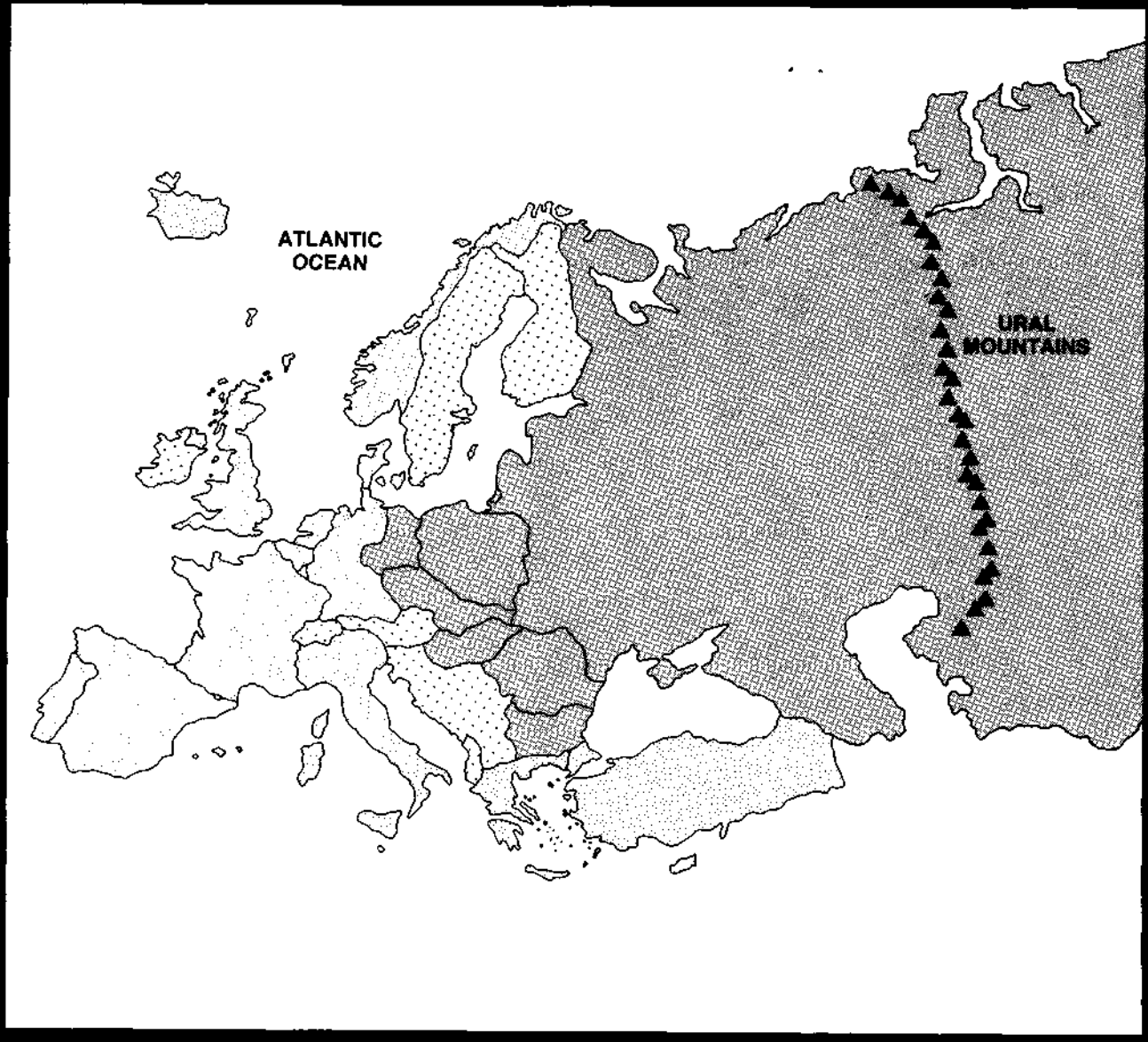




Budgetary and Military Effects of a Treaty Limiting Conventional Forces in Europe



A SPECIAL STUDY

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CBO STUDY OF THE EFFECTS OF A CFE TREATY

Within the next year, the members of the North Atlantic Treaty Organization (NATO) and the Warsaw Pact may sign a treaty limiting conventional forces in Europe (CFE). A Congressional Budget Office report, *Budgetary and Military Effects of a Treaty Limiting Conventional Forces in Europe*, assesses the effects of NATO's proposed version of a CFE treaty. The study focuses on those U.S. forces that would be affected directly by the treaty--the Army and the tactical Air Force--and finds that the treaty would greatly diminish the threat posed by the Warsaw Pact, but would result in only small savings in the U.S. defense budget. Larger savings could result indirectly from the treaty if U.S. forces committed to NATO were further reduced in light of the easing of military tensions after the treaty is carried out.

The Warsaw Pact currently enjoys a substantial advantage in weaponry stationed in the region covered by a CFE treaty. The treaty would limit each alliance to equal numbers of weapons, requiring only small reductions in NATO weapons inventories but large reductions for the Pact. Since the Pact would no longer have more weapons than NATO, its conventional advantage in Europe would be eliminated and NATO's military security would be greatly enhanced.

In contrast to the sharp reduction in military risk, the treaty would only modestly reduce the U.S. defense budget. To comply with the treaty, the United States might be required to eliminate from Europe two-thirds of an Army division and 1½ active Air Force tactical fighter wings. Budgetary savings would eventually be just under \$3 billion a year from funds for the Army and tactical Air Force, which account for about 35 percent of DoD's 1990 budget.

The United States could decide that the reduced military tensions following a CFE treaty, coupled with political changes in Eastern Europe, would permit larger cuts in U.S. forces committed to NATO. CBO examined two options involving such reductions. One option, designed to allow NATO to retain the ability to mount a forward defense along the inter-German border, would eliminate 2½ of the Army's 18 active divisions and 5½ of the Air Force's 35 active and reserve tactical fighter wings. Reductions would be made in forces stationed both in Europe and the United States. Savings from the 1990 budget level could eventually reach \$12 billion a year.

Another option would reduce U.S. forces for NATO by 50 percent--roughly in proportion to cuts required in Pact forces by the proposed treaty. The United States would eliminate 7 active Army divisions and 14½ active and reserve tactical fighter wings. If all NATO members reduced forces by 50 percent, the Pact would still have the same advantage over NATO that it enjoys today. But such a large reduction might be reasonable in view of political changes in Eastern Europe and the reduced threat of a major European war. This option could eventually reduce the U.S. defense budget by as much as \$27 billion from its 1990 level.

Especially for these larger cuts, full savings might not be realized for a number of years. NATO has proposed that the treaty be fully carried out by 1993, although doubts remain about the feasibility of this schedule. Full savings under some of these reductions would probably not be realized for several years after 1993.

Questions about the study should be directed to Frances Lussier of CBO's National Security Division at (202) 226-2900. The Office of Intergovernmental Relations is CBO's Congressional liaison office and can be reached at 226-2600. For additional copies of the study, please call the Publications Office at 226-2809.



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**BUDGETARY AND MILITARY EFFECTS
OF A TREATY LIMITING CONVENTIONAL
FORCES IN EUROPE**

**The Congress of the United States
Congressional Budget Office**

NOTES

Unless otherwise indicated, all years referred to in this report are fiscal years.

Unless otherwise indicated, all dollar amounts reflect budget authority in constant fiscal year 1990 dollars.

Details in the text, tables, and figures of this report may not add to totals because of rounding.

PREFACE

The United States and its allies in the North Atlantic Treaty Organization (NATO) are currently negotiating a treaty with the Warsaw Pact that would limit the number of conventional forces in Europe (CFE). This CFE treaty could result in disproportionately large reductions in the Pact's military weapons and personnel. Coupled with the dramatic political changes now occurring in Eastern Europe, this proposed treaty has raised the possibility of a large reduction in the U.S. defense budget.

At the request of the Senate Committee on the Budget, the Congressional Budget Office (CBO) is analyzing the effects of NATO's proposed CFE treaty on the U.S. military. CBO's analysis deals only with the Army and tactical Air Forces--whose forces would be directly limited by the CFE treaty--and examines both budgetary and military effects. In order to provide information for the upcoming debate over the defense budget, this paper summarizes CBO's findings to date. A more complete analysis will be made available later. In keeping with CBO's mandate to provide objective analysis, the paper makes no recommendations.

This paper was prepared by Frances M. Lussier of CBO's National Security Division under the general supervision of Robert F. Hale and John D. Mayer. William P. Meyers of CBO's Defense Cost Unit provided cost analyses. The author wishes to thank Dick Fernandez, Lane Pierrot, Jonathan Ladinsky, and David Moore of CBO, and Elizabeth Chambers, formerly of CBO, for their assistance. The author also wishes to thank several members of the RAND Corporation, particularly Richard Kugler, Paul Davis, and Adele Palmer, for their comments. (The assistance of external participants implies no responsibility for the final product, which rests solely with CBO.) Sherry Snyder edited the report. Pat Frisby and Rhonda Wright typed the earlier drafts, and Kathryn Quattrone prepared the report for publication.

Robert D. Reischauer
Director

January 1990

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*BUDGETARY AND MILITARY EFFECTS
OF A TREATY LIMITING CONVENTIONAL
FORCES IN EUROPE*

INTRODUCTION AND SUMMARY

The United States and its allies in the North Atlantic Treaty Organization (NATO) are currently negotiating a treaty with the Soviet Union and its Warsaw Pact allies that would limit conventional military forces in Europe (CFE). Under NATO's proposal, this CFE treaty would establish parity between NATO and the Warsaw Pact in the number of major weapons held by each alliance--a step that would require disproportionately large reductions in Pact weapons. For example, the Pact would have to destroy about 37,000 tanks compared with about 2,000 for NATO. The Soviet Union would have to withdraw from Europe and demobilize 325,000 troops compared with 30,000 for the United States.

These large reductions in Warsaw Pact military forces have raised the possibility of substantial reductions in U.S. military forces and in the military budget. The prospects for such a "peace dividend" have been enhanced by recent events in Eastern Europe--notably, the opening of the Berlin Wall, reduced cohesion within the Warsaw Pact, and the move toward democratic governments in several Eastern European countries.

This paper assesses the current balance of forces in Europe and how NATO's proposed CFE treaty would affect U.S. military forces and budgets. Two options that would make even larger reductions in U.S. forces are also examined. The analysis assumes that NATO's proposals are fully accepted even though negotiations are ongoing and will no doubt result in some changes. Also, because it is not clear how long it will take to reach agreement on, ratify, and carry out a CFE treaty, budgetary effects are assessed for a future period after enough time has elapsed to permit full implementation of the treaty. For the options discussed in this paper, which go beyond the reductions proposed by NATO, that period could be five years or even longer.

Finally, this paper focuses on funds allotted for the military forces directly limited by the CFE treaty--namely, the budgets of the Army and the tactical Air Force, which accounts for roughly one-third of the total Air Force budget.¹ A CFE treaty would not limit the other forces of the U.S. military--naval, strategic, and marine--and so they are as-

1. The rest of the Air Force budget provides funds for the strategic, air defense, and airlift forces within the U.S. Air Force, as well as for research and development programs, military construction, and other activities.

sumed to be outside the scope of this paper. The Army and tactical Air Force budgets together account for about 35 percent of the total 1990 budget for the Department of Defense (DoD), a proportion that readers should bear in mind when assessing the size of savings achieved. The remainder of this section summarizes CBO's key conclusions.

Effects of NATO's Proposed CFE Treaty

Today's balance of military forces in Europe heavily favors the Warsaw Pact. Based on CBO's analysis, which takes both the quantity and quality of weapons into account, the current capability of the Pact's ground forces in the central portion of Europe--where most U.S. forces in Europe are stationed in peacetime--exceeds NATO's capability by 20 percent to 90 percent, depending on how long both sides have to mobilize their forces. (Ground forces are defined as Army units intended to fight primarily on land.) Throughout Europe, the capability of the Pact's tactical aircraft exceeds NATO's capability by about 20 percent. (Tactical aircraft include the fighters and bombers that would attack enemy targets in the air and on the ground using conventional munitions.)

Once NATO's proposed version of the treaty has been carried out, NATO and the Warsaw Pact would have roughly equal capability on the ground, and NATO would have a significant advantage--about 32 percent--in the capability of its tactical aircraft. These large improvements in the balance of forces should sharply reduce the risk that the Warsaw Pact could successfully invade NATO countries.

In contrast to the sharp reduction in risk, the proposed treaty would result in only a modest reduction in the U.S. military budget because few U.S. weapons and personnel would be eliminated. CBO used an illustrative reduction that would meet the requirements of the treaty in order to estimate potential budgetary savings associated with the treaty. This potential reduction included withdrawal of two-thirds of one Army division and $1\frac{1}{3}$ wings of fighter aircraft from Europe--a total of 30,000 troops (25,900 Army and 4,100 Air Force). After the treaty is fully in place and military reductions have been made, which might not occur until 1993, savings might average slightly less than \$3 billion a year--about 3 percent of the budgets for the Army and tactical Air Force, and less than 1 percent of the total DoD budget. Savings re-

flect reductions from the level of funding in the 1990 budget in both operating and procurement costs, but they do not reflect added costs of verification, which cannot currently be estimated with confidence.

Option I: Make Larger Reductions in U.S. Forces for NATO but Maintain Adequate Geographic Coverage

The United States could decide that the reduction in military tensions that would follow in the wake of a CFE treaty, coupled with political changes in Eastern Europe, would allow it to commit an even smaller force to NATO. Although this approach would forgo some of the reduction in military risk afforded by the treaty, it would also realize greater budgetary savings by eliminating more U.S. military forces than required by the treaty. Reductions could involve U.S. forces stationed in Europe, those based in the United States that would reinforce European forces in the event of war, or both.

The United States might, for example, eliminate about 20 percent of the current ground and tactical air capability that would support its NATO allies early in a war. This approach could involve eliminating $2\frac{2}{3}$ of the Army's 18 active divisions and $5\frac{2}{3}$ of the Air Force's 35 active and reserve wings. Slightly more than 143,000 personnel would be cut from the Army and the tactical portion of the Air Force.

If NATO allies matched the U.S. reductions, as seems likely, the Warsaw Pact would have more weapons than NATO. But even with this 20 percent reduction, the balance of forces would be better than today's balance. Also, NATO's remaining forces should be able to mount a forward defense of the long inter-German border without having to withdraw to better defensive positions deep within West Germany.

A reduction in forces of 20 percent from current levels would eventually result in larger budgetary savings than those offered by the treaty itself. However, these reductions might not be initiated until after the treaty had been fully carried out. Furthermore, reducing the Army and the Air Force by more than 143,000 people could take several years. In an average year after full implementation of this option--sometime in the late 1990s--savings from the 1990 budget level could amount to \$12 billion. These savings represent 12 percent of the

affected portion of the defense budget, and 4 percent of DoD's 1990 budget.

Option II: Make Reductions in U.S. Forces for NATO Proportional to Pact Reductions

If a CFE treaty is signed and ratified, the United States also could consider a large military reduction on the same scale as that required of the Warsaw Pact by the treaty. Such a reduction might be justified by recent political changes and by a desire to achieve large budgetary savings. The United States could, for example, reduce its ground and tactical air forces committed to NATO by about 50 percent from the current level--roughly proportional to the cuts that the treaty would require in Pact forces. Proportional cuts would involve eliminating 7 of the Army's 18 active divisions and 14 $\frac{2}{3}$ of the Air Force's active and reserve wings. As many as 321,600 personnel would be cut from the Army and the tactical Air Force.

If the United States made such reductions, and the NATO allies made similar cuts, then the Pact could retain, even under the provisions of the CFE treaty, much of its current advantage in weapons and personnel. Thus, this approach would forgo the increased military security for NATO that would result from the treaty. Moreover, NATO might not have enough military forces to cover the inter-German border in a way that would permit a forward defense. By this measure, NATO could actually be at higher military risk than it is today.

Such a large reduction in forces, however, would eventually yield substantial budgetary savings. U.S. defense spending could eventually fall by as much as \$27 billion below the 1990 level--about 26 percent of the combined Army and tactical Air Force budgets, or 9 percent of the total DoD budget for 1990. Full savings would probably not be realized until several years after 1993.

Effect of Political Changes on Conventional Forces in Europe

A large reduction in NATO forces might be deemed reasonable in view of political events in the Soviet Union and Eastern Europe, which make war in Europe seem highly unlikely. For one thing, the threat

that the Warsaw Pact poses to Western Europe may seem less overwhelming because the Pact's cohesion can no longer be taken for granted. It is hard to predict what role, if any, non-Soviet Warsaw Pact members would play in an armed conflict. The easing of tensions between East and West that has resulted from the move toward democracy by Eastern European countries has also improved the climate for reductions in conventional forces that go beyond the currently proposed CFE treaty.

Large budgetary savings--on the order of those associated with Option II--could result from follow-on treaty negotiations, commonly referred to as CFE II. Although no formal proposals have been made, these negotiations could seek reductions of Pact and NATO forces to a level 50 percent below the current NATO level. In that case, NATO could enjoy a rough parity of military forces with the Warsaw Pact while still making reductions that would eventually reduce U.S. defense spending by as much as \$27 billion a year from the 1990 level.

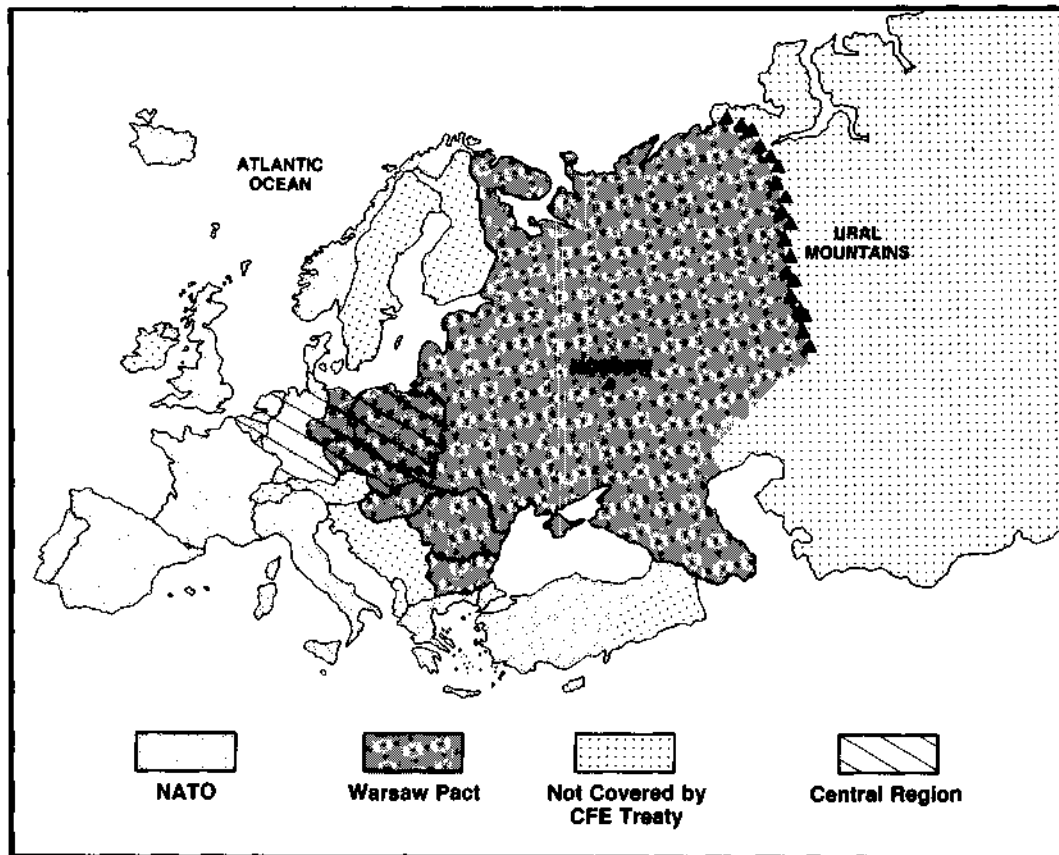
THE BALANCE OF MILITARY FORCES IN EUROPE TODAY

The concentration of weapons in Europe is currently very high. Including weapons owned by both alliances, the region between the Atlantic Ocean and the Ural Mountains in the Soviet Union--known as the "ATTU" region and covered by the ongoing CFE negotiations (see Figure 1)--currently contains almost 80,000 tanks, over 63,000 pieces of artillery, 19,300 combat aircraft, and more than 5 million ground troops organized into 292 divisions and 136 independent brigades. Indeed, the region has more than twice as many tanks today than in the fall of 1944 at the height of World War II. The majority of these weapons and ground troops belong to the Warsaw Pact, which enjoys an advantage of more than 2 to 1 over NATO in some categories (see Table 1). The Soviet Union operates most of the Warsaw Pact weapons, accounting for more than two-thirds of the Pact's weapons and troops, whereas the United States plays a much smaller relative role within NATO.

Numerical comparisons do not, however, tell the whole story. For example, the Pact's striking advantage in number of divisions can be partially explained by the fact that most Pact divisions contain fewer soldiers than NATO divisions. The Pact's numerical advantage in

combat equipment may also be offset somewhat by the higher quality of NATO's weapons. In addition, some analysts believe that NATO troops are better trained, fed, and supplied and thus would be better able to fight.

Figure 1.
Region Covered by NATO's Proposed Treaty Limiting
Conventional Forces in Europe



SOURCE: Congressional Budget Office based on Institute for Defense and Disarmament Studies, *Cutting Conventional Forces 1: An Analysis of the Official Mandate, Statistics, and Proposals in the NATO-WTO Talks on Reducing Conventional Forces in Europe* (Brookline, Mass.: Institute for Defense and Disarmament Studies, July 1989), p. 20.

Measuring Military Capability

Clearly, a method is needed to take into account both the quantity and quality of each side's weapons. Because of the inherent differences between air and ground combat forces, CBO used separate methods to analyze them.

TABLE 1. EQUIPMENT AND TROOPS POSITIONED BETWEEN THE ATLANTIC OCEAN AND URAL MOUNTAINS

	NATO			Warsaw Pact			Ratio NATO : Pact
	Total	U.S.	U.S. Share (Percent)	Total	Soviet	Soviet Share (Percent)	
Main Battle Tanks	22,224	6,000	27	57,300	37,000	65	1 : 2.6
Armored Personnel Carriers ^a	28,600	6,100	21	63,235	46,630	74	1 : 2.2
Artillery	17,328	2,232	13	46,270	33,000	71	1 : 2.7
Helicopters	2,599	700	27	3,880	2,850	73	1 : 1.5
Aircraft	6,706	700	10	12,592	9,234	73	1 : 1.9
Ground Troops (Thousands)	2,214	216	10	3,090	2,200	71	1 : 1.4
Divisions ^b	103	5 $\frac{1}{2}$	6	224 $\frac{1}{2}$	161 $\frac{1}{2}$	72	1 : 2.2

SOURCES: Congressional Budget Office based on Congressional Research Service, *Conventional Armed Forces in Europe (CFE) Negotiations: Facts and Figures* (October 30, 1989); Department of Defense, *CFE, Conventional Armed Forces in Europe* (July 1989); North Atlantic Treaty Organization, *Conventional Forces in Europe: The Facts* (Brussels: NATO, November 1988); The Analytic Sciences Corporation, *Atlantic-to-the-Urals Unclassified Conventional Weapon Systems Data Base* (Arlington, Va.: TASC, April 1988); and International Institute for Strategic Studies, *The Military Balance, 1989-1990* (London: IISS, Autumn 1989).

NOTE: Based primarily on NATO and U.S. assessments of alliance totals.

- a. National totals may not be consistent with alliance totals because of definitional differences between sources.
- b. Includes separate brigades and regiments. Assumes three brigades or regiments are equivalent to one division.

Ground Forces. For ground forces, CBO used a method developed by the Army that is based on weapon effectiveness indices (WEI) and weighted unit values (WUV).² The WEI/WUV technique evaluates and ranks each ground weapon of a particular type, such as an M1 tank, relative to other weapons of the same type and assigns it a score or index (WEI). Each type of weapon--such as tanks, artillery, or armored personnel carriers--then receives a weighting factor (WUV) that reflects its contribution to a combat unit's overall ability to perform its mission. For all the weapons in a combat unit, the individual indices (WEIs) are multiplied by the weighting factors (WUVs) and added up to attain a score for the unit. In this way, the ground forces of NATO and the Warsaw Pact can be evaluated on a common basis, taking into account both the quantity and quality of their weapons.

To compare the combat capability of the two alliances, CBO totaled the scores of all the combat units that would fight for the Pact and compared them with the total of the scores for NATO's combat units. It then divided the Pact's total score by NATO's total score to determine a ratio of Pact capability to NATO capability. These ratios do not take into account combat attrition; rather, they represent only those forces that would be available to each side before an attack begins.

The analysis of ground forces focuses on the central region of Europe (identified in Figure 1), which is generally assumed to include the NATO countries of West Germany, Belgium, Luxembourg, and the Netherlands, and the Pact countries of East Germany, Poland, and Czechoslovakia. This region is where U.S. forces stationed in Europe are concentrated in peacetime, and where most U.S. forces would fight in the event of war. Not all of the ground forces that might be involved in a conflict in the central region are stationed there during peacetime, however. In fact, most of the forces would have to be brought in from other countries, including a large number of reinforcing units from both the continental United States and the Soviet Union. When these

2. For a detailed discussion of CBO's analysis of the military balance in Europe, see Congressional Budget Office, *U.S. Ground Forces and the Conventional Balance in Europe* (June 1988). The WEI/WUV scores used in this paper are from a 1979 study and represent the latest data available on an unclassified basis (see Department of the Army, U.S. Army Concepts Analysis Agency, *Weapon Effectiveness Indices/Weighted Unit Values III (WEI/WUV III)* (November 1979)). Although 10 years old, this study included scores for weapons currently in use, such as the M1 and T-80 tanks and the Bradley fighting vehicle.

reinforcing units might actually arrive in the central region is a matter of some debate. This analysis used the assumptions of a study by the Department of Defense, which is one of the few detailed statements by DoD on this topic that is both unclassified and currently available.³

Recent press articles indicate that DoD is reevaluating the time that the Pact might need to ready its units that are not on full active status during peacetime. The mobilization rates used in this analysis assume that the least ready units would need 60 days of preparation. Units at the next highest level of readiness were assumed to be available after 15 days of preparation. Revising these times would not affect the total forces available to the Pact, but would affect the size of the advantage that the Pact would have over NATO at different points during the mobilization process.⁴ Unfortunately, no unclassified details of DoD's latest estimates are available. Thus, CBO's analysis does not reflect any recent revisions of Pact mobilization rates.

This analysis also assumes that all members of each alliance would participate in a major war. Recent events in Eastern Europe cast doubt on this assumption, particularly with regard to the participation of the Soviet Union's Eastern European allies. The military significance of the forces of these countries is discussed later in this paper.

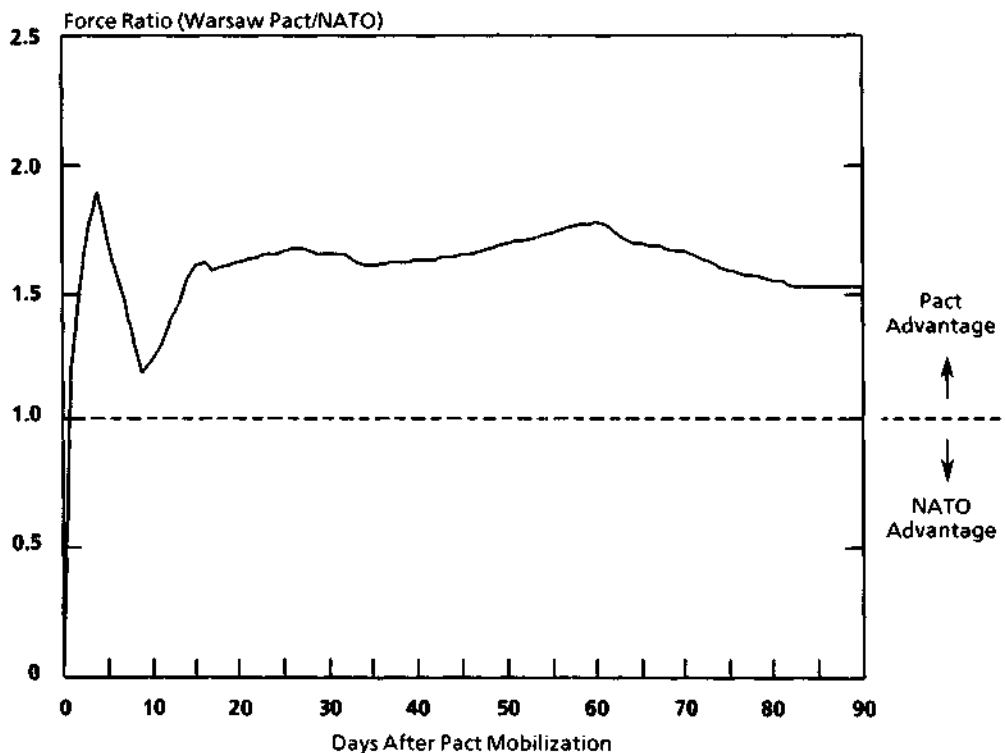
The calculations of forces available to the Warsaw Pact do not reflect recent unilateral reductions in Soviet forces. The reductions announced by President Gorbachev in December 1988 involve 5,000 tanks and six divisions and are still in the process of being realized in Soviet units in East Germany, Czechoslovakia, and Hungary. Recent reports from Eastern Europe indicate that these reductions are being made, but not quite as expected.⁵ Some equipment and personnel are being reassigned rather than eliminated from the Soviet military. When and if all of Gorbachev's announced reductions are carried out, the impact on Soviet forces available to oppose NATO will be measur-

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3. Department of Defense, Office of the Assistant Secretary of Defense for Program Analysis and Evaluation, *NATO Center Region Military Balance Study, 1978-1984* (July 1979).
 4. For more details on the effect of Pact mobilization times on the Pact/NATO force balance in the European central region, see Congressional Budget Office, *U.S. Ground Forces and the Conventional Balance in Europe*, pp. 23-25.
 5. House Committee on Armed Services, "Status of the Soviet Union's Unilateral Force Reductions and Restructuring of its Forces" (October 16, 1989).

able--a 10 percent to 24 percent reduction in forces available shortly after mobilization--but not large enough to offset the Pact's current advantage. Because of the uncertainty surrounding these reductions, they are not reflected in the rest of this analysis.

Based on these various assumptions, CBO's analysis suggests that the Warsaw Pact has a substantial advantage in the central region of Europe. Figure 2 shows the ratio of scores for Pact forces in the central region to those for NATO during the first 90 days after the Pact mobilizes for war. The ratio peaks at about 1.9 on the fourth day after

Figure 2.
Current Ground Force Ratios in the European Central Region



SOURCE: Congressional Budget Office based on Department of Defense data and William P. Mako, *U.S. Ground Forces and the Defense of Central Europe* (Washington, D.C.: Brookings Institution, 1983).

NOTE: Based on data available in mid-1989. Does not reflect unilateral Soviet withdrawals from Eastern Europe. Warsaw Pact forces include those from the Soviet Union, East Germany, Czechoslovakia, and Poland.

Pact mobilization begins and before NATO can respond on a large scale. The ratio drops to about 1.2 after nine days when all of NATO's divisions stationed in the central region during peacetime are ready for combat, and then stabilizes at a value of 1.6 or slightly higher through the seventy-fifth day after mobilization begins. Although these advantages are significant, they may not be sufficient to ensure the success of a Pact attack, especially since the WEI/WUV method describes the situation on the ground only.

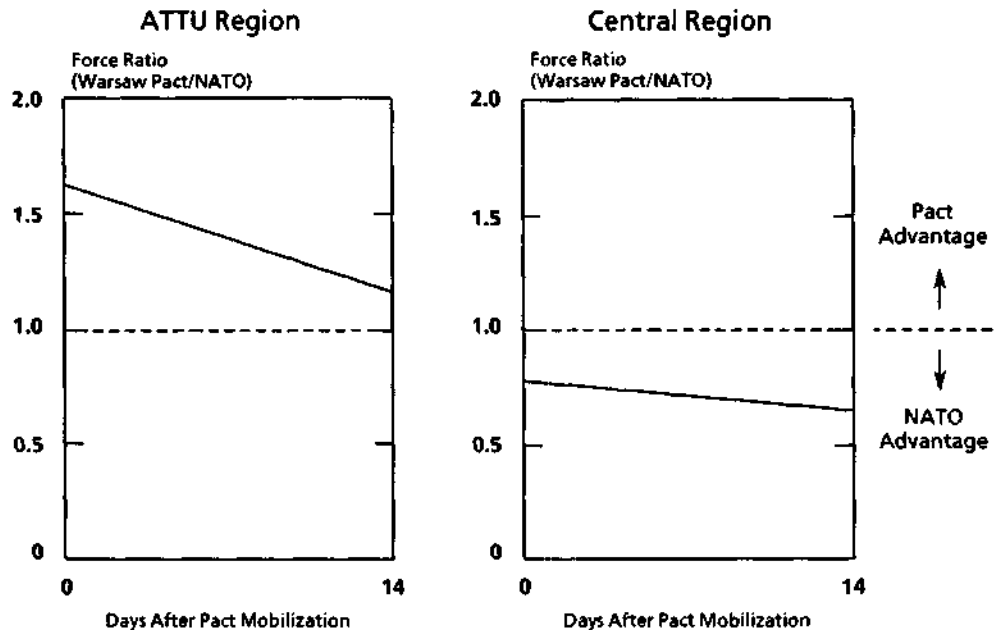
Air Forces. The Warsaw Pact enjoys markedly less advantage over NATO in the air than on the ground. Indeed, under some assumptions, Warsaw Pact air forces are inferior to NATO air forces. In the region between the Atlantic Ocean and the Ural Mountains, the Pact has many more aircraft than does NATO. According to NATO's assessment, the Pact has 12,592 combat aircraft in the ATTU region compared with NATO's 6,706--an advantage of about 2 to 1.

The Pact advantage may, however, be smaller than these numbers suggest. The Pact's numerical total includes more than 4,000 trainer aircraft, which may not be fully capable of performing combat missions. The Pact total also includes about 1,800 interceptor aircraft designed primarily to defend the Soviet Union. Some analysts question whether these interceptors would play a significant role in an invasion of Western Europe. Moreover, some NATO aircraft not in Europe in peacetime could be introduced into the theater during a war, including more than 1,400 additional U.S. aircraft based in the continental United States that could arrive within 10 days after NATO started to mobilize. If total numbers of aircraft are adjusted for these factors, the Pact's numerical advantage appears less formidable.

As with ground forces, these numerical tallies do not reflect the variations in quality among the many types of aircraft in each alliance. To account for differences in quality, CBO used a method called TASCFORM, developed by The Analytic Sciences Corporation. In a manner similar to the WEI/WUV method used for the ground forces, TASCFORM assigns scores to each type of aircraft.⁶

6. The Analytic Sciences Corporation, *The TASCFORM Methodology: A Technique for Assessing Comparative Force Modernization* (Arlington, Va.: TASC, January 1984). TASCFORM scores are also discussed in Congressional Budget Office, *Tactical Combat Forces of the United States Air Force: Issues and Alternatives* (April 1985).

Figure 3.
Current Air Force Ratios in Europe



SOURCE: Compiled by the Congressional Budget Office based on data from International Institute for Strategic Studies, *The Military Balance, 1989-1990* (London: IISS, Autumn 1989); The Analytic Sciences Corporation, *Atlantic-to-the-Urals Unclassified Conventional Weapon Systems Data Base* (Arlington, Va.: TASC, April 1988); and The Analytic Sciences Corporation, *The TASCFORM Methodology: A Technique for Assessing Comparative Force Modernization* (Arlington, Va.: TASC, January 1984).

NOTE: The ATTU region extends from the Atlantic Ocean to the Ural Mountains. The analysis assumes that all reinforcing aircraft arrive in the ATTU region within 14 days of Pact mobilization. The ratios depicted between zero and 14 days after mobilization are not meant to imply detailed knowledge of the exact arrival schedule of reinforcements. They are presented here only to give an indication of the impact of reinforcements on the air force ratios.

Taking into account the quality of Pact and NATO aircraft through application of the TASCFORM scores reduces the Pact's advantage because NATO's aircraft are more sophisticated and more capable. While Pact aircraft in the ATTU region outnumber NATO aircraft by a ratio of 1.9 to 1, the ratio of TASCFORM scores is only about 1.6 to 1 before the arrival of reinforcements from the continental United States (see Figure 3).⁷ The Pact advantage would be even

7. NATO probably would not start to mobilize its forces until it observed that the Pact was doing so. For this analysis, CBO assumed that NATO would start to mobilize 4 days after the Pact started to mobilize. All reinforcing aircraft, therefore, would arrive in theater by 14 days after Pact mobilization.

smaller if trainer and interceptor aircraft are assumed not to be used in combat.

Despite its large advantage in tactical aircraft throughout the ATTU region, the Pact is at a disadvantage when only those tactical aircraft based in the central region are considered. Although aircraft are more mobile than ground forces, the early stages of a conflict in a particular region might initially involve only the aircraft stationed there. The availability of ground facilities could also limit the number of additional aircraft that could be brought into the central region from the rest of the ATTU area. Before the arrival of reinforcements, NATO air forces in the central region outscore the Pact by a ratio of 1.3 to 1 using the TASCFORM system (see Figure 3). After the arrival of reinforcements from the United States and the Soviet Union, NATO outscores the Pact by a ratio of 1.5 to 1.

What the Ratios Mean

The measures of air and ground combat capability used in this study are crude and subject to important limitations. Neither the TASCFORM nor the WEI/WUV method takes into account losses during combat. Thus, the methods show the availability of weapons but do not predict the likely outcome of a war. Nor do they account for the aptitude and training of the soldiers and pilots operating the weapons. Both methods also ignore the contribution of noncombat capabilities such as logistics support, communications, and medical equipment. Finally, the scores and weights are, to some extent, subjective. Despite these limitations, both methods provide a simple way to assess the approximate level of combat capability.

The WEI/WUV method reveals a clear advantage for the Pact in ground forces in the central region. Would this advantage be sufficient to ensure success if the Pact decides to invade Western Europe today? Many defense experts feel that, because the defender can choose the place to defend, an attacker must attain a ratio of ground forces of at least 3 to 1 in a local area in order to overwhelm the defender. There is less agreement, however, on what ratios are needed in the central region as a whole in order to achieve the required local advantage while still providing enough forces elsewhere to prevent an enemy breakthrough. Although experts differ widely, ratios ranging between

1.2 to 1 and 2 to 1 are commonly suggested as the minimum theater-wide advantage that the Pact would need to have confidence of succeeding in an attack.⁸ CBO's analysis suggested that the ratio of Pact to NATO forces generally hovered around 1.6 to 1--above the level that some experts believe could lead to a Pact victory, but well below the threshold cited by other analysts.

Consequently, CBO's analysis leads to the conclusion that the Pact could not be confident of obtaining a military victory. The Pact's advantage on the ground is substantial but not overwhelming; it may not be enough to ensure quick success. Moreover, the ground advantage may be offset somewhat by the superiority of NATO air forces in the central region. Nor could the Soviet Union know ahead of time whether its allies would fully support an invasion or how quickly NATO would respond. Unfavorable assumptions about either of these factors would reduce significantly the Pact's advantage in ground forces. All these uncertainties make it hard for Pact planners to be confident of victory, and so add to deterrence. This uncertainty has probably helped to maintain the peace in Europe for 40 years.

Nevertheless, NATO military commanders have long argued that--if the Pact decided to attack NATO--they would have no choice but to resort quickly to the use of nuclear weapons to defend Western Europe. General Bernard Rogers, former Supreme Commander of NATO, has said repeatedly that he would be forced to seek permission to use tactical nuclear weapons within days of a Warsaw Pact invasion. Military commanders may have used conservative assessments in reaching such a conclusion, but their concerns have fostered strong interest in negotiating reductions in the Pact's military advantage through an agreement to limit conventional arms. Recent political events have made reductions of conventional forces in Europe a real possibility in the near future.

8. Andrew Hamilton, "Redressing the Conventional Balance," *International Security*, vol. 10, no. 1 (Summer 1985), pp. 111-136, cited in James A. Thomson, *An Unfavorable Situation: NATO and the Conventional Balance*, RAND Note N-2842-FF/RC (Santa Monica, Calif.: RAND, November 1988), p. 21.

EFFECTS OF A CFE TREATY ON THE MILITARY BALANCE IN EUROPE AND ON THE U.S. DEFENSE BUDGET

Both NATO and the Warsaw Pact have submitted the outlines of their proposals for a treaty limiting conventional arms at the CFE negotiations in Vienna. Although the submissions are not identical, they are surprisingly similar with respect to the ground force equipment each side would be allowed to retain. Most important, the Warsaw Pact has accepted NATO's longstanding position that the Pact must reduce its forces to a level equal to NATO's forces. The analysis that follows is based on NATO's proposed treaty. Major differences between the two proposals are noted, however, because those differences could well lead to revisions in NATO's proposal.

NATO's Proposal

In general, NATO's proposal for a treaty limiting conventional forces in Europe would reduce to equal levels the number of weapons held by each alliance in various categories. The proposed ceilings are purposely set below current NATO holdings (see Table 2). Although NATO would have to reduce its weapons holdings in various categories by between 2 percent and 27 percent, the Pact would have to make much larger reductions--as high as 65 percent. Proposed ceilings differ for various categories of equipment, as does the size of the reductions that would have to be made.

Ground Equipment. NATO proposes that each side would be allowed to station in the ATTU region no more than 20,000 tanks; 28,000 armored personnel carriers; 16,500 pieces of artillery; and 1,900 helicopters. Because the Pact starts with large numerical advantages in ground equipment, it would have to make much larger reductions than NATO. For example, the Pact would have to eliminate 37,300 tanks compared with only about 2,200 for NATO.

The Pact proposal includes similar ceilings for most ground equipment, but has different definitions of what would be counted. For example, the Pact would include light tanks, as well as main battle tanks, in its limit of 20,000 tanks, whereas NATO would count only main battle tanks. Similar disagreements exist with regard to definitions of armored personnel carriers and helicopters.

Aircraft. NATO proposes a limit of 5,700 on all land-based combat aircraft, including aircraft used for training and the Soviet interceptors that the Soviet Union claims would be used primarily to defend its homeland. This limit would require NATO to reduce its inventory of these aircraft by 15 percent and the Pact by 55 percent. Disagreements between NATO and the Warsaw Pact about aircraft are much more significant than those regarding ground equipment. The Pact would exclude some or all of the trainer and interceptor aircraft from the negotiations.

Troops. The treaty would also limit the number of U.S. and Soviet troops stationed in Europe but outside their home territory. The proposed ceiling of 275,000 on air and ground personnel would require the withdrawal of 30,000 U.S. and 325,000 Soviet troops. The Pact proposal would allow a larger number of troops in Europe but would

TABLE 2. PROVISIONS OF NATO'S PROPOSED TREATY
LIMITING CONVENTIONAL FORCES IN EUROPE

	Proposed Ceiling	Proposed Reductions				Ratio NATO : Pact
		NATO		Warsaw Pact		
		Number	Percent	Number	Percent	
Main Battle Tanks	20,000	2,224	10	37,300	65	1 : 17
Armored Personnel Carriers	28,000	600	2	35,235	56	1 : 59
Artillery	16,500	828	5	29,770	64	1 : 36
Helicopters	1,900 ^a	699	27	1,980	51	1 : 3
Aircraft	5,700	1,006	15	6,892	55	1 : 7
Troops ^b	275,000	30,000	1	325,000	11	1 : 11

SOURCE: Congressional Budget Office based on Congressional Research Service, *Conventional Armed Forces in Europe (CFE) Negotiations: Facts and Figures* (October 30, 1989).

- a. The ceiling on helicopters and the current NATO inventory reported by NATO (2,599) are inconsistent with a 15 percent reduction.
- b. U.S. and Soviet troops only.

apply the limit to all NATO and Pact troops located outside their home territory--not just those of the United States and the Soviet Union.

NATO also proposes that all eliminated weapons be destroyed and that the U.S. and Soviet troops removed from Europe be demobilized. NATO has proposed extensive verification procedures, including the right of both sides to inspect the other's military forces. Finally, NATO asks that a treaty be signed in 1990 and be fully carried out by 1993, although doubts remain about the feasibility of this schedule.

The Implications of a CFE Treaty for the Military Balance

The large reductions in the number of Warsaw Pact weapons required by NATO's proposed CFE treaty would have profound effects on the relative combat capability of both sides. The proposal would greatly reduce the concentration of arms in Europe, although each alliance would retain large military forces. In fact, even after the treaty is implemented and more than 39,000 tanks have been destroyed, the 40,000 tanks remaining in Europe would still exceed the number deployed there during World War II. Thus, each side would still have considerable capability to wage war.

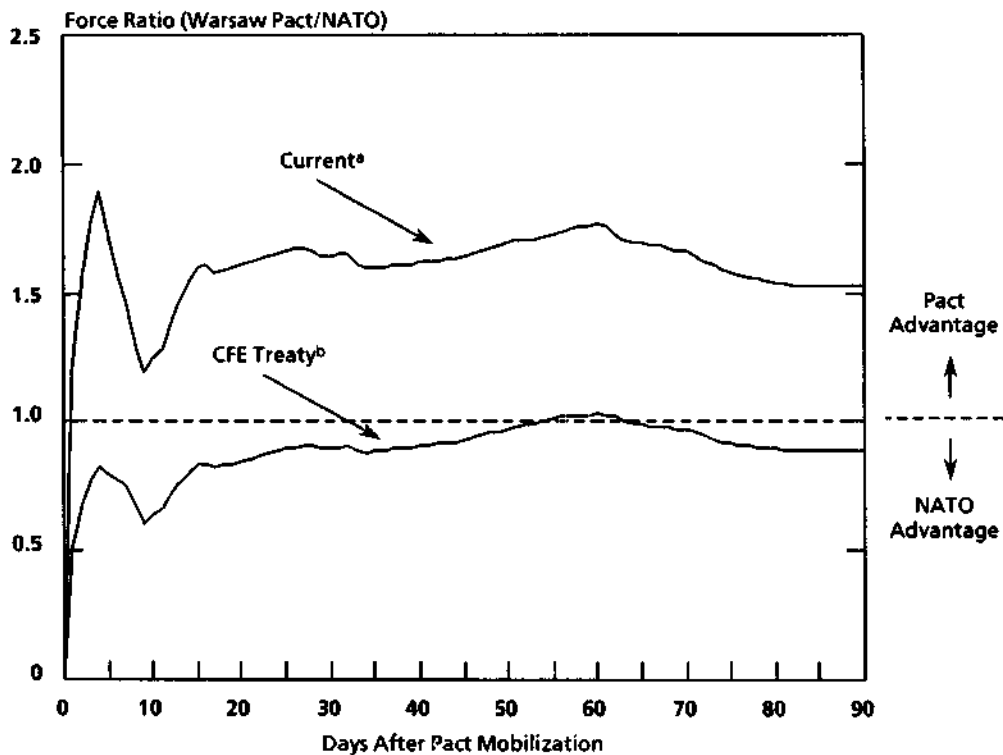
Once the treaty has been carried out, the capability of Pact ground forces--as measured by the WEI/WUV method--would almost never exceed that of NATO ground forces (see Figure 4).⁹ Indeed, during most of the 90-day period after the Pact starts to mobilize, NATO would enjoy a modest advantage because of its higher quality of weapons and the time that the Soviet Union would need to prepare its less ready units and transport them to the region near the inter-German border. This situation contrasts sharply with the current balance of forces; the Pact's current capability on the ground exceeds NATO's by between 20 percent and 90 percent during the first 90 days after mobilization begins.

The effects of NATO's proposed CFE treaty on air forces would be even more favorable to NATO. The proposal would permit each alli-

9. This analysis was based on the removal of entire combat units in order to meet CFE treaty limits on weapons held by each alliance. The analysis also assumes that each country in both alliances reduces its weapons inventories within each category by the same proportion.

ance to have 5,700 aircraft stationed in the ATTU region during peacetime. But aircraft stationed in the continental United States would not be limited by the treaty and would add significantly to NATO's air capability during a crisis. After these reinforcements arrived in Europe, NATO would have 28 percent more aircraft and, because its aircraft are of higher average quality, a 32 percent advantage in capability as measured by TASCFORM scores (see Figure 5). In contrast,

Figure 4.
Ground Force Ratios in the European Central Region
Under NATO's Proposed CFE Treaty



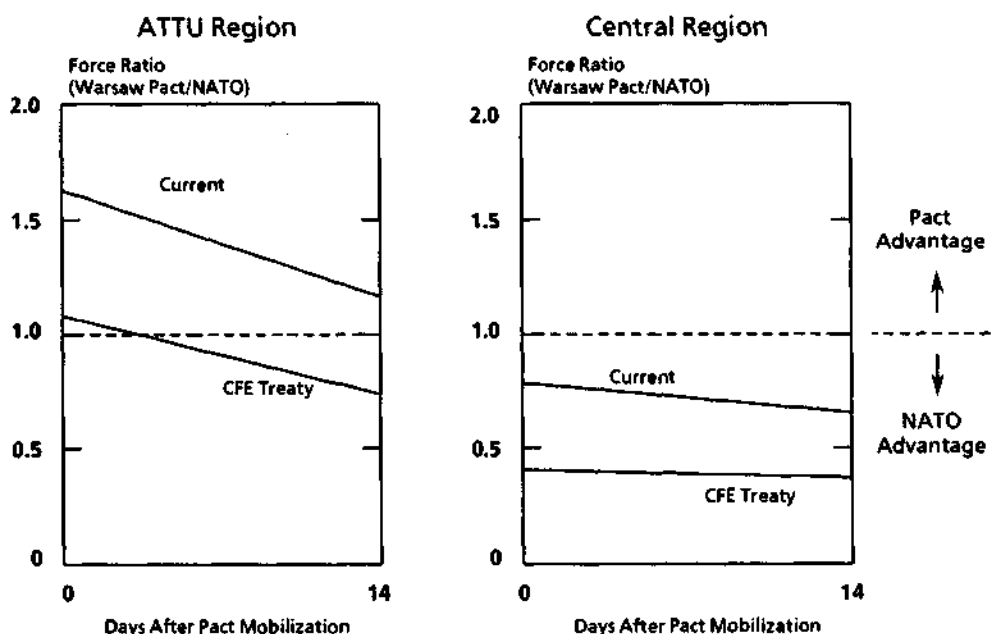
SOURCE: Congressional Budget Office based on Congressional Research Service, *Conventional Armed Forces in Europe (CFE) Negotiations: Facts and Figures* (October 30, 1989).

- a. Based on data available in mid-1989. Does not reflect unilateral Soviet withdrawals from Eastern Europe. Warsaw Pact forces include those from the Soviet Union, East Germany, Czechoslovakia, and Poland.
- b. Based on withdrawal of combat units to meet the treaty's ceilings on weapons.

the Pact currently enjoys an advantage in both numbers and capability in the ATTU region.

NATO's advantage could be even more pronounced in the central region of Europe. After reinforcements arrive from the United States, NATO could enjoy an advantage of 2.6 to 1 in capability based on the TASCFORM method (see Figure 5). This large advantage results in part because of the following assumptions: that, in complying with NATO's proposal, each Warsaw Pact member reduces its total holdings by the same proportion; that within broad types of aircraft, such as

Figure 5.
Air Force Ratios in Europe Under
NATO's Proposed CFE Treaty



SOURCE: Congressional Budget Office based on Congressional Research Service, *Conventional Armed Forces in Europe (CFE) Negotiations: Facts and Figures* (October 30, 1989).

NOTE: The ATTU region extends from the Atlantic Ocean to the Ural Mountains. The analysis assumes that all reinforcing aircraft arrive in the ATTU region within 14 days of Pact mobilization. The ratios depicted between zero and 14 days after mobilization are not meant to imply detailed knowledge of the exact arrival schedule of reinforcements. They are presented here only to give an indication of the impact of reinforcements on the air force ratios.

fighter-bombers, reductions are made proportionately; that the least capable aircraft are eliminated first; and that the remaining Soviet aircraft would not be redistributed from their current location. This disadvantage in air capability in the central region would be minimized if the Pact accommodated the proposed limits in a different manner. But NATO's proposal would almost certainly leave NATO with some advantage in air forces, both in the central region and in the entire ATTU region.

Budgetary Savings Resulting from a CFE Treaty

NATO's proposed CFE treaty would require it to reduce its inventory of selected weapons by as much as 27 percent. Assuming that all members of the alliance reduced their inventories proportionately, the United States would have to remove from Europe and destroy 600 tanks, 122 armored personnel carriers, 112 pieces of artillery, 189 helicopters, and 105 aircraft. To reduce the number of U.S. Air Force and Army personnel stationed in Europe to the proposed ceiling of 275,000, about 30,000 U.S. troops would have to be brought back from Europe and demobilized.

There are, of course, many ways to accommodate these limits. In order to estimate potential budgetary savings, CBO constructed an illustrative withdrawal that included two-thirds of one Army "heavy" division (that is, a full division minus one of its three brigades) and 1½ wings of F-16 fighter aircraft.¹⁰ The troops assigned to these units, and those that support them, would total 30,000--including 25,900 Army and 4,100 Air Force personnel (see Table 3).

The operating savings associated with eliminating these units and personnel from the military would total slightly more than \$2 billion a

10. An Army division of the "heavy" type that would be withdrawn consists of about 16,000 personnel directly assigned to the division and associated equipment. The heavy designation means that the division contains tanks and other heavy equipment. Divisions usually include three brigades. A wing of aircraft typically consists of 72 aircraft plus backups. A wing is usually made up of three squadrons, each with 24 aircraft. Thus, 1½ wings would refer to one full wing plus an extra squadron.

TABLE 3. EFFECT OF NATO'S PROPOSED CFE TREATY AND OPTIONS ON THE ARMY AND AIR FORCE

	1990 Levels ^a	Reductions		
		Treaty	Option I	Option II
Army				
Active Military Personnel	764,000	25,900	113,400	246,000
Active Divisions	18	2 $\frac{2}{3}$	2 $\frac{2}{3}$	7
Reserve Divisions	10	0	0	0
Air Force				
Active Military Personnel	567,500	4,100	29,800	75,600
Active Tactical Wings	23	1 $\frac{1}{3}$	4	10
Reserve Tactical Wings	12	0	1 $\frac{2}{3}$	4 $\frac{2}{3}$

SOURCE: Congressional Budget Office based on Department of Defense data.

NOTE: Option I would provide sufficient NATO forces to cover the entire inter-German border. Option II would make reductions in U.S. forces for NATO proportional to reductions in Pact forces resulting from the CFE treaty.

a. Based on Congressionally authorized end strengths for 1990.

year in 1990 dollars (see Table 4).¹¹ These savings include money for military pay and benefits, operation and maintenance of equipment associated with the units, procurement of spare and replacement parts, and some military construction. These savings, measured from the 1990 budget, would not be fully realized until the reductions associated with the treaty were made. Based on the current schedule for implementing the treaty, the cuts may not be completed until 1993.

11. Budgetary savings could be even more modest because of recent Congressional action. In its 1990 authorization bill for the Department of Defense, the Congress directed the Army and the Air Force to reduce their personnel in Europe by a total of 14,600 to reflect the removal of units associated with intermediate-range nuclear forces (INF) under the recent treaty. Since NATO's proposed CFE treaty would establish a ceiling of 275,000 for U.S. forces in Europe, removing the 14,600 INF-related troops might mean that only 15,400 other troops would have to be demobilized in order to comply with the CFE treaty. Demobilizing fewer troops could reduce annual savings by about \$550 million.

Further savings would also be achieved in procurement funding, because the fewer remaining units would not need as much modern equipment. If the annual procurement budgets for the Army and tactical Air Force were reduced by the same proportion as the force structure, then almost half a billion dollars could be added to the annual savings in an average year, resulting in total savings of almost \$3 billion a year.

These savings would be a small percentage of the total defense dollars spent each year for the Army and tactical Air Force. In 1990, funds for these forces accounted for about \$103 billion, or approximately 35 percent of the total budget for the Department of Defense.

TABLE 4. SUMMARY OF ANNUAL BUDGETARY SAVINGS
(In billions of 1990 dollars)

	Operating and Support ^a	Long- Term Procure- ment ^b	Total Annual Savings	Percentage Reductions in Army and Tactical Air Force Budgets
Reductions Required by NATO's Proposed CFE Treaty	2	c	3	3
Option I: Make Larger Reduc- tions in U.S. Forces for NATO but Maintain Adequate Geographic Coverage	10	2	12	12
Option II: Make Reductions in U.S. Forces for NATO Proportional to Pact Reductions	22	5	27	26

SOURCE: Congressional Budget Office based on Department of Defense data.

a. Includes share of overhead.

b. Long-term procurement savings are based on proportional reductions in procurement budgets for the Army and tactical Air Force.

c. Less than \$500 million.

The estimated annual savings of \$3 billion amounts to about 3 percent of the combined Army and tactical Air Force budgets for 1990, and less than 1 percent of the entire DoD budget for that year.

Costs of Verification

It is difficult to predict how much it will cost the United States to verify compliance with the proposed CFE treaty. History provides no guidance because the United States has not been involved recently in such a treaty. Moreover, basic decisions that will greatly affect the costs of verification--such as the frequency of inspections at military installations and production facilities--have not yet been made. Because verification costs cannot be predicted with confidence, they are not included in any of the cost estimates in this study.

It is fair to assume, however, that the costs associated with verifying compliance with a CFE treaty could substantially reduce the annual savings of \$3 billion attributable to the treaty. Implementation of the INF treaty, for example, costs the United States about \$150 million annually. These funds pay for destroying U.S. INF missiles, monitoring the Soviet Union's destruction of its missiles, monitoring several sites in the Soviet Union, and escorting the Soviet inspectors who are monitoring the single U.S. production site. While compliance with the INF treaty required each country to destroy hundreds of missiles and to monitor a small number of sites, carrying out a CFE treaty could require each alliance to destroy thousands of weapons and to monitor many production and storage sites. Thus, verification costs associated with the CFE treaty could conceivably be many times those associated with the INF treaty.

Overall Assessment of the Impact of NATO's CFE Proposal

NATO would enjoy substantial benefits if its proposed CFE treaty were carried out. The Warsaw Pact would have to make much larger reductions in its personnel and inventories of weapons than would the NATO allies, leaving NATO in a much better military position--both on ground and in the air--than it enjoys today. As a result, a CFE treaty would enhance NATO's conventional deterrence and reduce the

risk of NATO's having to resort to nuclear weapons in response to a Pact attack. In short, military risk would be sharply reduced.

While the reduction in risk is substantial, budgetary savings would be modest. Moreover, even these modest savings would be offset--perhaps to a substantial degree--by the costs of verifying compliance with the treaty. If larger budgetary savings are to be achieved, then NATO will have to consider forgoing some of the reduction in military risk offered by the treaty.

OPTIONS FOR LARGER U.S. FORCE REDUCTIONS

The proposed CFE treaty could reduce the combat capability of the Warsaw Pact on the ground and in the air by as much as 50 percent. NATO's combat capability, however, would be reduced by a much smaller fraction--about 8 percent or less. An attack by the Warsaw Pact might be highly unlikely, however, in view of the Pact's greatly reduced military forces, the economic problems plaguing its members, and the reduced cohesion within the Warsaw Pact as many of its members move toward democracy. Given this situation, the United States and its NATO allies might decide to make larger cuts in their military forces than are required by the proposed treaty, thereby achieving larger budgetary savings.

To illustrate the effects of larger reductions, this paper examines two options. The first would attempt to provide NATO with enough forces for adequate geographic coverage while still producing moderately larger budgetary savings than those associated solely with the treaty. The second would make reductions of 50 percent in U.S. forces currently committed to NATO--proportional to those that would be made by the Warsaw Pact under the treaty--and would produce even larger budgetary savings. Both options would reduce U.S. forces stationed in Europe as well as those forces that are stationed in the United States during peacetime but are intended as reinforcements for NATO in time of war.

Since the focus of this paper is on changes in the U.S. military that might occur as a result of the completion of a treaty limiting conventional forces in Europe, the options were constructed with the same limitations in mind. Only those forces that would be limited by a CFE

treaty--forces of the U.S. Army and the tactical Air Force--were considered as candidates for elimination from the U.S. military. The options that CBO analyzed therefore do not include reductions in naval, marine, or strategic forces. Nor are any reductions assumed in funding for the defense agencies that support the U.S. military as a whole, or in research and development programs.

Although this study focuses on budgetary changes in the Army and the tactical portion of the Air Force because those parts of the defense budget would be directly affected by the proposed CFE treaty, other portions of the defense budget could be affected indirectly. For example, if there are fewer Army divisions to support during a major European war, then fewer aircraft carriers and submarines may be needed to protect convoys headed for Europe. More important, if arms limitations of the sort in the proposed CFE treaty convince the United States that its national security is less threatened, then it may elect to make reductions in other defense forces, such as naval or strategic forces, even if they are not at all related to the treaty. Reductions in the 65 percent of the defense budget not addressed in this paper would obviously increase savings. Such reductions, although possible in the face of a reduced threat, cannot be directly attributed to a CFE treaty and are therefore beyond the scope of this paper.

The options considered here would remove units and personnel completely from the Army and tactical Air Force, resulting in a smaller U.S. military. One alternative to this approach would be to remove units from the active military and put them in the reserves. By placing units in the reserves, the United States would retain the capability to reinforce NATO, albeit at a slower pace than is possible today. Retaining some residual capability would come at a price, however. Although reserve Army units are much cheaper to maintain than active units, reserve Air Force units are almost as expensive to operate and support as active units, in part because of the high level of training required of reserve pilots. Although this paper focuses on eliminating active forces because such reductions produce large budgetary savings, placing such forces in the reserves is certainly an alternative that merits serious consideration.

Both options examined in this paper include reductions that go beyond those required by any treaty that is likely to be signed in the next year. As such, they would most likely be considered as actions

that would be taken after the provisions of a CFE treaty have been carried out. Thus, the process for making the reductions included in the options might not be initiated until 1993. Furthermore, the larger reductions associated with the options--several divisions and tactical air wings--could take several years to complete if they are to be made without significant disruption to the armed services or to local economies. The full annual savings associated with each of the options, therefore, might not be realized until several years after 1993.

Option I: Make Larger Reductions in U.S. Forces for NATO but Maintain Adequate Geographic Coverage

Some analysts have argued that, regardless of the threat from the Warsaw Pact, a minimum number of combat units would be required in the central region to cover adequately the entire 750-kilometer border between NATO and the Warsaw Pact countries. They claim that a minimum force is required to provide adequate firepower along the border and to provide enough personnel to maintain communications. Adequate geographic coverage is particularly important if NATO is to mount a forward defense near the inter-German border, rather than withdraw to better defensive positions deep within West Germany. A forward defense has been NATO's strategy since the 1960s.

A recent RAND analysis proposes an illustrative minimum force required for adequate geographic coverage in the central region.¹² That force would consist of 27 ground combat divisions equivalent in firepower to a U.S. armored division. Providing enough personnel to ensure adequate communications would require 32 divisions, each containing 16,500 troops--roughly the number in a heavy U.S. division--or an equivalent number of divisions containing a total of 528,000 combat personnel. This force would have to be in place at the start of a Pact invasion, assumed here to begin 15 days after the Pact starts to mobilize its forces. NATO, therefore, could have up to two weeks after the Pact starts to mobilize to amass a force containing at least 27 equiva-

12. Paul Davis, Robert Howe, Richard Kugler, and William Wild, Jr., *Variables Affecting the Central-Region Stability: The "Operational Minimum" and Other Issues at Low Force Levels*, RAND Note N-2976-USDP (Santa Monica, Calif.: RAND, September 1989). The report stresses that the size of the minimum force is highly uncertain and depends on many assumptions. In addition, reducing NATO's forces to this minimum might require NATO to adopt new tactics in order to continue to maintain a forward defense.

lent divisions of firepower and 528,000 combat personnel.¹³ Finally, in addition to these minimum forces, RAND argues that NATO would need to field forces sufficient to match the total capability of Pact forces that would be available in the central region.

According to CBO's analysis, NATO could reduce by 20 percent its air and ground forces that would be available 15 days after the Pact starts to mobilize and still have enough forces in the region to meet the criteria defined above. This 20 percent reduction from current levels would contrast with the much smaller reduction required by the CFE treaty (roughly 4 percent in U.S. military forces for NATO) and would produce larger budgetary savings. A 20 percent cut in U.S. forces for NATO would mean $2\frac{2}{3}$ fewer active Army divisions and $5\frac{2}{3}$ fewer Air Force tactical fighter wings. As many as 113,400 soldiers could be eliminated from the active Army, and another 29,800 could be eliminated from the Air Force (see Table 3).

Only $1\frac{2}{3}$ of the $2\frac{2}{3}$ divisions eliminated from the Army would come from U.S. forces stationed in Europe; the other division would be one of those stationed in the United States during peacetime but intended as a reinforcement in the event of a major war in Europe. Of the Air Force reductions, $1\frac{2}{3}$ active wings would come out of Europe. The remaining reductions would come from among active and reserve wings stationed in the United States.

Savings. Budgetary savings associated with these reductions could total as much as \$12 billion a year, relative to the 1990 budget--about 12 percent of the funds for the Army and tactical Air Force and 4 percent of the total DoD budget. This figure compares with annual savings of about \$3 billion if the United States makes only the cuts required by the proposed treaty. As noted above, none of these estimates reflects the costs of verifying compliance with the CFE treaty.

Approximately \$6 billion of the \$12 billion in potential savings stems from reductions in operating and support costs that are associated directly or indirectly with the units that are eliminated (see

13. Recent press articles have indicated that DoD has revised its estimate of how much preparation time the Pact might need before it could attack NATO. The longer preparation times suggested by the articles (up to several months) would mean more delay before war began and so would provide NATO with more time to gather its forces. Thus, longer preparation time would yield more favorable results for NATO than those discussed here.

Table 5). Direct costs pay for the operation of the unit itself. Indirect costs pay for combat support (for example, a portion of an artillery unit not included in a division that provides firepower for several Army divisions would be included in indirect costs for an Army division) or combat service support (for example, truck companies not assigned to any particular division that provide logistic support). Indirect costs also include portions of the costs of training, medical care, repair facilities, and other support necessary to ensure the proper functioning of the unit.

Another \$4 billion of the \$12 billion in savings could be realized through reductions in what this study labels "overhead." In addition to direct and indirect support, some categories of support are commonly assumed not to vary in size as the number of operating units changes, especially if such changes are small. Examples of overhead would include costs of operating headquarters and providing military support to other nations as well as portions of training, medical care, and other support costs that are assumed not to vary with small changes in numbers of units. Overhead costs might vary significantly, however, with large changes such as those assumed under this option. To illustrate the potential for savings in this category, CBO assumed that overhead costs are reduced in proportion to the number of units that are eliminated. Thus, for example, if the Army cuts 10 percent of its divisions, overhead costs are assumed to be reduced by 10 percent.

Finally, because the Army and the Air Force would have a smaller force to equip and modernize, this option could eventually save \$2 billion a year in procurement costs. As with the savings associated with the treaty, this estimate assumes that procurement costs are reduced in proportion to the reduction in the number of operating units.¹⁴ The full amount of these reductions in procurement might not be realized for many years. For example, if a military unit had recently been modernized with a new weapon, it might be many years before another, newer version of the weapon would be required.

14. Only the tactical portion of the Air Force procurement budget was included and was reduced by the same proportion as the number of tactical wings (5 $\frac{1}{3}$ out of 35 wings or 16 percent). The entire Army procurement budget was reduced by 10 percent--2 $\frac{1}{3}$ divisions out of 28 total, including the reserve divisions, because the Army must equip both active and reserve units.

TABLE 5. POTENTIAL ANNUAL SAVINGS ASSOCIATED WITH OPTION I (In billions of 1990 dollars)

Location and Status	Number of Divisions/Wings	Operating and Support				Long-Term Procurement ^d	Total (O&S and Procurement)	
		Direct ^a	In-direct ^b	Sub-total	Over-head ^c			Total
Army								
Europe	1 $\frac{1}{2}$	1.8	2.1	3.9	2.4	6.3	0.6	6.9
CONUS	1	0.5	0.6	1.1	0.7	1.8	0.3	2.1
Total	2 $\frac{1}{2}$	2.3	2.7	5.0	3.1	8.1	0.9	9.0
Air Force								
Active								
Europe	1 $\frac{1}{2}$	0.3	0.2	0.5	0.4	0.9	0.3	1.2
CONUS	2 $\frac{1}{2}$	0.3	0.2	0.5	0.4	0.9	0.4	1.3
Reserve								
	1 $\frac{1}{2}$	0.2	0.1	0.4	e	0.4	0.3	0.7
Total	5 $\frac{1}{2}$	0.8	0.6	1.4	0.8	2.2	0.9	3.1
Total Savings (Army and Air Force)		3.1	3.3	6.4	3.9	10.3	1.8	12.1

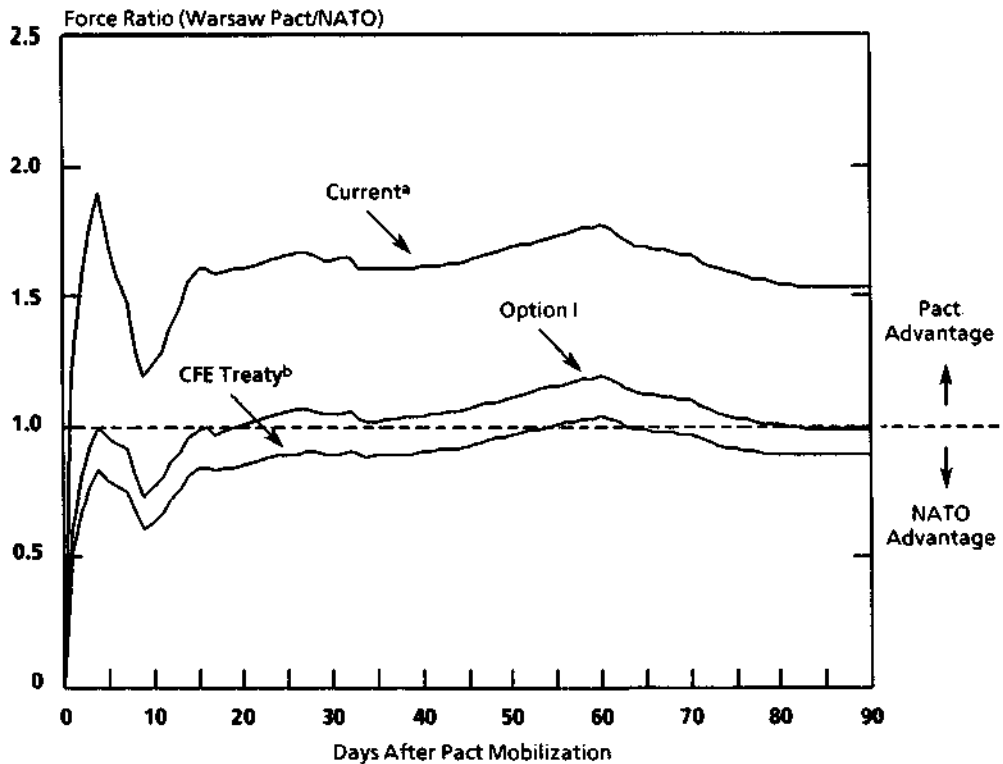
SOURCE: Congressional Budget Office based on Department of Defense data.

NOTES: Army units are active heavy divisions; Air Force units are tactical wings.

O&S = operating and support; CONUS = continental United States.

- a. Direct O&S costs are those tied to individual units. Examples include civilian and military pay, fuel, some supplies and spare parts, modifications, and munitions.
- b. Indirect O&S costs pay for items that are necessary to support units, but are not linked as closely to particular units. Examples include funds for operating bases, depot maintenance, training, management support, medical care, personnel support, logistics, and other centralized support functions.
- c. Represents a proportional reduction in that portion of the service's budget for military personnel and for operation and maintenance not covered by direct and indirect factors. The proportion is based on a ratio of O&S costs for the units eliminated to the total estimated O&S costs for combat units.
- d. Based on proportional reductions in procurement budgets for the Army and the tactical Air Force.
- e. Less than \$50 million.

Figure 6.
Ground Force Ratios in the European Central Region Under Option I



SOURCE: Congressional Budget Office based on Department of Defense data.

NOTE: Option I would provide sufficient NATO forces to cover the entire inter-German border.

a. Based on data available in mid-1989. Does not reflect unilateral Soviet withdrawals from Eastern Europe. Warsaw Pact forces include those from the Soviet Union, East Germany, Czechoslovakia, and Poland.

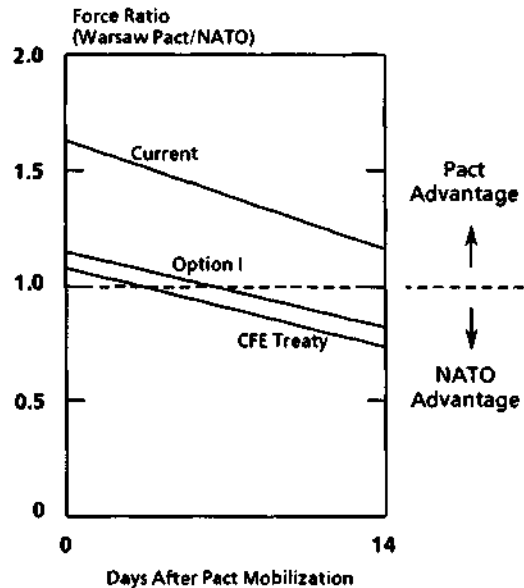
b. Based on withdrawal of combat units to meet the treaty's ceilings on weapons.

Military Consequences. Although a reduction of 20 percent in current NATO forces available within 15 days of mobilization would negate some of the benefits afforded by the CFE treaty, most would be retained. As was noted above, if both sides comply with the proposed treaty, then NATO and Warsaw Pact ground forces would be roughly equal in combat capability; indeed, in some cases NATO would have a modest advantage. Under the 20 percent reduction assumed in this option, the balance of ground forces shifts from the post-treaty level to one that modestly favors the Warsaw Pact, but never by more than about 20 percent (see Figure 6). In contrast, the Pact today enjoys an advantage that generally exceeds 50 percent.

Figure 7.
Air Force Ratios
in the ATTU Region
Under Option I

SOURCE: Congressional Budget Office based on Department of Defense data.

NOTE: The ATTU region extends from the Atlantic Ocean to the Ural Mountains. The analysis assumes that all reinforcing aircraft arrive in the ATTU region within 14 days of Pact mobilization. The ratios depicted between zero and 14 days after mobilization are not meant to imply detailed knowledge of the exact arrival schedule of reinforcements. They are presented here only to give an indication of the impact of reinforcements on the air force ratios.



The situation is even more favorable for NATO air forces in the ATTU region (see Figure 7). Even with the 20 percent reductions assumed in this option, NATO would continue to enjoy a modest advantage in air combat capability once reinforcing units had arrived from the United States.

In sum, this option would give up the parity of military forces that NATO could achieve under the proposed treaty but would retain most of the treaty's benefits. The option would enable the United States to save approximately \$12 billion a year--a 12 percent reduction in the budgets for the Army and tactical Air Force. Moreover, NATO might still be able to field the minimum forces required to provide adequate geographic coverage and to mount a forward defense in the event of a war in Europe.

Option II: Make Reductions in U.S. Forces for NATO Proportional to Pact Reductions

This second option would reduce active U.S. Army forces and U.S. tactical Air Force units (both active and reserve) committed to NATO

by 50 percent from current levels, roughly the cut that would be imposed on the Warsaw Pact's ground and air forces under the proposed CFE treaty. Such a proportional reduction would not only involve major cuts in U.S. forces stationed in Europe but also large cuts in forces based in the United States that are intended to reinforce Europe in the event of war. In view of the strong pressure for military reductions in NATO countries, this option assumes that both the United States and its NATO allies reduce their air and ground forces by 50 percent.

Of course, if the United States and its NATO allies made cuts proportional to those imposed on the Warsaw Pact, then the balance of military forces would remain roughly where it is today, giving the Warsaw Pact an advantage, especially on the ground. Thus, NATO would forgo most of the military benefits afforded by the proposed treaty. A proportional reduction might be consistent, however, with the perception that an adverse balance of military forces is acceptable because political changes have made the risk of war in Europe negligible. In addition, a proportional reduction in U.S. forces for NATO would yield large budgetary savings.

Under this option, the United States would make reductions only in the active Army units slated for use during a major European war. Army reserve units would not be reduced because they are relatively inexpensive to maintain and because they help to offset the capability provided by late-arriving Soviet units.

Based on these assumptions, the Army would eliminate 7 of its 18 active divisions, including 2 of the 4 $\frac{2}{3}$ divisions currently stationed in Europe and 5 divisions stationed in the United States intended as reinforcements for European forces in the event of war. As a result of these reductions, the Army would need 185,500 fewer soldiers, counting only those directly or indirectly involved with the disbanded units. If proportional reductions were also made in Army overhead, another 60,500 active-duty personnel could be demobilized. Thus, the total reduction could be as large as 246,000--leaving the Army about one-third smaller than it is today.

U.S. tactical air forces for NATO would also be reduced by 50 percent. Because operating costs for active and reserve units are more similar for air forces than for ground forces, reductions in air units are

assumed to affect both active and reserve units. Specifically, this option would reduce the size of the tactical air forces by 10 active wings and 4 $\frac{2}{3}$ reserve wings (see Table 3). Counting only direct and indirect personnel, the Air Force would be smaller by about 37,100 personnel. Assuming a proportional reduction in overhead would bring the total to 75,600, which would mean roughly a 40 percent reduction in the tactical Air Force but only a 13 percent reduction in the size of the total Air Force.

Savings. Once fully implemented, possibly several years after 1993, this option could reduce U.S. defense spending from the 1990 level by as much as \$27 billion a year--a reduction of 26 percent in the combined Army and tactical Air Force budgets and a 9 percent reduction in the total DoD budget (see Table 4). About two-thirds of the total savings would represent reduced funding for the Army; the remainder would come out of funds for the tactical Air Force.

Considering the Army and Air Force together, about \$14 billion of the total savings of \$27 billion would stem from operating costs directly and indirectly associated with the units that are eliminated (see Table 6). Another \$8 billion would be saved if overhead costs were reduced in proportion to the number of units eliminated. The final \$5 billion of savings would result from reductions in funds for procurement.

Military Consequences. Under this option, the balance of military forces would remain roughly at current (pre-treaty) levels. On the ground, the Warsaw Pact would enjoy a substantial advantage in conventional forces, as it does today (see Figure 8). At some points after mobilization begins, the ground capability of the Warsaw Pact--as measured by WEL/WUV scores--would exceed NATO's capability by 50 percent or more. In the air, reductions in NATO air forces would mean that NATO would have significantly fewer aircraft; in fact, Pact aircraft would outnumber NATO aircraft by one-third. Because of the technical superiority of NATO's aircraft as reflected in TASCFORM scores, however, NATO would suffer only a modest disadvantage in capability (see Figure 9).

Even though the balance of forces under this option would be similar to today's balance, some analysts would argue that NATO would be worse off than it is today. As was noted above, some analysts maintain

TABLE 6. POTENTIAL ANNUAL SAVINGS ASSOCIATED WITH OPTION II (In billions of 1990 dollars)

Location and Status	Number of Divisions/Wings	Operating and Support					Long-Term Procurement ^d	Total (O&S and Procurement)
		Direct ^a	In-direct ^b	Sub-total	Over-head ^c	Total		
Army								
Europe CONUS	2 Heavy	2.2	2.5	4.7	2.9	7.6	0.7	8.3
	4 Heavy	2.0	2.3	4.3	2.7	6.9	1.4	8.3
	1 Motor	0.5	0.6	1.1	0.7	1.8	0.3	2.1
Total	7	4.6	5.4	10.1	6.3	16.3	2.4	18.7
Air Force								
Active								
Europe	4½	0.8	0.7	1.5	1.1	2.6	0.7	3.3
CONUS	5½	0.7	0.5	1.2	0.9	2.1	0.9	3.0
Reserve	4½	0.7	0.4	1.0	0.1	1.1	0.7	1.8
Total	14½	2.1	1.6	3.7	2.1	5.8	2.3	8.2
Total Savings (Army and Air Force)		6.8	7.0	13.7	8.4	22.2	4.7	26.9

SOURCE: Congressional Budget Office based on Department of Defense data.

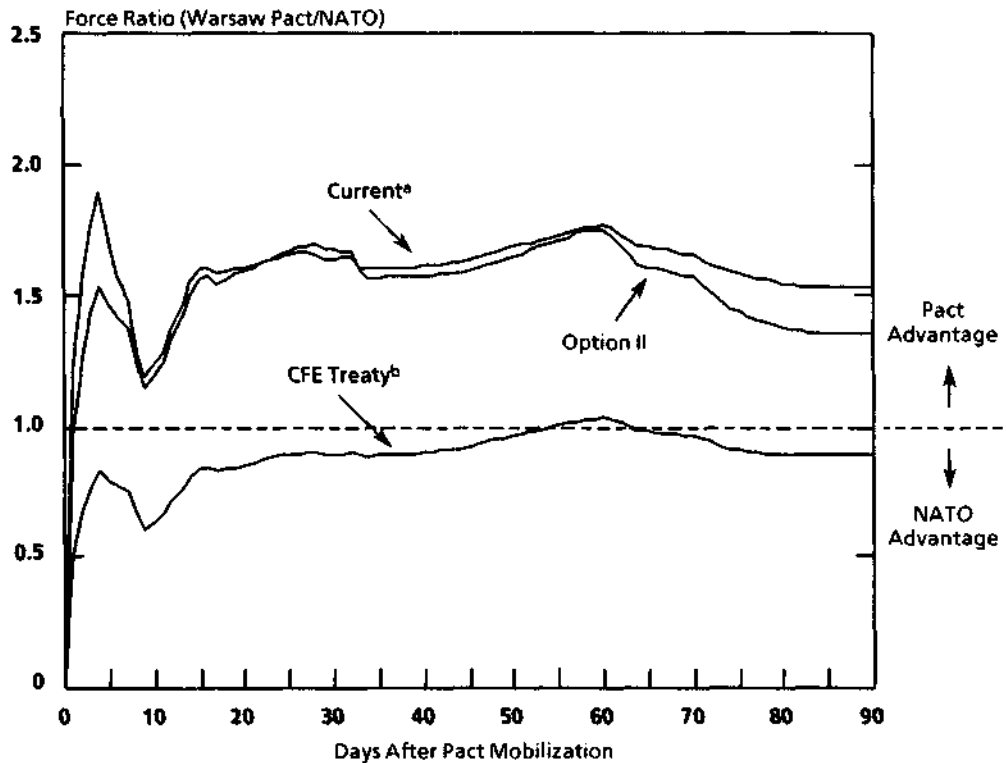
NOTES: Army units are active divisions; Air Force units are tactical wings.

O&S = operating and support; CONUS = continental United States.

- a. Direct O&S costs are those tied to individual units. Examples include civilian and military pay, fuel, some supplies and spare parts, modifications, and munitions.
- b. Indirect O&S costs pay for items that are necessary to support units, but are not linked as closely to particular units. Examples include funds for operating bases, depot maintenance, training, management support, medical care, personnel support, logistics, and other centralized support functions.
- c. Represents a proportional reduction in that portion of the service's budget for military personnel and for operation and maintenance not covered by direct and indirect factors. The proportion is based on a ratio of O&S costs for the units eliminated to the total estimated O&S costs for combat units.
- d. Based on proportional reductions in procurement budgets for the Army and the tactical Air Force.

that a minimum level of military forces is needed to provide adequate geographic coverage of the long border between NATO and Warsaw Pact countries. This coverage is particularly important if NATO is to defend forward, near the inter-German border.

Figure 8.
Ground Force Ratios in the European Central Region Under Option II



SOURCE: Congressional Budget Office based on Department of Defense data.

NOTE: Option II would make reductions in U.S. forces for NATO proportional to reductions in Pact forces resulting from the CFE treaty.

- a. Based on data available in mid-1989. Does not reflect unilateral Soviet withdrawals from Eastern Europe. Warsaw Pact forces include those from the Soviet Union, East Germany, Czechoslovakia, and Poland.
- b. Based on withdrawal of combat units to meet the treaty's ceilings on weapons.

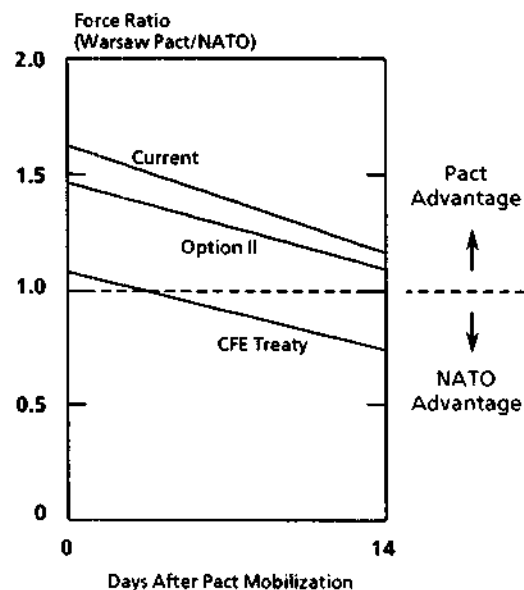
Assuming the force reductions under this option, NATO would probably not be able to provide the geographic coverage necessary for a forward defense. Fifteen days after the Pact begins to mobilize, NATO would be able to field only 17 divisions equivalent in combat capability to a U.S. armored division. Analysis cited earlier suggested that at least 27 such divisions would be needed to provide the necessary firepower. Nor would NATO, under this option, be able to field the equivalent of 32 divisions with 16,500 troops, the minimum required in order to have sufficient personnel available to maintain communications along the entire inter-German border.

A forward defense would be more feasible if the United States cut its forces by 50 percent but the NATO allies made only modest cuts in their forces. Such asymmetric changes might be justified considering the strong interest our NATO allies have in a forward defense. Asymmetric changes would also reduce the U.S. share of the costs to maintain NATO defenses. But such changes seem highly unlikely in view of the political pressure for military reductions in Western Europe and in view of the sharp declines in the number of young people available for military service--particularly in West Germany.

Figure 9.
Air Force Ratios
in the ATTU Region
Under Option II

SOURCE: Congressional Budget Office based on Department of Defense data.

NOTE: The ATTU region extends from the Atlantic Ocean to the Ural Mountains. The analysis assumes that all reinforcing aircraft arrive in the ATTU region within 14 days of Pact mobilization. The ratios depicted between zero and 14 days after mobilization are not meant to imply detailed knowledge of the exact arrival schedule of reinforcements. They are presented here only to give an indication of the impact of reinforcements on the air force ratios.



IMPACT OF RECENT POLITICAL CHANGES ON CONVENTIONAL FORCES IN EUROPE

The problem of having inadequate forces to guarantee geographic coverage suggests that, with a CFE treaty accompanied by a 50 percent reduction in current NATO forces, the alliance could actually face greater military risk, at least on the ground, than it faces today. But this conclusion ignores the dramatic political changes that have taken place in the Soviet Union and Eastern Europe. These changes may greatly reduce the risks facing NATO even if the allies carry out large reductions in their military forces.

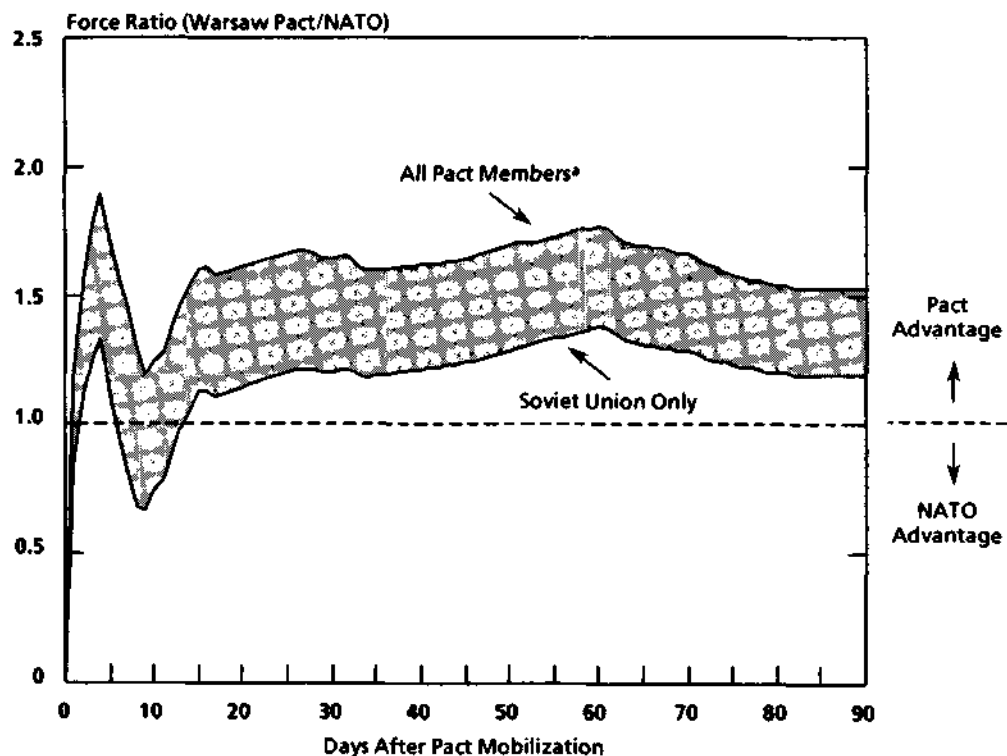
Cohesion of the Warsaw Pact

One reason the Warsaw Pact might be less threatening is that its cohesion can no longer be taken for granted; it is hard to predict what role, if any, the non-Soviet Warsaw Pact nations would play in an armed conflict. The preceding analysis of the ground force ratios assumes that East Germany, Poland, and Czechoslovakia--all countries that are located in the key central region of Europe--would support the Warsaw Pact in an armed attack on NATO. But in recent months, all three nations have moved toward democratic governments and more open societies. If those new governments chose not to support the other Warsaw Pact nations in an attack, but instead remained neutral, then only Soviet forces would be available to fight in the central region. Thus, the ratio of forces that Pact planners could expect in the central region would be much less favorable, even in the absence of a CFE treaty (see Figure 10). The outlook for the Pact would be even worse if these countries chose not to remain neutral and instead fought against their Pact allies.

The situation becomes even more problematic for Pact planners after implementation of a CFE treaty. With the treaty reductions in place, Pact planners--who could only count on the participation of Soviet forces in the central region--would face a balance of forces sharply in NATO's favor. In such an environment, even a 50 percent cut in NATO forces from current levels might not add substantially to military risk. Figure 11 emphasizes this point with regard to ground forces, assuming a 50 percent reduction in NATO forces and a reduction of Pact forces in order to comply with the CFE treaty currently

under negotiation. The shaded area shows a range of ground force ratios depicting the contributions that the forces from Czechoslovakia, East Germany, and Poland would make to the Pact if they fought alongside the Soviet Union and other Pact members. The top of the range suggests that a 50 percent cut in NATO forces would lead to a balance of forces that is unfavorable to NATO. However, if these countries do not fight with the Warsaw Pact, then even with a 50 percent

Figure 10.
Current Ground Force Ratios in the European
Central Region, With and Without
Full Participation of the Warsaw Pact



SOURCE: Congressional Budget Office based on Department of Defense data.

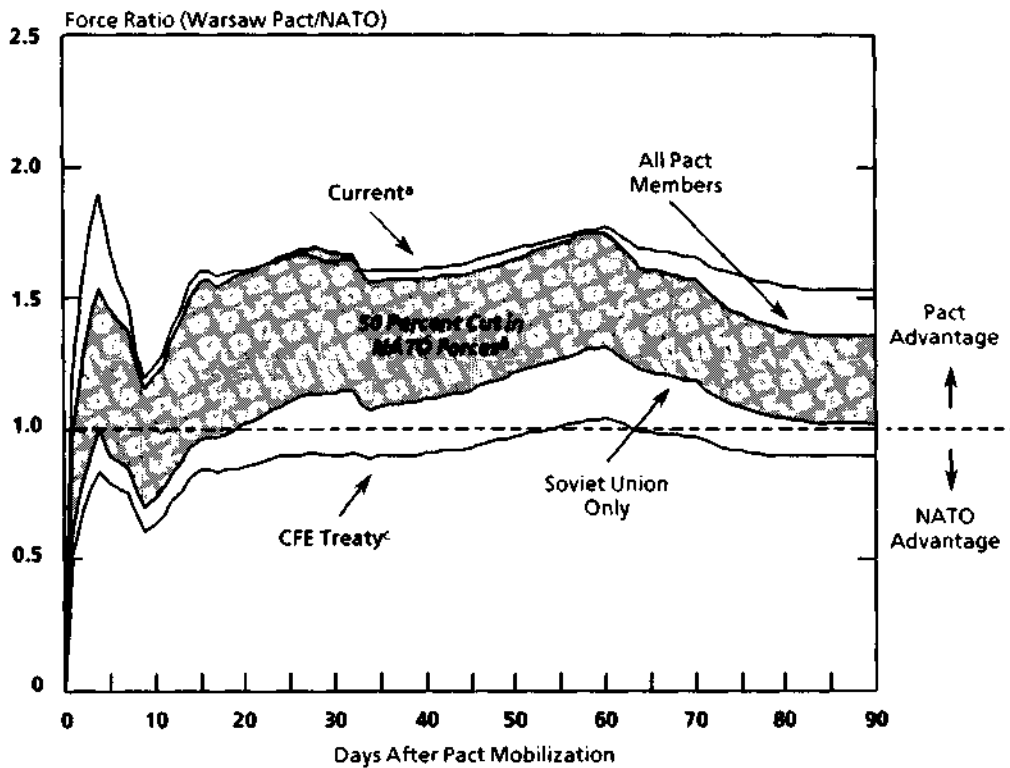
NOTE: Based on data available in mid-1989. Does not reflect unilateral Soviet withdrawals from Eastern Europe. The shaded area represents the potential contribution of East Germany, Czechoslovakia, and Poland.

a. Includes forces from the Soviet Union, East Germany, Czechoslovakia, and Poland.

reduction in NATO's forces, the balance of forces is roughly equal--a great improvement over today's situation.

The risks inherent in a particular balance of military forces must also be weighed against the probability of war. The recent political changes in Eastern Europe, coupled with a Soviet Union that seems

Figure 11.
Ground Force Ratios in the European Central Region
Under a 50 Percent Reduction in NATO Forces,
With and Without Full Participation of the Warsaw Pact

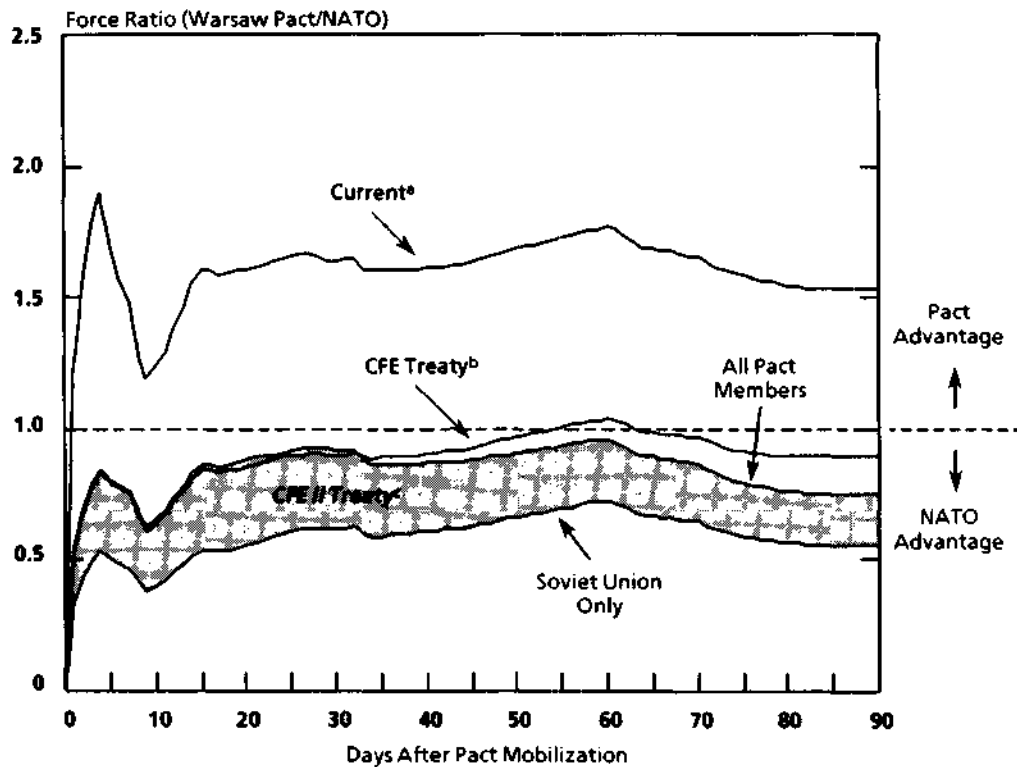


SOURCE: Congressional Budget Office based on Department of Defense data.

- a. Based on data available in mid-1989. Does not reflect unilateral Soviet withdrawals from Eastern Europe. Warsaw Pact forces include those from the Soviet Union, East Germany, Czechoslovakia, and Poland.
- b. The shaded area represents the potential contribution of East Germany, Czechoslovakia, and Poland to Pact ground forces after the CFE treaty has been carried out.
- c. Based on withdrawal of combat units to meet the treaty's ceilings on weapons.

much more concerned with its own political changes and improving its faltering economy than it does about intimidating or attacking Western Europe, have seemingly reduced the chance of a war in Europe to a very low level. If the chance of war reaches a sufficiently low level,

Figure 12.
Ground Force Ratios in the European Central Region
Under Follow-on (CFE II) Treaty, With and Without
Full Participation of the Warsaw Pact



SOURCE: Congressional Budget Office based on Department of Defense data.

- Based on data available in mid-1989. Does not reflect unilateral Soviet withdrawals from Eastern Europe. Warsaw Pact forces include those from the Soviet Union, East Germany, Czechoslovakia, and Poland.
- Based on withdrawal of combat units to meet the treaty's ceilings on weapons.
- The shaded area represents the potential contribution of East Germany, Czechoslovakia, and Poland to Pact ground forces under further force reductions mandated by a CFE II treaty.

then the added risk inherent in a 50 percent reduction in NATO forces may be deemed acceptable.

Effects of Further Negotiated Reductions in
Conventional Forces in Europe (CFE II)

Option II may serve as an illustration of the potential budgetary effects of arms control negotiations that go beyond those currently under way. Although no formal proposals have been made, such a follow-on negotiation--commonly referred to as CFE II--could involve reductions in weapons inventories to a level 50 percent below NATO's current holdings. If a CFE II were in place, then NATO could cut its ground forces by 50 percent and still maintain at least parity with the Pact's military capability. Indeed, as the shaded range in Figure 12 suggests, if the non-Soviet Warsaw Pact nations in the central region do not fight on the side of the Pact, then the balance of forces would favor NATO by a significant amount even after NATO made a 50 percent reduction in its forces.