be curtailed for such a long time that the United States can wait to deal with competition with the USSR until it returns in the distant future, if it ever does. As discussed, however, the USSR has not totally abandoned military competition even today. Further, it could return to more intense competition sooner rather than later. Even to hedge against a resurgent Soviet Union several decades from now requires that the United States take actions to maintain or enhance its current competitive position relative to both the USSR and other competitors in the multipolar world. And, perhaps most importantly, the clear U.S. ability to compete effectively at more intense levels will help discourage the Soviet Union from returning to increased military competition.

More narrow questions may also arise. For example, one might argue that long-range planning is pointless, since Americans focus only on the short term. Not only are such broad generalizations patently false, but the main point is that the future security environment requires longer-range planning than has been the practice in the Department of Defense. Explicit competition planning efforts are one way of turning the attention of DoD bureaucracies to longer planning horizons.

A more serious objection may be that the executive-congressional structure of the American government prevents the country from acting as a single entity in the military competition. But the rapidity and decisiveness of actions implied by the unitary actor model are not essential conditions for competing effectively in the global military arena. The United States has competed effectively in the past and can do so in the future within the institutional framework of its government. DoD competition planning must, however, be structured to take account of the roles of Congress and of other parts of the executive branch. Similarly, the objection that strategic planning is impossible because there is no central planning authority below the president is not a fatal flaw, since the secretary of defense is the central planning authority within the Defense Department and coordination between him and other cabinet members can be effected through a variety of means.

Despite the common use of the term competition, this complex striving between the United States and the Soviet Union for political, ideological, economic, technological, and military advantages is not well understood, at least not in the West. Even less well understood is military competition in the multipolar security environment. We seek to expand this understanding in the following chapters. Volume I develops a conceptual framework for thinking about military competition. It describes the nature of the competition, develops a number of key planning concepts, and, using U.S. and Soviet examples, describes means through which various sides may influence the strategy and actions of others in the military competition. We then analyze Soviet economic, technological, and planning weaknesses and describe the current state of the U.S.-Soviet military competition. We draw on this material to conclude volume I with recommendations for a general approach to competition strategy in the 1990s and beyond.

Even more important than one person's suggestions about a competition strategy is the development of systematic methods for competition planning and analysis. In volume II we discuss these methods, describing a layered competition planning approach, defining analysis requirements to support competition planning, and evaluating current analysis tools and techniques in terms of their ability to meet these requirements. We end volume II by describing in greater detail several analysis methods that are essential for systematic competition planning.

Volume III contains military competition case studies and other appendices.

ENDNOTES TO CHAPTER 1

1. "Joint Chiefs 'accept' reform as irreversible," Washington Times, March 12, 1990, p. 6.

2. See U.S. Joint Staff, 1990 Joint Military Net Assessment (Washington: U.S. Department of Defense, 1990), for an overview of U.S. and Soviet military balance trends related to the competition.

3. William A. Cockell and Gregory J. Weaver, "Defensive Sufficiency and Military Reality," Disarmament, vol. 12, no. 1 (1990), pp. 5-21.

4. Stephen R. Covington, "NATO and Soviet Military Defense," The Washington Quarterly, vol. 12, no. 4 (Autumn 1989), pp. 73-81. For similar cautions over interpreting changes in Soviet military doctrine as the rejection of an offensive military posture, see Stephen M. Meyer, "The Sources and Prospects of Gorbachev's New Political Thinking on Security," International Security, vol. 13, no. 2 (Fall 1988), pp. 124-63.

5. Jerry F. Hough, "Gorbachev's Politics," Foreign Affairs, vol. 68, no. 5 (Winter 1989/90), pp. 26-41.

6. See chapter 2.2 for more detailed discussion of military competition in the multipolar world.

7. For elaboration of this point, see Fred C. Ikle and Albert Wohlstetter, Discriminate Deterrence, Report of the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, January 1988), pp. 33-34.

8. See especially chapter 2.3.

2. PEACETIME MILITARY COMPETITION: MOVING BEYOND TRADITIONAL PLANNING APPROACHES

Americans have a certain instinct that it is important to compete effectively against the Soviet Union, but the nature of the U.S.-Soviet competition is not well understood. For example, what elements of the competition are most important? How does one side influence the actions of the other in this complex relationship? What are the goals of each side in the competition? How does one assess who is ahead? What does competitive advantage mean? How should we develop effective strategies? This chapter sets the stage for detailed discussion of these issues by describing the general nature of the military competition, discussing the broader environment for military competition, and identifying the distinguishing characteristics of competition strategies.

2.1 NATURE OF THE MILITARY COMPETITION

A point of departure for an improved understanding of the U.S.-Soviet competition is the appreciation that it fundamentally is a contest for power and influence in world affairs. This global competition has several dimensions: political, ideological, economic, technological, and military. While the United States and the Soviet Union competed actively in all these dimensions through the mid-1960s, currently the military dimension dominates, and it is the focus of this report. Further, the U.S.-Soviet competition was primarily a two-sided vying for power through the 1960s. Now, however, the U.S.-Soviet contest is played out in a multipolar world, as the old postwar alliances on both sides are wearing thin and new challenges from elsewhere are posed to both the United States and the USSR.

The relation between the global competition and the military competition needs further explanation. The military competition is a subset of the broader global competition, and both influences and is influenced by it. Our focus in this report is on the military competition, which is a kind of shadow-boxing in which U.S. and Soviet warfighting capabilities are prepared, deployed, and exercised. These warfighting capabilities are also applied more directly in support of the opposed interests of the two sides in military sales, use of proxy forces, support to insurgencies and counterinsurgencies, and other ways that affect the fighting capabilities of other countries.

While many instruments used in the military competition are military in nature, such as weapon systems developments and overseas basing of forces, other important instruments are nonmilitary in nature and are usually associated with the broader global competition even though they can be applied to the military competition. These include arms control, diplomacy, propaganda, and technology drawn from the civilian economic base. Thus, while our focus is on the military competition, U.S. strategies for pursuing this competition need not and should not be confined to using only military means.

The essential concept in the peacetime military competition is to achieve, safeguard, or restore U.S. and allied military advantages over the USSR by building on U.S. and allied strengths and exploiting Soviet weaknesses in more explicit, systematic, and institutionalized ways than in the past. Competing effectively involves looking forward several moves, making past Soviet military investments obsolete, and influencing future Soviet military investments in ways that improve the balance of power and enhance stability. This is to be done through a variety of means, including technology developments, weapon system developments and production, improvements in force deployments and support, changes

to operational concepts for force employment, conduct of public diplomacy, and negotiating arms control agreements.

In planning for the peacetime military competition, broad U.S. objectives are the same as in more traditional planning approaches: to deter Soviet attacks, to reassure allies, to be able to resolve crises peacefully to the U.S. advantage, and to be able to defend U.S. and allied territory and interests in the event of war. But, in today's conditions, America can no longer afford the rich man's strategy of buying enough military forces to have insurance against all plausible Soviet actions, if indeed it ever could afford such a strategy. The United States must take more explicitly into account the fact that it is in an extended era of peace with the USSR, but not necessarily an era of relations that are always harmonious or devoid of competition. The Department of Defense must manage those resources that the country makes available for national security by building on U.S. and allied strengths and Soviet weaknesses, in order most effectively to ensure that this extended era of peace continues, to maintain an adequate balance of power with the USSR, to steer the military competition in less threatening directions, and to be prepared to fight effectively should war come.

Consequently, strategies for the peacetime military competition with the Soviet Union should not be limited to traditional planning of forces to deter or to fight in wartime contingencies. They should also seek ways to improve the U.S. and allied competitive position, as well as to improve the military balance; give explicit consideration to how the USSR plans its force posture in order to influence that planning; use a planning horizon of two or more decades to consider U.S. and Soviet moves and countermoves; and evaluate alternative military investments in terms of U.S. and Soviet strengths and weaknesses. Thus, advantages are to be gained in the military competition by long-

term pursuit of broad military enterprises such as strategic bomber or armored superiority, not just by investing in a specific weapon system such as the B-2 bomber or the Abrams main battle tank.

Many of these things have been done in past U.S. military planning; what is needed is to be more explicit and systematic about planning for the peacetime competition in order to use available resources to maximum advantage. In this sense, competition strategies are an additional dimension to past approaches, not the abandonment of planning concepts that have worked well in the past.

As is discussed in chapter 3, it is not entirely clear what it means to "win" or prevail in the U.S.-Soviet competition, or even how to gauge who is ahead, given the complex, multidimensional character of the competition. While euphoric claims that "The cold war is over, and we have won" are too simplistic, a case can be made that the United States is holding its own in the competition and perhaps even that the United States generally has prevailed over the last four decades.

In the late 1940s and in the 1950s, the Soviet Union appeared to challenge the United States in all dimensions of the competition: political, ideological, technological, economic, and military. By the end of Brezhnev's regime, however, it was clear that military power, and the political pressures the Soviet Union can bring to bear when backed by military power, was the sole dimension in which the Soviet Union seriously challenged the United States. The following assessment by George Kennan is representative of the U.S. literature in the last few years:

> I saw at that time [1946] . . . an ideological-political threat emanating from Moscow. I see no comparable ideological-political threat emanating from Moscow at the present time. The Leninist-Stalinist ideology has almost totally lost appeal

> everywhere outside the Soviet orbit, and partially within that orbit as well.... On the other hand, whereas in 1946 the military aspect of our relationship to the Soviet Union hardly seemed to come into question at all, today that aspect is obviously of prime importance.[1]

Even in the third world, where in the 1960s and 1970s the USSR achieved an impressive series of political-economic-ideological successes and the position of the United States and its allies declined rapidly, the Soviet Union and its socialist allies now have a comparative advantage over the West only in military power. In most cases, Soviet political successes were temporary and reversible. Their use of economic means to affect third world policies is seriously hampered by the poor performance of the Soviet economy and the relatively minor role of the USSR in the international economy. The foreign policy utility of Soviet ideology has been diminished by the loss of Soviet Marxism's revolutionary appeal. Ironically, the ideological influence of Marxists from Latin America and Western Europe is much stronger in the third world than that of Soviet writers. In cultural matters, the world largely ignores the Soviet Union, while America and its allies have immense cultural impact.[2]

The West currently prevails over the Soviet Union in the political, economic, technological, and ideological dimensions of the struggle for power and influence, although it must sustain the effort to remain dominant in these areas against both the USSR and other competitors. More to the point for the military competition, the United States can compete effectively with the Soviet Union in the political, economic, technological, and ideological dimensions so long as it checks effectively the military power of the USSR.

And, in fact, the Soviet Union is retrenching in the military dimension of the competition, at least for a time. The West does not completely understand what motivated Gorbachev and

other Soviet leaders to relax tensions with the West, to initiate bold arms control moves, to undertake unilateral force reductions, to give up the Eastern European satellites, and to set in motion a remarkable series of internal political and economic changes. A case can be made, however, that the sustained competitive actions of the United States and its allies are in part responsible for the current beneficial state of affairs. As Robert Ellsworth recently put it:

> The economic and political power of the American/West European/Japanese international "system", NATO's robust and steady military strength, and the geopolitical resistance of America, Western Europe, Japan and China have, beyond doubt, helped bring the USSR to the point where it is willing to face the facts of its systemic failure.[3]

The U.S.-Soviet military competition does not, however, have a well-defined stopping point in the manner of a football game or a tennis match. That the United States is holding its own or prevailing now in no way guarantees that it will continue to do so, especially at a time when the Soviet Union appears to be trying to change the character of the military competition to its advantage and when changes in the competitive environment are taking place independently of the Soviet Union that are complicating U.S. strategy as compared with earlier periods in the competition.

2.2 THE COMPETITIVE ENVIRONMENT

The context in the outside world for the peacetime military competition can be termed the <u>competitive environment</u>: all those aspects of the world situation that can affect the U.S.-Soviet military competition or other military competitions of interest to the United States and that are not controlled directly by the defense planning process within the executive branch of the

U.S. government. Three parts of the competitive environment should be distinguished from one another: the Soviet Union, third countries and other non-U.S. actors that affect (and may participate in) the competition, and U.S. actors outside the defense planning community in the executive branch.

2.2.1 The Soviet Union

The Soviet Union is, obviously enough, the principal competitor, but that is not its only role. To one degree or another, U.S. and Soviet policies over the past thirty years have had as a goal, and at least at times as a practice, an element of mutual cooperation. For most of this period, the Soviet view of this cooperative element could be summed up by the phrase "peaceful coexistence," a concept that implies pursuit of the goals of the peacetime military competition by means that do not directly involve Soviet military operations. Even so, cooperation with the Soviet Union has influenced the options available for U.S. competition strategies, for example, by giving prominence to the issue of arms limitation.

The events of the last several years raise the question of whether the classic Soviet concept of peaceful coexistence is still appropriate in the conditions of the 1990s and beyond, and whether the Soviets are moving toward a concept that provides more explicitly for cooperation as the term might be understood in the West.

The Soviet debate on this matter is not over and may in the long term lead to no significant "new thinking," let alone new patterns of behavior, in Soviet security policy. Whatever the outcome, the fact that the Soviets have consistently envisaged a measure of at least tactical cooperation with the United States is an aspect of the competitive environment that will continue to

shape the options open to the United States. If the Soviet view of the role and goals of that cooperation should become more far-reaching, U.S. options could be substantially affected.

While this might apply primarily in the nonmilitary areas of the competition, even in the military area Soviet behavior could become such that to characterize their goals as still solely, if more selectively, competitive would be misleading. Any approach to planning for the competition must allow for an appropriate range of possible levels of noncompetitive or uncompetitive Soviet behavior. These considerations make even more important a sound and up-to-date U.S. understanding of all aspects of Soviet policy toward the peacetime military competition.

2.2.2 Non-U.S. Actors

The role of other countries is more complex than that of the Soviet Union. For much of the period after the second World War it was fashionable to speak of a bipolar world dominated by the U.S.-Soviet competition. In reality, the bipolar world of the 1950s and 1960s was less bipolar than is often implied. During that period the U.S.-Soviet peacetime competition was played out on three different "fields" (see Table 2). The first, and perhaps most important, was the field on which no other actor was involved and on which the primary yardstick of success was military, especially nuclear, power. But even at this level the competition was by no means only military. Economic and ideological factors were widely seen, both in the Soviet Union and in the United States, as of great significance to the longer-term future of the competition.

Table 2. Three fields of U.S.-Soviet competition.	
Field 1.	United States vs. Soviet Union (no other actors)
Field 2.	U.S. bloc vs. Soviet bloc
Field 3.	U.S.-Soviet competition in the third world

The second field of competition was that on which the two superpowers played with allies and friends -- the level that is often referred to, with only approximate accuracy, as the bloc-to-bloc competition. There are two distinguishing features of the competition on this field. Each superpower was aligned with other countries that, with varying degrees of conviction, shared the view that there was an East-West peacetime military and ideological competition. But, and this is the second distinguishing feature, none shared exactly the same interests as the superpower with which it was aligned.

Until recently, the allies of the Soviet Union have been less able or inclined to differ from the Soviet view of how to prosecute the competition than have the allies of the United States differed from the U.S. view. But the difference has not been absolute -- the Soviets soon lost two of the allies with whom they started out in the post-war period (Yugoslavia and China) and now effectively have lost the rest of Eastern Europe for purposes of the military competition. The West Europeans, although always quite independent in their attitudes, nevertheless generally followed the main lines of U.S. policy toward the East-West competition, at least until the height of the Gaullist period in the mid-1960s; many of them have continued to follow the U.S.

policy lead since. The same is generally true of the major U.S. allies in Asia.

On this second, bloc versus bloc, field, the existence of an economic and political competition alongside the military competition and of pressures to develop less competitive and more cooperative relationships are even more apparent than on the first field.

The third field is that of indirect competition between the superpowers in the third world. The competition on this field has been intense, although its military dimension has generally been less prominent than the political and economic ones. There have always been military aspects of it, but, by contrast with the first and second fields, the competition on this field has mostly been more subtle, reflecting the fact that third world countries did not for the most part share the superpowers' views of the competition. The struggle was therefore primarily one for U.S. and Soviet political influence in situations in which many local states increasingly saw their incentives as being not to align themselves too closely with either superpower's world view.

The bipolar world, therefore, was more multipolar than is often implied. In attempting to gauge how future changes in the competitive environment are likely to affect the competition, it is important to have an accurate view of this bipolarity.

What, then are the changes in the competitive environment that are leading to an even more multipolar world? This report is not the place to discuss these changes in detail. But it is useful for the development of the planning process that is our main subject to sketch some of the more important likely directions of change.

The number and importance of countries on the second and third fields whose policies and behavior will have a direct impact on those of the superpowers is increasing. At some stage this process could result in the emergence of one or more powers that would be more serious military competitors to the United States or the Soviet Union than either currently faces. Alternatively, the United States could seek incentives for other countries to align their goals with those of the United States and cooperate in competing with the USSR. The issue for planning is to foresee and assess accurately how the growth of the economic, military, and diplomatic strengths of other countries will affect -- either by expanding or contracting them -- the options open to the United States and the Soviet Union in pursuing their peacetime military competition.

In the wake of their respective experiences in Vietnam and Afghanistan, both superpowers are likely to be more cautious about direct military intervention in third world conflicts and conceivably may even play down indirect military means for pursuing the competition in the third world.

The salience of international conflict may diminish in the third world, due to a reduction in the number of active border disputes and an increased awareness of the uncertain nature of gains in modern war. The Iran-Iraq war may be an important example of the latter point. This may be a transient phenomenon, but were this shift to occur, economic strength as a measure of national importance would increase.

Legal and illegal international dealings beyond the realm, and often beyond the effective control, of governments will continue to grow. This change may be a more potent factor in transforming the options of the governments of the superpowers (and

others) than shifts in these countries' relative military and economic importance.

These changes are likely to be reflected on each of the three fields shown in Table 2.

On the first field, both superpowers already have domestic reasons for wishing to channel their military competition, if not to restrict it significantly, and to give a greater place to cooperative behavior in both the military and the nonmilitary dimensions of the competition. This does not mean that the military competition will cease to be important. Among other things, the high-level superpower military balance will always cast a dark, if somewhat uncertain, shadow over the second and third fields of competition. But it would substantially change the context for U.S. planning. In particular, since the threat of falling further behind the United States technologically is likely to remain an important sanction on Soviet behavior, more limited U.S.-Soviet competition on the first field would tend to increase the competitive value of U.S. defense-related R & D programs.

On the second field of competition, the future is likely to see a continuation of the trend toward greater independence of thought and action among the allies of the two superpowers. The competition at this level will become more like that on field three, namely a contest for influence within a pool of independent and more loosely aligned states onto which both the United States and the Soviet Union will be trying to devolve greater responsibility for their own defense. Such a devolution would inevitably be accompanied by greater independence of thought and action by those countries assuming greater responsibility for their own security.

This could have at least two consequences. First, it could make it harder for the United States to secure allied agreement to competition strategies and actions that were assessed as highly desirable by the U.S. planning process, perhaps resulting in independent U.S. actions. Second, it could create a situation in which economic competition among the western allies could make it harder to come to agreement on common policies in the defense area for the pursuit of the competition.

On the third field of competition, the emergence of a growing number of states with significant military potential, nuclear as well as nonnuclear, and strong political institutions will tend to reinforce for the superpowers the lessons of their recent experience: that direct military intervention in third world conflicts is a high-risk venture that increasingly will require use of their first-line weapons systems. Yet, in terms of economic strength, the quest for influence and access in the third world may become even more important to both superpowers than it is today. While this trend might increase the importance of the military component of the U.S.-Soviet competition in the third world, it could at least as easily reduce it.

The essential conclusion is that political, economic, and military changes in the third world may increasingly shape the superpowers' peacetime resource allocations, to some degree change their competition goals, and affect the extent of third party cooperation with, or leverage over, U.S. or Soviet pursuit of their competition. The relationships among third world countries, peaceful or not, and the growing economic, military, and political strength of countries like India, Brazil, and Iraq, among others, are likely to shape -- mostly by constraining, sometimes by expanding -- superpower options and policies more than they do now and to make the third world even less susceptible to superpower influence, let alone control.

It should be apparent from the foregoing that these and other potential changes in the competitive environment impose significant demands on the planning process. Planners will need to be even more acutely sensitive to shifts in the relative military, economic, and political weights of different countries and to those countries' judgments about the important elements of the U.S-Soviet competition than they had to be in the bipolar period, when the superpowers' influence was relatively greater. The Commission on Integrated Long-Term Strategy, through its Working Group on the Future Security Environment, made one attempt to create a framework for thinking about this kind of change.[4] Such assessments will need to become a larger part of the planning process than in the past, as discussed in more detail in volume II.

2.2.3 Other U.S. Actors

The third part of the competitive environment that needs to be mentioned briefly is the United States itself beyond those elements of the executive branch that compose the defense planning process. This part of the environment is not discussed in detail in this report. Suffice it to say that the ability to command support in this country, both in the Congress and in the population as a whole, for any policy toward the peacetime military competition with the Soviet Union is a vital component of success, as is the ability to sustain this support over the period of time appropriate to the successful implementation of the different elements of that policy. However well conceived a strategy may be in terms of its competitive value, if it cannot attract enduring support, the United States might be better off to pursue a different approach, one less effective in competitive terms, but one that could command sustained support.

2.3 HALLMARKS OF COMPETITION STRATEGIES

We have discussed the general nature of the military competition and the way it is affected by multipolar trends in the security environment. Yet another way to understand this competition, one that focuses more directly on planning approaches, is ask what are the distinguishing characteristics or hallmarks of strategies that seek explicitly to advance U.S. interests in the military competition. There are at least five ways in which a competition strategy differs from more traditional defense planning approaches. These differences make clear that competition strategies are both a distinctive approach to strategic planning and a particular way of analyzing military balances.

First, a competition strategy should have a planning horizon that goes well beyond the Five-Year Defense Plan (FYDP): two decades, and longer if possible. The cycle from initial research and development of a weapon system, through its production, deployment, and operations, until it is retired can be as long as four decades. Not only should a competition strategy guide development, production, and operation of U.S. weapon systems, it should also take into account plausible moves and countermoves by the adversaries. Thus, a planning horizon measured in decades is needed. Given the increase in uncertainty as one looks further into the future, two decades may be the outer limit of a feasible planning horizon except in unusual cases.

Second, a competition strategy should explicitly focus on the Soviet Union or other adversaries, rather than on generic defense capabilities such as deterrence of attacks or the ability to project power overseas. The strategy should explicitly consider the likely competition goals and strategy of the adversary; his strengths, weaknesses, and competitive position; and a plausible range of adversary initiatives and responses during the planning

horizon.[5] By focusing on specific adversaries, the planning process will be forced to consider ways in which U.S. programs and actions can influence the adversary's goals, strategy, programs, operational concepts, and other competition actions.

A third hallmark of a competition strategy is a clear statement of specific U.S. competition goals that the proposed actions are intended to accomplish. These goals should be formulated with the Soviet Union or other adversaries in mind and be developed from an assessment of the current state of the military competition with these adversaries.

Closely related is the fourth distinguishing characteristic. A competition strategy should provide a plausible explanation of how the actions proposed in the strategy will accomplish the goals of the strategy. More specifically, this explanation should address the means by which the proposed actions will render Soviet weapon systems obsolete, impose costs on the Soviet Union, encourage the USSR to retain forces that are easy to defeat, protect U.S. investments, improve the U.S. competitive position, or otherwise advance U.S. interests in the military competition, taking into account a plausible range of adversary moves and countermoves.

The final hallmark of a competition strategy is an explicit evaluation of proposed U.S. goals and actions in terms of U.S. and adversary strengths and weaknesses, their current competitive advantages, and their competitive positions. The explanation of how the proposed actions will accomplish the proposed goals, discussed in the previous paragraph, addresses the feasibility of the strategy in a chess-like competitive context. The evaluation of the proposed goals and actions that is the final hallmark addresses the "competitiveness" of the strategy in the sense of whether it would make the best use of available resources

to advance U.S. interests, given the current state of the military competition.

To summarize this chapter, the essence of the military competition is to build on U.S. strengths and weaknesses to influence the adversary's goals, strategy, and force posture to the advantage of the United States. The U.S.-Soviet contest is the primary military rivalry that America has been concerned about, but this competition increasingly is being carried out on a multipolar field, and other countries may also become military competitors of the United States in the 1990s. Strategies for advancing U.S. interests in the military competition differ from past approaches in several important ways. Understanding what these distinguishing characteristics are not only will render ineffective efforts of the DoD bureaucracy to promote traditional programs with the rhetoric of competitive strategies, but it yields additional insights into the nature of the military competition and of competition planning. More is needed, however, to advance the understanding of how to think about and plan for the military competition. Accordingly, the next chapter develops detailed competition planning concepts.

ENDNOTES TO CHAPTER 2

1. George F. Kennan, "Containment Then and Now," Foreign Affairs, vol. 65, no. 4 (Spring 1987), p. 888. Kennan does not, however, conclude that the United States must compete more effectively in the military dimension with the Soviet Union, calling instead for containment ". . . of the weapons race itself." For a view more sympathetic to competing militarily, which also concludes that the Soviet Union is not now a serious political, economic, or ideological competitor, see Zbigniew Brzezinski, Game Plan (Boston: Atlantic Monthly Press, 1986), pp. 8-12, 145.

2. Robert S. Litwak and S. Neil MacFarlane, "Soviet Activism in the Third World," Survival, vol. 29, no. 1 (January/February 1987), pp. 21-39. See also Daniel Pipes, "Fundamentalist Muslims Between America and Russia," Foreign Affairs, vol. 64, no. 5 (Summer 1986), pp. 939-59, which analyzes the fundamentalist Muslim perception of Soviet and U.S. threats and influences.

3. Robert F. Ellsworth, "The Future of U.S.-European Relations," Survival, vol. 31, no. 3 (May/June 1989), p. 198.

4. Andrew W. Marshall and Charles Wolf, Jr., The Future Security Environment, Report of the Future Security Environment Working Group, submitted to the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988).

5. See chapter 3 for more detailed discussion of such planning concepts as competition goals and competitive positions.

3. KEY COMPETITION PLANNING CONCEPTS

The U.S.-Soviet military competition is a complex phenomenon involving strategic, technological, operational, and political considerations, touching on most regions of the world, and having consequences that extend well into the future. Even to begin thinking systematically about this topic demands the introduction of certain concepts to organize the material, to provide a common terminology for discussion and analysis, and to help move the development of competition strategies out of the realm of instinct and intuition into a more structured planning system that can be used by the Department of Defense.

The term competition has enough currency among people who are trying to characterize the peacetime struggle between the United States and the Soviet Union that the definition of this word offers a point of departure. A survey of dictionary definitions shows that competition refers to a condition in which:

- Two or more rivals are seeking to gain the same object simultaneously.
- Not all the rivals can gain this object, so there are losers as well as winners inherent in the notion of competition.
- The vying of the rivals is governed by some sort of rules.

This definition suggests some concepts that can be used to describe systematically the U.S.-Soviet military competition: rivals, prizes, notions of "winning" and "losing," and rules governing the competition. While fundamental, however, these four concepts are not sufficient to describe the military competition. Examination of examples of competitive behavior in other arenas, such as sports, business, individual career

rivalries, and competition between bureaucratic organizations, leads to a richer set of concepts for describing the U.S.-Soviet long-term military competition that is described in this chapter:

- Subareas of the military competition, which break the field down into pieces that are more tractable for planning and analysis.
- Key elements of the structure of the competition: Who competes? For what purposes? Through what means? Under what rules? Over what time period should moves and countermoves be considered?
- States of the competition, an understanding of which is needed in order to assess where the United States stands in the competition, to determine where it should want to move, and to develop strategies to get there.

These concepts are used in subsequent chapters of this volume to analyze selected aspects of the military competition in more detail and in volume II to develop a systematic approach to competition planning and analysis. The chapter concludes with a summary of issues on which further research is needed in order to improve the conceptual framework.

3.1 BREAKING THE MILITARY COMPETITION DOWN INTO PLANNING SUBAREAS

The totality of the military competition between the United States and the Soviet Union is too large and complicated to be addressed directly by planning and analysis. It potentially includes strategic, general purpose, and special operations forces; operations in regions as diverse as Europe, East Asia and the Pacific, Central America, and outer space; military technology developments, weapon system development and production, and arms control limits; and both current operations and force balances two decades or more into the future. As military competition becomes more multipolar in the 1990s, it will become even more complex.

Thus, to be manageable for purposes of planning and analysis, the military competition must be broken down into subareas. Exactly how this breakdown is made will influence the effectiveness of U.S. planning for the competition, because the form of the subareas will affect which DoD and other government organizations are involved and how people in these offices think about the competition. As is clear from the multiplicity of categorization schemes now used for defense planning, programming, and budgeting, no single scheme is obviously right for defining subareas of the military competition. Two somewhat contradictory sets of requirements are in play: the need to allocate resources and the need to address regional political-military situations and operations. This suggests two general approaches to breaking the competition down into subareas:

- A "business-area" approach (to use a term from corporate strategic planning) that reflects planning, programming, and budgeting system (PPBS) categories and mission areas for U.S. forces.
- A regional approach that reflects geographic areas of importance in the military competition.

Table 3 illustrates the subareas that might be included in each of these approaches.

Each approach has its merits. The primary advantage of the business-area approach is that it would facilitate interfacing competition planning with the PPBS and with the mission area system for categorizing DoD research and development. This approach would most closely align with the organizations of the services and the Office of the Secretary of Defense, and thus might be a more readily acceptable addition to current Pentagon planning processes. Moreover, since many current military balance assessments are structured along business-area lines, this approach could easily

Table 3. Alternative approaches to subareas of the U.S.-Soviet military competition.

BUSINESS AREA APPROACH	REGIONAL APPROACH
• STRATEGIC FORCES	• HOMELANDS OR INTERCONTINENTAL THEATER
• AIRLAND BATTLE FORCES	• EUROPE
• POWER PROJECTION	• MIDDLE EAST/SOUTHWEST ASIA
• NAVAL FORCES	• EAST ASIA
• SECURITY ASSISTANCE	• CENTRAL AMERICA
• TECHNOLOGY	• OUTER SPACE

draw on this important source of analysis for competition planning.[1]

The regional approach to subareas of the military competition also has a number of advantages. By focusing on geographical regions rather than on types of military forces, this approach would encourage combined arms thinking in competition planning, which is likely to result in more effective strategies for any fixed level of resources. Further, a regional approach would help competition planners focus on strategic goals or ends, which will tend to be regional in nature, as well as on the means to accomplish those ends, which is more the focus of the business-area approach. Another advantage to the regional approach is that it parallels the Soviet approach to competition planning, which would encourage planners to focus on our primary adversary rather than on generic mission requirements for military capabilities. Moreover, the regional approach can be aligned with the U.S. Unified and Specified Command organization, which would facilitate the involvement of operational commanders in competition planning. Since some existing military balance assessments are carried out on a regional basis, this approach to subareas of the competition could also draw on this source of analytic support. Finally, a regional approach would facilitate the shift of U.S. competition planning to a multipolar framework.

The advantages of the regional approach appear to outweigh those of the business-area approach. Consequently, we recommend using the set of subareas shown in Table 4, which is primarily a regional breakdown. Table 4 also includes the business area of technology, which could be a particularly important area of military competition in the 1990s.

Table 4. Subareas of the U.S.-Soviet military competition.

- Homelands or the intercontinental theater (includes U.S. and Soviet intercontinental-range offensive forces and homeland defenses, but not general purpose forces based in the United States or USSR for employment in regional operations.
- Europe (including the northern, central, and southern regions)
- Middle East/Southwest Asia
- East Asia and the Pacific
- Central America
- Outer space
- Technology

Table 5 compares these competition subareas with the U.S. Unified and Specified Command structure and with Soviet theaters of military operations (TVDs).

A breakdown of the military competition into subareas should be a working tool for planners and analysts, not an immutable division of the world into mutually exclusive and exhaustive categories. Planners should have sufficient flexibility to change the definitions of subareas periodically, in order to focus on the most important regions or business areas for competition purposes at the time, just as the Soviet General Staff apparently changes the boundaries of their theaters of military operations to suit their evolving planning needs. For example, if Soviet aid and arms sales to countries in the western hemisphere were to decline, Central America might be dropped from the list of U.S. competition planning subareas. Or if India became an

Table 5. Subareas of the competition, unified and specified commands, and theaters of military operations.

COMPETITION SUBAREAS	U.S. OPERATIONAL COMMANDERS	SOVIET TVDs*
Homelands	CINCSAC	Intercontinental TVD
Europe	CINCEUR, CINCLANT	Western Theater (Northwestern, Western, Southwestern TVDs and related maritime areas)
Middle East/Southwest Asia	CINCCENT	Southern Theater (Southern TVD and related maritime areas)
East Asia and the Pacific	CINCPAC	Far Eastern Theater (Far East TVD and related maritime areas)
Central America	CINCSOUTH	?
Outer space	CINCSPACE	?
Technology	_____	_____

*Source: Soviet Military Power: Prospects for Change (Washington: U.S. Department of Defense, 1989), pp. 14-15.

important military competitor in the future, South Asia might be added.

While breaking the military competition down into subareas is necessary in order to carry out planning and analysis, competition strategies for each subarea should not be developed in isolation from one another. Volume II addresses questions related to planning across subareas, as well as planning within each subarea, but two general points should be noted here.[2]

The first is that there are strategic connections among subareas that should be taken into account in planning and analysis. For example, the world's oceans form a strategic connection among many of the subareas. Similarly, Eastern Turkey is close to Iraq and to Soviet invasion routes to the Persian Gulf, connecting the European subarea with the Middle East and Southwest Asia. The military competition in outer space is connected to virtually every other subarea. In formulating strategies for the military competition, such strategic connections between subareas should be taken into account and, if possible, taken advantage of.

The second point is that planning and analysis should seek competition actions that are likely to provide strong competitive leverage in more than one subarea. For example, because maritime operations play a significant role in almost every regional subarea and the seas are used to conceal a significant portion of both superpowers' strategic nuclear forces, investments in naval forces could yield significant competitive leverage.

Military space programs can also provide considerable competitive leverage across a number of subareas. Improved wartime survivability in space-based surveillance, communications, and navigation could significantly enhance U.S. military capability vis-a-vis the Soviet Union or other adversaries in almost any

conflict, as could the ability to deny the Soviets wartime access to space for similar purposes. Programs incorporating major technological advances, such as the B-2 bomber, may be strongly competitive if they are used to gain advantages in a number of subareas of the competition. Similarly, the research and development being undertaken in the Strategic Defense Initiative (SDI) program provides competitive leverage beyond the intercontinental or strategic forces subarea through technological spin-offs (e.g., rail gun technology, beam weapons technology, and sophisticated battle management and control software development) that could significantly affect other subareas.

3.2 STRUCTURE OF MILITARY COMPETITION

Several concepts are important for planning and analysis of the military competition in each subarea:

- Prizes and goals: For what ultimate objectives is each side competing? What are the more immediate competition goals that each side is pursuing as it seeks these ultimate prizes?
- Rivals and other actors: Who are the contending parties? What other parties affect the way in which military competition is carried out?
- Means: Through what instruments do countries compete militarily?
- Rules and referees: What determines "legitimate" behavior in the peacetime military competition? What mechanisms enforce these behavioral norms?
- Centrality of moves and countermoves: How best to think about the dynamic interactions of the contending parties?
- Time horizon: What is the proper time horizon to use in military competition planning?

3.2.1 Prizes and Competition Goals

Prizes are the ultimate objectives each side is seeking in the competition, while competition goals are stepping stones intended to lead to the ultimate prizes, tempered by the actions of the adversary, domestic politics, and the conditions of the competitive environment. In sports, the prize is to win the game or the league championship, while competition goals are steps toward these ultimate prizes, such as gaining position for a field goal in football. Career rivalries involve high-level jobs as prizes; more immediate competition goals might include gaining opportunities to demonstrate one's skills or to expose the weaknesses of opponents.

The ultimate prize for which the United States and Soviet Union are struggling in the peacetime military competition is the security of their respective territories and political, economic, and ideological ways of life. At the margins, so to speak, the competition has been particularly focused on control or influence over third parties (particularly the West European nations); on maintaining or expanding political, economic, ideological, and military freedom of action; on preventing armed attacks by the other side; and on having the ability to determine the outcome of crises or wars, should they occur.

These ultimate prizes in the peacetime competition are not the same as the immediate competition goals of each side in specific subareas of competition such as intercontinental offense and defense or Europe. Specific competition goals vary over time, and are related to the current state and trends in the competition. They should be sufficiently specific to guide military investments and operational doctrine, and should be related to such generic competitive functions as improving one's competitive position, imposing costs, or changing the military balance in some subarea.

Specific examples of competition goals are to make Soviet air defenses obsolete or to nullify the U.S. or Soviet investment in ballistic missiles.

While formulation of competition goals and strategies to achieve them should occupy much of the attention of those responsible for securing their country's interests in the peacetime military competition, the ultimate political-military prizes for which each side is contending must be kept in mind in order to decide among more narrow and immediate competition goals and actions.[3]

There are asymmetries in the prizes for which the United States and the Soviet Union are striving that stem from differences in the political and economic aims and philosophies of the two sides. For example, in East Asia, the Soviet Union probably seeks ultimately to prevail over China as a political-military rival, while the United States seeks to use China to divert Soviet investments from forces that threaten the United States and its allies.

3.2.2 Rivals and Other Influential Actors

To understand a competitive situation, one must know who the contending parties are. In some cases it is obvious, as in sporting events, many career rivalries, or bureaucratic competitions. In other cases, such as business activities or the military competition, analysis is needed to determine who the most serious rivals are and which actors can most powerfully affect competition.

Clearly, the primary rivals in the current military competition are the United States and the Soviet Union. However, from the Soviet perspective, China is a rival that conditions the

U.S.-Soviet military competition; depending on future political, economic, and military developments, China could also once again become a major rival of the United States. The allies of the United States and of the Soviet Union also affect the competition. Allies often constrain U.S. or (to a lesser extent) Soviet actions in the military competition and offer opportunities to the other side to influence one's competitive actions; over time, some allies might become rivals. In some specific areas of military competition, such as Southwest Asia or Latin America, nonaligned countries also influence the U.S.-Soviet competition.

As evidenced by even this brief discussion, the superpower competition increasingly is carried out in a multipolar arena in which other actors are influential, sometimes powerfully. Third parties increasingly affect regional manifestations of the U.S.-Soviet military competition, sometimes constraining one or both superpowers, sometimes providing opportunities for the United States or the Soviet Union to increase its competitive advantage over the other. Some third parties also compete directly with the United States (e.g., Japan, in the economic dimension) or the Soviet Union (e.g., China, in the political and military dimensions). These third party competitors -- or "third players" -- affect and complicate the U.S.-Soviet military competition, and of course pose independent challenges. The multipolar context for the U.S.-Soviet military competition affects the planning structure, the portfolio management aspects, and the analysis requirements of competition strategy development, as described in volume II.

Internal institutional structures can also be important for many areas of competition. For example, the U.S. Congress is a key party that affects the competitive actions of the executive branch in all subareas of the military competition. Gorbachev's

civilian advisors are emerging as actors who are not totally aligned with the Soviet military.

3.2.3 Means through Which the Peacetime Competition Is Exercised

To develop good competition strategies it is essential to understand what means or instruments are available for competing. In sports, the means are relatively few in number and obvious -- passing, running, and kicking in football, for example. In other forms competition, the available instruments are more numerous and complex.

The United States and the Soviet Union use a variety of means short of fighting with one another to seek to achieve their objectives in the military competition, to seize or maintain the initiative, and to influence each other's behavior. These means include military forces, military operations, and foreign policy actions.

Deployed military forces -- their size, their characteristics, and their peacetime stationing -- are, of course, primary instruments in the competition. Military research and development, technology applications, testing, prototype developments, and weapon system programs also are important, as are the size, rate of increase (or decrease), and allocation patterns in each side's military budgets.

Military operations short of direct U.S.-Soviet fighting constitute a second general means of competing. Such operations include exercises, covert actions, use of one's forces in third world conflicts, and use of one's forces in crises.

A third set of means for competing militarily is foreign policy actions. While not military in nature, foreign policy

actions are an important way to influence the military competition. These means include diplomatic actions in crises; security treaties and agreements; public statements; propaganda; arms control negotiations and other arms control actions (e.g., treaty violations, actions taken to enforce treaty compliance); foreign aid; military assistance programs; and the use of proxy forces in third world conflicts.

3.2.4 Rules and Referees

Obviously, the U.S.-Soviet military competition is not governed by a fixed set of explicit rules and enforcing mechanisms the way a football game is. Even the more complex rules governing business competition, enforced by customers, regulatory agencies, and courts, are not an appropriate analogy for the military competition, because -- while complex -- rules governing domestic business competition are explicit, change in explicit and open ways, and apply equally to each company. In the military competition, boundaries on legitimate behavior are fuzzy, frequently are tacit, change periodically without explicit announcements, and apply asymmetrically to U.S. and Soviet actions. Nevertheless, a variety of enforcing mechanisms do set boundaries on what constitutes legitimate behavior in the U.S.-Soviet military competition.

Probably the most powerful determinant of behavior in the military competition is the desire to avoid disastrous wars, especially nuclear wars. Another determinant is past patterns of behavior and bureaucratic mores, which acquire a certain momentum and tend to become the norm for military and civilian organizations that affect each side's competitive actions, unless they are upset by external events or new leaders. These two types of enforcing mechanisms channel both U.S. and Soviet behavior, although not necessarily in the same way.

Other mechanisms affect U.S. actions in the competition more strongly than they do Soviet actions. These include domestic politics, the views of allies and third players, and public opinion. The U.S. Congress and the western media operate uniquely to constrain U.S. behavior, but not Soviet behavior. Gorbachev's policy of glasnost is, however, opening opportunities for greater domestic influence on Soviet competition actions.

Both sides generally comply with international laws, international agreements, and domestic laws in the peacetime military competition. Each, however, seeks to exploit ambiguities in these legal restrictions to its advantage, and each side has been known to violate laws or agreements. But, domestic politics and the institutional structures of each side's government operate asymmetrically to give the Soviet Union greater opportunity than the United States to take advantage of legal and treaty ambiguities.

The rules governing the U.S.-Soviet military competition are too complex, fuzzy, and variable to attempt to set them forth here, and it probably is not helpful to do that in any event.[4] What is important to understand is that both sides are not governed by a common set of rules and enforcing mechanisms. Asymmetric rules of behavior constrain the United States more than the Soviet Union in the long-term military competition. But, the USSR is subject to some limits on its behavior, and it is important to understand what these limits are.

3.2.5 Centrality of Moves and Countermoves

Since it is the essence of the notion of competition that each side will seek advantages through specific strategies and actions that take into account the other side's strategies and

actions, consideration of moves and countermoves by each side is central to the competition planning process. This is a primary reason why the game of chess is an appealing analogy for competition strategies.

Table 6 summarizes the case histories of four major U.S.-Soviet weapon system move-countermove cycles. Noted are the time the United States initiated an action, the time the Soviets apparently detected that U.S. action, the time at which the technology necessary to counter or emulate the U.S. initiative was first developed (anywhere, not just in the Soviet Union), and the time an actual Soviet countermeasure or equivalent capability first became operational.

Three points are worthy of note from the perspective of the military competition. First, as illustrated by the case of the announced American intention to deploy the XB-70 high-altitude strategic bomber and the subsequent Soviet deployment of the SA-5 surface-to-air missile (SAM) system in 1967 and the MiG-25 high-altitude fighter in 1970, the Soviets will sometimes deploy counters to U.S. systems that are themselves never deployed. Whether this is due to inflexibility in the Soviet weapons acquisition process or because the Soviets foresee other missions for such counters is not clear. This Soviet characteristic does, however, open possibilities for U.S. cost-imposing actions through R&D programs.

Second, Soviet responses to U.S. actions do not always take the form of countermeasures, in the strict sense of measures to nullify the operational effectiveness of the U.S. action. Sometimes, as in the case of U.S. quieting of its submarines, the Soviets choose to compete with American initiatives by acquiring the same capability for their own forces.

Table 6. Soviet response times to U.S. actions.

INITIATION OF US ACTION	SOVIET DETECTION OF US ACTION	TECHNOLOGY AVAILABLE	SYSTEM OR MOD OPERATIONAL	SOVIET TIME TO COUNTER US ACTION
LOW ALTITUDE BOMBER TACTICS 1959 - 1960	PUBLICLY ANOUNCED 1959 FLIGHT IN 1960 (0 YEAR DELAY)	LOOK-DOWN RADAR: - INTERCEPTOR 1975 - AWACS 1975 (15 YEAR DELAY)	MIG-29,31 1984 SA-10 1985 SU-27 1986 MAINSTAY 1986	24 YEARS 25 YEARS 26 YEARS (24-26 YEARS)
SURVIVABLE ICBM LAUNCH CONTROL FACILITY (LCF): AIRBORNE LCF & ALTERNATE MINUTEMAN LCF 1966	LOOKING GLASS INITIAL OPERATING CAPABILITY (IOC) 1961 MM II IOC 1966 (0 YEAR DELAY)	APPROXIMATELY 1970 (4 YEAR DELAY)	SS-18 MOD 1979 SS-19 MOD 3 1979	13 YEARS
XB-70 HIGH-ALTITUDE BOMBER 1957	PUBLICLY ANNOUNCED 1956-57 (0 YEAR DELAY)	(?DELAY)	SA-5 1967 MIG-25 1970	10 YEARS 13 YEARS (10-13 YEARS)
SSBN/SSN QUIETING 1962	(? DELAY)	MID 1970s (? DELAY)	OSCAR 1982 TYPHOON 1983	20 YEARS 21 YEARS (20-21 YEARS)

Third, some Soviet counters operate against a broader set of U.S. capabilities than the action that prompted them. U.S. efforts to deploy a survivable intercontinental ballistic missile (ICBM) launch control capability and the Soviet deployment of the SS-18 Mod 4 and SS-19 Mod 3 ICBMs are a case in point. When deployed in large numbers, these Soviet hard-target attack systems threatened not only the alternate Minuteman launch control facilities, but all U.S. silo-based missiles.

Understanding the variety of ways in which the Soviets might make moves or countermoves thus is as important as understanding the time constants for move-countermove cycles. Figure 1 depicts the range of ways the Soviets might respond to a U.S. competition action and the time each response technique is likely to take, based on historical experience and an understanding of current Soviet weapon acquisition and operational planning processes.

There are three basic types of Soviet competitive responses to American initiatives. The first is the acquisition and deployment of an entirely new Soviet weapon system. The second is the modification of an existing Soviet weapon system in a way designed to counter or match the U.S. initiative. The third is the development of new tactics or operational concepts designed to counter the American actions.

In cases where the Soviets choose to modify an existing system in their arsenal or introduce an entirely new one, there is another factor that affects the response time: the availability of the required technology. If the planned Soviet response can be made with technology that is already available to the Soviet arms industry, the response can be fielded significantly faster than if the required technology must be developed domestically or acquired from Western sources.

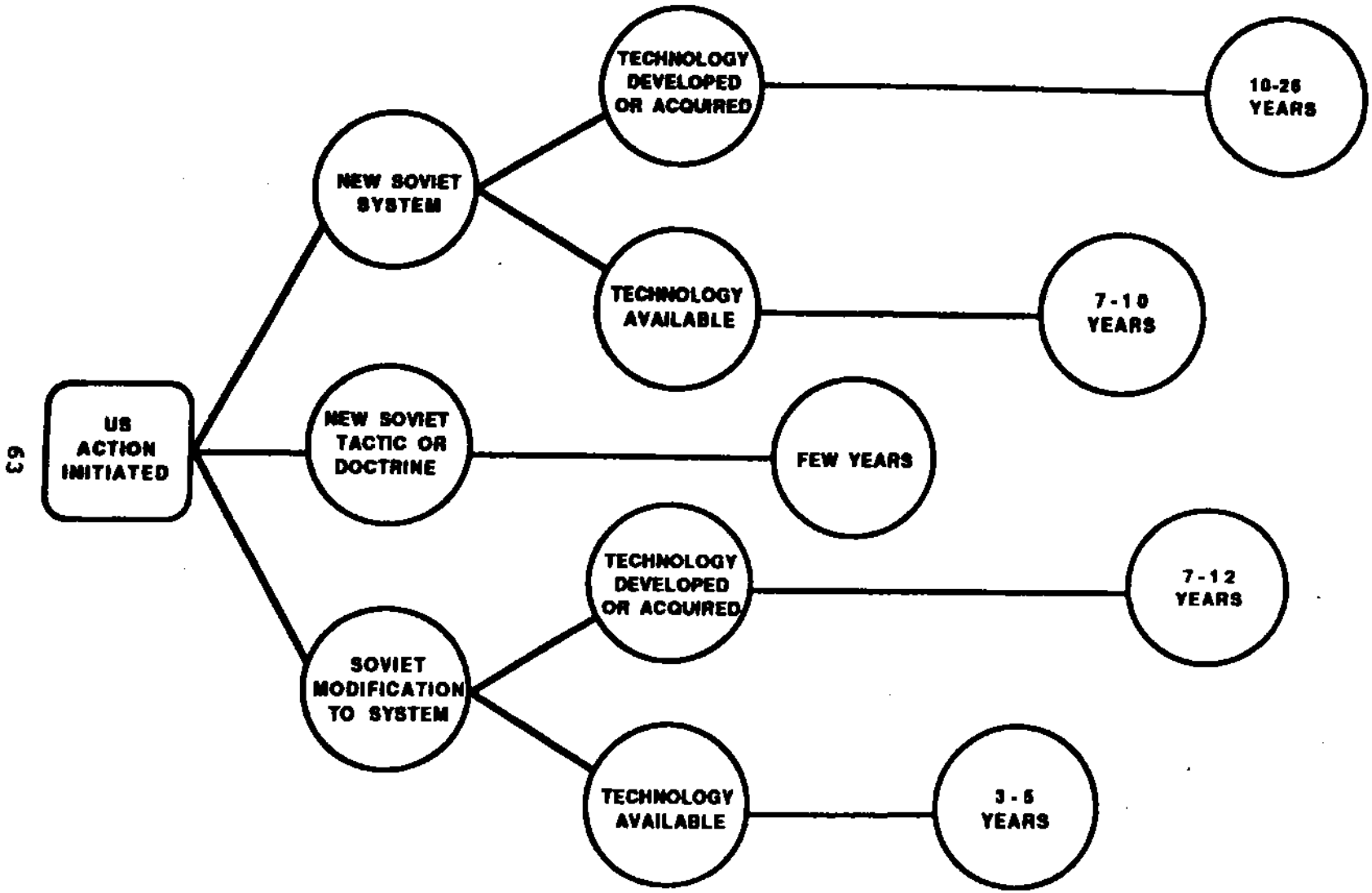

Figure 1. Soviet response means.

In the context of moves and countermoves, the best competition actions are those that impose the greatest temporal response burden on the Soviets relative to the time it takes to implement the U.S. actions. Thus, a proposed U.S. initiative that would take ten years to implement, but could be countered by a change in Soviet tactics in three to five years, is less desireable than a alternative ten-year initiative that would require the Soviets to deploy an entirely new weapon system based on their own technology, a task that would likely take them as long as twenty-five years to complete. Similarly, a U.S. initiative that could be countered relatively quickly were existing Western technologies applied to the task is less desirable than one that cannot be countered with any known technology, as Soviet acquisition of the Western technology in question could lead to a relatively rapid and effective Soviet response.

It should be remembered, however, that the Soviets often pursue more than one type of response to a particular competition action. For example, when faced with NATO's proliferation of antitank guided missiles (ATGMs), the Soviets first implemented operational and force posture changes (suppression of ATGM gunners with intense artillery fire coupled with a substantial increase in the number of deployed artillery batteries), followed by the deployment of a countermeasure based on technology acquired abroad (reactive armor, first developed by the United States and first deployed by Israel).

This discussion highlights the need for Soviet-style analysis in competition planning. The term "Soviet-style" is used to signify the importance for Americans to approximate as closely as possible the ways in which the Soviets would analyze a given situation or problem, as a guide to understanding how they might act. The need for Soviet-style analysis in U.S. military

competition planning arises from the many asymmetries between Soviet and Western analysis and planning methods. These asymmetries make it clear that mirror-image assumptions about Soviet competition initiatives or responses would be seriously misleading.

Uncertainty about future Soviet actions in the competition is a major problem for U.S. planners. The ability to anticipate likely Soviet actions -- or to make U.S. strategy robust in the face of a range of plausible future Soviet actions -- is critical to an accurate assessment of the advantages the United States can hope to gain from a given competition strategy. Soviet-style analysis is also important for an accurate appraisal of Soviet strengths and weaknesses and of ways in which the United States can exploit the latter (e.g., by threatening Soviet control of operational timelines or by affecting the correlation of forces at critical times and places).

The requirements for Soviet-style analysis are discussed in more detail in other chapters.[5] At this stage, it is sufficient to note two points. First, the concept is an integral part of any sound approach to planning for the long-term military competition. Failure in this area is likely to lead to ill-considered actions and to great inefficiencies in the conduct of the competition by the United States. But, secondly, the task of anticipating likely adversary actions is extraordinarily complex and difficult.

3.2.6 Time Horizon for Planning

It is important to establish the most distant feasible time horizon for competition planning. Effective strategies for the competition are based in part on projections of trends in the international security environment and in the military and technological capabilities of the opponent. The use of unnecessarily short time horizons can result in the failure to take

into account significant trends. Unrealistically distant planning horizons will exceed one's ability to make confident projections.

U.S. competition planners should use at least a twenty-year planning horizon, with more distant planning limits set where feasible.[6] There are a number of reasons for this twenty-year minimum. One superpower move-countermove weapon cycle historically takes between one and three decades, and a twenty-year planning horizon would cover most if not all of one cycle without unduly stretching the limits of our ability to foresee potential moves and countermoves confidently. A planning horizon of at least two decades is also important in order to take into account macroeconomic and demographic trends that can affect U.S. and Soviet military capabilities. Finally, international economic and political trends affect the future environment in which the U.S.-Soviet military competition will take place. Shifts in alliance structures, trends in the spread and contraction of ideologies and political systems, and changes in trade patterns and resource dependencies can have significant impacts on the superpower military competition. All are processes that take time to play themselves out. A twenty-year minimum planning horizon permits these factors to be taken properly into account.

3.3 STATES OF THE MILITARY COMPETITION

Determining where one should try to move in a competition requires, among other things, understanding what the current state of the competition is and what future states are feasible, which states the United States prefers, and who is ahead in the current state.

The state of the military competition at any particular time is determined by a complex set of interrelated political, economic, technological, and military conditions. It is analogous

to the combination of the score, the position of the ball, and the number of the down in football. Or, to use a linear algebra analogy, one can imagine a multidimensional state space in which each axis is a variable characteristic of the military competition. The current state of the competition is a single point in this space, and a good strategy is one that moves the state of the competition along a path in the state space that is preferred by the United States. Understanding and diagnosing the current state and determining toward what future state America wants to move the competition is important for selection of goals, strategies, and specific actions in the U.S.-Soviet military competition.

3.3.1 Describing States of the Competition

Understanding starts with the ability to describe. Thus developing succinct descriptions of past, current, and alternative future states of the competition -- descriptions that various parties engaged in formulating and implementing strategies can agree are accurate characterizations -- is an important ingredient to the planning process. Otherwise, issues about the proper strategy will become hopelessly confused with issues about what is the current state of the competition and toward what future state the United States should try to move.

Describing states is not easy because of the complexity and multidimensional character of the military competition. In particular, the state of the competition is too complex to be able to define even the axes of the state space in a formal, mathematical way. Nevertheless, a relatively succinct way to describe past, current, and future states of the competition is an important planning tool. At the minimum, state descriptions should address three dimensions of the military competition: the military balance, the competitive positions of the two sides, and the state of relevant elements of the competitive environment.

The condition of the U.S.-Soviet military balance is an important element of the state descriptor because it is a measure of the U.S. and Soviet abilities to fight effectively in time of war. The term military balance is used here in the sense of the military balance assessments carried out by OSD (Net Assessment): evaluations that include, in addition to force levels, the qualitative characteristics of weapons and forces; doctrine, operational concepts, and war plans; force deployments in peacetime or crises; warning time; C^3I; readiness and training; and the critical force engagements that have strong effects in determining war outcomes.

The relative position of the two countries in the military and nonmilitary (e.g., economic, ideological, diplomatic) dimensions of the competition is a second important element of the state descriptor because it indicates how well each side can compete in various areas in the future. This includes consideration of how well each side has translated inherent strengths and weaknesses into actual advantages for pursuing the competition.

Competition state descriptors should also include, as a third element, the extent to which the United States is achieving its more traditional peacetime political-military objectives (e.g., deterrence, reassurance of allies, and the ability to resolve crises peacefully). This helps to relate the assessment of states to the more immediate concerns of the Department of Defense.

Third player considerations thread throughout all three of these dimensions of the state of the competition, and it could be argued that a dimension related to third players should be added to the description of the state of the competition. But consideration of Soviet goals, strategies, and actions also threads

throughout the above three dimensions. Rather than complicate state descriptions with additional dimensions, it seems more tractable to treat such factors as the Soviet Union and third players within the three dimensions outlined above.

Obviously, this apparently simple and clear-cut set of dimensions of the U.S.-Soviet peacetime competition will not in practice lead to a simple and clear-cut set of numbers or indicators of the state of the competition at any particular time. Narrative descriptions of states will probably be necessary. Moreover, breaking the military competition into subareas, as discussed above, makes it easier to describe the state of the competition by addressing the military balance, competitive positions, and achievement of more traditional U.S. objectives on a subarea-by-subarea basis.

Treating the competitive position of one side relative to the other as an element of the state of the competition distinct from the military balance is important for formulating goals and strategies. The current U.S. competitive position in various subareas is a major guide to specific actions that build on U.S. strengths and exploit Soviet weaknesses. Additionally, the United States can make investments to improve its ability to compete in various subareas in the future, even if these investments do not directly result in improved military balances. Technology investments are an important means for improving the U.S. competitive position; negotiating new or sustained access to overseas bases is another example.

By considering the competitive positions of each side in various subareas of the competition, as well as the military balances, the distinction between competing on a weapon-system basis and competing on what might be called an enterprise basis becomes apparent. One side may exert and maintain an advantage

over another by taking a perspective based on more than investments in particular weapon systems, and thus be able to sustain that advantage for a longer period than the advantage derived from the lead in a specific weapon. This kind of enterprise approach to the military competition is aimed at gaining and sustaining a superior competitive position in some area of competition.

For example, the U.S. failure to prevail over the Soviet Union in armor and anti-armor forces, which is discussed in more detail in chapter 4, is not due to a lag in some technology or to not moving a new system into production sufficiently quickly. Rather, the U.S. armor and anti-armor failure was in not sustaining the long-term infrastructure of doctrine, research, procurement, and industrial capability that could have produced innovative designs and operational concepts. We might compare this situation with that of the U.S. automobile industry. To defeat the Soviets in the armor and antiarmor area would have required the decades-long commitment to achieving a superior competitive position in a particular enterprise that Toyota made to beating Detroit's "Big Three."

Changes in the state of the military competition can occur in a number of quite different ways: through a long-term effort (like that of Toyota), more rapidly as a result of events in the competitive environment that may be beyond the control of the rivals themselves, or through innovation in weapon systems or operational concepts. Competitive advantage can be overcome or a superior competitive position reversed because the side that is at a disadvantage makes a long-term commitment of resources and gradually nibbles away at the other side. On the other hand, the competitive environment can change rapidly in ways that neither side controls. As a result, the basis for advantage and disadvantage can change in a relatively short period, and the current competitive position and strategy of one side or the other

may no longer be useful in the new environment and could even become a liability. The most striking example of this phenomenon is the political change in Eastern Europe that was not foreseen by either side until very recently. The new environment in Europe is rapidly altering the basis for military competition there, with immediate advantages for the United States, but with longer-term consequences that are less clear.

A third type of change in the state of the military competition is one that comes about from a sudden and significant innovation introduced by one side or the other. An historical example is the German introduction of the type XXI submarine just at the end of World War II. This submarine incorporated much of the technical and operational experience of the last three years and, if introduced earlier, could have changed the outcome of the Battle of the Atlantic. Both the United States and the Soviet Union copied the hull design and other features of the type XXI in their first postwar submarines. A second historical example is the German introduction of the ME-262 fighter in World War II, which in the opinion of some at the time could have significantly eroded the effectiveness of the combined bomber offensive had it been employed properly.

These German experiences also illustrate the difficulty of finding and exploiting a technological innovation to suddenly reverse competitive advantages, especially if one is in an inferior competitive position. The second-place player usually will not be able to exploit fully the potential of innovation if his competitive position is markedly inferior.

3.3.2 Preferences for States

Specific U.S. goals in the military competition should reflect U.S. preferences for future states of the competition.

Hence, understanding what states America prefers the competition to be in and what states the Soviet Union prefers is an essential step in characterizing the competition and formulating strategies for competing effectively.

Not only is the concept of preferences for states important for setting U.S. competition goals and understanding Soviet goals, but consideration of state preferences also introduces the important factor of time through the dynamics of moving the competition from the current state into some more preferred future state. For example, U.S. goals in some areas of the competition may call for moving rapidly to a new state; such judgments depend on how strongly future states are preferred over the current state. Alternatively, if the United States prefers the current state over feasible alternatives, a goal might be to keep the competition in its current state for as long as possible, despite Soviet efforts to change the state.

Another way that state preferences enter into strategy formulation has to do with unintended consequences of U.S. actions. Future states of the competition are determined by the actions of many parties, not just the United States, and the complexity of the competition makes prediction of these actions and their results difficult. Therefore, U.S. actions directed toward achieving a specific goal may result in a different state of the competition than that intended by the United States. For example, actions intended to make Soviet silo-based ICBMs obsolete by increasing the capability of U.S. strategic forces to destroy hardened silos may have had the unintended result of driving the Soviet strategic force posture to a much greater degree of mobility than in the 1960s. Is this better or worse for U.S. security than the Soviet ICBM posture of the 1960s, which consisted entirely of silo-based systems? In other words, which future state should we have preferred? U.S. planners should analyze and debate which of a

range of plausible future states could result from contemplated U.S. actions and whether any of those states are preferred to alternatives that might result from other actions.

In some forms of competition, preferences for states are obvious. In a football game, for example, the preferences of a team can be expressed in terms of the score and the field position. Preferences are more complex and subtle in career rivalries or business competition, but are still relatively simple compared with preferences for states of the military competition.

Clearly, there are formidable theoretical and practical problems in seeking to define a multidimensional, multiorganizational utility or preference function over the states of the military competition. This suggests that the determination of preferences for states at best will be a crude process, perhaps a simple ranking of plausible future states and the current state. Despite these problems, it would be a mistake not to address preferences explicitly. One reason is that uncertainties related to the U.S. ability to predict future states of the competition should be distinguished explicitly from uncertainties about U.S. preferences among plausible future states, since there are different techniques for managing each type of uncertainty. As an example, adaptive strategies that take actions, observe Soviet responses, then select further actions in light of those responses are a means of managing uncertainty about predicting future states; but an adaptive approach to competition strategies assumes the U.S. government is clear about which states it prefers.[7]

Another reason for addressing U.S. preferences for states explicitly is to permit competition goals to be formulated in light of these preferences. For example, U.S. preferences -- and therefore U.S. competition goals -- should relate to what is better or worse for U.S. national security. Hence, a point of departure

for addressing state preferences might be the ultimate prizes in the competition discussed above (e.g., influence over key nations or maintaining U.S. freedom of political, economic, and military action).

Another approach to determining preferences among alternative states is to evaluate states in terms of stability. The United States seems to prefer stable military balances in which neither side has overwhelming advantages and that permit political and military authorities to maintain control over forces in a crisis ("crisis stability"). Stability in a different sense may be a useful indicator of Soviet preferences for alternative states, since the Soviet Union seems to prefer "stable" conditions in which Soviet control over the course and outcome of political and military situations is assured.

In all of this, it should be noted that the ability to describe states of the competition succinctly is necessary in order to assign preferences to states.

3.3.3 Scoring the Military Competition

The notion of <u>score</u>, or who is ahead, is fundamental for the idea of any kind of competition. In the U.S.-Soviet military competition, assessing which side is ahead or currently has the advantage is important for several reasons. Not only should assessing who is ahead provide a means for achieving consensus about whether the United States should be satisfied with current trends and the current state of the competition, but scoring the military competition also can serve as a diagnostic tool to help understand why America likes or does not like the current trends and state. This sort of diagnostic analysis can, in turn, help to achieve a consensus about preferences for future states of the

competition by providing a sense of scale about the relative U.S. and Soviet standings in the competition.

Assessing which side is ahead is, therefore, closely related to understanding U.S. preferences for states by illuminating in some detail what is good or bad about the current state of the competition and suggesting preferred directions in which to try to move the competition in order to improve the U.S. advantage or reduce the Soviet advantage. But, by including diagnostics about why one side or another is ahead, the scoring or assessment process goes beyond establishing preferences and, properly done, should contribute to strategy development.

Thus, scoring is important, but the complexity of the military competition makes it difficult to assess in an overall sense which side is ahead. Making such assessments in each subarea of the competition will ease the problem, but, even when broken down into subareas, the military competition is still too complex to assess which side is ahead by exclusive use, or perhaps even primary use, of quantitative measures.

What factors to assess and how to assess them for scoring purposes are key research issues. Currently, the United States assesses the state of the military competition largely through the judgment of various officials and planning staffs, influenced strongly by a few canonical planning contingencies (e.g., nuclear exchanges, major conventional war in Europe); by perceived technological opportunities; and by organizational biases. In making these assessments, there is little systematic analysis of potential Soviet counters to U.S. programs or competition actions (the SDI program, which does examine Soviet countermeasures on a systematic basis, is a notable exception). Military balance assessment is a potentially important tool for scoring the

competition, but there currently is no formal system for the use of such assessments in competition planning.[8]

How the Soviet Union scores or assesses the military competition is only partially understood by the West, and this understanding is confined to a small number of experts. The assessment procedures of the USSR apparently start with the analysis of the nature of future wars on a theater-by-theater basis, followed by more detailed correlation-of-forces analyses. The Soviets apparently make some systematic effort to anticipate U.S. counters to their competition actions, but it is not clear how thoroughly they carry out such move-countermove analyses, since their preference is for high correlation-of-force ratios in their favor, which can make many Soviet competition actions relatively insensitive to U.S. counters.

At least three factors seem important to capture in U.S. evaluations of who is ahead. These factors are those discussed above in connection with describing the state of the military competition -- warfighting capabilities, the ability of each side to compete effectively in the peacetime military competition, and the impact of the military competition on more traditional U.S. peacetime objectives such as deterrence, reassurance of allies, and the ability to resolve crises peacefully.

Military balance assessments and contingency analyses to evaluate the outcomes of possible future wars can be used to assess current or possible future warfighting capabilities. The current competitive position, or ability to compete, of each side is also important for scoring purposes, because it indicates how readily each side can improve its standing in the competition. The current ability to compete is, however, a complex matter that is not easy to assess. Evaluation of competitive positions clearly should include the strengths and weaknesses of each side, but this is not

sufficient. For example, current competitive advantages should also be taken into account.[9] A U.S. (or Soviet) competitive advantage is a benefit actually achieved in the competition by expending resources or taking other actions to convert one's strengths and the adversary's weaknesses into a tangible benefit. Competitive advantage is a dynamic concept; it can increase or diminish over time. Examples are the ease with which one side can offset competition moves of the other by producing more tanks or aircraft or by drawing on technology advances such as stealth that can nullify these moves.

A related concept for evaluating the U.S. and Soviet competitive positions is competitive leverage: making disproportionately large gains in the military competition relative to the resources expended. Leverage may be measured in terms of the adversary's cost to respond, his time to respond, or the stress imposed on his military or industrial establishments. A large gain could, for example, be measured in terms of how well the United States undercut past Soviet military investments or influenced Soviet military spending patterns or operational concepts. Leverage may be measured in terms of an adversary's cost to respond to an action or strategy, the time required to respond, or the stresses imposed by an action or strategy on an adversary's military or industrial establishment.

Competitive initiative is a third concept for assessing competitive positions. The side that is dictating the agenda or the pace in a subarea of the competition may be said to have the competitive initiative, since the adversary will be reacting to that side's actions, rather than undertaking initiatives of his own.[10] The ability to dictate the agenda of the competition facilitates building on one's strengths and exploiting the other side's weaknesses by steering the competition into areas where the United States is stronger and by putting the other side in the

position of expending time and resources responding to U.S. moves rather than initiating its own moves.

Maintaining the competitive initiative in an area depends in part on having competitive advantages in the variables that are critical to success in that area, including such factors as mastery of basic technologies, having the required industrial base for production, and being able to use geography to advantage. For example, while India is developing ballistic missiles, it is very far from having a capability to execute a counterforce attack against China or the United States because it does not have the required technologies and production capabilities in guidance systems, rocket motors, and nuclear warheads.

To assess the relative effectiveness of U.S. and Soviet force postures in terms of peacetime political influence is less straightforward than evaluating warfighting capabilities or even competitive positions, but nevertheless is an important part of understanding who is ahead in the military competition. Competition planners should think in terms of measures or assessments of demonstrated military influence on world affairs in peacetime (e.g., actual crisis outcomes; constraints that one side's military postures place on the other side's freedom of action; or political problems with allies that military initiatives such as the planned U.S. deployment of enhanced radiation/reduced blast weapons in Europe have caused). By focusing on demonstrated military influence, perhaps greater rigor can be brought to the subject of peacetime political impact for purposes of scoring the competition.

3.4 CONCEPTS NEEDING METHODOLOGICAL RESEARCH

Several attributes of the U.S.-Soviet military competition should be taken into account in strategy formulation:

subareas of the competition, prizes and goals, rivals, means through which each side competes, rules and referees, moves and countermoves, time horizons, the state of the competition, preferences for states, and scoring. While research on the specifics of each attribute may be needed to develop particular strategies, most of the concepts are clear in a methodological sense. Three attributes are, however, both important for strategy development and poorly understood in a methodological sense. Research needs to be carried out on the following questions about these attributes:

- How to describe states of the competition objectively and succinctly?
- How to determine U.S. preferences among states and achieve consensus on specific determinations? Closely related is the need to improve U.S. understanding of Soviet preferences for states.
- How to assess which side is ahead in the military competition?

ENDNOTES TO CHAPTER 3

1. The role of military balance assessments in competition planning is discussed in detail in volume II. See especially chapter 4.

2. See chapter 1 of volume II.

3. Volume II, chapter 2, discusses the use of competition goals as planning tools and describes analyses that can assist in setting competition goals.

4. John Lewis Gaddis identifies five tacit "rules" that he argues regulate the superpower competition -- respect for each other's sphere of influence, avoidance of direct U.S.-Soviet military confrontation, reservation of nuclear weapons for use only in the extremity of total war, a preference for predictable anomalies in international arrangements over less predictable but more "rational" situations, and placing off limits any attempts to take advantage of the other side's leadership crises. See "The Long Peace: Elements of Stability in the Postwar International System," International Security, vol. 10, no. 4 (Spring 1986), pp. 132-40.

5. See volume II, especially chapter 5.

6. Volume II describes a layered planning system in which planning horizons are set for each layer. We recommend at least a twenty-year horizon for the layers dealing with the competitive environment and with a top-level U.S. competition strategy. The other layers, which are concerned with more detailed subarea strategies and implementing actions, would have shorter planning horizons.

7. Chapter 6 of volume II describes the use of competition planning games and military contingency analyses for determining preferences for future states of the competition and for reducing the risk of unintended consequences in developing competition goals and strategies.

8. For discussion of ways to use military balance assessments to assess and diagnose the state of the competition, see volume II, chapter 4.

9. Our use of the term differs from the one in common use, in which advantage is synonymous with strength. Thus, the statement that the United States should exploit its technological advantage in the competition is not consistent with our usage because it is too imprecise. The more helpful way of making the point is to say that the United States

should try to exploit its technological strength in order to realize specific competitive advantages.

10. The concept of competitive initiative, as defined here, should be distinguished from the DoD Competitive Strategies Initiative, where the term initiative means a new step or set of actions.

4. SAMPLE APPLICATION OF PLANNING CONCEPTS: INTERCONTINENTAL SUBAREA

This chapter illustrates the planning concepts developed in chapter 3 by applying them to the intercontinental or strategic forces subarea of the U.S.-Soviet military competition. It describes the prizes for which each side is contending, their current competition goals, the key actors in this subarea, and the major competitive instruments each side is using. The chapter then discusses two key elements of the state of the strategic forces competition: trends in the military balance and the competitive positions of each side. It concludes with issues to be addressed in developing a strategy for the intercontinental subarea of the military competition.

4.1 PRIZES AT STAKE IN THE INTERCONTINENTAL SUBAREA

The superpower competition in the intercontinental subarea is primarily focused on the strategic nuclear forces of the two countries. The state of the competition in this subarea has direct and indirect effects on the competition in most other subareas of the overall competition, in large part due to the sweeping nature of the prizes at stake for the two sides in the intercontinental subarea.

Both the United States and the Soviet Union seek to maintain their freedom of action in crises and regional wars through dominating the competition in the intercontinental subarea, while attempting to deny freedom of action to the other side. A historical example of how the strategic nuclear balance can be used in this way is the early postwar American declaratory policy of massive retaliation for aggressive Soviet actions taken below the nuclear threshold. Both sides have sought to shape the strategic nuclear balance so as to deny the other escalation dominance

through strategic nuclear superiority and to avoid self-deterrence of action due to the self-perception of nuclear inferiority.

A second prize sought by the United States and the Soviet Union in the intercontinental subarea is the attainment of influence over major allies of the United States. While the nature of this prize is essentially the same for each side, what each country views as influence over American allies is quite obviously diametrically opposite. The United States seeks influence over its allies in Europe and Asia by providing them with reassurance that the central strategic nuclear balance is being maintained in a state that will continue to provide them with the extended deterrent of the American nuclear umbrella.

The Soviets, on the other hand, have traditionally sought to influence the major allies of the United States in quite the opposite direction through their competitive actions in the intercontinental subarea. The Soviet strategic nuclear buildup is in part motivated by the goal of bolstering Western European fears (originally articulated by Charles de Gaulle) that the American nuclear umbrella is not credible, that the strategic balance is such that America would never risk losing Chicago for Bonn, so to speak. Success in this effort could lead to Western European accommodation of Soviet demands in a crisis and even to a drift toward neutralism by American allies who had lost confidence in the political will of the United States. In the competition for this prize success is more important to the United States than to the Soviet Union.

A third prize in the intercontinental subarea is sought only by the Soviet Union: the international perception of its equality in power and prestige with the United States. If the USSR is to be perceived by the world as "the other superpower," it must

at least equal the United States in fundamental military power, given its serious economic lag behind America and Japan. Since strategic nuclear arms can destroy the opposing society in a matter of hours, strategic nuclear equality with the United States has in some ways come to be seen as the primary measure of Soviet superpower status.

The final prize at stake for both sides is the capability to determine intercontinental war outcomes. While the two sides both see war outcome determination as a critical prize at stake in the intercontinental competition, they have different views of what constitutes an acceptable war outcome. Since the early 1960s, the primary emphasis of U.S. strategic force planning has been on deterring Soviet attacks through the threat of nuclear retaliation that would inflict unacceptable damage on the Soviet Union. In contrast, Soviet doctrine and actions emphasize the goal of favorable outcomes in a nuclear war, defined as the simultaneous limitation of damage to the Soviet Union and military defeat of the United States.

4.2 COMPETITION GOALS

In pursuit of the prizes outlined above, the two countries have more specific goals. These competition goals have been designed to counter those aspects of the other side's strategic nuclear forces that most threaten the achievement of the intercontinental prizes sought by each side. Current U.S. competition goals are to nullify Soviet investments in various elements of their strategic forces, to offset Soviet hardening of targets that must be threatened in order to deter a Soviet attack, and to preserve the viability of the U.S. ICBM force.

In its effort to nullify the Soviet investment in ballistic missiles, the United States is pursuing research and

development in the SDI program. Similarly, the U.S. cruise missile and B-2 bomber programs are meant to undercut large-scale Soviet investments in strategic air defenses. The United States is also seeking to nullify recent Soviet investments in mobile ICBMs through research and development aimed at finding ways of locating and destroying relocatable targets such as mobile missiles.

To offset Soviet target hardening, the United States is pursuing a variety of weapons research and development and deployment programs, including the Peacekeeper ICBM and the Trident II submarine-launched ballistic missile (SLBM). In a similar vein, the United States has deployed multiple independently targetable reentry vehicles (MIRVs) and carried out R&D on penetration aids designed to counter Soviet ballistic missile defenses in order to preserve the U.S. ability to destroy critical targets should the Soviets break out of or abrogate the Antiballistic Missile (ABM) Treaty.

The United States also seeks to preserve the viability of its own ICBM force as a competition goal. The American approach is a two-track one. While trying to reduce dramatically the Soviet threat to its silo-based missiles in START by demanding deep cuts in Soviet ICBMs that are capable of destroying hard targets, the United States also is developing a mobile ICBM in an effort to ensure American ICBM survivability.

The Soviets have a similar set of competition goals in the intercontinental subarea. They too seek to nullify their opponent's investments in various strategic force elements. But their use of arms control differs somewhat from that of the United States.

Soviet efforts to render U.S. strategic force investments obsolete are focused on three components of U.S. forces: accurate

MIRVs, ballistic missiles, and strategic force command, control, communications, and intelligence (C^3I). The Soviets are deploying two new mobile ICBMs in an effort to counter U.S. accurate MIRVs, as well as continuing to harden critical fixed targets of interest to the United States. To nullify U.S. ballistic missile investments as a whole the Soviets are engaged in extensive research on ballistic missile defense and antisubmarine warfare (ASW) programs. Soviet counter-C^3I programs are aimed at undercutting the entire U.S. strategic nuclear force investment.

Unlike the United States, Soviet use of arms control in the intercontinental subarea of competition has focused on preventing the incorporation of new technologies into deployed U.S. offensive and defensive forces, rather than on the elimination of existing U.S. systems. This is most readily apparent in Soviet attempts to limit the SDI program through arms control, even to the point of banning SDI research itself (an area in which, as noted, they themselves are heavily engaged).

4.3 KEY ACTORS IN THE INTERCONTINENTAL SUBAREA OF COMPETITION

The United States and the Soviet Union are themselves, obviously, key actors in the military competition in the intercontinental subarea. But other key actors, both inside and outside the polities of the two superpowers, must be taken into account by U.S. competition planners.

Within the United States there are three key actors that influence the competition in the intercontinental subarea: the national security establishment of the executive branch, the Congress, and the media. The nature of the influence of the national security establishment is clear: it is the primary source of thought and action regarding U.S. competition moves, including

budget planning, strategy formulation, doctrinal changes, and arms control negotiations.

Congressional influence on the intercontinental competition is considerable. While the constitutional powers of the purse and advice and consent to treaty ratification are the most apparent sources of congressional influence, there also are opinion leaders in Congress who shape the political debate on strategic nuclear forces in ways that influence the executive branch beyond the statutory powers of the Congress to do so. Thus, the executive branch must not only take into account whether or not it can secure the votes necessary to fund its strategic force initiatives and ratify any arms control treaty it might conclude, but also whether its explanation of American strategic nuclear doctrine and force plans can meet the test of public opinion in the face of congressional opposition.

The U.S. media's role in the intercontinental competition is similar to this latter congressional role. Opinion leaders in the media must also be dealt with by the executive branch, with an eye toward how a particular U.S. competition action will be perceived by the public through the filter of the media's presentation.

In the Soviet Union, the military and the Party leadership were the dominant actors in competition planning until recently. Now, however, the role of the military in policy decisions has been reduced and the power of the Communist Party is diminished. Gorbachev's civilian advisors, especially those in the foreign ministry and in some of the regional research institutes, increasingly are strong actors in the military competition.

There are two other key actors in the intercontinental subarea of competition: the People's Republic of China and the collective nations of Western Europe.

China's role derives from the threat its own strategic nuclear forces pose to the Soviet Union. While the Chinese arsenal is nowhere near a match for that of the Soviets, its existence is a potential wartime problem the Soviets must take into account. One reason the Soviets maintain the one active ballistic missile defense system allowed them by the ABM Treaty probably is to protect Moscow from a Chinese attack, rather than from a large U.S. strike (which it would be incapable of stopping).

The West European role is two-fold. First, the Europeans are one of the prizes the two superpowers compete for in the sense of influence over major U.S. allies. The political and military reactions of the Western European nations to the course of the U.S.-Soviet intercontinental competition can have wide-ranging impacts on the superpowers. West German Chancellor Helmut Schmidt's call for the deployment of American land-based intermediate nuclear force (INF) missiles in preparation for the conclusion of the Strategic Arms Limitation Talks II (SALT II) Treaty is a case in point. Second, France and the United Kingdom each maintains its own independent nuclear force, which the Soviets cannot ignore in their conduct of the superpower intercontinental competition.

4.4 IMPORTANT COMPETITIVE INSTRUMENTS IN THE INTERCONTINENTAL SUBAREA

There are eight primary categories of competitive instruments important for the competition in the intercontinental subarea. Sound competition planning must not only consider ways in which these instruments can be used to U.S. advantage, but also how each could be used by the Soviets.

The most obvious competitive instrument in this subarea is the deployed strategic offensive and defensive forces of the United States and the Soviet Union. Their role in the competition is primarily as a force in being, the baseline from which the rest of the intercontinental competition is conducted.

Directly related to the forces of the two sides are the deployed C^3I and counter-C^3I systems of the superpowers. They are a separate competitive instrument because even a superior force is potentially useless if the other side is able to overcome its adversary's ability to control and employ it. Despite the differences in how the United States and the Soviet Union perceive desirable intercontinental war outcomes, command and control over one's strategic forces is critical to each side.

The third set of competitive instruments in the intercontinental subarea is the strategic weapons R&D and procurement programs of the superpowers. This is in fact where most military competitive initiatives are to be found. The development and deployment of new strategic weapons systems, both offensive and defensive, is at the heart of the intercontinental competition.

Arms control negotiations and agreements constitute another important competitive instrument in this subarea. Arms control agreements bound the competition to the extent the two sides comply with them, potentially channeling future competition in more predictable directions. Arms control negotiations provide both sides with opportunities to limit the competitiveness of the other side while preserving one's own.

Closely related to arms control are public statements and propaganda issued by both sides in the competition. Such

statements and propaganda can be used by the Soviets to undercut the requisite public support for U.S. weapons programs or arms control proposals. Likewise, the United States can use these instruments to bolster domestic and allied support for the American position and, in the era of glasnost, to influence Soviet public opinion.

Another political-military instrument that can be useful in the intercontinental competition is the crisis behavior exhibited by the two nations. For example, alerting one's strategic forces during a regional crisis, as President Nixon did during the October 1973 war in the Middle East, can be used to reinforce the opponent's perceptions of one's strategic power, as well as to influence the regional crisis.

The strategic force employment concepts and plans of the two sides also are competitive instruments. The formulation of concepts and plans that threaten the other side's military effectiveness in key strategic and conventional force missions can be a powerful way to influence the opponent's future strategic force investments, provided the opponent is aware of these concepts and plans. Information on employment concepts can be conveyed in several ways, including official or semiofficial writings, public statements, and exercises. Exercises constitute an important competitive instrument in other respects, notably for shaping the other side's views on the character of future wars that might involve intercontinental forces.

4.5 TRENDS IN THE STRATEGIC BALANCE

A number of important trends characterize the current state of the intercontinental military balance. These trends are primarily technological, although several also involve the

strategic thinking of each side as it relates to the conduct of the competition.

The first and perhaps most long-standing trend is that of the United States dictating the terms of the competition between strategic bombers and air defenses. As the history of the B-52 program makes clear, the U.S. bomber force has consistently maintained a considerable lead over Soviet air defenses.[1] This trend is currently being continued by the U.S. B-2 bomber and Advanced Cruise Missile programs, both of which incorporate stealth technology.

The second important trend in the strategic balance is the sustained Soviet move to superiority in deployed ICBM forces. The Soviets have been dictating the terms of the ICBM competition since their acquisition of MIRV technology in the early 1970s. By the end of the 1970s, the Soviets had attained a clear advantage in ICBM capability and are continuing to compete robustly in this area with the introduction of two new mobile ICBMs in the late 1980s, the hardening of targets that U.S. ICBMs would attack, and continued improvements in the hard-target capabilities of their own ICBMs.[2]

The trend in the development and deployment of wartime C^3I and counter-C^3I capabilities favors the Soviets, but less so than it did several years ago. The United States traditionally has neglected this area of strategic force competition, particularly in the counter-C^3I area, while the Soviets have maintained strong, long-standing programs in both. Recently, however, the United States has focused considerable attention and resources on this area, improving the long-term outlook.

As mentioned above, the two sides have divergent strategic doctrines. Despite doctrinal changes in U.S. strategic

force policy and targeting, concepts of Mutual Assured Destruction (MAD) still have an unduly strong influence on strategic force acquisition programs and arms control positions. The influence of MAD is clear among U.S. allies and within the U.S. Congress, but is implicit in many executive branch actions as well. This influence limits the types of intercontinental force initiatives the United States has chosen to carry out. For example, this MAD orientation contributed to U.S. neglect of the C^3I and counter-C^3I elements of the intercontinental competition, to the U.S. retrenchment on strategic defenses after the signing of the ABM Treaty, and to the difficulties in obtaining congressional approval of hard-target counterforce programs.

Soviet strategic doctrine, on the other hand, is based on an evolving set of counterforce and warfighting concepts. Despite Soviet public statements to the effect that a nuclear war cannot be won and must never be fought, there is no evidence that Soviet military planning is taking such declarations to heart, and considerable evidence to the contrary. This is not to say that the Soviets wish to fight a nuclear war, but rather that their actions in the intercontinental subarea of the competition are directed at improving their ability to prevail should such a war occur.

A fifth important trend in the intercontinental military balance is the continued Soviet emphasis on space warfare and military space programs. The Soviets started early in this area and have maintained their lead, both doctrinally and operationally. The United States has moved to catch up, including the establishment of the U.S. Space Command, but the trend in this area continues to favor the Soviet Union, due in large part to their considerable investment in military space programs and their advantage in space launch capacity.

In the area of ballistic missile defense the trends are mixed. Soviet operation, maintenance, and upgrade of the ABM system around Moscow is providing them with an expanding infrastructure of and increasing experience with ballistic missile defense. However, the American SDI program is pushing back the frontier of advanced BMD technologies, giving the United States a technological advantage.

Finally, the value of maintaining a significant, highly survivable force of SLBMs has led both sides to improve the security of their ballistic missile submarines and seek ways to detect and destroy those of the other side. The U.S. Trident program has continued the trend of high survivability for U.S. nuclear-powered ballistic missile submarines (SSBNs). The Soviets chose to combine new SLBM and SSBN developments with a change in operational concept (the bastion strategy) to secure their SLBM force. While both sides are actively pursuing ASW advances, technological trends appear to favor continued high survivability for SSBNs.

4.6 COMPETITIVE POSITIONS IN THE INTERCONTINENTAL SUBAREA

The U.S. and Soviet competitive positions in the intercontinental subarea can perhaps most readily be summarized in terms of who holds the competitive initiative. At present the United States holds the initiative in two respects, the Soviets hold the initiative in four, and both sides are exercising the initiative in two other regards.

The United States has the competitive initiative in the competition between American bombers and cruise missiles on the one hand and Soviet strategic air defenses on the other. The United States also holds the competitive initiative in the field of ballistic missile defense (BMD) technology as the result of the SDI

research program. The Soviets do have, however, an active BMD research program of their own, and it is unlikely they will limit their program beyond what is proscribed by the ABM Treaty, regardless of what the United States chooses to do with the SDI program in the future.

The Soviet Union holds the competitive initiative in ICBM development and deployment, as is evidenced by the ongoing deployment of the mobile SS-24 and SS-25 missiles. The Soviets also hold the initiative in the competition in wartime C^3I and counter-C^3I. Recent U.S. investments in this field have cut the Soviet lead, but the competitive initiative is still in Moscow.

The competitive initiative in deployed BMD systems also rests with the Soviets, although the importance of this absent a gross violation or abrogation of the ABM Treaty is debatable. Unless the Soviets go ahead with a much larger deployment than is allowed by the Treaty, their competitive initiative in this area may be of little advantage.

The Soviets also hold the competitive initiative in arms control proposals and related public diplomacy. Their repeated concessions to the U.S. in the INF and CFE negotiations and their surprising willingness to submit to verification procedures at which the United States has sometimes balked have seized the competitive initiative in this area away from the Americans. Bold new proposals in START that will capture the imagination of Western publics could, however, regain the initiative for the United States.

Both the United States and the Soviet Union are exercising initiatives in the fields of SLBMs and space warfare. American deployment of the Trident II with its hard-target-kill capability will provide the United States with a significant,

though probably fleeting, advantage in the intercontinental subarea. The deployment of large-scale space warfare capabilities is not imminent for either side, but both nations are seeking to exploit their respective competences in this field.

4.7 ISSUES FOR U.S. STRATEGY DEVELOPMENT IN THE INTERCONTINENTAL SUBAREA

The preceding review of the state of the military competition in the intercontinental subarea points to several issues that need to be addressed in U.S. competition strategy development.

Perhaps the most critical single issue is how best to exploit the competitive potential of the SDI program and its constituent technologies. The Strategic Defense Initiative promises to provide high leverage in the long-term competition, but its costs are considerable. The challenge for U.S. competition planners is to formulate competition goals for the SDI program that are affordable within likely future budget constraints. If such goals can be developed, then a strategy for fully exploiting the technological potential of the SDI program, including potential spin-offs in other subareas of the competition, should be formulated and implemented.

The second issue for U.S. strategy development is how to counter Soviet advantages in wartime C^3I and counter-C^3I capabilities. Improvements in U.S. wartime C^3I are essential if the Soviet competitive goal of nullifying U.S. investment in this critical area is to be blocked. Enhancements in American counter-C^3I capabilities will provide significant competitive leverage, as such programs would threaten Soviet control over the course and timing of an intercontinental war.

The Soviet advantage in ICBM capabilities should also be addressed by those developing U.S. strategy for the competition in the intercontinental subarea. The current Soviet monopoly in mobile ICBMs and large Soviet advantages in ICBM throwweight should be dealt with. Whether these problems can best be addressed through new U.S. ICBM deployments, the continuation of programs that can counter those Soviet capabilities (e.g., the B-2 bomber), or the conclusion of arms control agreements that eliminate or constrain these Soviet advantages is a question to be addressed by American competition planners.

The final issue arising from our analysis is the competitive role for nonnuclear weapons in the intercontinental subarea. Precision guidance technologies and nonnuclear warhead lethality are rapidly approaching the point at which they could be capable of performing strategic missions previously only achievable with nuclear weapons. The competition implications of and opportunities offered by such nonnuclear strategic weapons should be considered by those formulating U.S. strategy for the long-term competition in the intercontinental subarea.

ENDNOTES TO CHAPTER 4

1. See volume III, appendix B, for a review of the B-52 program.

2. Appendices G and I in volume III discuss U.S. and Soviet ICBM programs.

5. INFLUENCING THE STRATEGIES AND ACTIONS OF THE ADVERSARY

This chapter discusses historical examples of U.S.-Soviet military competition in order to illustrate the foregoing planning concepts. We first summarize U.S. and Soviet strengths and weaknesses that are relevant to military competition and give examples of the way that each side has invested resources to convert its strengths and the adversary's weaknesses to actual competitive advantages. These examples show that often it is easier for one side to make this conversion than it is for the other -- that is, one side has a superior competitive position in some subarea. We then use historical cases to illustrate how long-term investments can pay off with improved competitive positions. To further clarify the nature of the U.S.-Soviet military competition we give several examples of successful or failed competition enterprises or actions on each side. The chapter concludes with a summary of lessons from these historical cases for U.S. competition planners.

Some of the examples in this chapter illustrate ways in which the USSR is still actively competing with the United States in the military arena.

5.1 STRENGTHS, WEAKNESSES, AND COMPETITIVE ADVANTAGE

5.1.1 Enduring and Temporary Strengths and Weaknesses

Table 7 summarizes major U.S. and Soviet strengths and weaknesses relevant to the military competition that are likely to persist for at least the next twenty years and thus are "enduring."[1] These enduring strengths and weaknesses stem from comparatively unchanging conditions like geography and the funda-

Table 7. U.S. and Soviet enduring strengths and weaknesses.

	STRENGTHS	WEAKNESSES
UNITED STATES	• MARKET ECONOMY • TRADITION OF STATE/PRIVATE ENTREPRENEUR INTERACTIONS • YEAR-ROUND ACCESS TO OCEANS	• SOCIAL/POLITICAL SYSTEM NOT WELL-SUITED FOR SUSTAINED COMPETITION AGAINST A CENTRALLY-CONTROLLED ADVERSARY • ECONOMIC DEPENDENCE ON OVERSEAS COUNTRIES • LIMITED DEPTH FOR MANEUVER IN WESTERN EUROPE
SOVIET UNION	• CENTRAL GEOGRAPHIC POSITION RELATIVE TO ADVERSARIES • CONTIGUITY TO MAJOR THEATERS OF CONTENTION	• RIVALRY WITH CHINA • CENTRALIZED CONTROL PARANOIA • NO YEAR-ROUND OPEN-OCEAN ACCESS

mental natures of the U.S. and Soviet political, social, and economic systems.

Enduring U.S. strengths include its market economy and the well-established tradition of interaction between the Department of Defense and private industry that together foster technological innovation. These strengths can facilitate rapid movement of new technology into weapon, C^3I, and surveillance systems, provided that U.S. acquisition policy and practices do not hinder such rapid movement, as they do today. An important U.S. geographic advantage of military significance is its easy access to the world's oceans on a year-round basis, a marked contrast to the Soviet lack of warm water ports that are free of ice at all times.

The United States has several enduring weaknesses in the military competition with the Soviet Union. The pluralistic social and political system of the United States fosters personal freedom and technological innovation, but it is not well-suited to the kind of long-range defense planning that is essential for competing effectively. The economic interdependence between the United States and overseas nations makes America more dependent on continued access to overseas resources and on sea lines of communication in wartime than the Soviet Union. A geographic weakness of military significance is the limited depth of maneuver for U.S. and NATO forces in Western Europe, which Soviet military planning can exploit so long as Western Europe is a potential battlefield.

The USSR has a major geographic advantage in its central position relative to its adversaries, most of whom are located around the Soviet periphery, permitting the Soviets the advantage of interior lines of communication. A closely related geographic advantage is the fact that Soviet-controlled territory, and

therefore Soviet military forces, lie closer than U.S. territory to key areas of contention between the East and West: Southwest Asia, Northeast Asia, and Western Europe.

A number of enduring Soviet weaknesses can be exploited by the United States in the military competition. While Sino-Soviet relations currently are improving, the deep-seated and long-standing Sino-Soviet rivalry probably will continue to divert Soviet resources from competing with the United States and its allies.

The strong penchant, if not paranoia, of the Soviet Union for centralized control is both an economic and a military weakness.[2] While central control in the economy allows Soviet leaders to spotlight selected sectors for special efforts, on balance it clearly is a weakness, at least as implemented in the Soviet Union, because it removes market incentives that are necessary for future growth of the Soviet economy and for technological innovation, a point we discuss in more detail in chapter 6. In Soviet military planning, excessive central control leads to a certain rigidity in military operations that can be exploited by the United States in the peacetime military competition by deploying systems and using operational concepts that undercut the confidence of Soviet leaders that they can maintain control over wartime operations (see the discussion of this point in chapter 6.3 for more detail).

Temporary U.S. and Soviet strengths and weaknesses -- those likely to persist for a decade or so, but not necessarily longer -- are summarized in Table 8. They relate to political, economic, and social conditions that could change over time and to the current military postures of the two sides.

Table 8. U.S. and Soviet temporary strengths and weaknesses.

	STRENGTHS	WEAKNESSES
UNITED STATES	• WESTERN TECHNOLOGICAL INNOVATION • LEAD OVER USSR IN MOST AREAS OF MILITARY TECHNOLOGY • AIRCRAFT/CRUISE MISSILE PROGRAMS • STEALTH PROGRAMS • MARITIME SUPERIORITY OVER THE USSR • SSBN FORCE	• DOUBTFUL STAYING POWER IN MILITARY COMPETITION, ESPECIALLY IN PERIODS OF RELAXED TENSIONS • WESTERN EUROPEAN PREFERENCE FOR DETENTE POLICIES • TOLERANCE OF WESTERN PUBLICS FOR HOSTILE SOVIET ACTIONS
SOVIET UNION	• COMMAND ECONOMY • NATIONALISTIC PRIDE IN USSR AS WORLD POWER • DOMESTIC MECHANISMS FOR COERCIVE CONTROL • WEAPON ACQUISITION SYSTEM THAT EFFECTIVELY TAILORS AVAILABLE TECHNOLOGY TO MILITARY NEEDS • LARGE STANDING GENERAL PURPOSE FORCES • BALLISTIC MISSILE FORCES • AIR DEFENSES	• SYSTEMIC ECONOMIC PROBLEMS • LITTLE TECHNOLOGICAL INNOVATION, EXCEPT THROUGH TECHNOLOGY TRANSFER FROM THE WEST • BUREAUCRATIC OBSTRUCTION TO CHANGE • EXTERNAL EMPIRE – POLITICAL INSTABILITY/ECONOMIC WEAKNESSES OF EASTERN EUROPE – OTHER COSTS OF EMPIRE • NATIONALIST RESENTMENT OF RUSSIAN DOMINATION – EXACERBATED BY DEMOGRAPHIC TRENDS AND GLASNOST

Among temporary U.S. strengths are the substantial amount of technological innovation among the United States and its allies and the lead they hold over the Soviet Union in most areas of technology, particularly those that promise high competitive leverage in a variety of military areas (e.g., microelectronics and computers). To be sure, development and production of advanced technology electronic components has moved overseas to a greater degree than may be advisable for U.S. security, but technological innovation is still a major U.S. strength and the United States is beginning to give attention to the problem of its declining competitiveness in electronics.

The United States has substantial advantages in certain aspects of the military balance that also count as temporary strengths in the competition. These include strategic and tactical air forces, air-launched and sea-launched land-attack cruise missiles, the emerging applications of stealth technology, the U.S. superiority over the Soviet Union in general purpose naval forces, and the SSBN force, which is quieter, safer, and more capable than that of the USSR.

Temporary U.S. weaknesses in the competition are social in nature. The American public, and especially the Congress, have the capacity to waver in their support over a long period for the military programs and other actions that seem necessary to compete effectively with the USSR. This tendency to be less than steadfast in supporting U.S. competition goals is particularly noticeable during periods of improved relations with the Soviet Union. This tendency is even more pronounced in Western Europe, where there is a strong preference for policies of detente, which is understandable given the history of two world wars and the cold war in the twentieth century, but which makes it more difficult for the United States to sustain effective political, military, diplomatic, and arms control actions that yield competitive advantages. These

weaknesses are related in part to the high level of tolerance that U.S. and allied publics have for hostile Soviet policies and actions.

The Soviet Union has a number of important temporary strengths, including its command economy that allows Soviet leaders to concentrate enormous resources in the military sector when they choose to. Gorbachev's restructuring policies have not reduced this capability to date. Other Soviet strengths include the nationalistic pride that many Soviet citizens (especially Russians) take in the USSR as a world power and the extensive means available to Soviet leaders even in this era of glasnost and perestroika for coercive control of their population, enhancing the freedom of action of the Soviet government in the military competition. The Soviet weapon system acquisition process has proven to be adept at tailoring the technology available to the Soviet Union to the operational needs of the military, often getting adequate technology into deployed military systems faster than the United States is able to field its technologically superior weaponry, to the net advantage of the USSR. The Soviets also have substantial advantages in today's military balance, notably their large active duty and reserve general purpose forces; their programs for ICBMs and SLBMs; and their extensive, highly capable air defense system.

Many of these Soviet strengths may turn more and more into weaknesses over the next decade under the twin pressures of the domestic problems of the USSR and American military competition, adding to the substantial number of significant temporary weaknesses the USSR has today. One of these weaknesses is the serious, systemic problems in the Soviet economy, which produces little technological innovation except through technology transferred from the West. These problems have spurred social disruption in the USSR and have caused the Politburo to reduce the resources allocated to the military sector. Closely related to the

problems of the economy is the lack of incentives in civilian bureaucracies to change, which is impeding Gorbachev's efforts to improve Soviet economic performance.

Another major temporary weakness that is receding but will continue to hamper the Soviet ability to compete for some years into the future is the burden of the external Soviet empire: the residual military and economic costs of political instabilities and economic problems in Eastern Europe and the substantial economic support that continues to go to Cuba and Vietnam. Another serious weakness that may or may not be diminished by Gorbachev's reforms is the resentment of Russian domination by nationalist groups throughout the USSR, which is exacerbated both by glasnost and the demographic trends that are making these groups more powerful.[3]

5.1.2 Actions to Take Better Advantage of Strengths and Weaknesses

It is not sufficient to have inherent strengths or for the adversary to have inherent weaknesses. For effective impact on the military competition resources must be committed and actions taken to convert one's strengths and the opponent's weaknesses into actual advantages. We illustrate this concept by describing examples of U.S. actions to take better advantage of its strengths and of Soviet weaknesses, to reduce temporary Soviet strengths, and to reduce temporary U.S. weaknesses. We then discuss examples of ongoing or potential Soviet actions intended similarly to achieve competitive advantages for the USSR.

The Tomahawk Land-Attack Missile (TLAM) program is an example of applying U.S. strengths to undercut some temporary Soviet strengths, making Soviet investments obsolete and probably imposing costs on the USSR. More specifically, the United States has strengths in the maritime balance of forces and in land-attack

cruise missile technology and programs, while the Soviet Union has strengths in theater military balances ashore in Europe, Southwest Asia, and Northeast Asia. The nuclear TLAM/N and the conventional TLAM/C and TLAM/D programs build on these U.S. strengths to provide a survivable ability to attack fixed targets at long range and with high confidence of penetrating today's Soviet air defenses. By holding at risk Soviet fixed targets such as air bases and air defenses that are vital for theater operations, and doing so in ways that the Soviets are not currently able to counter easily, the TLAM program undercuts current Soviet investments and diminishes a current Soviet strength.

Since the Soviets probably feel compelled to attempt to nullify these effects of the TLAM program, Tomahawk probably also is imposing costs on the USSR, both in the diversion of naval forces from other missions to counter TLAM ships and submarines and in the expenditure of additional funds to improve air defenses against TLAM missiles and otherwise to reduce theater vulnerabilities to TLAM attacks. In this way, the TLAM program is achieving competitive advantages for the United States, probably with high competitive leverage, since the TLAM program cost is probably modest compared with the cost of Soviet efforts to counter it. However, to better estimate the competitive leverage of Tomahawk, as well as to understand better how to sustain its competitive leverage, an examination of plausible future Soviet counters to TLAM needs to be undertaken.[4]

The TLAM program, along with other U.S. cruise missile programs, is beginning to impose stresses on Soviet air defenses. But these programs only hold Soviet fixed targets at risk, and Soviet air defenses probably can be improved over time to reduce the penetration probabilities of the first generation U.S. land-attack cruise missiles. Much greater competitive advantage is being provided by the B-2 bomber, which is the first long-range

bomber to incorporate stealth technology in its basic design and which can impose tremendous stresses on Soviet air defenses. Moreover, the B-2, with its large payload, long range, and high survivability at both high and low altitudes, provide the ability to attack movable (as well as fixed) targets with conventional or nuclear weapons.

If the mission of the B-2 bomber were expanded from its current strategic nuclear mission to include support to theater operations with advanced technology conventional weapons, the United States and its allies could gain even greater competitive advantages. This action would build on two U.S. strengths -- stealth technology and technology for advanced conventional weapons -- and would undercut current Soviet strengths in theater military balances ashore in Europe, Southwest Asia, and Northeast Asia. This would make a number of major Soviet investments in air defenses and general purpose forces obsolete and impose major costs on the Soviets to counter this new threat to their theater forces, with high competitive leverage for the United States.

A somewhat different example relates to possible future U.S. efforts to make targets in the United States more difficult for Soviet strategic forces to attack. Today, most of these targets are fixed and are sufficiently soft that current or near-future Soviet ballistic missiles can destroy them with high probability. In this way, the United States has allowed the Soviets to turn their strength in ballistic missiles into a competitive advantage. However, America can take actions that make the target set in the United States substantially more difficult for the Soviets to attack, raising the cost to the Soviets of holding these targets at risk, reducing the military effectiveness of a Soviet missile force that is likely to be constrained by agreements resulting from the Strategic Arms Reduction Talks, and reducing a temporary U.S. weakness. These actions include making

part of the target base mobile (especially U.S. ICBMs and some C^3I targets); hardening of elements of the target base (e.g., some C^3I facilities and ground control elements of U.S. space systems); and deploying ballistic missile defenses.

Yet another example is found in the rate at which the United States moves advanced technology into deployed weapon systems. This is a case in which the United States has not done as well as it could in turning its strength in technology to actual advantage in the competition. The current U.S. weapons acquisition system impedes the movement of technology into deployed weapons through its unresponsiveness, its discouragement of risk-taking with advanced technology weapons, and its tolerance for long program acquisition times. The result is increased opportunities for the USSR to operate within U.S. acquisition timelines and to field counters to U.S. advanced technology systems soon after their deployment -- or occasionally even before the new U.S. weapon systems are deployed. Thus, the United States is failing to convert an important strength into its full potential competitive advantage. The acquisition reforms recommended by the Packard Commission and the Commission on Integrated Long-Term Strategy would help correct this problem.[5]

The Soviet Union is, of course, seeking to convert its strengths and U.S. weaknesses to competitive advantage, to undermine U.S. strengths, and to reduce its own weaknesses, just as is the United States. The following examples of such Soviet efforts illustrate the point that U.S. competition planning must take into account Soviet initiatives, as well as Soviet responses to U.S. initiatives.

Perhaps the Soviet action that has the greatest potential leverage in the 1990s is the quieting of their submarine force, aided by Western technology, some of which has been acquired

illegally. New classes of Soviet submarines introduced in the 1980s are eroding the acoustic advantage of quiet U.S. attack submarines, and this trend is almost surely to continue, undercutting U.S. superiority in the maritime balance. As this trend matures, Soviet submarines will be significantly more difficult to locate and track, reducing the ASW effectiveness of today's U.S. forces and imposing costs on the United States to develop and deploy improved ASW sensors and forces. If the United States is unable to develop effective counters to these quieter submarines, the Soviets could make U.S. strategy and military capabilities in the Pacific and Atlantic obsolete, undercut U.S. reinforcement strategy for Europe, and make U.S. sea lines of communication (SLOC) protection capabilities obsolete.[6] Given the likely prospect that U.S. overseas forces will be substantially reduced in the 1990s and the consequent greater U.S. reliance on a mobilization and reinforcement strategy, Soviet submarine quieting could yield significant advantage for them.

Soviet improvement of the accuracies of their ICBM force in the 1970s and 1980s already has provided them with significant competitive advantage in the intercontinental subarea. These improvements have given Soviet ICBMs a substantial hard-target kill capability that effectively threatens U.S. silo-based ICBMs and that therefore has undercut U.S. ICBM investments and is making the current U.S. ICBM force obsolete. The Soviet Union progressively has put the United States at a disadvantage in ICBMs, despite lagging behind the United States in ICBM technology.[7]

There are many examples of Soviet efforts to convert their strengths and U.S. weaknesses to competitive advantages in ground forces. For instance, the Soviet concept of the operational maneuver group (OMG) builds on Soviet strengths in its large, standing ground forces to exploit the U.S. and NATO weakness of limited strategic depth in Western Europe. OMGs would complement

Soviet air, rocket, and artillery deep attack capabilities by seeking to penetrate well into NATO's rear area, in an effort to disrupt NATO mobilization and reinforcement and command and control, and to threaten NATO air bases and nuclear forces. Thus, unless they are successfully countered, OMGs could undercut fundamental elements of NATO's strategy.

Another example of Soviet actions in the ground forces area is their use of U.S. attack helicopter concepts to add an additional dimension to their antitank capabilities. By incorporating proven antitank capabilities into their helicopters and adapting U.S. tactics to fit with Soviet operational concepts, the Soviets have drawn on their strengths (large standing ground forces and a weapon production system that can turn out large numbers of moderately advanced weapon systems) to hold their own in the continuing competition between armor and antiarmor systems.

5.2 ACTIONS TO IMPROVE COMPETITIVE POSITIONS

The preceding examples illustrate ways in which the United States and the Soviet Union are seeking to convert their strengths and the opponent's weaknesses into actual advantages in the military competition. Another approach to gaining advantages in the competition, one that has a longer-term, multimove (or chess-match) character, is to expend resources to improve one's competitive position, or ability to compete, in certain subareas of the competition. Devoting resources to improving one's competitive position generally entails sacrifice of short-term advantages. Hence, it could be a sound move if it allowed eventual conversion of one's strengths and the opponent's weaknesses to competitive advantages more readily, faster, at less expense, with greater competitive leverage, or in a more enduring way than by using those resources to seek more immediate competitive advantages.

Probably the most powerful current example of an effort to improve one's competitive position is U.S. stealth technology and the applications of this technology in new U.S. combat aircraft and cruise missile programs. The United States has been investing heavily in developing stealth technology since at least the early 1970s (for example, the development costs of the B-2 bomber are estimated to be about $21 billion). This is a long-term effort, consciously conceived to reduce aircraft and cruise missile signatures so drastically that existing Soviet air defenses will be rendered ineffective.[8] The development costs of the program do not represent just the direct cost of developing the B-2 aircraft. They are an investment in a much broader area of research and manufacturing technologies that will be applicable to other weapon systems incorporating stealth technology, including research data on stealth technology, new manufacturing processes, and the engineering of large composite structures.

The Department of Defense kept these programs highly secret until 1978, and even after the announcement of the Advanced Technology Bomber program (as the B-2 was then called) by Secretary of Defense Harold Brown, few details were made public until the rollout of the B-2 bomber in 1989.

By keeping stealth R&D secret, the United States was able to develop and prove the technology and to incorporate it into the design of several weapon systems before the existence and nature of this technology became widely known. In this way, the United States was seeking to improve its competitive position both by gaining a substantial lead in stealth technology over the USSR and by denying information to the Soviets that could facilitate their development of counters to stealth technology. Now, at least five major U.S. weapon system programs are based on stealth technology

-- the Advanced Cruise Missile, the B-2 bomber, the F-117 fighter, the Advanced Tactical Fighter, and the A-12 Advanced Tactical Aircraft.[9]

Stealth technology programs seek to nullify Soviet air defense investments by making Soviet strategic and tactical air defenses obsolete and to impose substantial costs on the USSR if it seeks to improve these air defenses. Perhaps even more importantly, however, U.S. development of stealth technology is intended to make substantial improvements in the U.S. competitive position in any subarea of the competition in which the opposition of U.S. aircraft and cruise missiles versus Soviet air defenses is an important component of the military balance. Stealth programs are shifting the competition between air-breathing weapon systems and air defenses into new technology areas where the United States has major strengths and the USSR has crucial weaknesses, technology areas where the United States apparently already has gained a major lead over the USSR. These programs, if carried to fruition, appear to have high competitive leverage and may allow the United States through continued improvements in stealth weapon systems to stay ahead of future Soviet air defense changes for a substantial period of time, perhaps for decades.

Consequently, stealth technology has the potential to improve the U.S. competitive position in several major subareas of the competition in which U.S. combat aircraft and cruise missiles figure prominently. These include the intercontinental subarea, Europe, East Asia, and the Middle Eastern/Southwest Asian subarea. They also include subareas of the competition in which U.S. combat aircraft could be used to project power against states protected by Soviet-supplied air defenses, as in the Middle Eastern/Southwest Asian subarea.

While stealth technology already is helping to improve the U.S. competitive position, the ultimate outcome is not yet clear for at least two reasons. One is the uncertainty of congressional funding for future U.S. stealth systems, particularly the B-2 bomber. The other reason relates to Soviet counters to U.S. stealth technology. It seems clear that stealth will yield significant advantages over Soviet air defenses and that effective air defense counters to U.S. stealth weapon systems will prove difficult and costly to the USSR.[10] The Soviets may, however, be able to counter U.S. stealth systems through means other than air defense improvements. For example, the Soviets have built political-military command centers deep underground and are shifting part of their ICBM force to a mobile configuration. In this way, the Soviets may be able to reduce some of the advantages the United States hopes to gain in the intercontinental subarea with the B-2 bomber by making these targets difficult to attack even by a bomber that could penetrate Soviet defenses with impunity. This illustrates the need for the kind of move-countermove analysis in competition planning that is described in volume II.[11]

The U.S. Strategic Defense Initiative has possibilities for effecting a similarly revolutionary improvement in the U.S. competitive position in the intercontinental subarea. The United States initiated the SDI program as an effort to shift the strategic forces competition onto new ground, away from ballistic missiles (where the Soviets are in a strong competitive position) to strategic defenses where, it was hoped, U.S. advantages in advanced technology could yield significant advantages over the USSR and a commanding competitive position.[12]

Whether the Strategic Defense Initiative will, in fact, improve in a fundamental and lasting way the U.S. competitive position in the intercontinental subarea is not clear; indeed, many

are pessimistic about this prospect. The technology to yield major, enduring defensive advantages over ballistic missiles is promising, but not yet proven. Even if technology proves up to this task, the cost of deploying and maintaining a BMD system may be prohibitive, or at least more than the U.S. public is willing to pay in an era of low U.S.-Soviet tensions. Moreover, the ABM Treaty is a strong political barrier in the United States to deployment of a BMD system, and the Soviet Union is using the ABM Treaty and other arms control and public diplomacy actions in a skillful competitive effort to block U.S. BMD developments and deployments. Even if the United States deploys a BMD system, the Soviet Union has an active program of its own in BMD research, development, and operations that predates the SDI program. Which side would end up with the strongest competitive position in a future world of extensive ballistic missile defenses and what the nature of each side's competitive advantages in that world would be are questions that are still not understood particularly well in the United States.

Nevertheless, while the Strategic Defense Initiative may not currently undercut Soviet ICBM advantages, it is challenging the strong competitive position the Soviets now hold in ballistic missile defenses and at the minimum is denying the Soviets dominance in this element of the military competition. It is advancing U.S. BMD technology, it has made serious consideration of ballistic missile defenses once again politically respectable in the United States, and it appears to be providing important arms control leverage to the United States in its effort to reduce Soviet advantages in ICBMs. Further, technology developed in the SDI program already is proving to be important for improving the U.S. competitive position in other subareas, such as the armor anti-armor balance in Europe.

The Soviet leadership carries out long-term military planning more systematically than the United States and, as an authoritarian government, finds it easier to implement these long-term plans. As a result, the USSR probably gives more explicit attention than does the United States to maintaining or improving its competitive position in various subareas of the military competition. Whether, however, this makes a major difference in the competition as it actually unfolds is less clear. The following examples illustrate both successes and failures in Soviet efforts to improve its competitive position.

One notable success is Soviet dominance of ballistic missile defenses by the late 1970s. After signing the ABM Treaty in 1972, the Soviet Union continued to pursue vigorously those BMD programs permitted by the agreement. They maintained the deployed Moscow ABM system and initiated a major upgrade of this system in the early 1980s. They continued research on advanced technologies for ballistic missile defense, including lasers, particle beams, radio-frequency weapons, and kinetic energy weapons, and on BMD radar technology. In contrast, after signing the ABM Treaty, the United States closed down its only ABM site at Grand Forks and reduced its BMD R&D funding to a low level.

As a result of these quite different competition planning choices, the Soviet Union achieved a dominant competitive position in the BMD component of the strategic forces subarea of the competition by the end of the 1970s. This position was sustained by the advanced technologies the Soviets were developing, the momentum of their research and development, their use of the Moscow ABM system as a test bed for improved radars and interceptors, their increasing infrastructure for a nationwide BMD system, the operational experience they were gaining with the Moscow ABM facilities, and the competitive initiative the Soviets were exercising in ballistic missile defenses.[13]

The U.S. decision not to compete in the area of ballistic missile defenses was based on the view that, with the signing of the ABM Treaty, this was no longer an important area in the U.S.-Soviet competition. By the early 1980s, however, an increasing number of U.S. defense specialists in and out of government were concerned about the U.S. inactivity in ballistic missile defenses and about the strong competitive position that Soviet BMD activities provided the USSR in the strategic forces subarea. Of particular concern were the Soviet radar infrastructure for a nationwide ballistic missile system, the substantial Soviet R&D programs on advanced technology for ballistic missile defenses, and the competitive advantages these could provide to the Soviets should they break out from the ABM Treaty.

The U.S. SDI program has substantially improved the U.S. competitive position in ballistic missile defenses, as discussed above. The Soviet competitive position remains strong, however, sustained by its continuing BMD research and development, its improved Moscow ABM system, and its nationwide radar infrastructure.

Ballistic missile defense is a case where the Soviet competitive position has remained strong since the 1960s, while the U.S. competitive position was strong in the 1960s, declined in the 1970s, revived in the 1980s, but is uncertain as we enter the 1990s. The next example is of a different kind. The history of the U.S. and Soviet abilities to project power into regions remote from their respective borders shows a dramatic, one-way change in competitive positions since the 1950s and also illustrates the important point that competitive position depends upon more than technology. Political relations as they affect operational military capabilities also are important.

In the 1950s, the United States had significantly greater airlift capability than the USSR. Of even greater significance, at that time the United States had base access and overflight rights in almost all countries on the Soviet periphery and in Africa. Moreover, U.S. forces that would be the initial response to contingencies in the Middle East or Southwest Asia were based in Europe, and the Europeans posed no objection to using these forces for non-NATO contingencies. In contrast, in the 1950s, the Soviet Union had no access to bases or airspace outside of Eastern Europe and China, making unopposed airlift to the Near East or Southwest Asia with Soviet aircraft of that period virtually impossible.

Over time, however, many countries in Africa, the Middle East, and Southwest Asia became nonaligned or moved into the Soviet sphere of influence, resulting in substantial reductions in high-confidence U.S. access to bases and airspace for staging refueling, or overflight. Even the NATO allies became reluctant to have U.S. forces in Europe used for contingencies outside of NATO or to provide staging, refueling, or overflight rights in contingencies in which they are not directly involved.

Conversely, the Soviet Union now has a large fleet of long-range aircraft to transport troops and military equipment and can use staging bases and air space in many countries in Africa, the Middle East, and Southwest Asia. Even U.S. allies such as Turkey have allowed the USSR to transit their airspace when resupplying client states in a crisis. As a result, the Soviet Union now can airlift forces to the Middle East or Southwest Asia quickly from nearby areas in the USSR without refueling or staging and in many cases can stage to more remote areas through friendly countries. The United States must airlift forces from the United States over intercontinental ranges in a crisis in the Middle East or Southwest Asia, and enroute staging is uncertain.[14]

These trends have affected significantly the competitive positions of the United States and the Soviet Union in the Middle Eastern/Southwest Asian subarea of the military competition and to a lesser degree in the competition in areas more remote from Soviet borders like Africa. Compared with the 1950s and 1960s, the United States must spend more to maintain the capability to project power into the Middle East and Southwest Asia, must commit more airlift aircraft and deal with increased operational problems in order to move troops there, and would in many cases face political opposition from allies and friends. The Soviet Union, on the other hand, can project power into the Middle East, Southwest Asia, and more remote areas of the world now, whereas in the 1950s it simply did not have these options in the military competition.

Soviet investments in long-range airlift capabilities contributed to their improved competitive position, but by and large the changes in U.S. and Soviet competitive positions for power projection came about because of political changes in Europe, the Middle East, Southwest Asia, and Africa over which neither superpower had much control. The competitive environment of the 1980s is quite different from that of the 1950s, affecting the competitive positions of both sides. As discussed in volume II, part of sound competition planning is to survey periodically the trends in the competitive environment in order to understand how they may constrain U.S. or Soviet options or open up opportunities in the future military competition.[15]

Our final example of Soviet efforts to improve their competitive position relates to the increasingly important role of advanced technology in military balances and in the U.S.-Soviet long-term military competition. Mr. Gorbachev and Soviet military planners recognize that computers, microelectronics, photonics, and other advanced electronic and optical technologies are coming to

play a strong role in all subareas of the competition. They also recognize that the economies, R&D capabilities, and production systems of the United States and its allies put the West in a much better competitive position than the USSR to use these technologies to military advantage, despite legal and illegal Soviet technology transfer efforts. Even when the USSR acquires Western samples of microelectronics or computer technology, the serious, systemic problems in Soviet development, production, and maintenance systems for civilian or military microelectronics and computer products result in delays in their exploitation of these samples for major competitive advantages.

While the motivations of Gorbachev, his advisors, and the major bureaucratic organizations in the USSR are complex, varied, and not fully apparent to the West, a case can be made that improving the Soviet ability to compete with the West in advanced technology military systems is one of the reasons for the economic reforms that Gorbachev is pursuing. At the minimum, improving the Soviet competitive position is the reason why the military is supporting these reforms. In effect, perestroika can be interpreted, at least in part, as a major effort to improve the Soviet position across all subareas in a military competition whose outcomes increasingly are being determined by the ability to use advanced technology for operational military purposes. This is a long-term Soviet effort to improve its competitive position, one for which they apparently are willing to make substantial short-term sacrifices in competitive advantage.

We return to the issue of Soviet economic and technological weaknesses in chapter 6 and discuss the implications of these weaknesses for U.S. competition planning in chapter 7.

To sum up this chapter so far, we reviewed U.S. and Soviet strengths and weaknesses that are relevant to the military

competition, noting that resources must be committed and other actions taken in order to convert one's strengths and the opponent's weaknesses to actual competitive advantages. We illustrated the concept of competitive advantage with several U.S. and Soviet examples and in the process saw that often it is easier for one side than it is for the other to convert strengths and weaknesses to competitive advantages in certain subareas of the competition. That is to say, one's competitive position in various subareas bears on the ability to achieve or sustain competitive advantages. In some cases a sound competition strategy invests in improvements in one's competitive position, sacrificing some near-term competitive advantages in hopes of longer-term gains. We illustrated this concept with examples of U.S. and Soviet efforts to improve their competitive positions and also noted that trends in the competitive environment can affect the competitive positions of each side.

We now examine briefly some cases of past U.S. and Soviet competition successes and failures in order to understand better how each side can influence the other in the long-term military competition. In most, if not all, of these examples the United States or the Soviet Union may not have initiated programs as a result of a formal competition planning process or strategy. The programs or actions discussed here did, however, yield advantages or result in disadvantages in the military competition, whatever their original rationale.[16]

5.3 U.S. COMPETITIVE SUCCESSES AND FAILURES

Table 9 lists some U.S. competitive successes and failures in terms of achieving such competition goals as making Soviet military investments obsolete, imposing costs on the USSR, causing the Soviets to sustain expenditures on obsolete weapons, or otherwise diverting Soviet resources into areas that are less

Table 9. Notable U.S. competition successes and failures.

SUCCESSES	FAILURES
• ASW PROGRAMS (1960s - 1970s) • LAND-ATTACK CRUISE MISSILES • TACTICAL AIR CAPABILITIES • NUCLEAR-POWERED SUBMARINE INVESTMENTS • THEATER NUCLEAR FORCES (1950s - 1960s) • B-52 PROGRAM • SATELLITE RECONNAISSANCE	• DOCTRINE OF MUTUAL ASSURED DESTRUCTION (MAD) • FAILURE TO CONTINUE TO MAKE STRATEGIC TARGETS IN UNITED STATES DIFFICULT FOR USSR TO ATTACK (1970s - 1980s) • FAILURE TO REDUCE DEPENDENCE ON THEATER NUCLEAR FORCES IN EUROPE (1970s) • FAILURE TO MAINTAIN INITIAL COMPETITIVE ADVANTAGE IN ARMOR/ANTI-ARMOR CAPABILITIES

threatening to the United States or where the Soviets have less competitive advantage. Many of the successes provided major advantages to the United States for several decades. For example, U.S. ASW programs as they evolved in the 1960s and 1970s made Soviet submarines obsolete almost as they were launched, undercutting substantial Soviet investments in submarine forces and imposing costs on the USSR as it sought through successive generations of submarines to overcome this important U.S. advantage in maritime forces. The combination of quiet U.S. nuclear-powered attack submarines (SSNs), long-endurance maritime patrol aircraft, and SOSUS and other advanced technology ocean sensors allowed the United States to set the agenda and maintain the competitive initiative in the submarine versus ASW race during the 1960s and 1970s.

It also can be argued that U.S. ASW programs helped shape the nature of Soviet ballistic missile submarine programs to the advantage of the United States by encouraging the Soviets to move their ballistic missile submarines into protected bastions in Soviet home waters. This has imposed substantial operational costs on the USSR. The Soviets commit a significant number of general purpose naval and air forces to protecting the bastions, keeping these forces from more threatening operations against U.S. carrier battle groups and sea lines of communication. Moreover, so long as they remain in the bastions, far from U.S. shores, Soviet ballistic missile submarines do not pose a short-warning threat to strategic bomber bases in the United States.

The high survivability and underwater endurance of U.S. SSNs, when combined in the late 1980s with cruise missile technology, also renewed the waning competitive advantage of the United States in long-range theater nuclear forces in the European, East Asian, and Middle Eastern/Southwest Asian subregions. As discussed above, TLAM/N will maintain the U.S. long-range theater

nuclear threat to Soviet air bases and other fixed military targets even after Pershing II and ground-launched cruise missiles (GLCMs) are withdrawn and destroyed in compliance with the INF Treaty. Moreover, the submarine-launched TLAM/N maintains this capability in a mode that is more survivable than Pershing II and GLCM and that is relatively immune to Soviet exploitation of antinuclear sentiment to make basing of theater nuclear forces in Europe or Asia difficult for the United States. In this way the TLAM/N program offsets certain Soviet competitive advantages in theater nuclear forces, undercuts Soviet investment in threats to U.S. and NATO land-based theater nuclear forces, and undercuts Soviet public diplomacy efforts to make foreign basing of U.S. nuclear forces untenable.

Tactical air capability is an example in which U.S. application of technology successfully reduced Soviet competitive advantages gained through Warsaw Pact numerical superiority in ground and air forces in Europe. Throughout the 1960s and 1970s, and to a considerable extent even in the 1980s, U.S. tactical aircraft have helped significantly to maintain a military balance in Europe that has denied high confidence to the USSR of being able to invade Europe successfully and quickly. This capability has undercut the considerable investment the Soviets made in ground and air forces in Europe and imposed substantial costs on the Soviets as they sought to counter the U.S. tactical air capability. U.S. tactical air also contributes importantly to maintaining adequate military balances in the East Asian and Middle Eastern/Southwest Asian subareas.

Other examples of U.S. successes in achieving competitive advantages also resulted in the United States achieving commanding competitive positions, allowing it to hold the initiative in certain parts of the military competition and to make force improvements that maintained leads over the USSR, despite Soviet

gains in the military competition. One example is the U.S. development of nuclear-powered submarines in the 1950s. Combined with U.S. technology to build and operate quiet submarines and with underwater sensor technology, nuclear power allowed the United States to achieve a dominant position in submarines in the 1950s that it has maintained to this day, and which is only now beginning to be threatened by Soviet submarine quieting programs. Nuclear power has been an essential ingredient in the U.S. SSBN programs, the attack submarine programs, and the emerging sea-launched cruise missile programs. This was a high leverage investment in the 1950s, one that continues to have high payoffs today.

Similarly, U.S. investments in nuclear weapons technology resulted in major competitive advantages and a commanding competitive position in theater nuclear forces in the 1950s and 1960s. This technology permitted the United States to develop small, lightweight nuclear warheads suitable for tactical weapon systems, which were also safe and secure in overseas field environments. Combined with a doctrine of early first use of nuclear weapons, U.S. theater nuclear forces undercut the Soviet numerical advantage in ground forces, reducing both the military and political advantages the Soviets sought through their large body of conventional forces in Eastern Europe and the Western Military Districts. The competitive position that theater nuclear forces provided the United States and its allies in Europe denied the Soviets major competitive gains despite continued improvements in Soviet general purposes forces in Europe, because these improvements did not outweigh U.S. theater nuclear forces in the overall European military balance in the 1950s and 1960s. Moreover, the commanding U.S. competitive position in European theater nuclear forces during this period made it difficult and costly for the Soviets to catch up in theater nuclear forces.

Eventually, of course, they did catch up, and the Soviets were able to turn the NATO theater nuclear force posture to their own political advantage in the military competition during the 1970s and 1980s, in part because the United States and its allies failed to understand that it was time to get out of that business and sharply reduce their military dependence on theater nuclear forces.

In both nuclear-powered submarines and theater nuclear forces, the Soviets eventually developed similar weapon systems. But the United States deployed them first and had a sufficiently large advantage in technology and production techniques that it was able to stay ahead of the Soviets in these areas for several decades.

The B-52 program is another example of an early U.S. lead established through technology and U.S. maintenance of that lead over more than three decades through successive modifications of the B-52 to stay ahead of Soviet air defense improvements. The basic B-52 design -- long range, large payload, and an airframe that could be adapted to low-level flight -- proved remarkably robust. The B-52 was intended initially for high altitude penetration of the USSR; later models were configured to penetrate at very low altitude as the Soviets deployed an extensive air defense network in the late 1950s and in the 1960s. By the late 1970s, Soviet low altitude air defenses improved to the point where the B-52 attack concept was once again changed. The large payload of the B-52 allowed it to be used in a stand-off mode to carry air-launched cruise missiles (ALCMs).

The original B-52 design helped the United States to achieve a strong competitive position in strategic bombers versus Soviet air defenses, one that it maintains to this day. Moreover, successive models of B-52s made then-current Soviet air defenses

obsolete, imposing substantial costs on the Soviets as they sought to catch up and helping to shape Soviet military investments in ways that diverted some Soviet funds into the relatively less-threatening area of homeland air defenses.[17]

Our final example of American competitive successes is the development of satellite reconnaissance capabilities in the late 1950s. While current U.S. satellite programs are unlikely to provide major advantages in wartime because of their vulnerabilities to Soviet interference or ASAT attack, these programs have materially enhanced the U.S. competitive position in most subareas of the peacetime military competition by denying the USSR the advantages it sought through extensive secrecy and compartmentation in its military programs. By providing high quality intelligence in peacetime on many Soviet weapon system developments and deployments -- particularly in strategic forces, but increasingly also in general purpose forces -- U.S. satellite reconnaissance has allowed the United States to begin early counteractions and reduced the competitive advantages the Soviets otherwise might have gained.

U.S. competitive successes tend to be based on technology applications, combined with the evolution of military operational concepts to use this technology eventually to the best operational advantage. In contrast, the more obvious competitive failures of the United States stem from political and bureaucratic shortcomings -- the failure to make investments, strategic doctrine that was out of touch with reality, or inattention to changes in the competitive environment or in the behavior patterns of the Soviet adversary.

For example, the strategic doctrine of mutual assured destruction was intended to limit U.S. investments in strategic offensive and defensive forces. To work, however, it was necessary that the Soviet Union share this doctrine. Until the late 1970s,

the United States failed to see that Soviet strategic doctrine was focused on providing strategic forces in sufficient quantity and with appropriate characteristics to achieve key military goals in wartime, not on destroying American cities. Consequently, the United States discounted Soviet ICBM and BMD initiatives on the grounds that they were irrelevant, allowing the USSR to achieve major competitive advantages and a superior competitive position in ICBM programs and, until the mid-1980s, in ballistic missile defenses. Even today, the ways in which Soviet strategic doctrine differs from MAD are not taken adequately into account by the Congress and many parts of the Pentagon.

Similarly, after an initial effort in the 1950s to make strategic targets in the United States difficult for the Soviets to attack, America neglected passive and active measures to protect its strategic assets in a nuclear war. The program to harden Minuteman silos, which continued into the 1970s, was the last major effort of this kind until the 1980s, when passive protection of strategic C^3 facilities through hardening, redundancy, and mobility began to get renewed attention. But the United States still has not made fundamental changes in the vulnerability of most of its strategic assets to Soviet ICBMs, as evidenced by the continued U.S. inability to shift its ICBM basing posture strongly in the direction of mobility. On the other hand, the Soviet Union has been pursuing major programs to protect its strategic assets since the 1950s, as discussed in chapter 5.4 below. The result is a targeting asymmetry that works to Soviet advantage in the intercontinental subarea of the competition. U.S. democratic political processes, the strength of environmental groups in the United States, the persistent influence of the MAD doctrine in Congress, and the bureaucratic priorities of the services make such programs difficult to carry out in the United States. However unavoidable it may have been, this example must be judged a U.S. competitive failure.

Of somewhat different character is the U.S. failure to sharply reduce the dependence of NATO's military posture on theater nuclear weapons in the 1960s, when it began to be apparent that this dependence was beginning to change from a competitive asset to a liability. John Kennedy and Robert McNamara tried to reduce this dependence, but the European allies would not go along. Meanwhile, by the 1970s the Soviets achieved dominance in the theater nuclear balance in Europe and at the same time continued to modernize their general purpose forces. Partly because of these unfavorable shifts in the military balance and partly because of growing popular concerns about nuclear weapons in Germany and the Benelux countries, the Europeans pressed for nuclear arms control negotiations and opposed theater nuclear modernization. But, in a time of more relaxed tensions with the USSR, the Europeans continued to be unwilling to make the investments necessary to substantially upgrade NATO's conventional forces to offset the lost influence of theater nuclear forces in the military balance.

While much of this probably was inevitable, given political trends in Western Europe, the United States failed to take the Soviet nuclear theater nuclear buildup adequately into account and, even more seriously, failed to note the changes in European attitudes that were part of the shifting competitive environment. By continuing to press for theater nuclear force modernization in the late 1970s and 1980s, the United States provided opportunities for the Soviet Union to help foster dissension in NATO that may prove to outlast the political gains the United States made with the INF Treaty.

Our final example of a U.S. competitive failure is in the area of armor and anti-armor forces. This is a case of a consistent U.S. failure to invest adequately in the entire enterprise of armored warfare since before World War II. The

Soviets made much more extensive institutional investments that the United States in such essential elements of an armored force infrastructure as engineers, military operations specialists, test facilities, and laboratories. In part, this was because the USSR saw ground warfare generally and tank warfare in particular as the principal means of success in modern wars. While the United States considered tank warfare to be important, it also placed considerable emphasis on tactical air in its doctrine.

The United States has generally been behind the Soviet Union in armor and anti-armor forces since World War II. It was only after the Korean War that the Department of Defense decided to build a modern tank. Until that time, U.S. tanks had been outclassed by their German and Russian counterparts. The U.S. Sherman tanks of World War II, although far more reliable mechanically, were undergunned and underarmored compared with German tanks. In the Korean War these same Shermans were opposed by Russian T-34s, which also were superior to American tanks, and this trend has continued.

Similarly, the United States has not dominated the technology of armor and antiarmor. For example, spaced armor was developed by the British and the wire-guided antitank missile, which gave rise to the current generation of more sophisticated antitank weapons, was developed by the French. The best shoulder-fired antitank weapons have been Soviet (RPG-7s), not U.S. (M-72).

After achieving an early lead over the Soviets in precision-guided anti-armor weapons by the late 1960s, the United States failed to keep pace. The Soviets kept making improvements in both their armored forces and their own anti-armor weaponry. But the United States was preoccupied in the 1970s with the strategic force balance, SALT negotiations, and Vietnam, and allowed the Soviet Union to achieve competitive advantages and a

strong competitive position in armor/anti-armor forces, not noticing these changes until it found itself seriously behind the USSR by the 1980s.

5.4 SOVIET COMPETITIVE SUCCESSES AND FAILURES

Table 10 lists some Soviet successes and failures in terms of making U.S. military investments obsolete, imposing costs on the United States, causing the United States to sustain expenditures on obsolete weapons, or otherwise diverting U.S. resources into areas where it has less competitive advantage. Soviet successful competition actions generally have combined proven technologies with the large-volume production strength of Soviet heavy industry, their large active duty force structure, and operational concepts tailored to reduce the impact of the limitations of Soviet troops. While not always successful initially, the Soviet Union pursued these actions steadfastly, often over a long period of time, and in many cases finally achieved strong competitive positions and substantial competitive advantages over the West. As Moscow has finally come to realize, however, the substantial investment required to make these military gains has contributed strongly to the economic disasters in the USSR.

Perhaps the most prominent example of such successes is the way the USSR built up its ground force capabilities for combined arms offensives in Europe. During the 1960s and 1970s, the Soviets gradually increased their ground force troops and combat equipment in Eastern Europe and the Western Military Districts of the USSR. Starting in the 1970s, the Soviets also began a sustained program of qualitative improvements in armor, anti-armor, artillery, helicopters, and other combat systems, in an effort to offset the superior quality of NATO's smaller forces. This combined arms buildup drew on Soviet strengths of the 1960s

Table 10. Notable Soviet competition successes and failures.

SUCCESSES	FAILURES
• COMBINED ARMS OFFENSIVE CAPABILITIES IN EUROPE • THEATER NUCLEAR FORCES BUILDUP (1960s - 1980s) • ARMOR/ANTIARMOR PROGRAMS (1970s - 1980s) • ANTI-CARRIER WARFARE PROGRAMS • PROGRAMS TO MAKE STRATEGIC TARGETS IN USSR DIFFICULT FOR UNITED STATES TO ATTACK • PARTITION OF GERMANY • HIGH RATE OF MILITARY INVESTMENT (1970s)	• FAILURE TO DEVELOP EFFECTIVE ASW VS. U.S. SSBNs • CONTINUED OCCUPATION OF JAPANESE ISLANDS • EFFORTS TO PREVENT U.S. INF DEPLOYMENTS (1970s) • ECONOMIC IMPACT OF MILITARY SPENDING

and 1970s -- a large pool of draft-age manpower; an industrial system geared to large-scale production of heavy equipment, with periodic block upgrades to incorporate proven technology advances; an R&D establishment that drew on both Soviet and Western sources to adapt already proven technology to military purposes; operational concepts that used a centralized, top-down command philosophy to direct the comparatively unskilled Soviet troops to exploit NATO's military weaknesses; and a centrally controlled military and economic planning system to integrate these elements into an effective program.

This strategy worked well (in a military sense) so long as the dominant elements of the military balance in Europe were the armor, artillery, and rotary wing machines that Soviet industry could term out effectively and in large numbers. As the military balance began to depend more upon advanced electronics and computers in the mid-1980s, however, the Soviet competition strategy began to falter.

Nevertheless, the sustained investment in combined arms forces of the 1960s and 1970s was shrewdly directed and yielded substantial competitive advantages for the USSR, undercutting U.S. and European investments in ground forces and imposing major costs on the United States and other NATO countries as they sought to maintain a sufficient military balance to deny the USSR high confidence of being able to mount a quick, successful invasion of Europe. Soviet ground force capabilities reached a point where it was no longer clear that the continued tactical air advantages of NATO were sufficient to offset Soviet ground force advantages, particularly when the Soviets began to improve their own tactical air capabilities in the 1970s. The Soviet combined arms buildup also contributed to the European feeling that the West could not keep up with the USSR in this race and that arms control negotiations were the only solution, introducing a new dimension

to the nuclear and conventional force competition in Europe, a dimension in which the authoritarian Soviet government has political advantages over the Western democracies.

Through this substantial investment in combined arms forces, the Soviet Union achieved a strong competitive position in the European subarea by the late 1970s. They have a major advantage in military capital stocks that would require enormous Western investment and substantial time for the West to offset in the absence of Soviet force reductions; they maintained the competitive initiative and dominated the competitive agenda in Europe until the early 1980s, when the United States began to introduce Follow-On Forces Attack concepts; and they are in a strong military position to exact concessions from NATO in Conventional Forces in Europe (CFE) arms control negotiations.[18] Because of the major strain of this buildup on the Soviet economy, however, the Soviets cannot be said to have achieved competitive leverage through the combined arms buildup, and they may find themselves unable actually to exact CFE concessions because of the urgency of reducing military expenditures in order to help repair their economy.

An important part of the Soviet competitive strategy for Europe was to nullify NATO's advantage in theater nuclear forces, so that Soviet combined arms conventional forces could become the dominant factor in the European military balance. If the United States had been able to continue to offset large, qualitatively capable Soviet conventional forces with a credible threat of early first use of nuclear weapons, the Soviets would not have been able to realize the full advantage they sought in the peacetime competition (and in wartime operations) through their combined arms buildup in Europe.

The Soviet approach to this problem was slowly but steadily to build up a theater nuclear force in Europe that was larger than NATO's and of sufficient quality in terms of survivability, accuracy, and military effectiveness that it could deny NATO any military advantage should NATO initiate the use of nuclear weapons. The Soviets also developed general purpose force capabilities and operational concepts to attack NATO's theater nuclear forces during the conventional phase of a war in Europe, further eroding NATO's theater nuclear force advantages.

The USSR again exploited its strength in heavy industry for large-scale production of intermediate-range ballistic missiles (IRBMs), tactical missiles and rockets, and nuclear artillery systems that could accommodate the weight-to-yield limitations and other constraints of Soviet nuclear weapons technology. Further, they built upon their strong competitive position in combined arms ground forces in Europe to integrate these theater nuclear forces into their existing force structure. By the mid-1960s, the Soviet Union had achieved parity with NATO in theater nuclear forces and surpassed NATO in the 1970s.[19] Even after full implementation of the INF Treaty, the theater nuclear balance in Europe will continue to favor the USSR. Further, the Soviet Union skillfully exploited antinuclear sentiment in Western Europe to inhibit seriously U.S. modernization of theater nuclear forces in the 1970s and 1980s, while continuing to modernize its own theater nuclear forces.

The result was that, by the late 1970s, the USSR had reversed the dominance that the United States exercised over the theater nuclear balance in the 1950s and 1960s, undercutting, if not nullifying, U.S. and NATO investments in theater nuclear forces; seizing the competitive initiative; achieving a strong competitive position in this area, while weakening that of the United States; and successfully reducing the influence of theater nuclear forces in the overall military balance in Europe.

Theater nuclear forces were not the only component of the European military balance in which the Soviets moved ahead of the United States in the 1970s. They also reversed an earlier U.S. qualitative lead in armor and anti-armor forces, in part because of the U.S. failure to sustain its initial competitive advantage, as discussed above. By steadily upgrading its armor and anti-armor forces, the Soviets pulled ahead of the United States in terms of the capabilities of their newest forces. The Soviets even began to deploy tanks against which existing U.S. and NATO antitank weapons had virtually no capabilities and to deploy antitank weapons that could readily disable most U.S. or NATO armored vehicles then in the field. In some cases, the Soviets began to deploy improved armored vehicles that countered new U.S. antitank weapons at about the same time the new U.S. weapons began to be deployed. In this way, the Soviets maintained their competitive initiative in armor and anti-armor forces, undercut U.S. and NATO investments, and imposed costs on the United States.

Soviet anticarrier warfare programs are a similar example from another warfare area: naval forces. Over a period of decades, Soviet investments in antiship cruise missile technology and production capabilities began to pay off. First in air-launched cruise missiles deployed on the long-range bombers of Soviet Naval Aviation (SNA) and more recently in submarine-launched cruise missiles, the Soviets have succeeded in posing a multi-azimuth threat to U.S. aircraft carriers in which they can launch their cruise missiles from outside the air defense and ASW defense envelopes of the carrier battle group.

This program has, however, been less successful than Soviet ground force combined arms programs. The USSR must concentrate a substantial number of air and submarine forces to successfully threaten carrier battle groups unless they use

nuclear-armed cruise missiles; they have a formidable command and control problem in coordinating air and submarine cruise missile attacks for maximum stress on fleet air defenses; and the U.S. Navy has been deploying electronic and air defense counters to Soviet antiship cruise missiles.

Nevertheless, Soviet anticarrier warfare programs have imposed significant costs on the United States in both dollars and operational limitations. For example, much of the development and production costs of today's fleet air defenses have been imposed by Soviet cruise missile programs, and some of the costs of escort ships in carrier battle groups have been similarly imposed on the United States by the USSR. Moreover, despite fleet air defense improvements, single carrier battle groups can no longer operate safely in areas within which the USSR can mount major SNA raids. Two or more carrier battle groups are required to operate together for mutual support in such important areas as the eastern Mediterranean, the Norwegian Sea, or the northwest Pacific, reducing the navy's operational flexibility in a war with the Soviet Union.

An example of Soviet competitive success in the intercontinental subarea is the variety of passive and active measures the Soviets have pursued for decades to make strategic targets in the USSR more difficult for the United States to attack. Through such efforts as moving part of its ICBM force from fixed silos to mobile basing, the Soviet Union has undercut U.S. strategic force investments and imposed costs as the United States sought to regain its attack capabilities.

An example of a political-military action that has yielded advantages to the USSR in the military competition is the Soviet occupation of territory in eastern Germany during the closing days of World War II and the partitioning of Germany into

eastern and western parts. This reduced the depth of maneuver for NATO in West Germany, allowed the Soviet Union to station military forces farther forward than would otherwise have been the case, and facilitated Soviet progress toward a high-speed combined arms force capable of blitzkrieg operations. The partitioning of Germany also provided the Soviets a powerful political instrument with which to influence West German attitudes about U.S. theater nuclear forces in Europe, NATO military strategy and operational concepts, arms control, and technology transfer to the East.

Our final example of Soviet gains is a short-term success, but may turn out to be long-term failure in the military competition. This is the high military investment that the USSR made in military forces during the Brezhnev years. This investment substantially improved both the size and the capabilities of Soviet nuclear and conventional forces, with major competitive advantages and an improved Soviet competitive position in the European, East Asian, and intercontinental subareas of the military competition.

But the best of Soviet manpower, production resources, and intermediate products went into these military systems, as did a substantial share of the Soviet gross national product. As a result, the Soviet military investment program exacerbated the problems of an economy that was already in serious trouble. Further, military technology has been changing at a rapid rate, and computers, microelectronics, and other advanced technologies are playing a larger role in military systems and military balances. It may turn out that the heavy Soviet investment in military capital stocks in the 1960s and 1970s will be less relevant to future military balances, accelerating the obsolescence of these stocks. Overextension of Soviet military spending and investment in military forces and technologies more suited to the past than the future help to explain the military retrenchment of the Gorbachev regime.

There are military examples of Soviet competitive failures, as well. For example, the Soviets have invested substantial sums in research and development and in deployed naval forces intended to improve their ability to detect, locate, and attack U.S. nuclear-powered ballistic missile submarines (SSBNs) at sea. These investments have not resulted in any serious capability to hold SSBNs at risk and do not appear to have prospects for doing so in the near future.

Most examples of Soviet competitive failures, however, are political failures resulting from Soviet indifference to or misjudgment of attitudes among U.S. allies. An example of indifference is the continued Soviet occupation of the Japanese northern territories, seized by the USSR at the end of World War II, but still claimed by Japan. The Soviet Union is aware that occupation of these islands is a strong barrier to closer political or economic relations with Japan and that it seriously limits the Soviet ability to influence Japanese foreign policy. Nevertheless, the Soviets apparently see sufficient military value in holding these islands that they are willing to forego the possibly considerable political gains they might make in the military competition by returning them to Japan.

An example of Soviet misjudgment was their concerted political, diplomatic, and arms control campaign to cause Western Europeans, especially West Germans, to reject the U.S. deployment of Pershing II and ground-launched cruise missiles in Europe. Despite substantial controversy about these deployments, NATO successfully pursued the dual track of deployments and arms control negotiations, and the Soviet Union in the end agreed to destroy not only the SS-20s that initially stimulated the NATO INF modernization programs, but also their SCALEBOARD and SS-23 missile systems.

5.5 LESSONS FOR U.S. COMPETITION PLANNERS

This review of selected examples from the U.S.-Soviet military competition is far from comprehensive, and even a more thorough study of competition case histories cannot substitute for the kind of systematic, forward-looking competition planning that we describe in volume II. Nevertheless, some lessons can be gleaned from these examples that are of value to U.S. competition planners; these lessons are reflected in the planning approach discussed in volume II.

Several of the foregoing examples illustrate the need to examine periodically the environment within which the U.S.-Soviet military competition is taking place. Political, economic, demographic, and technological trends can affect national alignments, military balances, the resources available for future military competition, and the nature of future wars. All these, in turn, can affect the competitive advantages and the competitive positions of the two sides.

Further, the current Soviet efforts at restructuring their economy vividly illustrate the important point that competition planners must keep their competition goals and strategies consistent with the resources that are likely to be available to implement them.

Perhaps the single most important lesson is, however, that things change. One cannot hope to achieve permanent advantage in the U.S.-Soviet military competition. What is important is to gain advantage in a particular area, then work to stay ahead through, for example, maintaining a superior competitive position or exercising continued competitive initiative. Equally important is to watch closely what the adversary is doing. Systematic

observation of Soviet military and political-military actions is needed, with analysis of the implications of these actions for the ongoing military competition, and systematic feedback of these implications into U.S. competition moves. An important characteristic of good competition planning is to look ahead several moves in an effort to anticipate Soviet counters to U.S. moves or Soviet competition initiatives, in order to avoid actions that can be easily blocked or countered, to exploit opportunities to make gains over the Soviet Union, and in general to devise robust competition strategies.

Influencing Soviet actions in the military competition requires knowledge of the Soviet military planning process, sometimes in considerable detail, raising the question of whether the United States can know enough about Soviet planning to formulate competition planning goals and strategies. The foregoing examples suggest that some types of U.S. competition goals require less knowledge of the Soviets than do others.

The type of competition goal that places the least demand on U.S. knowledge of Soviet planning is hedging against Soviet counters to U.S. competition strategies or actions. This is because a specific U.S. action can be vulnerable to only a limited number of technical or operational counters. Often hedges can be incorporated into the U.S. strategy or action so that its success is not heavily dependent upon understanding what specific counters the Soviets are likely to mount. Or the strategy or action can be designed to observe which counters the Soviets put into play and adapt accordingly. While an understanding of how Soviet planners go about choosing their counters would be helpful in developing hedges, it is not essential for this purpose.

U.S. competition goals that seek to undercut past Soviet investments or to make deployed weapons or existing operational

concepts obsolete demand greater understanding of how the Soviets would develop and select responses. For example, to be confident of undercutting the effectiveness of an established Soviet operational concept such as echeloned ground force operations, it is not essential to be able to replicate completely the process by which the Soviets would produce counters to the U.S. move. But it is important to know what variables Soviet planners believe are critical for successful wartime operations (e.g., constant, positive control over operational timelines), in order to focus U.S. actions on affecting this critical set of variables.

A third type of goal, imposing costs on the Soviet Union, is even more demanding in terms of U.S. knowledge because not only must the U.S. actions result in competitive advantages, there must also be reasonable assurance that the Soviets will in fact incur costs in an effort to overcome the U.S. advantage. To select cost-imposing actions requires sufficient replication or emulation of the Soviet planning process to understand what types of Soviet technical or operational responses to candidate U.S. actions are likely.

The type of goal that is most demanding in terms of U.S. understanding of the Soviet planning process is one of reflexive control over Soviet strategies and actions to, for example, direct Soviet investments into areas that are less threatening to the United States and its allies. The U.S. moves that encouraged the USSR to deploy its ballistic missile submarines in protected bastions falls into this category. Such goals require the ability to project specific Soviet investments and actions in response to candidate U.S. strategies and actions.

Just as the United States seeks to influence Soviet strategies and actions in the competition, so the Soviets seek to influence the United States. The examples discussed in this

chapter indicate that U.S. competition planning should take Soviet competition initiatives and responses into account, should consider the wide variety of means the Soviets use in their efforts to influence U.S. strategies and actions, and should understand the uncertainties facing the Soviets as they seek to influence the United States in the military competition.

Obviously, deployed military forces, weapon system research, development, and production, and operational concepts for force employment are major ways in which the Soviets try to influence the United States. There are other, less obvious, means that are also favored by the Soviets. One is to inhibit the progress of U.S. weapons programs or deployments by influencing U.S. and allied public opinion and congressional attitudes or by negotiating arms limitations with the West. Specific techniques include unilateral Soviet moritoria on nuclear weapons testing, unilateral force reductions, threats of countervailing weapons programs, and arms control proposals, some of which are intended primarily for propaganda purposes.

Another means for influencing U.S. competition planning favored by the Soviets is the use of propaganda and public diplomacy to influence U.S. views about how future wars would be fought. An example is Soviet public statements in the 1970s about the horrors of nuclear war while they actually were carrying out numerous programs to improve the nuclear warfighting capabilities of Soviet forces.

A third Soviet method is to reduce U.S. and allied military preparedness or inhibit increases in force readiness during crises by strategic deception, propaganda, and covert mobilization capabilities. Attempting to reduce U.S. military support to its allies and to divide America and its allies is yet another Soviet competitive means, using public diplomacy and arms

control proposals for such purposes as blocking U.S. Pershing II and GLCM deployments in Europe and raising Asian concerns about U.S. Navy nuclear weapons to reduce access to overseas bases.

The Soviets also face uncertainties that complicate their competition planning and to which Soviet planners accord greater importance than do their U.S. counterparts. Four types of Soviet uncertainties stand out: the nature and consequences of future U.S. technological innovation; the sometimes unexpected cohesiveness of political will in the United States and among the Western allies in opposing Soviet competitive moves; the increased U.S. use of compartmented weapon development programs, which denies the Soviets early information about some U.S. weapon systems until they reach the production stage; and the eventual size of U.S. weapons production runs. U.S. competition planning should try to explcit the impacts of these uncertainties on Soviet planning.

The Soviet Union has more fundamental weaknesses than these, however, including its economy, its technology base, and its approach to military operational planning. These are discussed in the next chapter.

ENDNOTES TO CHAPTER 5

1. This material is based in part on Harry Gelman, Soviet Vulnerabilities and Advantages: An Attempt at a Balance Sheet, Discussion Paper No. 106 (Santa Monica, Calif.: The California Seminar on International Security and Foreign Policy, August 1985).

2. The tradition of strong central control goes back to the tsars and is a Russian tendency that became more pronounced after the revolution.

3. See volume III, appendix D, for discussion of Soviet demographic trends and the U.S.-Soviet competition.

4. See volume II, chapters 5 and 6, for an approach to evaluating plausible future Soviet counters to U.S. competition actions.

5. For a critique of the U.S. weapon acquisition system and recommended improvements, see Charles Herzfeld, Technology for National Security, Report of the Working Group on Technology, submitted to the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988). See also Charles Herzfeld, "Technology and National Security: Restoring the U.S. Edge," The Washington Quarterly, vol. 12, no. 3 (Summer 1989), pp. 171-83.

6. See House Armed Services Committee Report no. 101-10, Report of the Advisory Panel on Submarine and Antisubmarine Warfare to the House Armed Services Subcommittees on Research and Development and Seapower and Strategic and Critical Materials (March 21, 1989).

7. See volume III, appendix G, for discussion of U.S. and Soviet ICBM forces in the military competition.

8. Donald A. Hicks, "Stealth -- Its Implications for the Future," Armed Forces Journal International (September 1986), pp. 70-71, and the Commission on Integrated Long-Term Strategy, Discriminate Deterrence (Washington: U.S. Department of Defense, January 1988), pp. 49-50. On the B-2 development costs, see the Northrop Corporation brochure, "B-2 Advanced Technology Bomber, A Revolution in Deterrence," (Los Angeles, Calif.: Northrop, n.d. [1989]).

9. Frank C. Carlucci, Secretary of Defense, Annual Report to the Congress, Fiscal Year 1990 (Washington: U.S. Department of Defense, January 17, 1989), pp. 160, 163, 189; Dick Cheney, Secretary of Defense, Annual Report to the President and the

Congress (Washington: U.S. Department of Defense, January 1990), p. 43.

10. Commission on Integrated Long-Term Strategy, Discriminate Deterrence, p. 49; Herzfeld, Technology for National Security, pp. 39-40.

11. See volume II, chapters 2, 5, and 6.

12. See volume III, appendices G, H, and I, for historical discussions of ICBMs and ballistic missile defenses in the competition.

13. See volume III, appendices H and I, for further discussion.

14. Commission on Integrated Long-term Strategy, Discriminate Deterrence, pp. 24-25.

15. See volume II, chapter 1.

16. The examples in chapters 5.3 and 5.4 are based in part on material in volume II, appendices B, F, G, and H. Also see appendix E for lessons relevant to today's U.S.-Soviet military competition that are derived from instances of military competition in earlier periods.

17. See volume II, appendix B, for more details on the B-52 program.

18. On military capital stocks, see Andrew Marshall and Charles Wolf, Jr., The Future Security Environment, Report of the Future Security Environment Working Group, submitted to the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988), pp. 18-25.

19. Science Applications, Incorporated, NATO-Warsaw Pact Theater Nuclear Balance, Phase Two (U), 30 November 1979 (SECRET). Also see J. J. Martin, "How the Soviet Union Came to Gain Escalation Dominance: Trends and Asymmetries in the Theater Nuclear Balance," in Soviet Power and Western Negotiating Policies, ed. Uwe Nerlich (Cambridge, Mass.: Ballinger, 1983), pp. 89-119.

6. SOVIET ECONOMIC, TECHNOLOGICAL, AND OPERATIONAL PLANNING WEAKNESSES

Anecdotal examples or case histories of the sort discussed in chapter 5 and in volume III are useful for illustrating competition planning concepts, but U.S. competition planners need to understand how to proceed in a systematic way to identify effective future strategies and actions. This chapter, therefore, examines Soviet economic, technological, and operational planning weaknesses in greater detail to indicate connections among these weaknesses that the United States can take better advantage of in the military competition.

We are not suggesting the United States should seek to worsen the already considerable economic problems of the USSR or, because the Soviets have more serious economic problems than the United States, that America should try to outspend them in the military competition. The point is more subtle. Despite major economic and technological problems, and even though the skills of their military manpower are limited, the Soviets have built a formidable military force. It is important to understand how they achieved this feat in order to compete more intelligently and make it more difficult for them to work around their problems in the future if they try to perpetuate their military power. This chapter argues that the United States can do this by maintaining current trends that are shifting the military competition into areas of technology in which the United States has advantages and the Soviet Union has systemic weaknesses, setting the stage for the discussion in chapter 7 for a recommended U.S. approach to military competition with the USSR in the 1990s.

6.1 SOVIET ECONOMIC WEAKNESSES

Glasnost has made clear what only a few Western experts were beginning to deduce at the start of the 1980s: the Soviet economy is a disaster, more akin in many ways to that of an underdeveloped country than a superpower. Despite these serious, systemic economic problems, however, the USSR has built and sustained a large, well-equipped, modern military force, primarily by focusing a disproportionately large portion of Soviet resources on the military sector, compared with Western countries.

The Soviet Union is finding it difficult to maintain its position in a military competition that is shifting to advanced technology weapons. Mikhail Gorbachev apparently has decided upon some near-term retrenchment in the military competition while pursuing economic reforms intended over a longer period to improve the future competitive position of the USSR. The reforms he has initiated to date are not making fundamental inroads on the systemic problems in the Soviet economy, and the future of the economy is not at all clear at this stage. Much depends on Gorbachev's success in dealing with growing domestic dissatisfaction with his policies.

6.1.1. Systemic Economic Problems

Soviet gross national product (GNP) growth had been slowing since the mid-1970s, with less than one percent growth in 1985, when Gorbachev came to power. Agricultural growth had failed to keep pace with population increases for a decade. Industry grew at only about 50 percent of the planned rate in the first half of the 1980s. There was near stagnation in steel output, a sharp fall in investment and labor force growth, serious increases in the costs of energy and other raw materials, and a decline in

productivity. The eleventh Five-Year Plan (1981-85) had the worst performance of any five-year plan since World War II.

These problems resulted from fundamental flaws in the centrally controlled Soviet economic system and will not be cured quickly or easily. The Soviet technology base is relatively backward, compared with that of the West, and there is little incentive for innovation, as discussed in greater detail in chapter 5.2. Soviet production processes are inflexible, consisting largely of outdated methods and organization.

The centrally directed system of economic planning and management is grossly inefficient, staffed by a huge bureaucracy that is out of touch with the developments, production complexes, and services organizations they purport to be controlling. In fact, Soviet planners have no good statistics or indicators to use in measuring the performance of their country's economy. The key indicators used in a market economy (prices, costs, and profits) are of no value to Soviet planners because they are artificially constructed and do not reflect actual economic performance. Statistics on output can be used to determine if planning norms are being met, but output statistics do not reflect quality or productivity. Further, this centrally directed, norm-oriented economic planning system incentivizes managers to take few risks, to resist innovation, and to distort planning input data and output statistics in order to have higher confidence of meeting their quotas. While some of the methods of central direction have been abandoned, none of the key economic means to guide decentralized decision making has been put in place.

Things are getting worse in terms of Soviet productivity. The lack of technological innovation and the obsolete production processes contribute to declining productivity, as does the poor transportation system, which is plagued with bottlenecks. These

problems are exacerbated by a cynical malaise among a large part of the labor force due to poor housing, chronic shortages in food and consumer products, no improvement in Soviet standards of living, serious environmental problems, poor health care, and -- perhaps most importantly -- the belief that the Soviet leadership is incapable of making major improvements in these areas. The disillusionment of the work force is reflected in its high alcoholism rate, absenteeism, corruption, and inefficiency.[1]

These problems are made worse by Soviet demographic trends. Soviet mortality rates are increasing at a time when they are declining in the West. The industrial work force is growing at a decreasing rate, and most of the labor growth in the early 1990s will come from non-Russians in Central Asia and Kazakhstan, posing a dilemma. Either the regime can try to force these new laborers to migrate to European Russia (where most of the industry is) or to Siberia (where the new mineral resources are), with the risk in either case of exacerbating regional unrest in the USSR. Or it can invest large sums for industrial development in Central Asia and the Transcaucasus which it can ill afford.[2]

From the end of World War II until the mid-1970s, the Soviet economy grew by expanding its labor and capital inputs. Labor and capital are, however, reaching the limits of expansion, and this classical Soviet growth strategy is no longer feasible; future growth must come from improved productivity. Major investments must be made in technology, agriculture, and transportation in order to increase productivity. Heavy investment must also be made in health services, housing, and consumer goods to incentivitize the work force to greater productivity. The industrial plant must be modernized. Yet, the rate of growth of investments has been declining, partly under the impact of high military spending in a slowly growing economy.

The command economy of the USSR works well when effort can be concentrated on a few high priority areas. But, what is needed now is across-the-board improvements and the Soviet economic system inherited by Gorbachev is unable to cope with this need.

6.1.2 Military Sector of the Soviet Economy

How is it that the Soviet Union has been able to equip its large military forces with modern equipment and to become a formidable military force in Eurasia, when its economy is in such shambles?

Part of the answer to this question is that, despite its weaknesses, the Soviet economy is large. Until recently the Soviet gross national product was the second largest in the world, fueled by expanding labor and capital inputs until the mid-1970s.[3] Moreover, it still has a number of strengths applicable to the military sector: a large and strong heavy industry sector, a large labor force, an enormous base of natural resources, and the ability, through its central-planning apparatus, to focus (or spotlight) resources on the military sector.

Part of the answer also is the high priority given to the military sector and the massive commitment of resources to the military during the period 1965-1985. Soviet military expenditures grew by 50 percent during 1965-1975, with slower growth after the mid-1970s, according to CIA estimates. By the early 1970s, the military share of the Soviet gross national product was 12-14 percent, growing to 15-17 percent by the early 1980s.[4] The Department of Defense estimates that the USSR invested $510 billion more than the United States in military research, development, test, and evaluation (RDT&E), procurement, and construction during 1969-1986.[5] Even if we assume the Soviet funds were used much less efficiently than U.S. funds, this investment gives the USSR major

advantages and a strong position in many subareas of the military competition. One study estimates the value of Soviet military capital stocks in 1990 to be $1.28 trillion, compared with $1.16 trillion for the United States, a Soviet advantage of $120 billion in military capital stocks.[6]

The Soviet weapons industry probably uses resources more efficiently than other sectors of the economy, because it has been structured and operated since the 1920s in ways that take advantage of certain strengths (from a military point of view) of the Soviet economic system: the economic priorities accorded the military for outputs of other sectors of the economy and the centrally planned economic allocations. Moreover, the weapons industry has adapted over time to reduce the impact of Soviet technological deficiencies.

Despite recent shifts at the margin of defense R&D and production facilities to supporting the civil sector, this is the largest weapons industry in the world, consisting of about fifty major weapons design bureaus and about 150 major production complexes. Following are the key characteristics of the Soviet weapons establishment:

- Centralized management by the highest level of the Soviet government, resulting in strong continuity of personnel and stability of funding and programs.
- Assured production authorization and funding early in the acquisition cycle.
- Relatively simple, low-risk weapon designs that emphasize the use of standard components and proven technologies.
- Systems that are designed for easy manufacturing, that can be fabricated by a technologically unsophisticated labor force with semiskilled or unskilled people operating conventional machine tools and equipment.

- Long production runs that yield large numbers of weapons and gain economies of scale.
- Weapon improvements that emphasize incremental, block upgrades rather than development of completely new systems or subsystems.

This design and production system delivered over 50,000 tanks, 80,000 light armored vehicles, 9,600 strategic ballistic missiles, 50,000 aircraft, 650,000 surface-to-air missiles, and 270 submarines during 1965-1985.[7]

Impressive as it has been in terms of the military competition, massive Soviet military expenditures at a time of little economic growth clearly have contributed to the overall crisis in the Soviet economy. Further, the ongoing military competition exacerbates the systemic problems in the economy in a number of ways. U.S. competitive actions have prevented the USSR from achieving the political-military dominance outside Eastern Europe that it has sought through its military buildup. By undercutting Soviet military investments, contributing to early obsolescence of many Soviet weapons, and imposing higher costs on the Soviets to sustain the competition, U.S. competitive actions have contributed to the current Soviet belief that they cannot sustain the pace of the military competition and at the same time make major improvements in other sectors of their economy. The renewed vigor with which the Reagan administration pursued the military competition probably also contributed to the Soviet realization in the early 1980s that the Brezhnev competition strategy was bankrupt.

Perhaps of even greater influence on Soviet competition strategy is Western innovation, which is producing technological advances that already are shifting the ground of the competition and that promise to affect profoundly the nature of future wars. Technologies for high weapon accuracy, advanced sensors, high-

capacity information transmission and fusion, signature reduction, miniaturation of weapon and C^3I system components, and the like are setting the terms of the future military competition. Soviet strengths in heavy industry are less relevant to this kind of competition than are U.S. and allied strengths in information technologies, microelectronics, and other advanced technologies.

6.1.3 Gorbachev's Reforms

Since most Soviet weapon system programs of the late 1980s were already in production on existing lines, Gorbachev's economic reform efforts did not strongly impact the military sector at first. But, as the Soviet weapons industry faced the need to expand and renovate its production facilities in order to prepare for delivery of new weapon systems in the 1990s, Gorbachev's choices became more difficult. He and other Soviet leaders have concluded that the modernization needs of other Soviet industrial sectors and the need to satisfy rising popular demand for improved standards of living require new investments at the expense of military production in the 1990s.

Gorbachev appears to have adopted a breathing-space strategy in the military competition, making near-term sacrifices in hopes of achieving major long-term improvements in the Soviet position in the future competition. He is using arms control, public diplomacy, and unilateral force reductions skillfully in an effort to slow the pace of the military competition, inhibit U.S. military applications of advanced technology, and gain Western help for improving the Soviet technology and industrial bases. Soviet long-term goals in the military competition are less apparent, but one important goal probably is to modernize Soviet R&D and production capabilities for military applications of advanced technology in order to support a smaller, but technologically improved, military force in the future. In this breathing-space

strategy, the USSR will still retain a large (although smaller) active-duty establishment and an advantage in military capital stocks over the United States, even when the arms control agreements and unilateral Soviet force reductions now under consideration or in progress come to fruition. This will provide the Soviets with a hedge against both sustained U.S. military competition in the 1990s and renewed competitive challenges from third players such as China, and will be a base from which the USSR can transition to an advanced capability force if and when the Soviet technology and industrial bases improve.

Whether the Soviets will, in fact, be able to make fundamental improvements in their economy is not clear at this stage. Gorbachev has initiated a number of important reforms. At first, he concentrated on worker attitudes and discipline and on alcoholism, with little improvement in productivity. More recently, he has moved toward decentralizing economic planning, including allowing small-scale cooperatives to operate free of central planning, especially in the services sector, and allowing limited use of land for individual farming outside the collective agricultural system. His efforts to decentralize planning within Soviet industry have been more extensive. By 1988, some 60 percent of Soviet industrial enterprises was responsible for setting their own production plans, choosing their suppliers, and to a limited extent setting their own prices and retaining some profits for reinvestment. He also plans to eliminate redundant positions in the state bureaucracy and useless jobs.[8]

These measures have proved to be disruptive and, at best, will result in only marginal economic improvements. Of greater impact will be Gorbachev's large planned investments in the Soviet technology and production bases, which will have to come from a combination of sources, including reduced spending in the military sector; slower investments in energy and agriculture; and Western

investments, technology, and products. How fast and how far he will be able to pursue this technological and industrial modernization program is not clear.

Even if there is a substantial increase in investment in civilian sectors of the economy, a number of fundamental problems have yet to be resolved, which Gorbachev may not be able to overcome:

- The system of collectivized agriculture.
- Achieving meaningful price reform without extensive economic and social disruption.
- The opposition of the vast central-planning bureaucracy to Gorbachev's reforms.
- The resistance of the Soviet people to phenomena like unemployment and inflation that probably would result from introduction of market mechanisms into the Soviet economy in a major way.

The serious economic problems of the USSR present opportunities for the United States in the military competition, but exactly how to proceed is not obvious for two reasons. One is the uncertainty about the extent to which Soviet reform efforts will actually improve the country's economic performance. The other is the even greater uncertainty about whether successful political, economic, and social reforms will cause Soviet leaders to change their foreign policy goals and result in permanently improved U.S.-Soviet relations. For example, a Soviet Union that became economically powerful (however unlikely this may now seem) and that still gave high priority to expanding its territory and influence would be an even more challenging military competitor that is the case today.

It is not in the interests of the United States to embark upon a form of economic warfare by undermining Gorbachev's reform

efforts and seeking to make the economic problems of the USSR worse. Such a strategy would create political problems for the administration at home and overseas. More importantly, it would violate one of the tacit ground rules of the U.S.-Soviet competition, with unpredictable consequences -- neither side has sought directly to take advantage of the other side's leadership crises. U.S. efforts to worsen Soviet economic problems might even result in Soviet reversion to military confrontations and domestic repression, such as characterized the 1950s and early 1960s, and in sustained Soviet commitment of substantial resources to the military, as in the 1970s, none of which appears to be in the U.S. interest.

Further, U.S. planners should be careful to avoid using Soviet economic problems as the rationale for U.S. competition actions. To focus explicitly on Soviet economic problems in competition planning would foster the mistaken impression that America was engaging in economic warfare and would invite comparison with the economic problems the United States itself faces.

Nevertheless, the United States must protect its interests in the ongoing military competition. A sick bear can still be dangerous, and even a grossly inefficient centrally directed economy can still focus a large amount of resources on the military sector. Therefore, the United States should do what it can to facilitate the shift of the military competition to areas in which it has strong technological advantages and the USSR has systemic weaknesses. Macroeconomic analyses are of only limited value for determining competition actions the United States should be pursuing related to advanced technology. For this, we need to carry out microeconomic analyses of Soviet technology.

6.2 SOVIET TECHNOLOGICAL WEAKNESSES

Historically, Russia acquired most of its new technology from the West, and this remains true for today's Soviet Union. There are important exceptions to this generalization, principally in areas of technology to which the Soviets have accorded high resource priority such as weapon systems and the space program, but these exceptions are necessarily limited by the nature of the Soviet economic system.

The reasons for the chronic lag of Soviet technology behind that of the West indicate that this situation will continue unless there is a radical change in the Soviet economic and political systems. There are few incentives for innovation in the centrally controlled, norm-driven Soviet economy; in fact, the incentives generally cause Soviet R&D and system designers to avoid technological risk. Moreover, there are substantial political and organizational barriers to diffusion of new technology within the USSR. Western restrictions on the transfer of militarily significant technologies also contribute to the lag in Soviet technology.

Nevertheless, the Soviet Union has built a large, powerful, and modern military force within these technological limitations. But the USSR is falling even further behind the West in many of the technologies that will be important for the military competition in the 1990s. In particular, the Soviets are seriously deficient in both the numbers and the capabilities of computers, a limitation that will seriously retard many other Soviet efforts to improve their technology and apply it in both the civilian and military sectors.

6.2.1 Trends in Soviet Technology

It was not only the postwar communist government of the Soviet Union that depended on Western technology, that took a conservative approach to incorporating new technology into weapon systems, or that used illegal means to acquire technology from the West. As early as Peter the Great, who ruled Russia during 1689-1725, the tsars looked to Europe for new advances in weaponry. Invention or propagation of new weapons in eighteenth century Russia were sporadic at best. Russian administrators satisfied the needs of the tsars for military force by adhering to familiar, proven methods and introducing military innovations only after other countries showed them to be successful.

Peter the Great built up Russia's armaments and armies with foreign imports, to the point where his successors were able to achieve impressive military victories, especially in the second half of the eighteenth century. But dependence on foreign technology inevitably meant that Russian arms lagged in terms of technology. The superior innovation and adaptability of the market economies of Great Britain and Western Europe allowed them to make military advances and efficiencies that eclipsed the military power of the tsars by the mid-nineteenth century.[9]

To cite a more recent example, the Soviet espionage apparatus sought Western technology as a matter of priority as early as the 1930s. One of their more lucrative sources was an American chemist, Harry Gold, who stole numerous industrial and pharmaceutical processes and blueprints for his Soviet masters. Among the technological secrets he passed to the Soviet Union were a formula for producing synthetic rubber, the Eastman-Kodak color photography process, blueprints of a system for producing aerial camera film, a nylon production process, and the formula for RDX, a powerful explosive.[10]

Despite legal and illegal importation of Western technology, most Soviet industries still are below those of the United States, Western Europe, and Japan in terms of technology levels and innovation. The University of Birmingham conducted an extensive study to assess the comparative technological levels of Soviet industry in the mid-1970s and to determine trends during 1955-1975.[11] This extensive and detailed study found that the technological levels of Soviet industry generally lagged behind those of the West, that the USSR had not been able to close the gap during the two decades examined, and that in some cases (e.g., computer technology) the gap was growing larger.

As summarized in Table 11, during the 1950s the Soviet Union had a technological lead in a few traditional industrial areas (iron and steel production, machine tools, and high voltage electric power transmission). While the West caught up in these areas, the USSR was able to maintain technological equivalence. In science-based, high-technology industries, however, the Soviet Union lagged considerably behind the West, did not improve its position, and was falling behind in some areas.

The University of Birmingham researchers also found that Soviet military technology lagged behind that of the West during 1955-1975 in the four areas that were studied by the group: tanks, ICBMs, space launch vehicles, and manned space capsules. Since the mid-1970s, however, Soviet technology in these areas has advanced and U.S. technology has not changed extensively, so that Soviet technology probably is equal to that of the West in these areas, and probably is ahead of the West in armored vehicles.

The study came to additional conclusions that help to explain the general lag of Soviet technology behind that of the West. It found that the Soviets rely extensively on foreign

Table 11. Technological comparison of selected Soviet and Western industries (1955-1975).

SOVIET EQUIVALENCE/LEAD	SOVIET LAG
• IRON AND STEEL • MACHINE TOOLS • HIGH VOLTAGE ELECTRIC POWER TRANSMISSION	• CHEMICAL INDUSTRY • INDUSTRIAL PROCESS CONTROL AND INSTRUMENTATION • COMPUTER SYSTEMS • NUMERICALLY CONTROLLED MACHINE TOOLS

technology, especially in the science-based, high-technology industries, and that this dependence actually increased during 1955-1975. The acquisition of foreign technology advances did not, however, mean an immediate increase in the technological level of those industries to which the advances were relevant, since the diffusion of new products and processes was generally slower in the Soviet Union than in the West. While there were some exceptions (e.g., numerically controlled machine tool technology), generally there was little incentive among Soviet R&D and industrial organizations to diffuse new technology, and existing production means tended to be maintained without technological improvements for longer than in the West. Consequently, Soviet products made a slow transition from the development stage to full-scale manufacture. New products, for which new production processes had to be devised, were particularly slow in reaching the stage of full-scale production, compared with product improvements that only required that existing manufacturing processes be upgraded.

The University of Birmingham group took issue with the prevailing view among western Sovietologists that the technology lags of the USSR could be explained solely by the rigidities and incentives structure of the central planning system.[12] They accepted this explanation as far as it goes, but developed more detailed evidence indicating that other factors also affect Soviet innovation, accounting for technological variations among industries that are all subject to the same central-planning mechanisms. These additional factors are as follows:

- The absence of a developed organizational infrastructure in the Russian economy at the time of the revolution that would have facilitated catching up with the West.
- The concentration of Soviet resources through the mid-1950s on a few industries (particularly the heavy machine industries) to accelerate economic

development. This concentration allowed technological lags in other industries to persist.

- The institutional separation of science and production in the Soviet system, which reinforced the already divergent preoccupations of R&D organizations with academic success and of industry with meeting output norms. This inhibited technology diffusion.

- The traditional Russian dependence on foreign technology, which was reinforced by the Soviet central-planning approach to the economy, by Stalin's policies, and by the devastation of World War II.

Despite these problems, the Birmingham study suggests, informal relationships between some enterprising individuals and political leaders provided a mechanism for overcoming barriers to innovation. In fact, the study finds that the direct intervention of Soviet political leaders -- particularly in the defense industries -- is the major factor accounting for variations in Soviet technological performance between industries.

Such high-level spotlighting can be quite effective in the command economy of the USSR. Evidence suggests that Gorbachev and his associates are similarly trying to concentrate Soviet scientific research in ways that will improve the technology base of the USSR. A 1985 study by the Central Intelligence Agency concluded that Soviet scientists are being focused increasingly on applied science in areas that are important for the economy and for the military competition, with reductions in basic scientific research.[13] This implies an even greater Soviet dependence on Western basic scientific findings than in the past and probably also means continued high priority for acquiring Western technology to help overcome Soviet lags, even with improvements in the state of Soviet applied science. Upgrading the Soviet technology base by shifting scientists from pure research to applications is, however, difficult because of the characteristics of the Soviet system: an incentives structure that does not encourage technical

innovation, restricted communication among Soviet scientists, and a hierarchical bureaucracy that does not easily allow interministry scientific projects. These characteristics may be changing under the Gorbachev reforms, but only slowly.

The best Soviet theoretical and experimental scientists are every bit as good as their Western counterparts, and a few exceptionally bright scientists can make the difference between significant technology advances and continued lags. The scope and quality of Soviet theoretical research is largely comparable to that of the West. But Soviet experimental research is generally not as advanced as their theoretical research or the theoretical and experimental research of the West, in large part because of the lack of computers, instrumentation, and other equipment. Soviet scientists are, however, generally excellent in mathematics, allowing them to overcome to some extent their limited computer capabilities. Often Soviet scientists are the first to come up with a new concept, but they usually fall behind the West in developing the idea. An example is the Tokamak process for controlled thermonuclear fusion, a Soviet concept that now is more advanced technologically in the West than in the USSR.

These conclusions are borne out by the Foreign Applied Sciences Assessment Center (FASAC), which was set up in 1981 by the U.S. government to evaluate foreign technologies with military, economic, or political importance. The FASAC project has examined several dozen areas of Soviet applied science to date, using panels of U.S. scientists and engineers who are experts on both U.S. and Soviet research to evaluate the state of Soviet technologies and compare them with those of the United States.

Table 12 is a brief summary of the state of Soviet applied science relative to that of the United States in a number of key areas, based on the work of the FASAC panels.[14] The Soviet

Table 12. Comparison of Soviet and U.S. applied science (mid-to-late 1980s).

USSR STRONG, COMPETITIVE WITH UNITED STATES	USSR LAGS BEHIND UNITED STATES
• APPLIED MATHEMATICS	• MICROELECTRONICS
• THEORY OF ARTIFICIAL INTELLIGENCE AND ROBOTICS	• COMPUTERS
• PULSED POWER	• ARTIFICIAL INTELLIGENCE AND ROBOTICS APPLICATIONS
• COMPOSITE MATERIALS	• FAST-REACTION CHEMISTRY
• ARCTIC AIR-SEA-ICE INTERACTIONS	• HIGH-STRENGTH STRUCTURAL MATERIALS (EXCEPT COMPOSITES)
• HIGH-PRESSURE PHYSICS	• PHYSICAL OCEANOGRAPHY
• SPACE SCIENCE IN SUPPORT OF MANNED SPACE EXPLORATION	• SEMI CONDUCTOR LASERS
• NEUTRAL PARTICLE BEAM ACCELERATORS	• RADAR SCATTERING RESEARCH RELATED TO LOW-OBSERVABLES SYSTEMS
• LOW-ENERGY LASERS	• COMBUSTION SCIENCE AND TECHNOLOGY
	• HETEROGENEOUS CATALYSIS
	• TRIBOLOGY

Union currently is equal to or, in a few cases, leads the United States in certain areas of applied science: those that have a strong theoretical content (applied mathematics, the theory of artificial intelligence and robotics, and high pressure physics) and those to which the Soviet government has made a strong political commitment (the manned space program and military technologies: pulsed power, composite materials, arctic science, neutral particle beams, and low energy lasers). On the other hand, Soviet applied science is behind that of the United States in many key areas, including the following:

- Areas where Western technology is improving so rapidly that the Soviets are falling behind despite their importation of Western devices (computers and microelectronics).
- Areas that require advanced instrumentation or extensive experimental work to obtain practical results (fast-reaction chemistry, high-strength structural materials, and physical oceanography).
- Areas that have low political priority (combustion science and technology, heterogeneous catalysis, and tribology, which have relatively few military applications).
- Areas that depend strongly on computers or microelectronics (artificial intelligence and robotics applications, semiconductor lasers, and radar scattering research related to low-observables systems).

The Soviet lag in microelectronics is a serious one for them, since it affects their ability to design the chips that are the basis of modern computers and other advanced technologies for civilian and military systems. The Soviet approach to microelectronics is to copy Western technology, but they have been much less successful than the Japanese in executing this approach. The Soviets expend so much talent simply to assimilate Western microelectronics technology that they are unable to stay abreast

of the West in terms of manufactured electronics products, much less catch up.[15]

The University of Birmingham project on Soviet industrial technology found that from the early 1950s to the mid-1960s Soviet computer technology was significantly inferior to that in the best computers of the West. Moreover, during that period the Soviets had relatively few computers compared to the West and there was an enormous gap in software capabilities favoring the United States. As a result, the Soviet government placed higher priority on computer technology, took measures to increase the coordination among various parts of the computer industry, and produced an improved line of Soviet computers, the RYAD series, that was copied from the IBM System 360 computer series. Thus, by spotlighting the computer industry, they made some progress during the period 1965-1975, but there was still an eight to ten year gap in performance between Soviet and Western computers and the software gap persisted, albeit with some narrowing. But, significantly, all important technological innovations in computers originated in the West.[16]

The standard Soviet practice today is still to design computer systems and software by reverse-engineering of U.S. machines, operating systems, and programming languages. Since this takes the Soviets several years to accomplish, they continue to lag behind the United States by at least that time interval. Moreover, the relatively primitive Soviet telephone system and other aspects of the support infrastructure limit what the Soviets can do with their computers, making, for example, the development of computer networks very difficult. Despite attempts to restructure their computer development, the Soviets are likely to fall further behind the West in computer capabilities and availability. This will have negative effects on all areas of Soviet research and development and possibly will prevent some lines of research and development

such as computer-aided design of high-density, complex integrated circuits.[17]

The key question is what Soviet computer and microelectronics deficiencies mean for the military competition. For example, neither the poor telephone system nor obsolete computers have prevented the Soviets from carrying out successful ICBM or space programs. Nevertheless, unless there are basic changes in the Soviet system, the Soviets will fall even further behind in the computer and microelectronics technologies that are essential for the military competition in the 1990s. Very capable computers are needed to provide computer-aided design/computer-aided manufacturing (CAD/CAM) tools. In turn, CAD/CAM is needed to design and reliably produce the chips that are needed to produce highly capable computers and microelectronics devices. Moreover, complex software must be developed to run these machines efficiently and without error.

On the other hand, the Soviet Union may still be able to maintain significant advantages in the military competition with weapons, sensors, surveillance systems, and command and control systems that embody second-best computer and microelectronics technology.[18] To better understand this issue, we must examine in more detail how the Soviets utilize technology in the design and production of military systems.

6.2.2 Soviet Gains in the Military Competition despite Technological Limitations

The Soviet weapons procurement process has worked well, despite the handicaps imposed on it by the state of Soviet technology, production processes, and manpower base. Soviet weaponry is generally comparable to Western weapons in overall

military effectiveness, is affordable in large numbers, and can be operated by a relatively unskilled force of military conscripts.[19]

These weapons often are inferior to those of the United States in terms of technology, but they meet the needs of the Soviet military. Several factors account for the Soviet ability to develop and maintain military forces that are strongly competitive with those of the United States, even though Soviet technology generally lags that of the West. First is the large portion of the Soviet national budget that goes into military forces compared with the U.S. defense budget, allowing the Soviet Union to deploy substantially more forces and weapons than the United States in most categories. Soviet military manpower costs are less than those of the United States and the Soviets invested more than the United States in weapons acquisition during 1969-86, so -- despite the inefficiencies of Soviet R&D and production -- they are able to make up for technological deficiencies with more forces. Moreover, until recently, the military segment of Soviet industry was allocated the best of the country's management, labor, R&D, and material resources.

Further, technology level is not the most appropriate measure of merit for military weapon systems. The real question is how well they perform their military missions. Thus, a second important characteristic of the Soviet weapons acquisition system is the way that it is closely coupled with Soviet operational planning. The acquisition system is directed by a single top-level body. This centralizes program management and decision making, facilitating coordination with military planners. Further, the Soviet General Staff astutely selects missions and develops doctrine for military forces that effectively support Soviet objectives within the constraints imposed by Soviet technology, industrial plant, and manpower.

A third characteristic is the way the Soviet acquisition process itself works effectively within these constraints. Soviet design teams are kept together for long periods and each can concentrate on a specific area of weaponry, such as tactical fighters or artillery. Such specialization and continuity of design personnel help to reduce the consequences of slow Soviet diffusion of new technology and facilitate insertion of newly acquired Western technology into weapon designs by allowing Western technology acquisition to be directly targeted on specific weapons design projects.

Equally important, Soviet weapons programs must pass fewer approval milestones than U.S. programs and are fully funded early in the acquisition cycle. Both the continuity of personnel and assured funding provide stability to programs that permits steady progress toward deploying improved-technology weapons at the times set by the Soviet planning systems. Further, this kind of program stability facilitates the incremental upgrade of new production blocks of Soviet weapons, another characteristic of Soviet weapons acquisition that fits well into a system that diffuses new technology slowly, that depends strongly on gaining access to Western technology, and that is structured around meeting production norms. This stable, predictable approach to weapons acquisition also allows extensive operational testing of new weapons and feedback of the results to the design teams and to the process of incremental weapons upgrades.

This steady, often unspectacular, approach to weapons R&D and production does not have the capacity that the U.S. acquisition system has to move new technology rapidly into production and deployment. In the last two decades, however, the U.S. system has rarely realized its own capacity to deploy new technology rapidly; instead, the U.S. system has increasingly been encumbered by unpredictable funding changes, delays imposed by Congress, and

counterproductive micromanagement by both the Department of Defense and the Congress. The volatility and management inefficiencies of the U.S. system now impose significant delays on deploying new technology weapons, allowing the slower, but more steadfast, Soviet acquisition system to match and sometimes beat U.S. timelines for new weapons deployments, to the competitive advantage of the USSR, despite Soviet deficiencies in technology. In particular, the Soviet system has yielded competitive advantages in the more traditional areas of weaponry that draw on the strengths of Soviet heavy industry -- large production runs of armored vehicles, artillery, antitank weapons, tactical aircraft, ships, submarines, and ballistic missiles, with periodic block upgrades.

ICBM programs provide an excellent illustration of how the USSR has been able to make significant competitive gains over the United States despite inferior technology.[20] U.S. ICBM technology has been more advanced that of the Soviet Union since 1960. After a series of spectacular Soviet achievements in the 1950s, the United States moved ahead in most areas of ICBM technology -- warhead yield-to-weight ratios, accuracy, MIRVs, other penetration aids, and solid propellant rockets.[21] Nevertheless, the Soviets have over time deployed an ICBM force that is superior to that of the United States and still maintains the competitive initiative in this area. Through sustained large investments, a strong and stable design bureau, large payload missiles that compensated for Soviet warhead, computer, and electronics technology deficiencies, acquisition of relevant Western technologies, and a long-term commitment to certain competition goals, the USSR made slow, incremental progress toward an ICBM capability that fits well into their overall military strategy.

They also used arms control negotiations and public diplomacy to inhibit U.S. pursuit of new ICBM programs while

protecting their own developments. Moreover, the Soviet Union also carried out a series of actions to protect the primary targets of U.S. ICBMs, thus undercutting U.S. ICBM investments and accelerating the obsolescence of deployed U.S. ICBMs. These actions included an extensive system of hardened, dispersed, and (in some cases) buried command posts; major upgrades to the hardness of Soviet ICBM silos; development and deployment of mobile ICBMs that are difficult for U.S. ICBMs (or other weapon systems) to attack effectively; the ability to launch their own ICBMs out from under U.S. attacks; hardening, dispersal, and redundancy programs for strategic communications; dispersal and hardening of war-supporting industrial facilities; and wartime programs to evacuate the civilian leadership from Soviet cities.

The United States contributed to the current Soviet ascendancy in ICBMs. The last U.S. deployment of advanced technology in ICBMs of any major significance for the military competition took place in the 1970s: the Minuteman III MIRV program. Today's MX and mobile missile programs potentially are significant, but MX is unlikely to be deployed widely in fixed silos and the future of U.S. mobile ICBMs is problematic. Moreover, the United States has done relatively little compared to the USSR to protect the military and civilian targets of Soviet ICBMs and has not vigorously pursued in the last decade or so the competitive goal of making current Soviet ICBMs obsolete. Thus, through a combination of slow, steady Soviet progress toward important goals in the military competition and U.S. neglect of the ICBM area of the competition, the Soviets have gained competitive advantages despite the limitations of their technology.

The final word is not yet in on ICBMs, because the military competition is moving into areas where Soviet ICBM strengths in ICBMs may be less relevant than in the past. Arms control agreements that reduce ICBM force levels while preserving

opportunities for advanced U.S. bomber and cruise missile technologies eventually may nullify current Soviet ICBM advantages. Moreover, other advanced technologies are becoming critical for the military competition of the 1990s and, as discussed above, the United States currently has major systemic advantages in such technologies that the USSR will find it difficult to overcome.[22]

The Soviet Union is, however, making changes in its defense industrial establishment in order to respond to this new competitive environment. While defense continues to have a high priority, the Soviets are trying to change their investment patterns to provide for more balanced improvement of industry, services, and the technology base than in the past, with reduced weapons investment in the near future. They are moving away from their traditional emphasis on proven technologies and simple weapons design approaches. In weapons production, they are beginning to manufacture advanced weapons in smaller quantities in order to keep up with technological change in the military competition. Further, they are investing more in improvements to the high technology segments of the defense industry (radioelectronics, telecommunications, special materials, and advanced production equipment) than in the more traditional heavy industry segments. They are revising industrial organization, planning, and management to encourage innovation and production quality. And they are emphasizing more than ever the systematic, targeted acquisition of Western technology.[23]

This last is a particularly important part of the Soviet long-term strategy for the military competition, one that may prove to be more effective than Soviet efforts to reform their system for actually utilizing the technology they acquire. For some time the Soviet government has been operating a massive program to obtain Western technology, both legally and illegally, in support of military weapons development. The USSR receives thousands of

pieces of Western equipment annually and many tens of thousands of documents as part of this program. Almost every Soviet military research project (over 4,000 annually in the late 1970s and more than 5,000 per year in the early 1980s) benefits from this technology input.[24]

This technology collection program is complex, well-organized, and targeted specifically for the improvement of Soviet weapon systems. The Soviet intelligence services, trade delegations, and scientific organizations all are actively involved in obtaining Western technology; until recently, the East European intelligence services assisted the Soviets in this collection of technology. Among the prime targets are western defense contractors, other manufacturers, trading firms, academic institutions, and electronic data bases. High on the priority list for these collection programs are the technologies that appear to be most important for the military competition in the 1990s: computers, microelectronics, optics, telecommunications, radars, advanced munitions, and directed energy.

Thus, a continuing element of U.S. strategy for the military competition should be to restrict or retard Soviet access to technologies that are critical for their success in the competition. At the same time, however, U.S. competition planners should recognize that -- despite U.S. efforts to restrict their access -- the Soviets will continue to draw heavily on Western technology.

How effectively the USSR can utilize this technology in the competition depends in part on whether it can reform its economy and upgrade the ability of defense industries to use advanced computer, microelectronics, and other relevant technologies. Gorbachev faces formidable political and social problems as he seeks to reform the system, and his prospects are

difficult to gage. Much of this is beyond U.S. control in any event. What America can do, however, is to accelerate movement of the competition into areas where it has major systemic strengths and the Soviets are chronically weak and to carry out strategies that in fact convert these U.S. strengths to actual advantages.

A part of the U.S. strategy should be to emphasize technologies that the Soviets will have major problems in responding to, even if they successfully implement economic reforms. To understand how to devise such a strategy, we must address one more aspect of the Soviet military system -- operational planning -- in order to see how to deal with the Soviet ability to field effective weapons in spite of their technological deficiencies.

6.3 SOVIET OPERATIONAL PLANNING WEAKNESSES

U.S. competition strategies should take into account the uniquely Soviet approaches to planning for employment of their weapons, in order to take advantage simultaneously of Soviet economic, technological, and operational planning weaknesses. The West knows less about Soviet military operational planning than about the Soviet economy and the state of Soviet technology, because it has been carrying out research on the Soviet economy and technology for a longer period than research on Soviet operational planning methods. Moreover, glasnost has not extended significantly into Soviet military operational matters, despite high-level U.S.-Soviet military exchanges during the past few years.

Nevertheless, study of Soviet operational planning methods since the mid-1970s allows us to sketch out the essential characteristics of this planning for purposes of developing U.S. approaches to the military competition. These studies indicate

that current Soviet operational planning characteristics are deeply rooted, reaching back at least to World War II, and therefore are unlikely to change quickly in any fundamental way.[25]

As in most other Soviet organizations, military operational planning is centrally directed and driven from the top, in this case the Soviet General Staff. It starts with a major effort in peacetime to reduce wartime uncertainties to acceptable levels. Important uncertainties for the Soviets in this regard are the technical performance of the weapon systems of the Soviet Union and its adversaries; the force levels, overseas force deployments, and orders of battle of adversary forces; and the actions and alignments of the United States, its allies, and other key nations in prewar crises. While U.S. operational planners focus on the same issues in peacetime, Soviet intelligence services, weapons acquisition planners, and military operational planners probably focus more directly and in a more coordinated way on peacetime reduction of wartime uncertainties than is the case in the United States.

Soviet operational planning then proceeds to the systematic determination of missions that are critical for achieving wartime strategic goals in each theater of military operations. Again, this is not different in kind from U.S. operational planning, but the Soviet General Staff probably carries out more extensive and detailed analysis of the nature of critical missions, specific goals for these missions in time and space for each theater, and the relations among various missions than do U.S. planners.

It is, however, in the detailed planning of critical missions that the unique characteristics of Soviet operational planning emerge. Essentially, plans are designed to ensure Soviet control over the military situation as it changes within the range

of uncertainties that remain after prewar efforts to reduce uncertainty. Three principles are key in developing these plans for the employment of available Soviet forces:

- Provide high confidence that the Soviet Union can maintain control over the timing of military operations. The Soviets recognize that the side which controls the timing of combat can retain the initiative by controlling the tempo and focus of action, by massing firepower, and by taking advantage of massed firepower in subsequent maneuvers. The means of maintaining control over the timing of operations include surprise, high-speed or "blitzkrieg" operations, a heavy air offensive at the start of the war, use of SPETNAZ troops and Operational Maneuver Groups, and echeloned ground force operations.

- Ensure that the correlation of forces at places and times critical for the success of a mission is sufficiently large that there will be a high probability of accomplishing the mission within the required time norms. Moreover, the force correlations at these decisive places and times should be large enough that the success of the mission is insensitive to wartime intelligence errors. Having large, favorable force ratios in peacetime is one way to carry out this principle; another is to be confident of controlling the timing of operations, as in the first principle outlined above.

- Train tactical units (division-level and below) for execution of relatively simple tasks, so that the actions of tactical units and the time required to accomplish these actions are predictable to higher-level Soviet military planners.

These characteristics of Soviet operational planning are competitive strengths insofar as they permit the USSR to mount powerful military operations within the limits of the capabilities of Soviet weapon systems, command and control systems, and manpower skills. In the 1990s, however, as the military competition moves into areas where technologies of information, surveillance, and precision weapons delivery at long range can give important

advantages to defenders, these same Soviet operational planning characteristics can be turned to the competitive advantage of the United States.

The point of departure for U.S. competition planning in this regard is to recognize the threat characteristics -- that is, the characteristics of U.S. competitive initiatives -- that would cause the greatest problems for Soviet operational planners. Based upon the foregoing analysis of Soviet operational planning approaches, these threat characteristics, or U.S. competition goals, are as follows:

- The U.S. or allied ability to reduce Soviet control over operational timelines by, for example, allowing the Soviets less time during operations to adapt their plans to new situations or by materially increasing Soviet peacetime uncertainty about the amount of time available to carry out critical operations. U.S. concepts or capabilities that can carry the war to Soviet territory at an early stage (e.g., sea-launched cruise missiles, the maritime strategy, or the concept of NATO counteroffensives) are examples of such threat characteristics.[26]

- The U.S. ability to change the correlation of forces at decisive places and times rapidly, unpredictably, and in the U.S. favor, by deploying forces that can be employed in diverse ways. The Follow-On Forces Attack program, stealthy aircraft, and long-range, accurate missiles have these characteristics.

- The U.S. ability to create substantial Soviet uncertainty about the actions of tactical units, especially about the ability of these units to accomplish their missions within predictable and acceptable time norms. The Follow-On Forces Attack program and effective anti-armor weapons have these characteristics.

With this analysis of Soviet economic, technological, and operational planning weaknesses, we are now in a position to summarize the implications of the foregoing chapters for U.S. competition strategies.

ENDNOTES TO SECTION 6

1. For a summary of systemic problems in the Soviet economy, see "The Soviet Economy Under a New Leader," A paper prepared jointly by the Central Intelligence Agency and the Defense Intelligence Agency for submission to the Subcommittee on Economic Resources, Competitiveness, and Security Economics of the Joint Economic Committee, U.S. Congress (19 March 1986), pp. 1-9. See also Sewaryn Bialer, The Soviet Paradox: External Expansion, Internal Decline (New York: Alfred A. Knopf, 1986), pp. 57-80. The most recent CIA/DIA report to Congress does not dispel this gloomy assessment. See "The Soviet Economy Stumbles Badly in 1989," A report presented by the Central Intelligence Agency and the Defense Intelligence Agency to the Technology and National Security Subcommittee of the Joint Economic Committee, U.S. Congress (20 April 1990).

2. Bialer, The Soviet Paradox, p. 65. See also appendix D in volume III on Soviet demographic trends.

3. Japan's gross national product now exceeds that of the USSR. Because of the unreliability of Soviet economic statistics, there is considerable uncertainty about the actual size of Soviet GNP, even in the USSR. Consequently, the Soviet economy may not even be the third largest in the world.

4. "The Soviet Economy Under a New Leader," p. 3.

5. Frank C. Carlucci, Secretary of Defense, Annual Report to the Congress, Fiscal Year 1989, (Washington: U.S. Department of Defense, February 18, 1988), p. 21. This difference is based on a comparison of U.S. defense investment expenditures with the estimated dollar cost of Soviet defense expenditures, both in FY 1989 dollars, and includes programs that in the United States are not funded by the Department of Defense, such as nuclear warheads.

6. Andrew W. Marshall and Charles Wolf, Jr., The Future Security Environment, Report of the Future Security Environment Working Group, submitted to the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988) p. 22. Military capital stocks include weapons, other military equipment, and military facilities; depreciation as well as new investment are considered in the calculations, which are expressed in FY 1986 dollars.

7. U.S. Central Intelligence Agency, The Soviet Weapons Industry: An Overview (Washington: CIA, September 1986). The above summary was taken from p. iii.

8. See, for example, Zbigniew Brzezinski, The Grand Failure: The Birth and Death of Communism in the Twentieth Century (New York: C. Scribner's Sons, 1989), pp. 66-68.

9. William H. McNeill, The Pursuit of Power: Technology, Armed Force, and Society Since A.D. 1000 (Chicago: University of Chicago Press, 1982), p. 157.

10. Anthony Cave Brown and Charles B. MacDonald, On a Field of Red: The Communist International and the Coming of World War II (New York: G. P. Putnam's Sons, 1981), pp. 401-2.

11. The Technological Level of Soviet Industry, ed. Ronald Amann, Julian Cooper, and R. W. Davies (New Haven: Yale University Press, 1977). Appendix C in volume III contains a detailed summary of this book.

12. Industrial Innovation in the Soviet Union, ed. Ronald Amann and Julian Cooper (New Haven: Yale University Press, 1982).

13. U.S. Central Intelligence Agency, A Study of Soviet Science, (Washington: CIA, December 1985).

14. Selected Aspects of Soviet Applied Science, FASAC Integration Report (Mclean, Va.: Science Applications International Corporation, April 1985); J. Bengston, R. R. Cronin, R. B. Davidson, and G. Gamota, Soviet Science as Viewed by Western Scientists, FASAC Integration Report II (McLean, Va.: Science Applications International Corporation, April 1989).

15. Bengston et al., Soviet Science as Viewed by Western Scientists, pp. 2-1 through 2-5.

16. Amann, Cooper, and Davies, The Technological Level of Soviet Industry, pp. 377-406.

17. Bengston, et al., Soviet Science as Viewed by Western Scientists, pp. 2-6 to 2-8.

18. Ibid., pp. 3-7 and 3-8.

19. Arthur J. Alexander, "Research in Soviet Defense Production," NATO's Fifteen Nations (October - November 1981), pp. 51ff. See also Central Intelligence Agency, Soviet Weapons Industry, for a more recent evaluation that comes to essentially the same conclusions.

20. See volume III, appendices G and I.

21. Anmann, Cooper, and Davies, The Technological Level of Soviet Industry, pp. 446-88.

22. See Marshall and Wolf, Future Security Environment, pp. 26-42, and Charles Herzfeld, Technology for National Security, Report by the Working Group on Technology, submitted to the Commission on Integrated Long-Term Strategy, (Washington: U.S. Department of Defense, October 1988), pp. 37-46.

23. Central Intelligence Agency, Soviet Weapons Industry, pp. 37-40.

24. U.S. Central Intelligence Agency, Soviet Acquisition of Militarily Significant Western Technology: An Update (Washington: CIA, September 1985).

25. John A. Battilega, et al., A Soviet-Style Assessment of Emerging U.S. Strategic Technologies (Revision I) (U), SAIC Report 85/6078/FSRC/E (Denver, Colo.: Science Applications International Corporation, 25 September 1985) (SECRET-NOFORN), pp. 2.3-2.8. While they do not address Soviet operational planning methods in as much detail as Battilega, et al., the following references are also useful: Fritz W. Ermarth, "Contrasts in American and Soviet Strategic Thought, "International Security, vol. 3, no. 2 (Fall 1978), pp. 138-55; Christopher N. Donnelly, "Soviet Operational Concepts in the 1980s," in Strengthening Conventional Deterrence in Europe, Report of the European Security Study, (New York: St. Martin's Press, 1983), pp. 105-36; John G. Hines, Phillip A. Petersen, and Notra Trulock III, "Soviet Military Theory from 1945-2000: Implications for NATO," The Washington Quarterly, vol. 9, no. 4 (Fall 1986), pp. 117-37.

26. On NATO counteroffensives, see Samuel P. Huntington, "Conventional Deterrence and Conventional Retaliation in Europe," International Security, vol. 8, no. 3 (Winter 1983-84), pp. 32-56.

7. IMPLICATIONS FOR U.S. COMPETITION STRATEGIES

Despite all the impediments to change in the Soviet Union, Mikhail Gorbachev has set in motion trends that may over time result in real changes in Soviet interests and goals, with an accompanying shift in the U.S.-Soviet relationship away from competition. U.S. strategies and actions that are designed simultaneously to protect America's interests in the military competition and to keep open, if not encourage, the possibility of widening the areas in which we do not compete can prove effective in promoting this more beneficial relationship.

This probably means greater emphasis in future U.S. competition planning on political-diplomatic instruments, arms control, and military research and development with limited system production, as contrasted with earlier periods in which the emphasis was on large-scale weapon systems production, force levels, and force deployments. It also means that, in deciding on priorities and funding strategies within declining budgets, the Department of Defense should take more thoroughly into account the changing nature of the long-term U.S.-Soviet military competition. Some U.S. competition goals that would be consistent with an effort to reduce or eliminate the military competition while safeguarding U.S. security interests are the following:

- Induce the Soviet Union to stop using Cubans as proxy forces or agents of Soviet subversion in the third-world countries.
- Negotiate permanent improvements in the U.S.-Soviet military balances in such key subareas of the competition as strategic forces, Europe, and the Far East.
- Resist agreements that constrain either side's development, testing, and applications of military technology. This is a subarea in which the West has major competitive advantages. By continuing to press

these advantages and to thwart Soviet efforts to deny America the opportunity to exploit them, the United States may be able to discourage Soviet military competition over time.

Without serious reform in Soviet economic incentives for innovation (probably by wide introduction of market mechanisms), Soviet technology almost surely will continue to lag behind that of the West. This suggests that the general U.S. approach to the military competition with the USSR in the 1990s should be through a "leapfrog" strategy that works within the tight DoD budget constraints that are likely to prevail over the next decade and that takes advantage of the breathing space that Gorbachev is achieving in this competition. In a leapfrog approach, the United States would forego a certain amount of near-term force modernization and perhaps even readiness, but would invest heavily in military research and development in order to be in a strong position if the Soviet Union successfully upgraded its technology and production bases and heightened the pace of the military competition in the early twenty-first century. This approach to competition strategies would also serve to discourage the Soviet Union from actually returning to increased military competition by making clear that the United States can and will sustain its advantages and superior competitive position in the technologies that are important for modern combat operations. Further, it would also serve U.S. interests in future military competition with lesser powers by maintaining advanced technology in a smaller U.S. military force.

By emphasizing political and diplomatic means, arms control, and military research and development, U.S. competition strategies could take advantage of ongoing political changes such as the collapse of the Warsaw Pact as a military threat and the reduction in Soviet military spending that is beginning to take place, without threatening legitimate Soviet security interests.

This approach is also consistent with political changes in the West, including declining threat perceptions at home and among the allies, reductions in DoD budgets, and growing pressures to reduce U.S. forces overseas.

If successful, the strategy would shift the military competition with the USSR to areas in which the United States has strong technological advantages and the Soviet Union has systemic economic, technological, and operational planning weaknesses. The combination of advanced technology weapons like stealth and arms control limitations could accelerate the obsolescence of existing Soviet weapons, reducing the advantage the USSR now has in military capital stocks. And it would impose heavy costs on the Soviets should they seek to modernize obsolete forces, as a way of encouraging the Soviet leadership to forego some military modernization projects and shift resources away from the military sector. This approach to competition strategies would make it more difficult for the USSR to maintain a large, threatening military force, but would not harm the Soviet civilian economy.

To summarize the analysis in chapter 6, the Soviet Union historically has obtained most of its new technology from Western sources rather than from internal developments; this dependence on Western technology is as strong today as it ever was. This means that Soviet technology levels inherently lag behind those of the West in most areas. There are, however, important exceptions to this general finding, especially in technology areas that have high national priority for the USSR, such as some weapons programs and the space program.

Several factors account for the Soviet lag in technology:

- The lack of incentives for technological innovation in the centrally directed Soviet political, economic, and social system for technological innovation.

- The political and organizational barriers to diffusion of technology in the USSR.
- The risk-adverse approach of Soviet design bureaus to weapon system development.
- Western barriers to transfer of critical military technologies to the Soviet bloc.

Despite these limitations, the Soviet Union has built a large, modern military force that has gained superpower status for the USSR and that seriously challenges the United States in the military competition. The USSR has been able to accomplish this feat by devoting a much higher percentage of its GNP to military spending than do Western nations; by according high priority to the military in allocating other economic resources; by tailoring its military research and development, production, and operational planning to achieve Soviet competition goals within the constraints of Soviet technology, industrial plant, and manpower; and by a large, centrally directed program to acquire Western technology to support Soviet military programs.

In spite of these efforts, however, the USSR is falling behind the West in most of the technologies that appear to be critical for the military competition in the 1990s. Earlier Soviet successes in the military competition were based on Soviet strengths in heavy industries, complemented by adroit use of technology derived from the West. In some cases, the United States contributed to Soviet successes by failing to take full competitive advantage of Soviet limitations. But the military competition appears to be shifting into areas where heavy industry is less of an advantage and technologies of information, surveillance, signature control, and smart weapons are increasingly important.

The United States and its allies are strong in these areas and the Soviet Union is weak. Serious and systemic Soviet

deficiencies in computers and microelectronics are a key limitation that affects many other areas of Soviet development and production of advanced weapons systems. The poor state of Soviet computer and microelectronics technology also retards their efforts to bring the civilian economy up to Western standards. Gorbachev and other Soviet leaders recognize these problems. They are trying to reform the Soviet political, economic, and social system to substantially upgrade Soviet technology levels and economic performance without abandoning the fundamental precepts of Marxism and Leninism and without losing political control over the USSR. Whether they can accomplish this goal remains to be seen.

This analysis leads us to recommend continuing, if not strengthening, certain kinds of military technology applications, particularly advanced technologies such as computers, microelectronics, composite materials, directed energy, and sensor technologies. This recommendation is not intended to imply that technology is the only competitive instrument for the United States, or even the most important one. Basing, force deployments, doctrine, operational concepts, arms control, and public diplomacy, as well as technology and weapon system developments, are important means upon which the United States should draw in the military competition.

Nor do we mean that U.S. technology is uniformly superior to that of the USSR or that U.S. technology can necessarily offset superior Soviet force levels. It has, however, become fashionable in some quarters to criticize the United States for depending excessively on technology in the military competition, whereas in fact America has not been sufficiently innovative in many of its weapon system developments during the last two decades and has let an increasingly cumbersome acquisition process impede the proper use of technology in the competition.[1] As shown by the examples of chapter 5, technology is a major component of the military

competition and has contributed importantly to both U.S. and Soviet competitive advantages.

The key point concerning technology is that the military competition is shifting to areas in which advanced technology is critical, areas in which the United States currently has advantages and the Soviet Union is weak. Soviet leaders recognize that this shift is taking place, are systematically studying the influence of advanced technology on future wars, and are seeking to improve their competitive position.[2] The United States also should be investigating more thoroughly the nature of future wars, how to sustain or accelerate the shift in the competition to areas in which America has technological advantages, and how to make it more difficult for the USSR to work around its systemic economic, technological, and operational planning weaknesses in the future military competition.

It cannot be assumed that a shift of the military competition into areas of advanced technology will automatically convey major advantages on the United States. The Soviet Union is trying to use arms control and public diplomacy to channel the competition in directions that favor the USSR, so that trends in the competition could change. Even if the competitive environment continues to move in the direction of advanced technology, the combination of even modest improvements in the Soviet economic system, Soviet spotlighting of weapons developments for high resource priority, and relaxed Western restrictions on technology transfer in a time of declining threat perceptions may allow the Soviet Union to be competitive on an advanced technology playing field.

Therefore, the United States must plan skillfully and with vision for applications of advanced technology in the military competition of the 1990s, using a systematic approach to

competition strategies such as described in volume II. Several points are important in carrying out this planning.

First, it must be recognized that technology is not the only means through which the competition is carried out, as discussed in chapters 2 and 3. While current trends indicate that technology will be an important element of the military competition in the 1990s, U.S. competition planning must artfully combine technology applications with other military, arms control, and public diplomacy instruments of competition.

Second, merely incorporating advanced technology into U.S. weapons will not be sufficient to gain competitive advantages in the military competition. Technologies must be selected to exploit specific Soviet economic, technological, and operational planning weaknesses. Based on the foregoing analysis, we can formulate the following criteria for selecting technologies to emphasize in the future military competition:

- U.S. military applications of technology should influence Soviet views about the nature of future wars. In particular, these technology applications should change Soviet assessments of which missions are critical for their operational success in various TVDs or assessments of their ability to be successful in these missions. The goal is to cause the Soviets to conclude that critical missions are becoming more difficult for them to carry out.

- One specific way of undermining Soviet confidence in their ability to carry out critical missions is to pose fundamental threats to the Soviet ability to maintain control over military situations in wartime. Therefore, U.S. technology applications should seek to make operational timetables less predictable for Soviet planners, to impose correlation of forces requirements that are difficult for the Soviets to achieve, to create uncertainties about critical mission requirements that are difficult or impossible to reduce in peacetime, or to create situations in which the Soviets must delegate operational decisions

to lower-level tactical units that are not constituted or trained to make such decisions.

- The ease with which the Soviet Union can counter U.S. technology applications should also be taken into account in competition planning. In this regard, the United States should emphasize technologies and operational concepts that require extensive Soviet use of computers or microelectronics in order to counter the U.S. initiatives. Such U.S. moves may or may not draw on advanced technology; the point is that Soviet responses should have to draw on the kind of advanced technologies that their system is especially poor in fostering.

- It is also important that U.S. technology applications impose delays on Soviet counters, to allow the United States to field new or improved weapons inside of Soviet weapon acquisition timelines. Thus, for example, the United States should emphasize technologies that require the Soviets to enter into new weapons production or to develop new production processes, rather than to improve or scale up existing production means. Such U.S. actions would thereby impose costs and delays on the Soviets and introduce uncertainties into their weapons acquisition planning in ways that are especially difficult for the Soviet system to deal with.

- U.S. policy should continue to seek restrictions on transfer of technologies to the Soviet bloc that would materially enhance the Soviet position in the military competition in the 1990s.

The DoD Competitive Strategies Initiative has made a limited examination of military technology applications that could meet these criteria, although the DoD effort did not use the above criteria as specific goals.[3] Much more works needs to be done in order to understand the specific technology applications that will most benefit the United States in the military competition of the 1990s. Nevertheless, it is possible to give examples of the types of technology applications that seem to meet these criteria. They include stealth technology; the technologies emerging from the SDI program; the combination of advanced surveillance technologies and smart weapons that underpins the Follow-On Forces Attack program;

highly accurate, long-range cruise missiles; advanced conventional munitions that have tactical military effects comparable to those of nuclear weapons; and laser and other directed energy weapons.

Deployment of such advanced technology weapons should be combined with development of doctrine and operational concepts to use these weapons for greatest military effectiveness. New technology and old operational concepts generally will not be adequate to exploit fully the Soviet weaknesses in operational planning.[4] Finally, and perhaps most importantly, U.S. competition planning should examine thoroughly the moves and countermoves likely to be made by the Soviet Union, to ensure that U.S. technology applications take full advantage of the limitations of the Soviet economy, technology, and operational planning as they evolve in the 1990s.

Moves, countermoves, and other such competition planning methods are discussed in detail in volume II, as are systematic ways to transform the general approach to the U.S.-Soviet military competition described above into more specific competition goals and strategies.

ENDNOTES TO CHAPTER 7

1. See David Packard, et al., A Quest for Excellence, Final report to the President by the President's Blue Ribbon Commission on Defense Management (Washington: U.S. Government Printing Office, June 1986) and Charles Herzfeld, Technology for National Security, Report by the Working Group on Technology, submitted to the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988).

2. Andrew W. Marshall and Charles Wolf, Jr., The Future Security Environment, Report of the Future Security Environment Working Group, submitted to the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988), pp. 26-42.

3. Frank C. Carlucci, Secretary of Defense, Annual Report to the Congress, Fiscal Year 1989 (Washington: U.S. Department of Defense, February 18, 1988), pp. 116-18.

4. For further discussion of this point, see Herzfeld, Technology for National Security, pp. 23-27.

GLOSSARY

Competition. A condition in which two or more rivals seek to gain the same object simultaneously; in which not all the rivals can gain this object, so there are winners and losers; and in which the vying of the rivals is governed by some sort of rules. In the context of the U.S.-Soviet competition, the term refers to the contest between the two superpowers for power and influence in world affairs.

Competition Planning. The process of analyzing the competitive environment, setting goals relating to pursuit of the competition, and developing strategies and plans of action for achievement of these goals.

Competition Planning Games. Planning games that specifically are focused on understanding the range of plausible U.S., Soviet, and third player moves and countermoves associated with a given set of U.S. competition goals and strategies. Competition planning games should also indicate the range of future states of the military competition that are likely to result from a given set of U.S. goals and strategies.

Competitive Action. An action taken in a specific subarea of the competition that is intended to achieve, or contribute to the achievement of, a specific competitive goal.

Competitive Advantage. A benefit attained in the long-term military competition by exploiting one's strengths or an adversary's weaknesses. Realizing a competitive advantage involves actions (e.g., the expenditure of resources) to convert strengths and weaknesses to tangible benefit in the competition. The concept of competitive advantage is dynamic. Such advantage can increase or diminish with time, and understanding the process of decline is an important analytical task.

Competitive Environment. All aspects of the world situation that (1) can affect the U.S.-Soviet military competition or other military competitions of interest to the United States and (2) are not controlled directly by the defense planning process within the executive branch of the U.S. government. Examples include economic, demographic, and technology trends; Soviet goals, strategies, and actions; and third player goals, strategies, and actions.

Competitive Goal. A specific objective in the long-term military competition to be achieved within a specific period of time. Such goals could involve influencing Soviet or third party investments or behavior in particular ways or achieving defined states in the future military balance in a particular region.

Competitive Initiatives. The ability to dictate the agenda or set the pace in a particular area of the competition, for

example by keeping an adversary reacting to one's actions instead of undertaking initiatives of his own.

Competitive Leverage. The ability to make disproportionately large gains in the competition in relation to the resources expended on a competitive action or strategy. Leverage may be measured in terms of an adversary's cost to respond, or the stresses imposed by an action or strategy on an adversary's military or industrial establishment.

Competitive Position. The ability of one side relative to the other to compete in the future. The concept of competitive position includes strengths, weaknesses, current competitive advantages, and who holds the competitive initiative in various subareas of the competition.

Competitive Strategies Initiative. An initiative by the secretary of defense to use the concept of competitive strategies as a long-range planning tool. This initiative was carried out through the competitive strategies council, which was chaired by the secretary of defense and consisted of top DoD civilian and military officials.

Competitive Strategy. A set of inter-related competitive actions which, pursued together, are designed to achieve competitive goals in one or more subareas of the competition or in the competition as a whole.

Contingency Analysis. Two-sided analysis of the performance of military forces in various military contingencies or war scenarios, with an emphasis on understanding how each side's forces affect the likely war outcome in each contingency. Combat outcomes in a contingency analysis can be used as a measure of the U.S. preference for future military balances and, therefore, the U.S. preference for future states of the military competition.

Critical Engagements. Those opposing force engagements in various war scenarios that most powerfully affect the course, pace, and outcomes of these wars.

Feedback. The process of monitoring a specific part of the competition planning process, adversary actions, or other aspects of the competitive environment, and modifying U.S. competitive goals, strategies, or actions in light of the results of this monitoring, all with a view toward improving U.S. performance in the military competition.

Iteration. Repetition of parts of the competition planning process or supporting sequence of analyses in order to take advantage of feedback.

Long-Term Military Competition. The military competition between the United States and the Soviet Union. This terminology is intended to highlight both the deep historical roots of this

competition and the need to look forward twenty years or more into the future in developing U.S. goals and strategies for competing effectively.

Military Balance Assessment. A net assessment of the balance of opposing military forces that consists of the analysis of past and projected future trends and asymmetries in this force balance and the evaluation of the relative combat capabilities of the sides in a range of plausible war scenarios.

Move/Countermove Games. Another term for competition planning games.

Planning Games. Politico-military games in which the simulated environment is a period in the future in which each side makes decisions about military research and development, acquisition, force deployments, arms control, and other aspects of peacetime force planning for the purpose of understanding the military force balances that are likely to result through a competitive process that plays out in a multipolar environment.

Politico-Military Gaming. Simulation of past, current, or future politico-military situations in which human players assume roles within the simulated environment. The players normally are organized into teams that may compete or cooperate with one another, within assumptions and constraints specified by the game scenario.

Portfolio Management. A set of planning techniques that is designed to limit or control the risks inherent in any one or more strategies or actions within a subarea of the competition or across several subareas. These techniques should also make it easier for the United States to exploit new opportunities for realizing competitive advantages when they appear. Examples of portfolio management techniques include multiple, partially overlapping, competitive goals and building into U.S. strategies and actions the ability readily to adapt to Soviet actions or other changes in the competitive environment.

Soviet-Style Analysis. Analysis by Americans (or other people not raised and trained in the Soviet system) that approximates as closely as possible the ways in which Soviet planners would analyze a given situation or problem, as a guide to understanding how they might act. The need for Soviet-style analysis in competition planning arises from the many important asymmetries between Soviet and Western analysis and planning methods that make it clear that a mirror-image approach to Soviet competitive initiatives and responses would be seriously misleading.

State of the Competition. The past, present, or future condition of the U.S.-Soviet competition. When used in reference to the military competition, descriptions of the state of the competition should include the state of the U.S.-Soviet military

balance, the competitive positions of the two sides, and the state of relevant elements of the competitive environment.

Subareas of the Competition. A component of the worldwide scope of competition planning that is suitable for detailed planning and implementation of competitive actions. Generally, subareas of the competition should be geographic regions, such as Europe or East Asia, but not exclusively so; technology is an example of a nonregional subarea.

Third Player. Any national actor that can affect significantly the U.S.-Soviet competition and that may also compete directly with the United States or the Soviet Union at times. Third players may be allies, friends, or adversaries of the United States or the Soviet Union, or may be neutral.

Third Player Leverage. The ability of a third player to influence excessively the ability of the United States or Soviet Union to compete with one another effectively. Examples of third player leverage are base access, diversion of superpower resources away from the superpower competition, or undue influence on superpower military doctrine or arms control positions.