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A Comparison of Soviet and US Defense Activities, 1976-85

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An Intelligence Assessment

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SOV 86-10028
May 1986

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A Comparison of Soviet and US Defense Activities, 1976-85 (U)

An Intelligence Assessment

This paper was prepared by
the Office of Soviet Analysis

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A Comparison of Soviet and US Defense Activities, 1976-85

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Key Judgments

Information available as of 24 March 1986 was used in this report

Between 1976 and 1985 the Soviet Union committed substantially more resources to improving, operating, and expanding its forces than did the United States. The Soviets procured more weapons of almost every type—more than 10 times as many ICBMs, more than three times as many tanks, nearly 60 percent more tactical combat aircraft, and more than twice as many submarines. The United States emphasized the modernization of existing systems, although several new systems were introduced

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Because of the larger size of the Soviet military establishment and higher levels of military production, the cumulative dollar value of Soviet defense activities over the past 10 years exceeded comparable US outlays by about 25 percent. Over this same period, however, the disparity between the annual dollar costs of the two countries, which in 1976 favored the USSR in all major resource categories and missions, decreased. In 1985, for the first time since 1971, the dollar costs of Soviet defense activities were not substantially larger than comparable US outlays (see figure).

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Investment

The narrowing of the disparity resulted from markedly different trends in the two countries, particularly in procurement costs, which comprise most of investment:

- US procurement in military programs more than doubled over the 1976-85 period, growing an average of about 11 percent a year. Growth was particularly rapid after 1980, when military procurement climbed by more than 13 percent a year.
- Soviet military procurement, after dramatic increases in the late 1960s and early 1970s, leveled off after 1974

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The costs of Soviet procurement over the 1976-85 period remained at a relatively high level—about $60 billion annually—and exceeded comparable US outlays during seven of the last 10 years. By maintaining their weapons procurement at this level, the Soviets were able to produce significantly more weapons than the United States. In contrast, the United States emphasized the purchase of fewer weapons that individually were more capable and more costly than Soviet equipment. The United States also devoted an increasing share of its procurement outlays to improving both combat readiness and sustainability by increasing war reserve stockpiles of munitions and major spare parts

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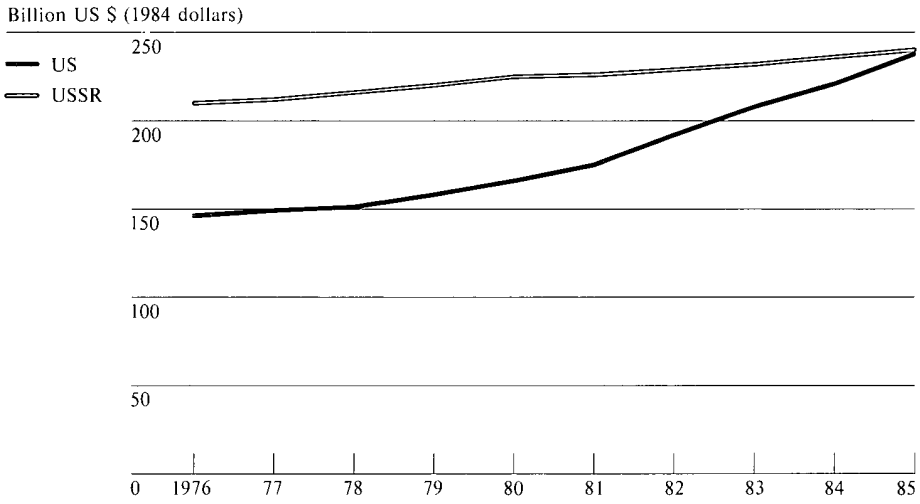
US and Soviet Defense Activities, 1976-85



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The slower growth in Soviet military investment after 1976 affected each of the three major military missions—strategic, general purpose, and support. Prior to the mid-1970s, dollar investment in each mission grew rapidly as the Soviets both equipped and modernized a rapidly expanding military establishment. During the 1976-85 period, however, the manpower levels and equipment inventories of most Soviet military forces stabilized, and investment growth for each of the major missions slowed considerably. In the United States, investment in each mission declined sharply through 1976, primarily because of the end of US involvement in Vietnam. In the post-1976 period, US investment in each mission increased sharply. Despite these trends, however:

- Soviet investment costs for strategic and support forces exceeded comparable US investment outlays in each of the last 10 years.

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- The Soviets maintained an edge in cumulative investment in general purpose forces, although US outlays for these forces experienced dramatic growth throughout the period and, after 1982, were higher than the Soviet values 25X1

Operating

The dollar value of Soviet operating activities was about 15 percent higher than US outlays for the 1976-85 period. Personnel costs—which make up almost two-thirds of Soviet operating costs—were nearly 70 percent greater than US personnel outlays. Cumulative US outlays for the operation and maintenance (O&M) of weapons, however, were about 35 percent larger than our estimate for the Soviets, even though the Soviets deploy larger numbers of weapons. Moreover, the gap has been widening since 1980. US O&M expenditures have been growing at twice the rate we estimate for the Soviet costs and by 1985 were 50 percent greater. 25X1

The disparity in O&M costs results from a number of differences in US and Soviet force structures and practices:

- Soviet military equipment, for the most part, is less technologically sophisticated than similar US equipment and, therefore, less costly to maintain.
- During peacetime the Soviets operate their equipment at lower rates than does the United States. This is particularly true of Soviet military aircraft, which are operated at less than half the rate of comparable US aircraft.
- After 1980 the United States increased the intensity of its maintenance practices to improve the combat readiness of its forces. 25X1

Research, Development, Testing, and Evaluation

Over the 1976-85 period, the dollar value of Soviet military RDT&E activities grew fairly steadily at about 4 percent a year, and cumulatively it exceeded comparable US outlays by more than 35 percent. The disparity was considerably greater in the mid-to-late 1970s when Soviet costs were growing at almost twice the rate of US outlays. Since 1980, however, US RDT&E outlays have accelerated, growing at an average of about 10 percent a year. As a result, the gap closed considerably, and in 1985 Soviet dollar costs were only about 15 percent greater than US outlays. 25X1

Extended Comparisons

The foregoing comparison is limited to US and Soviet military programs that, in the US view, directly contribute to national defense. They include national security programs funded by the Department of Defense, defense-related nuclear programs funded by the Department of Energy, Selective Service activities, the defense-related activities of the Coast Guard, and the

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comparable Soviet programs. We have also compared the costs of a number of other activities that enhance national security or foreign policy interests. They include activities such as maintenance of strategic reserves and industrial surge capacity that contribute to mobilization and wartime preparedness, international activities such as economic and military aid that support a nation's global position, and costs related to past defense activities (pensions and veterans' benefits).

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Comparing the dollar value of these categories for 1983, the most recent year for which we have reasonably complete data, shows that:

- The USSR had a much more extensive preparedness program than the United States, with a dollar valuation of roughly four times the comparable US outlays.
- The dollar value of Soviet international activities was approximately two-thirds greater.
- Costs related to past Soviet defense activities were only slightly larger.

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Outlook

We expect the high level of military procurement the Soviets have sustained over the past decade to continue over the next five years, albeit at relatively slow rates of growth. At such procurement levels, improvements to Soviet strategic and conventional forces will be substantial.

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Most of the weapons to be deployed during this time period will be manufactured in existing plants and thus, in the near term, will impose no significant demand on the resources needed for General Secretary Gorbachev's industrial modernization program. However, the demand for new investment for defense plant and production equipment will almost certainly rise in the late 1980s and early 1990s when the Soviets will have to begin tooling up for another generation of weapons

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Preface

This assessment compares US and Soviet defense activities over the past 10 years, 1976 to 1985, using both physical and value measures. Physical measures include data on the annual production and delivery of weapons and equipment to military units, the inventory of major weapon systems, and trends in military manpower. Such measures are useful in portraying the weapons mix and the relative sizes of the various components of the two opposing forces. They cannot, however, be used to produce an aggregate measure of diverse kinds of activities. How, for example, can 2,000 tanks, 400 tactical aircraft, and four infantry regiments be summed? 25X1

To aggregate such diverse activities, one needs to assign to each some weight that captures its relative worth—in terms of military capability, resource costs, or some other measure—and then calculate the weighted sum. Because prices are a useful way to combine incommensurable quantities and since the assessment of trends in defense activities is often related to economics, it has become common practice to develop aggregate measures based on the costs of the resources devoted to various defense activities. These costs can be calculated in any currency, but dollars are the frame of reference of US policymakers and force planners because they can conceptualize what a "defense dollar" will buy. Dollar valuations of Soviet programs in conjunction with US defense program data capture differences in the technical characteristics of military hardware, the number and mix of weapons procured, manpower strengths, and the operating and training levels of the forces being compared. They can be useful, therefore, in portraying the relative magnitudes of similar programs, general trends in the relative resources devoted to defense activities, and shifts in resources among those activities. 25X1

Dollar valuations, however, have the following important limitations:

- *They do not measure actual Soviet defense spending, the impact of defense on the economy, or the Soviet perception of defense activities.*

  The Soviets do not spend dollars. Issues of defense burden are properly analyzed with estimates of ruble expenditures. Dollar costs measure what it would cost the United States, at prevailing US prices and wages, to develop, deploy, and maintain a military force of the same size and with the same weapons as that of the USSR and to operate that force as the Soviets do.

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- *Dollar costs of Soviet defense activities do not reflect the Soviet view of the distribution of the USSR's defense effort.*

  Because the price structures in the two countries are substantially different, Soviet costs in rubles are distributed differently among the resource categories. For example, Soviet investment in rubles accounts for about half of total costs, but measured in dollars it accounts for only about one-fourth.

- *Dollar costs are not a measure of the overall military capabilities of US and Soviet forces.*

  One of the most serious temptations in using dollar cost estimates is to interpret them in terms of capabilities—Soviet capabilities relative to those of the United States, or changes in Soviet capabilities over time. These estimates are not intended to and cannot support such interpretations. Rather, they are useful for measuring medium- to long-term trends in the yearly flow of resources allocated to the military. Because dollar costs measure only the defense goods and services produced in a single year, they capture only a small part of a country's total military stockpile. Moreover, assessments of capability must take into account military doctrine and battle scenarios; the tactical proficiency, readiness, and morale of forces; the effectiveness of weapons; logistic factors; and a host of other considerations. Dollar costs of defense activities do not provide a reliable measure of these disparate factors

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The purpose of valuing observed and estimated Soviet defense programs in dollar terms is to provide an appreciation of the physical size of the Soviet defense effort by showing the level of effort that would be required to reproduce those programs in the United States. Thus, estimates of the costs of individual items represent what we believe it would cost a US firm to manufacture them, using Soviet design and material specifications but US manufacturing practices and paying US prices

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Finally, we do not address the question of whether the Soviets would choose to have the same military establishment if they had to pay dollar prices instead of ruble prices for their weapons and manpower. Presumably, if the Soviets were to make their decisions on the basis of a dollar price list, they would buy a different mixture of weapons and manpower. In this paper, however, we are concerned only with the value in dollars of the defense activities they actually engage in.

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In addition to the valuation of Soviet defense activities in dollars, US military outlays can be valued in rubles for comparison with Soviet ruble outlays. Such an exercise recognizes the validity of using either currency as the common measure in a US-Soviet comparison. Ruble comparisons provide as valid a measure of the resources devoted to US and Soviet defense activities as dollar comparisons do. The difference in results is the consequence of differences in relative prices and quantities produced in the two countries. While an average could be taken of the two ratios produced (such as a geometric mean), that ratio would be difficult to interpret.

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We have developed ruble estimates of US defense activities for comparison with Soviet ruble outlays but have much less confidence in these than in our dollar estimates. Obviously, we cannot ask Soviet contractors to estimate what it would cost to produce items of US equipment in the USSR

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A Comparison of Soviet and US Defense Activities, 1976-85

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Introduction

The estimates of Soviet costs presented in this paper were derived using the building-block methodology (see appendix B). The costs of all Soviet defense activities are developed by identifying and listing Soviet forces and their support apparatuses, and estimating their orders of battle, equipment inventories, and new equipment purchases. To these detailed estimates of physical resources, we apply appropriate 1984 dollar prices

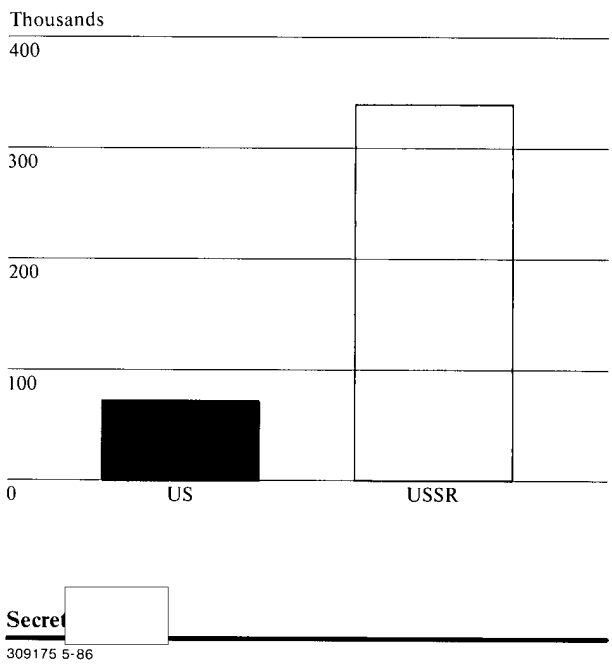
Because the building-block approach is based on the individual components of the Soviet defense effort, we can estimate costs by resource categories—investment; operating; and research, development, testing, and evaluation (RDT&E)—and apportion investment and operating costs among the strategic, general purpose, and support missions. A three-year study has calculated RDT&E costs using a building-block approach that focuses on resource inputs, but we are not yet able to apportion RDT&E costs by mission because we lack mission-specific data.

US data in this paper are expressed in terms of calendar-year outlays derived from the *Five-Year Defense Program* (FYDP) issued by the Department of Defense in January 1985 and from the US budget. Defense-related activities of the Department of Energy, the Coast Guard, and the Selective Service have been added to improve the comparison with Soviet programs. The outlays are expressed in 1984 dollars so that trends in cost estimates reflect real changes in military forces and activities and not the effects of inflation. US order-of-battle data were also derived from the FYDP; US production data were provided by the Department of Defense.

Force Trends and Comparisons

The period from 1976 to 1985 was one of considerable force modernization in both the Soviet Union and the United States. The Soviet Union, however, committed substantially more resources to improving, operating, and expanding its forces, which in many cases were already much larger than their US counterparts

Figure 1
US and Soviet Manpower Growth, 1976-85



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Manpower

In 1985 Soviet military manpower was double that of the United States, numbering about 4.5 million men. Soviet manning levels have risen every year since 1976, with total personnel costs growing at about 1 percent a year. The Soviets added about 340,000 men over the period, with most of the increase (some 280,000 men) occurring in the land forces mission (see figure 1). In contrast, US manning levels declined

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Table 1
US and Soviet Military Manpower, 1985

Thousands [a]

	US	USSR
Total	**2,190**	**4,540**
Strategic offensive forces	75	220
Intercontinental	75	130
Peripheral		90
Strategic defense forces [b]	20	330
General purpose forces	1,010	2,020
Land	560	1,670
Tactical air	200	120
Navy	210	210
Mobility	40	20
Support forces [c]	1,085	1,970

[a] Because of rounding, components may not add to the totals shown.
[b] Includes strategic control and surveillance activities.
[c] Includes RDT&E and space activities.

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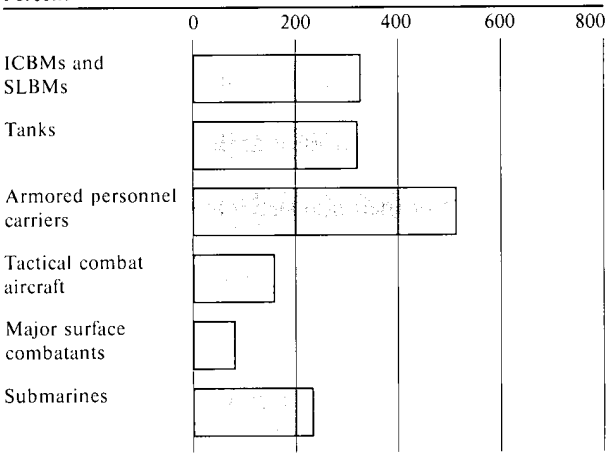
Figure 2
Soviet Procurement of Major Weapon Systems as a Share of US Procurement, 1976-85



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through 1979 as the United States found it increasingly difficult to maintain its manpower levels with an all-volunteer force. After 1979 US manpower levels rose by about 100,000 men. Most of the increase occurred in the tactical air and naval missions (some 75,000 men).

The comparison of manpower levels in table 1 highlights several differences in Soviet and US missions and force structures:

- Soviet strategic offensive manpower is about three times as large as that of the United States, primarily because the Soviets maintain a large peripheral strategic strike force to which the United States has no equivalent. The disparity also reflects the fact that the Soviet intercontinental attack force consists of a large force of liquid-propellant ballistic missiles, which require considerably more manpower to operate than the solid-propellant missiles that make up nearly the entire US force.

- The Soviets commit a large force of men to strategic defenses because of the threats posed by the US heavy bomber force and the USSR's proximity to potential war theaters in Europe and the Far East. The United States has only a small force dedicated to this mission because of the relatively small threat posed by the Soviet heavy bomber force.

- Soviet manpower levels for general purpose forces are twice as large as those of the United States. The Soviet land forces, which are three times as large as the US counterpart, account for this difference. The disparity in land forces reflects Moscow's decision to maintain large forces opposite both a potentially hostile China in the East and NATO in the West.

Weapons Acquisition

Over the past 10 years, the Soviets procured more weapons of almost every type than did the United States—more than 10 times as many ICBMs, more

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Table 2
US and Soviet Cumulative Procurement of Major Weapon Systems, 1976-85

	US	USSR
ICBMs and SLBMs	702	2,290
Tanks	7,400	23,700
Armored personnel carriers	8,400	43,000
Tactical combat aircraft	3,500	5,545
Major surface combatants (more than 1,000 tons displacement)	90	73
Submarines	39	91

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than three times as many tanks, nearly 60 percent more tactical combat aircraft, and more than twice as many submarines (see figure 2 and table 2). The United States emphasized the modernization of existing systems, although several new systems were introduced. Moreover, the United States purchased technologically sophisticated weapons that individually were more capable and more costly than similar Soviet equipment. The United States also devoted an increasing share of its procurement outlays to improving both combat readiness and sustainability by increasing its war reserve stockpiles of munitions and spare parts.

Strategic Weapons. During the 1976-85 period, the Soviets outproduced the United States in all categories of major strategic offensive and defensive weapons. At the same time, they continued to upgrade the capabilities of their fielded systems with the procurement of improved subsystems such as missile guidance components and aircraft avionics. Over the entire period, the Soviets more than tripled the number of nuclear weapons available for strategic offensive operations, from about 3,000 in 1976 to over 9,000 in 1985. They also continued longstanding efforts to improve their strategic defenses, building a large and sophisticated defense against aircraft penetrating at medium and high altitudes (see table 3).

Table 3
Major US and Soviet Strategic Weapon Programs, 1976-85

US	USSR
Procurement of 135 Minuteman III ICBMs.	Procurement of over 1,000 MIRVed SS-17, SS-18, and SS-19 fourth-generation ICBMs.
Retrofit of 350 Minuteman III ICBMs with improved guidance systems and higher yield MIRVs.	Introduction of a new solid-propellant road-mobile ICBM, the SS-25, deployed in late 1985.
Hardening of Minuteman silos.	Procurement of 25 Delta- and Typhoon-class SSBNs and over 880 SLBMs, most of them SS-N-18s and SS-N-20s that can carry MIRVs.
Construction of six Ohio-class SSBNs and 565 Trident C-4 SLBMs; conversion of launch tubes and fire-control systems to backfit Trident SLBMs on 12 older Benjamin Franklin–class SSBNs.	Procurement of 50 Bear-H heavy bombers capable of carrying the AS-15 ALCM.
Procurement of two B-1 bombers.	Procurement of about 720 MIRVed SS-20 intermediate-range ballistic missiles and about 140 Backfire medium bombers for the Soviet Air Forces.
Procurement of 1,600 air-launched cruise missiles (ALCMs) and improved avionic systems for B-52 heavy bomber force.	Procurement of over 1,300 interceptor aircraft for strategic defense.
Procurement of new command and control systems, including Pave Paws radars and E-4B airborne command posts.	Procurement of about 45,000 strategic surface-to-air missiles, including the SA-10, which is capable of engaging targets at all altitudes.

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During the same period, US strategic force improvements focused on the modification of existing offensive weapons and the production of only 135 Minuteman III ICBMs, six Ohio-class SSBNs, 565 Trident C-4 SLBMs, and two B-1 bombers. The United States also began series production of the MX Peacekeeper ICBM, although none had been delivered by the end of 1985.

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Table 4
US and Soviet Procurement of Major General Purpose Weapon Systems, 1976-85

US	USSR
Procurement of nearly 7,400 tanks, including 3,150 new M1 Abrams; modernization of many existing M48 and M60 models.	Procurement of about 23,700 tanks, primarily T-64s and T-72s; introduction of T-80 in 1979.
Procurement of 8,400 armored vehicles, including nearly 2,100 infantry and cavalry versions of new Bradley fighting vehicle.	Procurement of about 43,000 armored vehicles, nearly half of which were BMP infantry vehicles.
Procurement of 780 UH-60 Blackhawk utility helicopters and initial production of 65 AH-64 Apache attack helicopters for deployment in 1986.	Procurement of about 2,600 attack helicopters, mostly MI-8 Hips and MI-24 Hinds; MI-26 Halo heavy-lift helicopter introduced in the early 1980s.
Procurement of 1,700 artillery pieces, half of which were self-propelled.	Procurement of about 24,300 artillery pieces, primarily 152- and 122-mm self-propelled guns.
Procurement of nearly 3,500 tactical aircraft, including 745 F-15s, 915 F-16s, and 705 A-10s for the Air Force, and 330 F-14s, 255 F-18s, and 190 A-7s for the Navy.	Procurement of about 5,545 tactical aircraft, including 2,300 MIG-23 and MIG-27 Floggers and 1,400 SU-17 Fitters. Procurement of SU-25 Frogfoot, SU-27 Flanker, and MIG-29 Fulcrum began in the early 1980s.
Procurement of 90 naval surface combatants, including three Nimitz-class aircraft carriers, eight guided-missile cruisers, 34 destroyers, and 45 guided-missile frigates.	Procurement of 73 naval surface combatants, including two Kiev-class carriers, eight cruisers, 12 destroyers, and 20 frigates—all equipped with guided missiles.
Procurement of 33 Los Angeles–class nuclear-powered attack submarines; five Ethan Allen–class SSBNs converted to attack submarines.	Procurement of 41 nuclear-powered submarines (seven armed with missiles) and 25 diesel-powered submarines armed with torpedos.
	Procurement of over 300 IL-76 Candid jet-powered transport aircraft.

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General Purpose Weapons. The Soviet Union both expanded and modernized nearly all of its general purpose forces over the 1976-85 period. Expansion and modernization of the land forces have significantly improved the mobility, firepower, and survivability of Soviet divisions. Soviet divisions are now better able to operate as self-sustaining units against air and antiarmor threats and to respond more quickly to changing tactical situations. Similarly, modernization of the tactical air forces has improved their ability to provide close air support to ground forces, carry out conventional strikes deep in the rear areas of combat zones, and conduct aerial combat against other fighters. 25X1

The United States also expanded and modernized its general purpose forces, although it bought considerably fewer weapons than the Soviets (see table 4). The weapons procured by the United States, however, were considerably more technologically advanced and therefore more capable and costly than the Soviet equipment. In addition, the United States accelerated its procurement of ammunition, bombs, missiles, and major spare parts in order to improve both the combat readiness and the sustainability of its general purpose forces. 25X1

Comparisons of Investment Trends

Investment activities can be divided into two categories:

- Procurement—the acquisition of weapon systems and support equipment, including major spare parts.
- Construction—the building of military facilities. 25X1

Procurement and Construction Costs

For the 1976-85 period, the estimated cumulative dollar value of Soviet military investment was more than 40 percent greater than US investment outlays (see figure 3). The dollar value of Soviet military procurement exceeded comparable US procurement by more than 30 percent while the value of Soviet military construction was more than two and a half times US construction outlays. The investment margin, however, was considerably higher at the beginning of the period when the cost of Soviet investment 25X1

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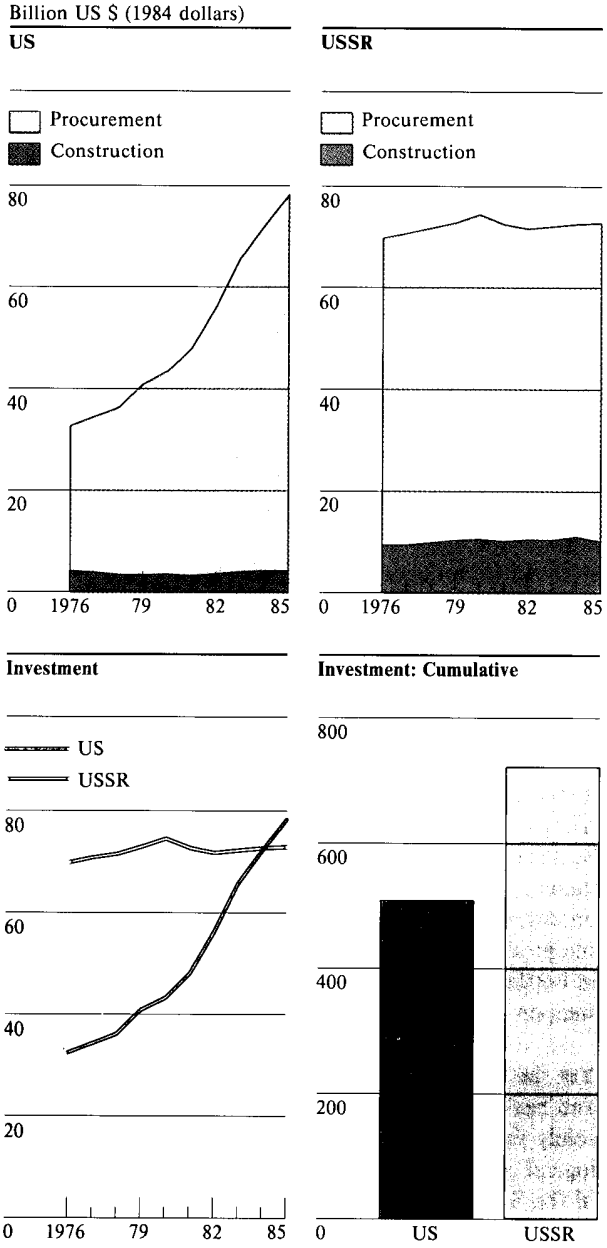
Figure 3
US and Soviet Military Investment, 1976-85



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was more than twice that of the United States. By the end of the period, US investment outlays were slightly larger than the dollar value of comparable Soviet investment. In 1985 US procurement outlays exceeded the estimated dollar value of comparable Soviet activities by 18 percent. 25X1

The estimated dollar cost of Soviet investment grew an average of less than one-half of 1 percent per year during the 1976-85 period. In contrast, average annual growth from 1965 to 1975 was about 4 percent a year. (Appendix A presents our estimates for those years.) The deceleration resulted from slower growth in the dollar value of Soviet weapons procurement, which before 1976 had been increasing at about 5 percent a year. During 1976-85 Soviet procurement stabilized at the high level of about $60 billion annually and exceeded comparable US outlays during seven of the 10 years. Soviet military construction grew by about 1 percent per year over the period as the Soviets continued to expand their military forces, but this category makes up only about 15 percent of Soviet investment costs. 25X1

US investment in military programs more than doubled between 1976 and 1985, increasing an average of about 11 percent a year. Growth was particularly rapid after 1980, when military investment was increasing by about 13 percent a year. The rapid rise in US investment reflects an across-the-board modernization of military forces that emphasized the procurement of technologically sophisticated weapons. It also reflects a decision in the early 1980s to improve the combat readiness and sustainability of US forces by building up war reserve stocks of ammunition and major spare parts. 25X1

Soviet procurement of each of the four major categories of weapons—missiles, naval ships and submarines, aircraft, and land arms—remained nearly constant during 1976-85. This was a marked departure from the 1965-75 period (see figure 4), when each of these procurement categories increased rapidly:

- Aircraft procurement, the largest component of military procurement, declined during the entire 1976 to 1985 period after having been a major source of procurement growth between 1965 and 1975. 25X1

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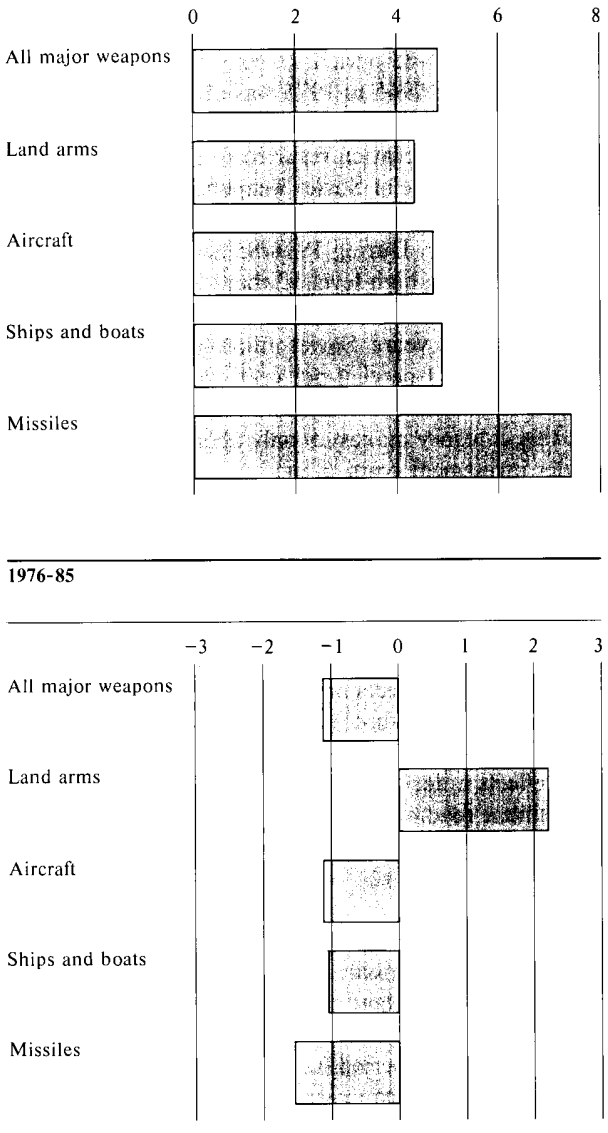
Figure 4
Average Annual Growth of the Dollar Costs of Soviet Procurement by Major Weapons Category, 1966-75 and 1976-85



- Procurement of surface ships and submarines for the Navy has declined by about 1 percent a year since 1976, after having grown by about 5 percent during the 1965-75 period.

- Missile procurement declined by about 1.5 percent a year between 1976 and 1985 after having grown by more than 7 percent a year during 1965-75.

- Procurement of land arms—primarily tanks, armored vehicles, and artillery—has grown the fastest of the four categories since 1976 but considerably less than the 4 percent per year average observed between 1965 and 1975

25X1

A number of factors contributed to the leveling off of Soviet procurement. Since the mid-1970s, for example, the Soviets have had difficulties with the development and manufacture of several advanced weapon systems that incorporate Soviet state-of-the-art technology. Technical problems have either significantly delayed the start of series production or have resulted in rates of production slower than we have seen for similar weapon systems in the past, and in some cases much slower than we believe the Soviets intended. Major programs that we have been able to identify as having encountered significant problems include the SS-X-24 solid-propellant ICBM, the SA-10 strategic surface-to-air missile (SAM), and the two new fighter-interceptor aircraft—the MIG-29 Fulcrum and the SU-27 Flanker. The poor overall performance of the Soviet economy during the period, particularly for industry, also contributed to some extent to recent procurement trends. In some instances, shortfalls in the production of key industrial commodities resulted in bottlenecks and shortages that disrupted specific weapon programs.

25X1

Yet the leveling off in procurement has lasted too long and has affected too many categories of weapons to be solely the result of unanticipated economic or technological problems. In a 10-year period, the leadership of the Soviet Union could have used its control of industrial priorities to ensure a higher rate of growth of military procurement. It is more likely that Soviet leaders, faced with a sluggish economy and perhaps

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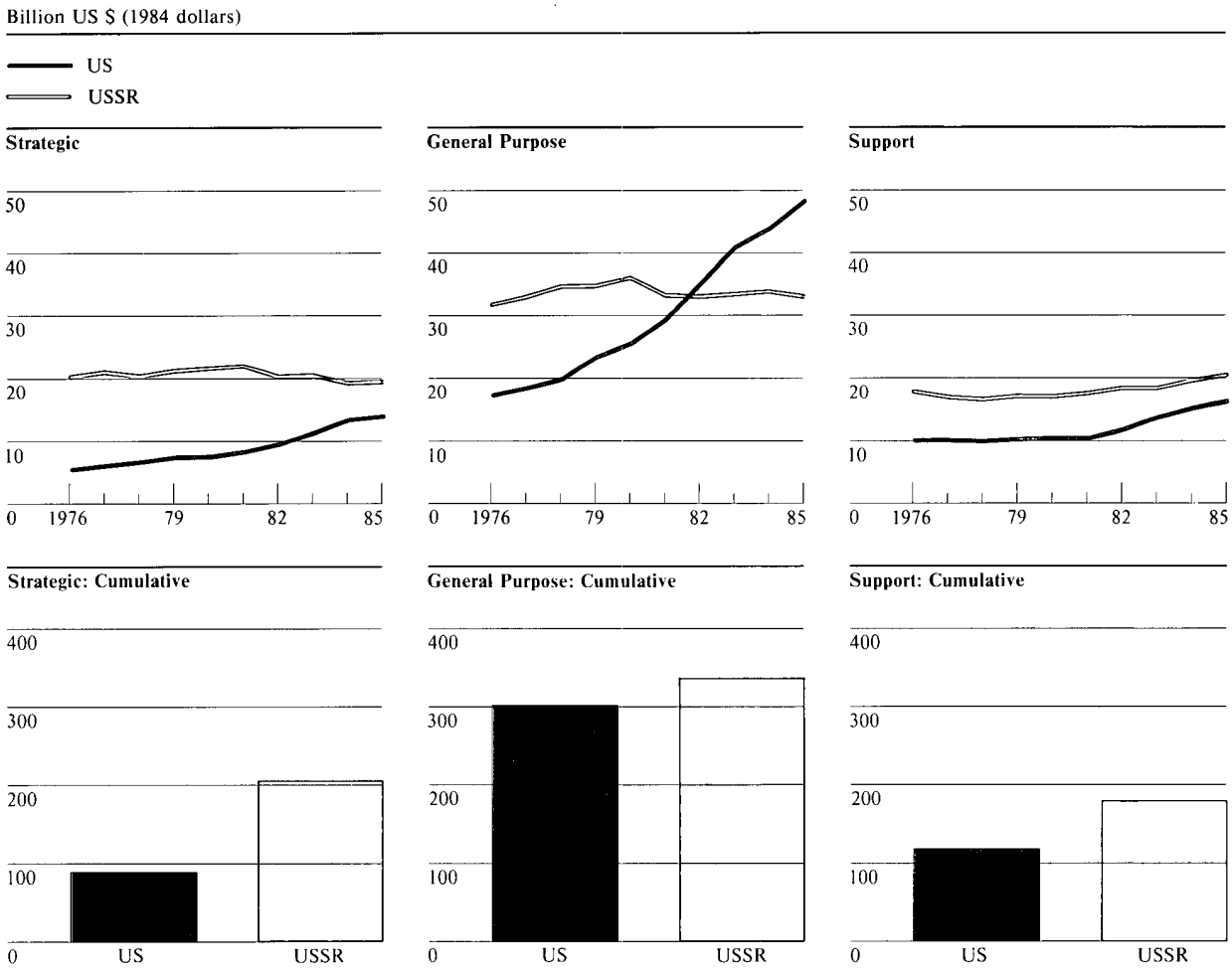
Figure 5
US and Soviet Investment by Military Mission, 1976-85



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anticipating the kinds of technological and manufacturing problems mentioned above, made decisions in the mid-1970s that allowed military procurement to continue at its high level, but not to increase much. Such decisions may have been part of an effort to revitalize the economy. The failure of Soviet efforts to increase economic growth during the 1970s through the more productive use of resources and the difficulty the defense industries were having with the production of advanced weapons would have argued for such a diversion of resources

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Investment by Major Military Mission

The slower growth in Soviet military investment after 1976 was apparent in each of the three major military missions—strategic, general purpose, and support (see figure 5). Before 1976, Soviet investment—measured

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in dollars—in each of these missions had grown rapidly because of the need to both equip and modernize a rapidly expanding military establishment (see appendix A). After 1976, the size of most military forces stabilized, and investment growth in each of the major missions slowed considerably. Even so, investment remained at high levels as the USSR continued to modernize its weapons inventories with the addition of newer, more capable systems

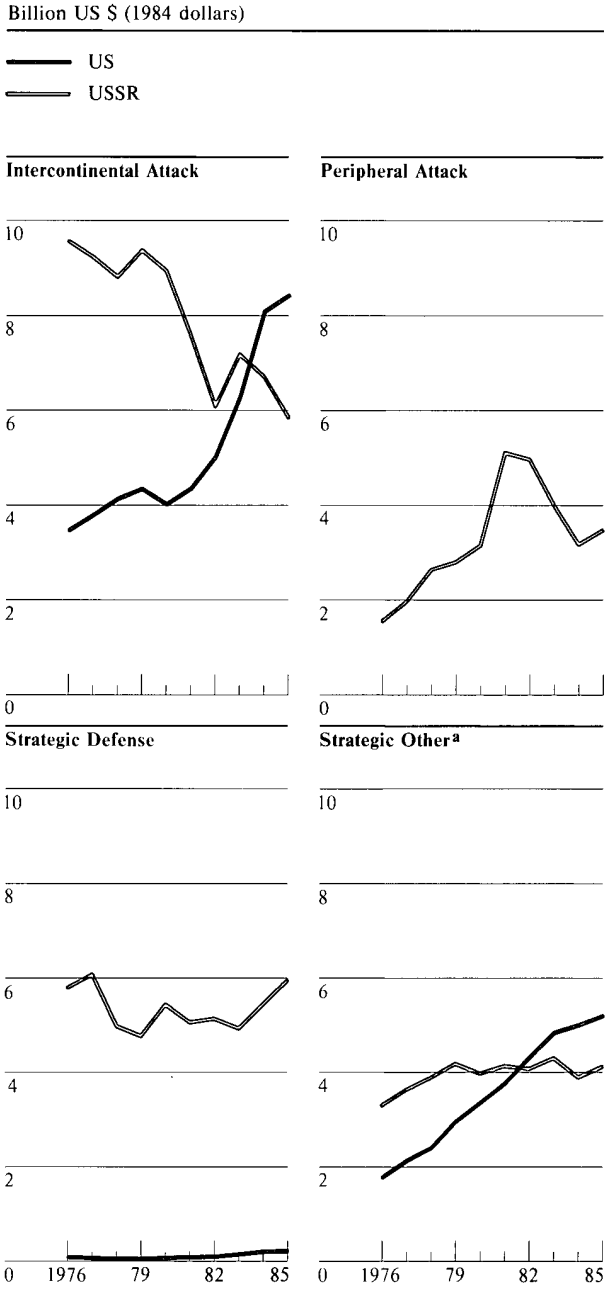
US investment in each major military mission followed a different pattern, with costs declining through the mid-1970s and then increasing sharply through 1985. The decline in US investment in general purpose and support forces resulted primarily from the end of US military involvement in the Vietnam conflict. The decline in US investment in strategic programs reflected the completion of the Polaris SSBN and Minuteman I ICBM programs. Since the mid-1970s the United States has invested heavily in each mission in an effort to both modernize its forces and rebuild its stockpiles of war reserve materials.

Despite these trends, Soviet investment costs for strategic and support forces exceeded comparable US investment outlays in each of the last 10 years. US investment in general purpose forces began to exceed estimated Soviet costs in 1982, but the cumulative value of Soviet investment in these forces was over 10 percent higher for the entire period

Strategic Forces. This mission includes all nuclear weapons and the forces assigned to intercontinental attack, strategic defense, and strategic control and surveillance. It also includes Soviet forces for peripheral attack, for which there are no US counterparts.

Over the period, the estimated dollar value of Soviet investment in strategic offensive and defensive forces (excluding RDT&E) was about $210 billion, exceeding corresponding US outlays by 130 percent. Soviet investment costs for this mission declined slightly over the period while US strategic investment outlays more than doubled, increasing about 11 percent a year. As a result, the investment gap was considerably smaller at the end of the period than at the beginning, when

Figure 6
US and Soviet Investment in Strategic Forces, 1976-85



[a] Includes command and control systems, and the production of nuclear materials.

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Soviet costs for strategic forces were about four times comparable US outlays. By 1985 the Soviet costs were 40 percent greater than those of the United States.

The disparity in investment costs reflects the steady pace of Soviet modernization of both its strategic offensive and defensive forces between 1976 and 1985 (see figure 6). In contrast, most of the growth in US investment in strategic programs occurred after 1980 and was concentrated almost exclusively in programs for intercontinental attack. The disparity also reflects Soviet modernization of that portion of strategic offensive forces intended for attacking targets along the periphery of the Soviet Union. If investment in those peripheral attack forces were excluded, the dollar value of cumulative Soviet investment would be 95 percent larger than that of the United States

Over the 1976-85 period, the cost of Soviet investment in *intercontinental attack forces*—ICBMs, SLBMs, and heavy bombers—exceeded comparable US outlays by over 50 percent. Soviet investment declined over most of the period as a number of modernization programs that had been started prior to 1976 neared completion. The United States, on the other hand, initiated several programs that resulted in a significant rise in investment outlays. As a result, the disparity was reversed, and by 1985, US investment outlays exceeded the dollar value of Soviet investment by about 45 percent:

- The decline in Soviet costs, which averaged about 5 percent a year, reflects the completion of the SS-17, SS-18, and SS-19 ICBM modernization programs and a slowdown in SSBN deliveries—from seven boats in 1976 to fewer than two boats per year in the late 1970s and early 1980s.

- US outlays averaged growth of about 12 percent a year. Growth during the first half of the period, less than 4 percent per year, was largely due to the Trident SLBM and air-launched cruise missile programs. After 1980, costs grew about 18 percent a year because of the B-1B bomber and Peacekeeper ICBM programs.

Over the 1976-85 period, we estimate more than 15 percent of the cumulative dollar cost of Soviet strategic investment—roughly $35 billion—was for *peripheral attack forces*. These are forces we believe are primarily dedicated to strategic targets along the periphery of the Soviet Union, primarily in Western Europe and China. They include the SS-20 intermediate-range ballistic missile (IRBM), the Backfire medium bomber, and about 70 percent of the Fencer light-bomber force. The United States has no direct counterpart in terms of a discrete mission, although certain US missiles, tactical aircraft, and submarines could perform similar functions 25X1

Over the 1976-85 period, the cumulative dollar value of Soviet investment in the modernization of *strategic defense forces*—interceptor aircraft, strategic SAMs, ballistic missile defenses, and warning and control systems—was nearly $55 billion. This total represents more than a quarter of the estimated cumulative dollar value of Soviet strategic investment. In contrast, US investment outlays for strategic defenses over the same period were roughly $1 billion, or about 1 percent of total strategic investment. 25X1

The disparity in levels of investment activity reflects significant differences in the two countries' approaches to strategic weapons. Since the early 1960s, US strategic doctrine has emphasized the use of offensive forces to deter an enemy attack rather than the deployment of defensive forces aimed at limiting the damage from an enemy strike. Moreover, after agreeing in the 1972 antiballistic missile (ABM) treaty not to deploy a nationwide defense against the relatively large Soviet ICBM and SLBM threats, the United States decided not to commit the resources necessary to modernize its air defenses against the somewhat limited Soviet heavy bomber threat. In contrast, Soviet military doctrine historically has favored more balance between offensive and defensive forces. Although the Soviets also agreed not to deploy a nationwide ABM system, they have continued to commit substantial resources to the modernization of their defenses against bombers. This emphasis was influenced by the threats posed by the US strategic 25X1

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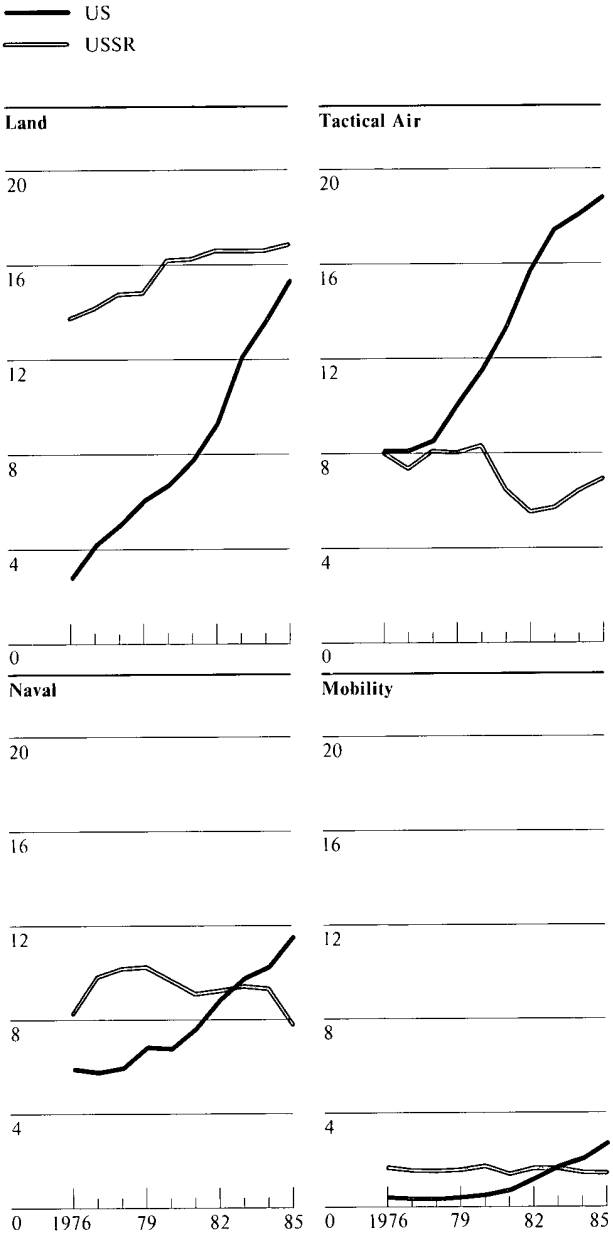
Figure 7
US and Soviet Investment in General Purpose Forces, 1976-85



bomber force—a force much larger than its Soviet counterpart—and by the threat from potentially hostile aircraft in the European and Pacific theaters and in China. In addition, the Soviets have continued to modernize their ABM defenses around Moscow and, while this effort remains within treaty limits, it puts them in a position to deploy a more comprehensive system in a relatively short period of time. 25X1

General Purpose Forces. This mission includes all land, tactical air, general purpose naval, and mobility (airlift and sealift) forces. 25X1

Over the period, the cumulative dollar value of Soviet investment in general purpose forces (excluding RDT&E) was about $340 billion—roughly 11 percent more than comparable US outlays. The margin was considerably higher in 1976, when our estimate of Soviet investment was nearly twice the US level. Over the next 10 years, however, Soviet investment costs grew at a steady, but slow, pace of less than one-half of 1 percent a year as the USSR continued to modernize its forces and to expand them along both the Sino-Soviet border and in the Warsaw Pact region. Meanwhile, US investment outlays nearly tripled, growing by more than 12 percent a year—a reflection of growth in all categories of general purpose forces, particularly in land and tactical air forces (see figure 7). Thus, US investment in general purpose forces by 1982 began to surpass our estimates for the USSR by a growing margin and by 1985 were about 45 percent greater than the dollar value of Soviet investment. 25X1

Over the 1976-85 period, the cumulative dollar value of Soviet investment in *land forces*—primarily for Ground Forces combat divisions, ground-attack helicopters, and certain elements of the Border Guards—was nearly twice the US investment outlays for land forces. The Soviet costs were nearly five times US outlays in 1976. The margin declined each year, and in 1985 they were only 10 percent greater than US investment 25X1

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The substantial disparity in cumulative investment costs reflects continuing Soviet efforts to both expand and modernize land forces that in 1976 were already significantly larger than those of the United States. The USSR added 35 active divisions and independent corps and increased the size of the equipment holdings in each of its combat divisions. Thus, in 1985 the USSR had 12 percent more tanks, 70 percent more armored troop carriers, and more than 50 percent more artillery pieces than it had at the start of the period. At the same time, the Soviets replaced large blocks of older equipment with newer, more capable versions. By 1985, for example, more than 35 percent of the Soviet tank force consisted of modern T-64, T-72, and T-80 models compared with about 10 percent in 1976. This modernization was undertaken at a relatively steady pace and, when measured in dollars, required average growth in investment costs of more than 2 percent a year.

US investment outlays for land forces climbed dramatically throughout the period, averaging growth of about 20 percent a year. By 1985, US outlays for land forces were nearly five times as high as at the start of the period. However, the United States did not significantly increase the size of its land forces or produce as much new equipment as the USSR. The number of tanks acquired over the period, for example, was only about one-third of our estimate of total Soviet procurement. Instead, the United States procured smaller numbers of weapons—such as the M1 tank, the M2 infantry fighting vehicle, and the AH-64 attack helicopter gunship—that were not only much more advanced and therefore more capable than their Soviet counterparts, but also considerably more costly. The United States also made a concerted effort in the early 1980s to improve both the combat readiness and sustainability of its land forces by accelerating its purchases of ammunition and major spare parts.

Both countries added sophisticated new fighter aircraft to the inventories of their *tactical air forces* (which include land- and sea-based fixed-wing aircraft that are used in a tactical combat role, as well as multipurpose aircraft carriers) during the 1976-85 period. US cumulative investment costs were about 85 percent greater than estimated Soviet investment, even though the Soviets procured nearly 60 percent more aircraft over the period. Moreover, the disparity widened throughout the period; by 1985 US investment outlays for its tactical aircraft were two and a half times our estimate for the Soviets. 25X1

In part, the higher US figures reflect the costs associated with the construction of three Nimitz-class carriers; these accounted for about 20 percent of US investment costs over the period. They also reflect US efforts to increase its stockpiles of ammunition and major spare parts. Primarily, however, the disparity in investment costs resulted from the US purchase of aircraft, such as the F-16 and F-18, that are more sophisticated and considerably more expensive than their Soviet counterparts. 25X1

Since 1976, Soviet investment in tactical air forces has followed an erratic but downward trend as production of the Flogger and Fishbed programs neared completion. In the early 1980s, the Soviets began series production of two new fighters, the Flanker and Fulcrum, which we believe have capabilities approaching those of current US fighters. Production of these aircraft, however, has proceeded at a relatively slow rate compared with past aircraft programs. In fact, we believe production has been below the level the Soviets intended, probably because of manufacturing difficulties. Partly because of these factors, by 1985 the dollar cost of Soviet investment in tactical aviation was about 15 percent less than it had been at the start of the period 25X1 25X1

Over the 1976-85 period, the estimated cumulative dollar cost of Soviet investment in *general purpose naval forces*—including major and minor surface combatants, attack submarines, antisubmarine warfare aircraft and carriers, amphibious warfare ships, and naval auxiliaries directly supporting the fleet—was about 15 percent larger than comparable US investment outlays. The difference in costs reflects the considerable modernization accomplished by the Soviets. The number of Soviet major surface combatants (more than 1,000 tons displacement) increased by 19 over the period, and the number of nuclear-powered submarines by 37. 25X1 25X1

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The difference in investment was greatest during the first half of the period, when the dollar value of annual Soviet investment was about 40 percent greater than US outlays. During the latter half of the period, the disparity narrowed considerably as investment in the US Navy grew at an annual rate of nearly 8 percent a year. This spending growth reflected an acceleration in the pace of ship and submarine construction in order to achieve the projected goal of a 600-ship Navy by the late 1980s. Soviet naval investment continued at about the same pace as during the first half of the period. As a result, US outlays began to exceed our estimates for the USSR in 1983 and by 1985 were nearly 50 percent higher.

25X1

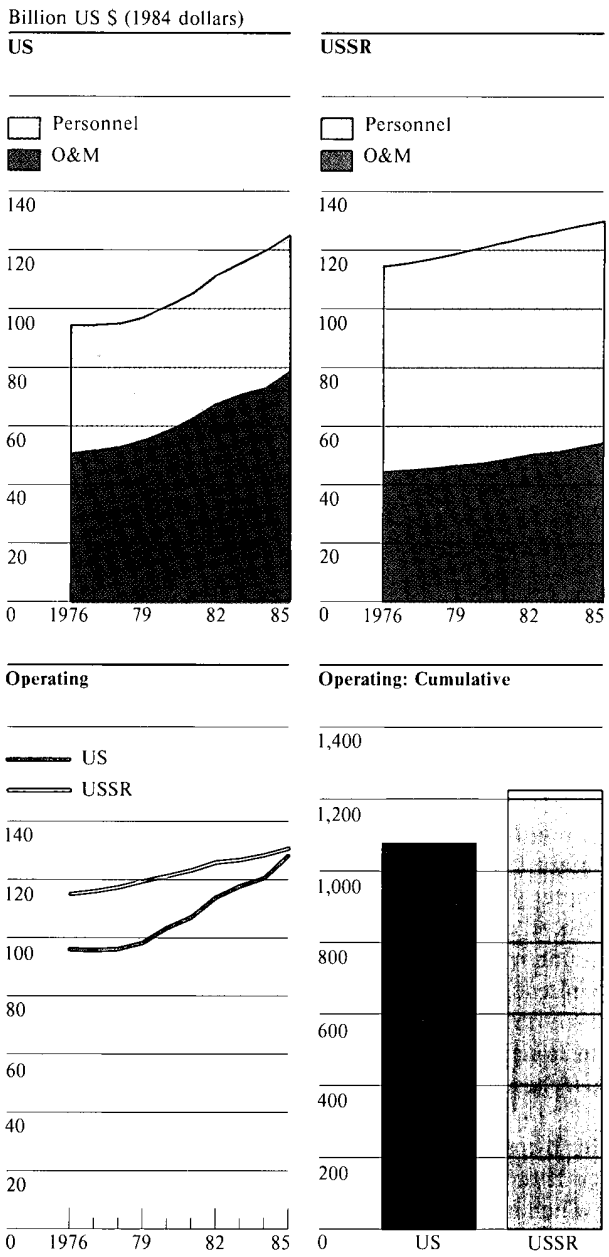
Over the entire period, cumulative Soviet investment in *mobility forces* (airlift and sealift activities and military port operations) measured in dollars was about one and a half times that of the United States. The Soviet costs reflect the modernization of the transport aircraft fleet with the new IL-76 Candid medium-range jet. Most US transport aircraft had been procured before 1976, and investment was directed toward the modification of existing aircraft, primarily the C-141 and C-5A jet transports.

25X1

Support Forces. The support mission includes those activities that are required to support US and Soviet combat forces. Because of the diverse nature of each country's support establishment, dollar costs are a particularly useful way to compare these activities in the aggregate. Some of the major elements of this mission are:

- The operation and maintenance of fixed military facilities.
- Training conducted at other than the unit level, primarily recruit/conscript, officer, and skills training.
- Administrative activities, including those of centrally located command personnel; recruitment, conscription, and personnel management services; and the administrative costs of US participation in NATO and the USSR's administration of the Warsaw Pact Alliance.

Figure 8
US and Soviet Military Operating Activities, 1976-85



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- Many other support services, such as satellite communications, hospitals and medical clinics, data-processing support, security, investigative and judicial activities, and the maintenance of emergency command posts.

In addition, the defense-related activities of the US Coast Guard and the administration of the Soviet KGB are included.

Over the decade as a whole, estimated Soviet investment in support forces was about 55 percent greater than comparable US outlays. The Soviet margin reflects, in large part, the cost of supporting a much larger military establishment

Comparisons of Operating Costs

Operating activities are divided into two categories:
- Personnel—the goods and services provided active and reserve military personnel, including pay, food, clothing, travel, and other allowances.
- O&M—the operation and maintenance of military equipment and facilities and the services provided by civilian personne

The dollar value of Soviet operating activities was about 15 percent higher than US outlays for the 1976-85 period. The costs for both countries increased over the period, primarily because of the maintenance required by increasingly more complex weapons of all types (see figure 8). Through 1980, the trends in US and Soviet operating costs roughly paralleled one another, with each increasing at between 1 and 2 percent a year. After 1980, however, growth in US operating expenditures accelerated to an average rate of almost 5 percent a year. For the same period, our estimates of Soviet dollar operating costs showed continued steady growth at about the average rate of the previous five-year period. As a result, by 1985 Soviet and US operating costs were nearly equal.

Personnel Costs

For the Soviet Union, military personnel costs accounted for almost two-thirds of the estimated dollar operating costs for the 1976-85 period (see inset). They were more than 65 percent greater than US outlays for military personnel, which account for less than half of US operating expenditures. The USSR has more than twice as many personnel, but a higher percentage of them are at the lower end of the pay scale

Over the entire period, the growth in US personnel costs averaged about the same as in our estimates of Soviet costs. Since 1979, however, annual US costs have been increasing more than twice as fast as Soviet personnel costs. In part, the acceleration in US personnel costs after 1979 reflects increases in manpower levels. Primarily, however, it reflects increases in the

Estimating Soviet Personnel Costs in Dollars

The dollar value of Soviet military personnel costs is derived by applying US military pay rates to the relatively large Soviet force. US pay rates are applied to the job structure of the Soviet military and not to the rank structure because the Soviets often require officers to perform functions that in the United States would be assigned to enlisted personnel. This method, therefore, is consistent with what the dollar values represent—the cost of reproducing Soviet military activities in the United States.

Critics argue that this approach makes the disparity between the two defense establishments look greater than it is, because the Soviet military consists of numerous conscripts that are poorly paid, even when compared to the average ruble wage in the USSR. If, however, the dollar value methodology is to provide comparisons that have validity and precision, US cost factors must be applied equally to all Soviet activities; no part of the whole can be withdrawn for calculation by a separate set of rules. Moreover, the dollar valuation of Soviet military activities does not and is not intended to address the question of whether the Soviets would choose to have such a large military establishment if they had to pay dollar prices instead of ruble prices for their manpower.

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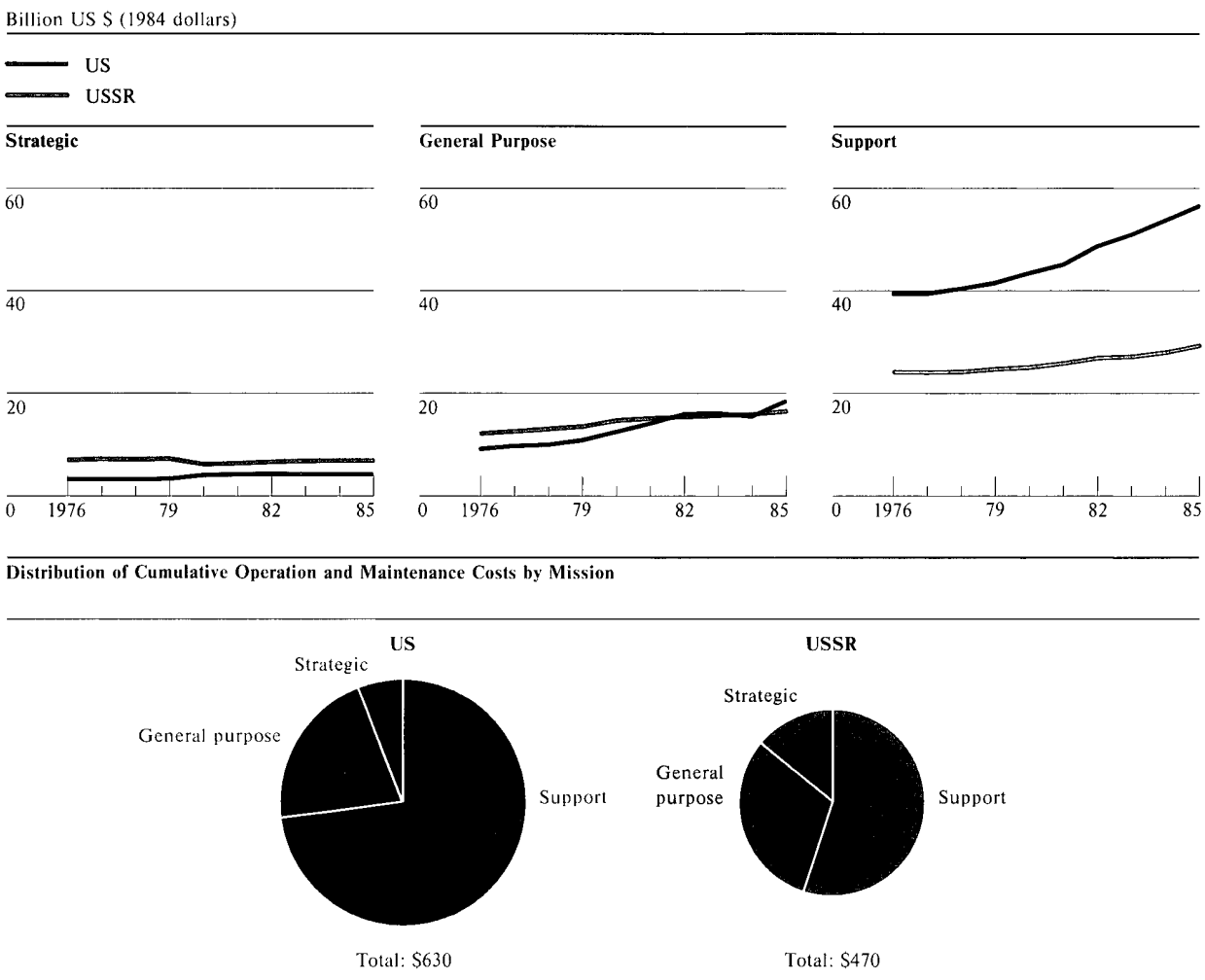
Figure 9
US and Soviet Operation and Maintenance Costs, 1976-85



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rate of reenlistment among US servicemen. As the number of reenlistments increased, so did the number of officers and enlisted men at the higher end of the pay scales.

Operations and Maintenance

Since 1976, the dollar cost of operating and maintaining the Soviet armed forces (including civilian personnel costs) has been increasing at a fairly steady rate of more than 2 percent a year. This trend is a result of the continued growth in the weapons inventories of Soviet general purpose forces (see figure 9). It also reflects the maintenance and support required by increasingly complex tactical weapons

Operation and maintenance costs for Soviet *strategic forces* did not grow over the period, despite the considerable force modernization that has taken place since 1976. In part, this reflects the fact that the inventories of most strategic weapons remained relatively stable over the period. Moreover, while the newer systems are more technologically sophisticated than the ones they replaced, in many cases they are not as hard to operate and maintain. For example, the SS-20 solid-propellant IRBM is considerably easier to operate and maintain than the older, liquid-fueled SS-4 and SS-5 missiles. The chief reason for the lack of growth in O&M costs, however, stems from a reorganization of the Soviet Air Forces that occurred during the early 1980s. This reorganization changed the primary mission of about 1,000 aircraft from what had been strategic air defense to a tactical one. This required an accounting change, as the O&M costs associated with these aircraft were shifted from the strategic to the general purpose forces, and offset the increases in the O&M costs for other strategic offensive forces.

The costs of operating and maintaining the Soviet *general purpose forces* grew steadily over the period by 3.5 percent a year. The costs of each of the force components increased as inventories were expanded and equipment quality improved:

- The rise in the dollar value of Soviet land forces O&M was the result of growth in the inventories of most major land arms, particularly tanks and armored vehicles. Moreover, the quality of the forces continued to improve as T-64 and T-72 tanks, late-model BMPs, and self-propelled artillery accounted for increasing shares of the Soviet inventories.

25X1

- The O&M costs of Soviet tactical air forces went up over the first half of the period as third-generation Flogger and Fencer aircraft were deployed and the total number of tactical aircraft increased. During the latter half of the period, O&M costs stayed fairly level as those programs neared completion; fourth-generation Flankers and Fulcrums began to be deployed, but at a relatively slow pace.

- The O&M costs of Soviet general purpose naval forces increased fairly steadily over the period with the expansion in the inventory of major surface combatants and general purpose submarines. The higher O&M costs also reflect the growing sophistication of the forces; the newer ships and boats are generally faster than the ones they replace and incorporate more advanced weapons and electronic systems.

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The dollar value of Soviet O&M of *support forces* increased an average of about 2 percent a year. In part, the annual cost increases reflect the additional requirements of supporting an expanding Soviet military establishment. After 1980, O&M costs accelerated sharply as Soviet military space programs began to play a much larger support role, particularly in the areas of communications and intelligence collection.

25X1

The United States devotes considerably more resources to the operation and maintenance of its forces than does the USSR. We estimate that in the 1976-85 period, US outlays for O&M activities were about a third higher than the dollar value of comparable Soviet activities, even though the weapons inventories of most US force components were smaller than their Soviet counterparts. Moreover, by 1985, US O&M expenditures had increased by more than 50 percent over their 1976 levels while our estimate of the dollar cost of Soviet O&M activities had risen only about

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20 percent. The disparity in cost levels results primarily from higher US operating rates—especially for naval forces and aircraft—as well as the more technologically complex nature of US equipment, which makes maintenance more difficult and costly. In addition, since 1980 the United States has made a determined effort to upgrade the combat readiness and sustainability of its forces by undertaking more extensive maintenance of its military equipment, particularly for its tactical combat aircraft.

Growth in US operation and maintenance requirements affected each of the major missions:

- US O&M expenditures for strategic programs increased an average of about 3 percent a year. Most of the growth reflects increases in the cost of maintaining the aging B-52 heavy bomber force.

- US O&M outlays for general purpose forces rose by more than 8 percent a year, mainly reflecting increases in the weapon inventories of each of the major force components. It also reflects the growing complexity of US forces as weapons like the M1 tank, F-18 fighter-bomber, and Aegis-class cruiser make up an increasing share of the inventory.

- US O&M expenditures for support forces, accounting for about three-fourths of total O&M outlays, grew by about 4 percent a year. The increased outlays resulted primarily from increases in the pay and benefits of civilian personnel who operate bases and logistics establishments and serve in administrative capacities.

Research, Development, Testing, and Evaluation Activities

During the 1976-85 period the Soviets continued their longstanding commitment to a large and growing military RDT&E establishment. Over the decade we identified 185 new or signficantly modified Soviet weapon, aerospace, and military support systems. We project that at least another 105 to 125 new systems or major modifications will be ready for series production by the mid-1990s, on the basis of our identification of 76 that are currently in flight-testing and development. Moreover, since 1976 Soviet resources committed to the development and acquisition of key advanced technologies—including microelectronics and advanced manufacturing systems—appear to have grown even faster than the resources committed to the development of individual weapons.

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Resources committed to US RDT&E grew rapidly beginning in the early 1980s. This growth reflected:

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- A vigorous research program—the Strategic Defense Initiative—to assess the potential for an effective defense against strategic ballistic missiles.

- Efforts to improve strategic nuclear forces, including enhancements to the command, control, and communications systems that support strategic forces; development of the Peacekeeper ICBM and the B-1B bomber; and research on a small ICBM, the Advanced Technology Bomber, an antisatellite system, and the new D-5 SLBM for the Trident submarine.

- In the conventional area, development of precision guided munitions and a conventional initiatives program, both of which rely on microelectronics technology.

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Manpower and Floorspace

We estimate that the floorspace devoted to Soviet military RDT&E between 1976 and 1985 increased at an average rate of over 3 percent per year. In 1985, floorspace dedicated to military RDT&E programs totaled more than 80 million square meters, and the Soviets employed about 3 million people to support their military RDT&E activities. Total manpower increased over the period at an average rate of about 3 percent a year, somewhat faster than during the 1965-76 period.

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Additional floorspace studies show that growth in the allocation of military RDT&E resources has been greatest in newer technological areas, such as advanced electronic systems and lasers. The

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Resource Implications of Soviet Responses to SDI

The Soviet Union has long expended significant resources on the strategic defense mission, including development of ballistic missile defense and antisatellite systems, as well as an extensive national air defense network. Existing military research programs provide a solid base for exploration and development of a variety of advanced technologies that the Soviets will need to support efforts to either counter or emulate the US Strategic Defense Initiative (SDI). Some of these programs, however, are in the early stages and are essentially intended to demonstrate technology feasibility. To incorporate emerging technologies into viable system designs, the Soviets must first overcome technological challenges in such areas as advanced microelectronics, high-speed computers, communications hardware and software, signal processors, and electro-optical systems.

Since the United States announced its SDI program in 1983, the Soviets probably have taken some steps to refocus existing research efforts and to allocate resources for new research initiatives to better understand key SDI technology thrusts and to examine any potential countermeasures existing programs may offer.

We believe, however, that the Soviets will wait until the early 1990s—when the US architecture is more clearly defined and SDI's likely impact on US strategy and force posture can be assessed with greater confidence—before deciding precisely how to respond. To be effective, Soviet countermeasures must be developed against specific US operational capabilities.

The Soviets might choose to:

- *Expand the size of their offensive nuclear forces to saturate US defenses.*
- *Develop and deploy a variety of active and passive measures to enable strategic weapons to better penetrate their targets.*
- *Develop and deploy operational capabilities to directly attack space- or ground-based elements of the US strategic defense system.*
- *Develop and deploy a nationwide, ground-based ballistic missile defense system.*
- *Emulate the SDI approach and develop their own integrated space- and ground-based strategic defense system.*

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None of these options are likely to require significant increases in resources in the research phase, which normally lasts for several years. But sharply increasing production of existing strategic systems or moving new strategic programs incorporating advanced technologies into advanced engineering development, testing, and production would require a substantial increase in resources.

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Even though relatively small in absolute terms, Soviet research and development efforts in response to SDI could impair much-needed progress in other areas. The initiation of major new programs in the next several years would almost certainly conflict with, or even preempt, resource allocations for other projected priority military programs, such as smart tactical weapons, as well as conflicting with General Secretary Gorbachev's industrial modernization program. Trade-offs with the economy as a whole would be particularly severe in the allocation of scarce, high-quality resources, such as microelectronics, computers, and skilled personnel.

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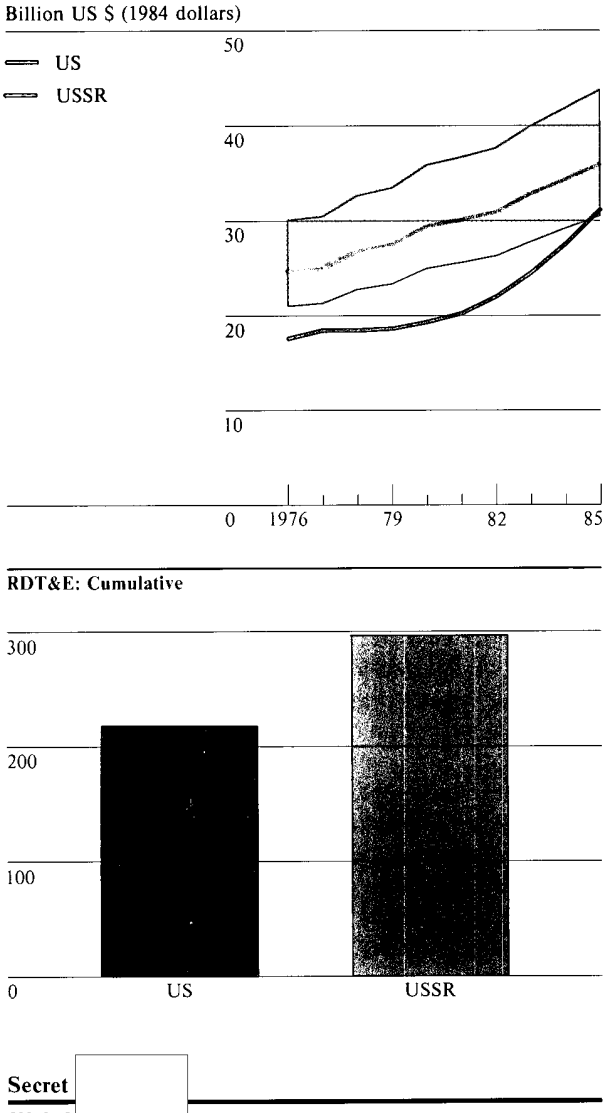
Figure 10
US and Soviet Military RDT&E, 1976-85



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New Methodology for Estimating the Cost of Soviet RDT&E

A new building-block methodology has been developed to estimate Soviet military RDT&E expenditures, which makes maximum use of available all-source intelligence data. The method has two stages. We first build a file of all the Soviet facilities identified as being involved in military RDT&E activities. Then, using the data collected on individual facilities, we estimate the aggregate commitment of floorspace and manpower to the Soviet military RDT&E effort. These estimates are then used with all-source data on resource costs to calculate total expenditures for resource inputs such as the wage bill; purchases of materials and equipment; expenditures for travel, training, and other operating costs; capital repair; and new construction. The sum of the inputs in these categories represents our estimate of total Soviet military RDT&E expenditures. We believe it unlikely that this estimate is in error by more than 15 or 20 percent

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The estimate is first calculated in rubles. The ruble estimate is converted to dollars by using an average dollar-ruble ratio for military procurement to reflect differences in the productivity of research and development resources in the two countries.

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trend toward developing weapon systems that incorporate higher levels of technology is apparently requiring increasing support from the nondefense segment of the Soviet RDT&E establishment. We estimate that, together, the Academies of Science, the nondefense industrial ministries, and the higher educational institutes now account for about one-half of all the manpower supporting military RDT&E activities.

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Cost Comparisons

Over the 1976-85 period, the dollar value of Soviet military RDT&E activities grew steadily at about 4 percent a year and exceeded comparable US outlays

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by more than 35 percent. (The Soviet estimate is based on a new methodology; see inset.) The disparity was considerably larger during the 1976-80 time period when Soviet costs were growing at almost twice the rate of US outlays (see figure 10). Since 1980, however, US RDT&E expenditures have accelerated, increasing an average of more than 10 percent a year. As a result, the RDT&E dollar cost gap closed considerably, and in 1985 Soviet costs were about 15 percent greater than US outlays.

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Trends in Total Defense Costs

Because of the larger size of the Soviet military and the higher levels of military production, the estimated cumulative dollar cost of Soviet defense activities exceeded comparable US defense outlays by about 25 percent in 1976-85. The margin narrowed throughout the period (see figure 11). In 1976 the costs were 45 percent higher, but by 1985 they were virtually the same as US defense outlays

Growth in the dollar cost of Soviet defense activities averaged 1.5 percent a year over the entire period. Military investment was fairly level, accounting for the slow pace of total growth compared with the previous decade. Thereafter, RDT&E was the primary source of growth, although operating costs also increased somewhat due to the steady pace of Soviet modernization. In mission aggregations (excluding RDT&E), the costs for general purpose forces and support activities showed some growth over the period while the costs of strategic programs declined.

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In contrast, US defense outlays at the beginning of the period were rising at an average rate of nearly 3 percent a year, and in the early 1980s this growth accelerated to a rate of about 8 percent a year. The rapid growth after 1980 reflected large increases in military investment—which more than doubled over the period—as well as moderate growth in operating costs. Substantial growth occurred in each of the major missions. US spending on strategic and general purpose forces doubled over the period; support costs grew at a more modest rate.

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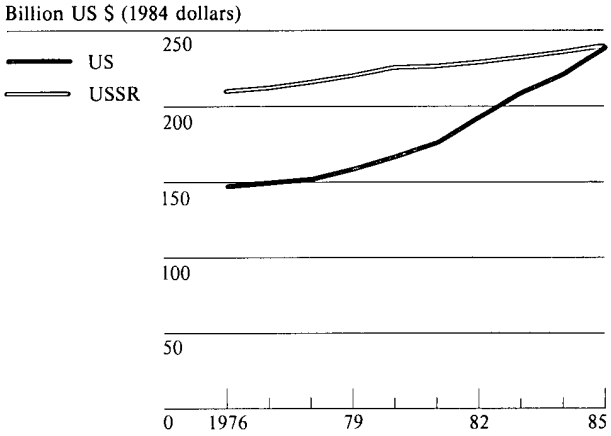
Figure 11
US and Soviet Defense Activities, 1976-85



Distribution of Cumulative Costs by Resource Category

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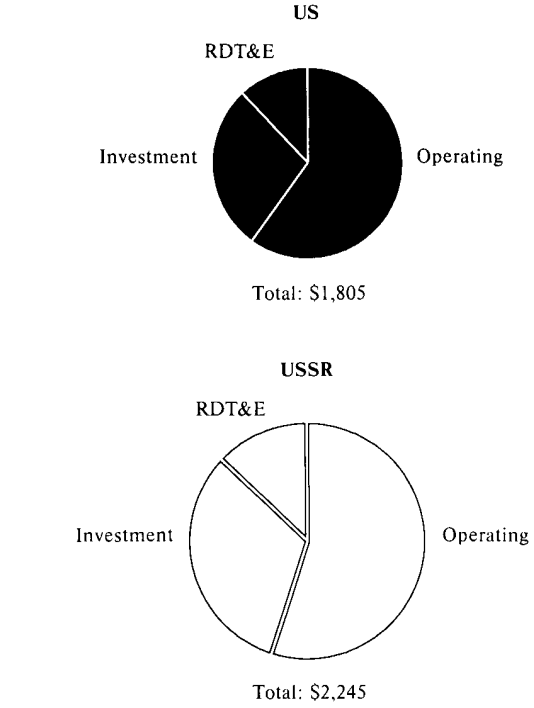

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Table 5
Estimated Costs of Selected US and Soviet National Security Activities in 1983

Activities	US	USSR	USSR as Share of US
	(billion 1984 dollars)		*(percent)*
Traditional defense activities (baseline definition)	**208**	**232**	**112**
Other national security activities	**87.9**	**123.5 to 131.7**	**140 to 150**
Mobilization/wartime preparedness	6.4	23.5 to 29.6	367 to 462
Internal security troops	2.1	3.0	
Railroad and construction troops	3.0	9.0	
Civil defense	0.2	7.5 to 8.9	
Industrial and strategic reserves	0.2	0.1 to 0.4	
Defense highways	0	3.6 to 5.2	
Industrial surge capacity	0.01	0.3 to 3.0	
Synthetic fuels	0.4	0.04	
Merchant fleet O&M	0.4	NEGL	
Enhancement of global position	19.4	31.6	163
Economic aid	3.0	11.3	
Military aid	6.8	5.1	
Conduct of foreign affairs	1.9	2.9	
Foreign information and exchanges	0.6	4.0	
Government-funded foreign students	0.1	1.5	
Civil space	7.0	7.0	
Past defense activities	62.1	68.4 to 70.5	110 to 114
Veterans' benefits	29.5	13.9	
Civilian pensions	7.9	6.6	
Military pensions	17.1	43.0	
Defense-related lawsuits	0.1	NEGL	
Cash flow (interest on national debt attributable to defense less new debt created for defense)	7.6	4.9 to 7.0	
Traditional defense plus other national security activities	**295.9**	**356 to 364**	**120 to 123**

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Extended Dollar Cost Comparisons

The baseline definition of defense used in this paper is the one commonly used in the United States. It includes current activities of the Department of Defense and a few closely related activities of other government agencies (see appendix B for a complete definition). This section examines the dollar costs of a wider set of activities that support national security in a broad sense but are only loosely related to traditional concepts of defense. (Appendix C describes these activities extensively.) We have estimated these costs for a single year, 1983—the most recent year for which we have reasonably complete information (see table 5)

The additional activities are arranged into three functionally related sets. The first set includes activities that bolster mobilization or wartime preparedness. The second set includes activities that enhance a nation's global position. It includes the costs of the foreign policy establishment and of such international activities as military and economic aid. The final set includes the continuing cost of past national security activities, such as military pensions and veterans' benefits. These activities are not usually included in defense cost comparisons because they do not directly contribute to national war-fighting potential.

Wartime Preparedness

The Soviet Union has a much more extensive preparedness program than the United States, and its dollar valuation in 1983 was roughly four times higher than comparable US outlays:

- Civil defense activities are much more extensive in the USSR than in the United States and include about 150,000 full-time military and civilian personnel, blast shelters, and military civil defense installations.

- We believe the Soviets hold reserves of industrial materials at their factories sufficient to support military production for four to 12 weeks. In contrast, US industry sets its own inventory level. These inventories fluctuate widely with economic trends and are not driven by defense policy.

- In addition to material reserves, the USSR builds industrial surge capacity into its machine-building sector to permit increases in military production during a war. The United States does not have an extensive program to set aside excess capacity. Although it exists in varying degrees in defense industries, it is also largely dictated by economic trends rather than defense policy 25X1

Enhancement of Global Position

Soviet international activities in 1983 were approximately two-thirds greater than those of the United States:

- The largest costs for both countries were incurred for economic and military aid. Almost 45 percent of Soviet economic aid was in the form of price subsidies in trade with other Communist countries. The Soviet trade deficit with Eastern Europe constituted another 20 percent. US economic assistance was smaller because the United States had no provisions for subsidizing its trade. 25X1

- Soviet costs for conducting foreign affairs were higher than US costs because Moscow has about twice as many diplomats. 25X1

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Past Defense Activities

The dollar valuation of past Soviet defense activities was only slightly higher than US outlays:

- The costs of Soviet veterans' benefits were considerably less than US costs. Stricter Soviet eligibility rules and higher mortality rates limit the number of beneficiaries to a little more than one-third the US level.

- Soviet military pension costs, on the other hand, were much larger than US costs. Although the Soviets have fewer career enlisted men than the United States, they have more retired officers 25X1

Comparison of National Security Costs

The dollar value of Soviet national security activities in 1983 exceeded comparable US costs, no matter what collection of activities is selected (see figure 12).

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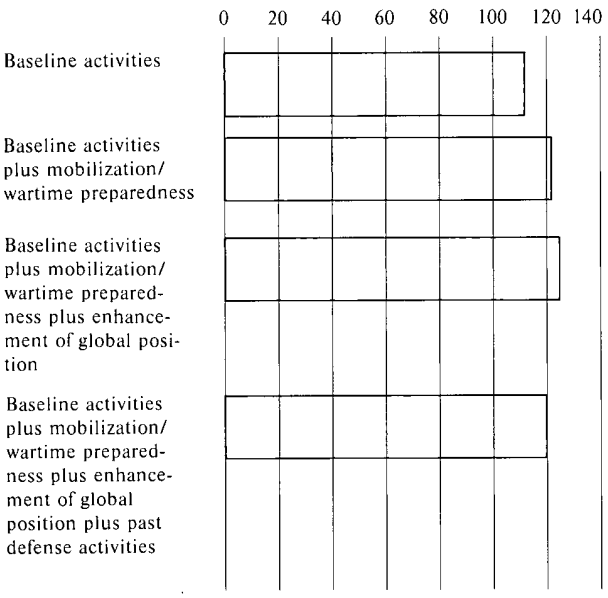
Figure 12
US and Soviet Extended Comparisons for 1983



[a] Soviet costs as a percent of US costs.

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The USSR's margin ranged from 12 percent (for the traditional definition of defense) to 26 percent (defense plus the first two categories above). Under the broadest definition (defense plus all three of the other national security categories), Soviet activities exceeded those of the United States by almost $70 billion, or by about 23 percent

Outlook

Soviet General Secretary Gorbachev has firmly established industrial modernization as a top priority, and his plans for refurbishing the country's industrial base imply increased demands for many of the resources involved in the production of weapons

Table 6
USSR: Procurement of Selected Weapon Classes

Weapon Class	1981-85 (estimated)	1986-90 (possible)
ICBMs/SLBMs	550	700
Submarines	40	50
Tanks	12,600 [a] (350)	18,000 [a] (9,700)
Fighter aircraft	2,400	2,000 [b]
Helicopters	2,500	2,100 [b]
Medium and heavy bombers	200	210

[a] Includes major retrofits of older tanks (number shown in parentheses).
[b] Although our projections suggest lower overall numbers in these categories, the fighters and helicopters the Soviets will procure during 1986-90 are more complex, capable, and costly than those purchased during 1981-85.

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In the near term, the Soviet defense establishment is well positioned to accommodate these demands because of major investments made in defense industrial facilities since the late 1970s. As a consequence, most Soviet weapons expected to be delivered to the Soviet forces through 1990 will be manufactured in plants already built and operating. For these reasons, we expect the high levels of military procurement the Soviets have sustained over the past decade to continue, albeit at relatively slow rates of growth. 25X1 25X1

Table 6 compares 1981-85 production of major weapon systems with representative levels of production of the same systems that are feasible over the next five years if procurement remains at its current level. The specific mix of weapons may be somewhat different, but, because of the sunk costs and the momentum of ongoing programs, the Soviets are unlikely to make major adjustments to key programs. Therefore, we believe these figures reflect the general level of procurement that will occur during the 1986-90 period. At such a level, improvements to Soviet strategic and conventional forces will be substantial. 25X1 25X1

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Over the longer term, competition between industrial modernization and force modernization is likely to build. The demand for new investment for defense plant and production equipment will almost certainly rise in the late 1980s and early 1990s when the Soviets will have to begin tooling up for the next generation of weapons. New weapon systems will require advanced microelectronics design, fabrication, and testing capabilities and, consequently, will also require new production machinery. Military pressures for the same resources needed for industrial modernization will intensify, particularly if tensions in the US-Soviet relationship heighten and the Soviets think they have to initiate additional, costly weapon programs such as a space-based ballistic missile defense.

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On the other hand, such pressures could be mitigated if the United States and the USSR conceived a comprehensive arms control agreement that called for sizable reductions in strategic forces and prevented or delayed deployment of a US SDI. Reductions in deployed forces would enable the Soviets to save material and labor, and even greater savings would accrue if the agreement allowed the Soviets to forgo or postpone the investment in plant and equipment for production of new weapon systems

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Appendix A

Statistical Tables

Table A-1
Dollar Value of Soviet Defense Activities and
US Defense Outlays by Resource Categories, 1965-85 [a]

Billion 1984 dollars

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	Cumulative
US total	**179**	**203**	**228**	**235**	**220**	**198**	**180**	**165**	**157**	**152**	**149**	**146**	**149**	**151**	**158**	**166**	**175**	**192**	**208**	**221**	**238**	**3,873**
Investment	46	55	66	70	63	53	45	39	37	34	33	33	34	36	41	43	48	56	66	72	78	1,049
Procurement	41	50	61	65	59	49	41	36	33	31	29	28	31	33	38	40	45	53	62	68	74	964
Construction	5	6	5	5	4	4	4	3	4	4	4	4	4	3	3	3	3	4	4	4	4	85
Operating	109	124	138	140	135	125	115	106	100	99	99	96	96	96	99	104	107	114	118	121	129	2,370
Personnel	58	63	69	71	70	65	59	53	49	48	46	45	44	43	43	44	44	45	47	48	50	1,103
O&M	51	61	69	69	65	60	56	53	51	51	52	52	52	53	56	60	63	69	71	73	79	1,267
RDT&E	23	24	25	25	22	21	20	20	20	19	18	17	18	18	19	19	20	22	24	28	31	454
USSR total	**143**	**147**	**156**	**163**	**170**	**178**	**183**	**186**	**193**	**201**	**204**	**210**	**212**	**216**	**220**	**225**	**226**	**229**	**232**	**236**	**240**	**4,170**
Investment	46	47	52	55	58	61	60	60	63	68	69	70	71	71	73	74	73	72	72	73	73	1,359
Procurement	37	39	43	45	47	49	49	49	54	59	60	60	61	61	63	64	62	61	62	62	63	1,151
Construction	8	7	9	11	11	11	11	10	9	9	9	9	9	10	10	11	10	10	10	11	10	208
Operating	83	84	87	92	95	99	102	105	108	110	112	115	116	118	120	121	123	126	127	129	131	2,303
Personnel	56	57	59	61	63	65	67	69	69	70	71	72	73	73	74	76	76	77	78	78	79	1,465
O&M	26	27	29	30	32	33	35	37	38	40	41	43	44	44	45	46	47	49	49	50	52	838
RDT&E	15	17	17	16	17	19	20	21	22	23	24	25	25	27	27	29	30	31	33	34	36	508

[a] Because of rounding, data may not add to totals shown.

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Table A-2
Dollar Value of Soviet Defense Activities and US Defense Outlays by Missions, 1965-85 [a]

Billion 1984 dollars

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	Cumulative
US total	**179**	**203**	**228**	**235**	**220**	**198**	**180**	**165**	**157**	**152**	**149**	**146**	**149**	**151**	**158**	**166**	**175**	**192**	**208**	**221**	**238**	**3,873**
Strategic forces	20	18	17	17	16	15	14	14	13	12	11	11	11	12	13	13	14	16	17	19	21	315
Intercontinental attack	12	10	10	10	10	9	8	8	8	7	7	7	8	8	8	9	9	10	11	13	14	194
Intercontinental bombers	4	4	5	5	5	4	3	3	3	3	3	2	2	2	3	3	4	4	5	7	7	83
Intercontinental submarines	4	3	3	3	3	3	3	3	3	3	3	3	4	4	5	5	4	4	4	4	5	76
Intercontinental missiles	4	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	35
Strategic defense	4	3	3	3	3	3	3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	40
Strategic other	4	4	4	3	3	3	3	3	3	3	2	3	3	3	4	4	5	5	6	6	7	80
General purpose	53	66	81	84	75	64	54	45	43	44	45	45	47	48	53	57	62	71	78	81	88	1,283
Land	21	28	36	38	33	27	21	16	15	16	16	16	17	18	19	20	21	24	27	30	33	489
Tactical air	14	18	23	24	21	18	16	14	13	13	14	14	14	15	16	19	21	24	26	26	29	393
Naval	14	15	16	16	16	14	13	13	13	13	13	13	14	14	15	16	17	19	21	21	23	332
Mobility [b]	9	12	14	14	12	10	9	7	6	5	5	5	5	5	5	7	7	8	9	9	10	174
Support	83	95	106	110	106	98	92	86	80	77	76	73	72	73	74	77	79	84	89	93	98	1,820
RDT&E	23	24	25	25	22	21	20	20	20	19	18	17	18	18	19	19	20	22	24	28	31	454
USSR total	**143**	**147**	**156**	**163**	**170**	**178**	**183**	**186**	**193**	**201**	**204**	**210**	**212**	**216**	**220**	**225**	**226**	**229**	**232**	**236**	**240**	**4,170**
Strategic forces	26	29	33	34	36	37	35	34	36	39	38	39	39	38	39	38	38	37	37	36	36	753
Intercontinental attack	5	8	12	12	13	14	13	12	14	16	15	14	14	13	14	13	12	10	11	11	10	257
Intercontinental bombers	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	1	1	1	2	11
Intercontinental submarines	1	1	3	4	5	6	5	6	8	8	6	6	6	6	5	6	6	4	5	5	5	107
Intercontinental missiles	3	6	9	7	7	8	7	6	6	8	9	8	8	7	8	7	5	5	5	5	4	138
Peripheral attack	6	5	5	5	5	4	4	4	4	4	5	5	5	6	6	6	8	8	7	7	6	118
Strategic defense	13	13	14	14	16	16	15	14	15	15	15	16	16	15	15	14	13	14	13	14	15	303
Strategic other	2	2	2	3	3	3	3	3	3	3	3	4	4	4	5	5	5	5	5	5	5	75
General purpose	52	52	54	57	58	62	64	66	68	70	73	73	75	78	79	83	81	82	83	84	84	1,476
Land	31	32	33	37	38	39	40	42	43	43	43	44	44	46	47	50	50	51	52	52	53	909
Tactical air	7	5	5	5	5	7	8	10	11	11	13	12	12	13	13	14	12	11	12	12	13	210
Naval	12	13	13	12	13	13	13	12	12	13	14	14	16	16	16	16	16	16	16	16	15	297
Mobility	2	2	2	2	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	60
Support	50	50	53	56	59	61	63	65	67	69	70	73	73	73	74	75	77	79	79	82	84	1,433
RDT&E	15	17	17	16	17	19	20	21	22	23	24	25	25	27	27	29	30	31	33	34	36	508

[a] Because of rounding, data may not add to totals shown.
[b] Because a number of US mobility services are charged to other US defense missions, the total shown for general purpose forces will be less than the sum of its components. The mobility component includes these other service charges in order to illustrate the true mobility mission size. They have been excluded from the general purpose forces' total to avoid double counting.

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Table A-3
Dollar Value of Soviet Military Investment and US Investment Outlays by Missions, 1965-85 [a]

Billion 1984 dollars

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	Cumulative
US total investment	**46**	**55**	**66**	**70**	**63**	**53**	**45**	**39**	**37**	**34**	**33**	**33**	**34**	**36**	**41**	**43**	**48**	**56**	**66**	**72**	**78**	**1,049**
Strategic forces	11	9	9	9	9	9	8	8	8	7	6	5	6	7	7	7	8	9	11	13	14	180
Intercontinental attack	7	6	5	6	6	5	5	5	4	4	4	3	4	4	4	4	4	5	6	8	8	108
Intercontinental bombers	1	2	2	3	3	2	1	1	1	1	1	1	1	1	1	1	1	2	3	5	5	37
Intercontinental submarines	2	2	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3	2	2	2	45
Intercontinental missiles	3	2	2	2	2	2	1	1	1	1	1	1	1	1	NEGL	NEGL	NEGL	NEGL	1	1	1	27
Strategic defense	1	1	1	1	1	1	2	2	1	1	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	12
Strategic other	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	4	5	5	5	59
General purpose	23	31	40	43	38	31	24	20	19	18	17	17	18	20	23	25	29	35	41	44	48	608
Land	6	9	13	14	12	9	6	4	3	4	3	3	4	5	6	7	8	9	12	14	15	165
Tactical air	9	13	17	18	16	13	10	9	8	8	8	8	8	9	10	11	13	16	17	18	19	257
Naval	6	6	7	8	8	7	7	7	6	6	6	6	6	6	7	7	8	9	10	10	12	154
Mobility	2	3	3	3	3	2	2	1	1	1	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	1	1	2	2	3	31
Support	12	15	17	18	16	13	12	11	11	10	10	10	10	10	10	10	10	12	14	15	16	262
USSR total investment	**46**	**47**	**52**	**55**	**58**	**61**	**60**	**60**	**63**	**68**	**69**	**70**	**71**	**71**	**73**	**74**	**73**	**72**	**72**	**73**	**73**	**1,359**
Strategic forces	13	15	19	19	21	21	19	16	19	21	20	20	21	20	21	22	22	20	20	19	19	409
Intercontinental attack	3	6	10	9	10	11	9	8	10	11	11	10	9	9	9	9	8	6	7	7	6	176
Intercontinental bombers	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	NEGL	1	1	3
Intercontinental submarines	1	1	3	4	5	5	5	5	7	7	5	4	4	4	4	4	5	3	4	3	3	88
Intercontinental missiles	2	5	7	5	5	5	4	2	3	4	5	5	5	5	5	4	3	3	3	3	2	85
Peripheral attack	2	2	2	1	1	1	1	1	1	1	1	2	2	3	3	3	5	5	4	3	3	47
Strategic defense	5	6	6	6	7	7	6	5	5	6	6	6	6	5	5	5	5	5	5	5	6	119
Strategic other	2	2	2	2	2	2	2	2	3	3	3	3	4	4	4	4	4	4	4	4	4	66
General purpose	22	21	22	23	24	26	27	28	29	31	32	32	33	35	35	36	33	33	33	34	33	621
Land	9	10	10	13	13	13	13	14	15	14	14	14	14	15	15	16	16	17	17	17	17	293
Tactical air	4	3	3	2	2	4	5	7	7	7	9	8	7	8	8	8	6	6	6	6	7	124
Naval	8	8	8	7	7	7	7	6	7	8	8	8	10	10	10	10	9	9	9	9	8	174
Mobility	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	2	1	1	30
Support	11	10	11	13	14	14	14	15	15	16	16	18	17	17	17	17	18	18	18	20	20	329

[a] Because of rounding, data may not add to totals shown.

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Appendix B

Methodology

Definitions

The following US activities and their Soviet counterparts are included in the baseline comparisons in this report:

- National security programs funded by the Department of Defense.
- Defense-related nuclear programs funded by the Department of Energy.
- Selective Service activities.
- The defense-related activities of the Coast Guard. (U)

The following are excluded from the comparisons:

- All costs of military retirement and veterans' programs, which reflect payment for past rather than current military activities.
- Soviet space activities that in the United States would be funded by the National Aeronautics and Space Administration (NASA).
- Military assistance (except for the pay and allowance of uniformed personnel) and foreign military sales.
- Civil defense programs.

Methodology

We develop the dollar costs of all Soviet defense activities by identifying and listing Soviet forces and their support organizations. Our model contains a description of over 1,300 distinct defense components—for example, individual classes of surface ships; Ground Forces divisions, divided into categories on the basis of type and readiness level; and air regiments, categorized by aircraft type for each service. It also contains our latest estimates of the order of battle, manning levels, equipment inventories, and new equipment purchases of each component.

To these detailed estimates of physical resources, we apply appropriate US prices and wage rates. This procedure is complex, but in general we do the following:

- For procurement, we estimate what it would cost to build the Soviet weapons and equipment in the United States at prevailing dollar prices for materials and labor (including overhead and profit), using US production technology. It is assumed the necessary manufacturing capacity, materials, and labor would be available.

- For operations and maintenance, we apply dollar prices to estimates of the labor, materials, spare parts, overhead, and utilities required to operate and maintain equipment the way the Soviets do.

- For military personnel, we estimate the military rank of the person in the United States who would be assigned the duties of each Soviet billet. We then apply the appropriate US pay and allowance rates to that billet.

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The results are then aggregated by military mission and by resource category

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Our previous estimates for Soviet RDT&E were based on a "residual" methodology, which derived total RDT&E costs in rubles using published Soviet data on resources devoted to "science." Civilian expenditures were subtracted from the total RDT&E estimate to derive expenditures for military RDT&E. This was the only element of our estimate that was derived in the aggregate, and it was the one to which we attributed the greatest uncertainty

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To improve our understanding of the Soviet military-industrial complex, we have developed a new approach, the "resource costs" method, to estimate Soviet military RDT&E expenditures. The new methodology assigns ruble values to the resources used in Soviet military RDT&E activities. These include wages, materials, equipment, capital repair, capital construction, travel, training, and other operating costs

The ruble estimate is converted to dollars by using an average of our military procurement dollar-ruble ratios. The purpose of using a procurement dollar-ruble ratio is to reflect the different productivities of research and development resources in the two countries. In effect, we are assuming that the ratio of the dollar value of the research and development work performed in the Soviet Union to the ruble cost of these resources equals the ratio of the dollar value of military hardware produced in Soviet defense plants to the ruble cost of the resources employed in those plants.

The resource cost methodology defines military RDT&E according to the definition used by the US Department of Defense in its reporting of US outlays for military RDT&E. RDT&E consists of all phases of programs and activities from research through full-scale testing and includes the improvement or modification of operational systems

US data in this paper are expressed in terms of outlays derived from the *Five-Year Defense Program* issued by the Department of Defense in January 1985 and from the US budget. Defense-related activities of the Department of Energy, the Coast Guard, and the Selective Service have been added to improve the comparison with Soviet programs. The data have been converted from fiscal to calendar year terms and indexed to 1984 dollars using detailed price indexes for each type of military expenditure. The US figures in this report, therefore, do not match actual budget authorizations or appropriations

The physical quantity data for weapon systems contained in this paper are of two types: delivery data, which refer to the quantities of selected weapon systems acquired during a calendar year, and order-of-battle data, which refer to the existing inventory of weapon systems in active units at a given time (the middle of the calendar year for the Soviet Union and the end of the fiscal year for the United States).[1] US order-of-battle data were derived from the FYDP; US production data were provided by the Department of Defense.

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Confidence in the Dollar Cost Estimates

The annual revision to incorporate new information provides a method of assessing how well we estimate the dollar costs of Soviet defense activities. This method examines how much change the estimate undergoes each year over a period of several years. Presumably, our estimates for any one year (for example, 1976) would improve as time passes because we should know more about the quantities and characteristics of the weapon systems and facilities produced in that year.

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If estimates for a given year changed greatly with every review—indicating that different analysts, improved data, and new methodologies produce very different results—we could have little confidence that we had discovered the accurate level of military activities in that year. On the other hand, if the estimates fluctuated only for a few years after they were first made, and by only a small amount, we could feel confident that they were substantially correct, given the methodology used. For example, our total for 1976 as it was estimated each year from 1977 to 1985 did not change greatly; it increased by less than 1 percent a year.

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The use of this and other statistical techniques leads us to believe that our dollar cost estimate for total defense activities is unlikely to be in error by more

[1] In 1976 the US fiscal year was changed from a July-June timespan to October-September. Therefore, the end of the fiscal year is 30 June through 1976 and 30 September thereafter.

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than ± 10 percent for any year from 1976 to 1985.[2] The margin of error can be much wider for some individual items and categories than for the total. We are more confident in our estimates for the higher levels of aggregation than in those for the lower levels because of the tendency for errors to be partially offsetting. We generally have more confidence in data that represent trends than in data for absolute levels, especially the levels for individual years.

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All the Soviet cost data in this paper, whether displayed in graphics or in tables, are presented for the reader's convenience as point estimates rather than as ranges. The reader should remember, however, that around each one of these estimates there is an implicit confidence band and that, in general, when the information is more detailed, the margin of uncertainty is greater.

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[2] We are most confident in our estimates for the middle years of the 1970s because those estimates are based on the most data. Our confidence is somewhat less for more recent years. We are even less confident in the historical data for the 1960s in appendix A

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Appendix C

Extended Dollar Cost Comparisons

The problem of how to identify defense-related activities not heretofore captured in our estimates was submitted to an interdisciplinary working group. The group concluded that, since the nontraditional activities would be hard to bound within a single definition, they should be aggregated in layers or tiers of functionally related activities. The group developed three broad tiers:

- The costs of activities that enhance a nation's mobilization and wartime preparedness capabilities.
- The costs of activities that enhance a nation's global position.
- The continuing cost of past activities that were related to national security.

Wartime Preparedness/Mobilization

This category consists of measures that enhance national war-fighting capability or contribute to national security but are not baseline activities. Soviet costs for these activities in 1983 were roughly four times higher than comparable US outlays.

Internal Security Troops

Soviet Internal Security Troops are not intended to fight enemy military forces, so they are not in the baseline costs. They do, however, assist in controlling Soviet borders and have a wartime role of maintaining order in rear areas and occupied territory. We estimate their cost in 1983 at $3.0 billion.[3] The United States does not have an exact counterpart but we have included the costs of US border control and state costs for the National Guard and Reserves as the nearest equivalents ($2.1 billion).

Construction and Railroad Troops

We include the Soviet construction and railroad troops because their wartime mission is to build fortifications, repair battle damage, and maintain existing structures and rail lines, although in peacetime they also work on civilian projects. We count only the costs of those personnel who worked on civilian projects because labor on military projects is already part of the baseline estimate. The large number of personnel with civilian tasks, estimated at over 600,000, accounted for the large costs ($9.0 billion). Outlays for the closest US counterpart, the civilian Corps of Engineers, totaled $3.0 billion in 1983. 25X1

Civil Defense

Civil defense activities are much more extensive in the USSR than in the United States and include about 150,000 full-time personnel (military and civilian), urban and exurban blast shelters, and civil defense installations run by the military. Other progams, whose details are largely unknown, include underground industrial plants, hospitals, power plants, and food and fuel storage, as well as individual protective gear and equipment and material reserves. Our estimate of Soviet civil defense costs is presented as a range of $7.5-8.9 billion because of our uncertainty about the probable size of the shelter program.[4] 25X1 25X1

Industrial Reserves

The Soviets maintain reserves of industrial materials for mobilization as well as to hedge against seasonal or temporary interruptions of supply. We have little information on their exact size and disposition but believe they are intended to support military production for four to 12 weeks. The cost to maintain them was about $0.1-0.4 billion in 1983. 25X1

[3] We exclude the estimated 280,000 Internal Troops who guard prisons and labor camps because they do not perform a national defense role.

[4] Soviet writings discuss the need to protect industries by dispersing and hardening them, but we find no evidence of widespread geographic dispersal. Industrial siting seems to be driven more by economic requirements, with new plants often built next to or expanded from existing plants. 25X1 25X1

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In contrast, US industry does not depend on government inventories for its daily operation, and inventories fluctuate widely because of economic trends rather than defense policy. Therefore, we include only US Government-owned stockpiles, which consist of raw materials such as bulk and packaged ores, precious metals, concentrates, and crude oil in the Strategic Petroleum Reserve. The cost of operating these stocks in 1983 was $0.2 billion.

Surge Capacity

In addition to maintaining material reserves, the USSR builds industrial surge capacity into its machine-building sector to increase military production during a war. We have only fragmentary data from a small number of plants, so we do not have a good measure of costs. We have estimated them by taking what we believe is a probable range of 0.5 to 5 percent of the machine-building sector's annual investment, or $0.3-3.0 billion.

In contrast, the United States does not have an extensive program to set aside excess capacity, although it exists in varying degrees in defense industry. The Defense Logistics Agency, however, acquires some industrial machinery for mobilization purposes. Although none was procured in 1983, the maintenance cost was $0.01 billion.

Railroads

Neither the United States nor the USSR subsidizes its railroads primarily for defense purposes. The Soviet rail system has had to struggle to meet economic needs for over a decade, and ongoing improvements can be clearly linked to civil needs. The Baikal-Amur Mainline (BAM), which costs about $2 billion a year, was probably intended for defense needs when work first began in the 1930s, but we believe that, since 1974 (when most of the line was laid), the BAM's economic value was the driving force for its completion.

Highways

Defense needs were behind the development of some major highway systems in both countries. For the past decade, however, US defense needs have been considered only in the distribution of reconstruction funds, rather than in the level of funding. Civilian economic needs have been sufficient to ensure continued funding support. The Soviets have built a 30,000-mile network to provide all-weather supply routes from Moscow to the western borders. We estimate the annual costs of maintaining this network at $0.7 billion. In addition, cost for upgrading other roads for defense purposes could be as much as $4.5 billion.

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Merchant Shipping

To provide for expanded wartime shipping, the United States subsidized the operating costs of its merchant shipping by $0.4 billion in 1983. We believe the Soviets do not subsidize their fleet for national security purposes. Indeed, it is a source of much-needed hard currency

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Synthetic Fuels

Both countries are developing synthetic fuels technology for national security and commercial motives. Our estimate of annual Soviet costs, $0.04 billion, is an order of magnitude lower than US costs. We believe, however, the Soviet effort is more defense oriented than the US effort because of its emphasis on liquid synfuels (which can be used by existing military equipment) rather than on gas.

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Enhancement of Global Position

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This category covers activities that serve foreign policy goals. The dollar value of Soviet international activities in 1983 exceeded those of the United States by 61 percent.

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Economic and Military Assistance

The USSR and the United States use economic and military assistance to support their allies and clients and to expand their presence and influence in less developed countries. We estimate that the net value of Soviet economic assistance in 1983 was $11.3 billion. Almost 45 percent of this was the result of price subsidies in trade with other Communist countries. Also included is a $2.3 billion trade deficit with Eastern Europe, financed by Soviet credits that we doubt will be paid back. The estimated net value of Soviet military assistance was $5.1 billion.

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Comparable net US outlays for economic assistance programs in 1983 were $3.0 billion.[5] The United States had no provisions for subsidizing its trade as the USSR did, so its economic assistance was smaller by comparison. US international security assistance totaled $6.8 billion, which included the financing of military aid and outlays for foreign military sales credit loans.

Conduct of Foreign Affairs

This category primarily includes the costs of administering foreign policy—the personnel and operating costs of the US Department of State and the Soviet Ministry of Foreign Affairs. Soviet costs in 1983 ($2.9 billion) were higher because we estimate that the USSR had roughly 7,000 diplomats, about twice as many as the United States had.[6] Also driving the Soviet costs upward were several semiofficial academic institutes that advise the government on foreign affairs, such as the Institute of the USA and Canada (IUSAC) and the Institute of World Economics and International Relations (IMEMO). The United States has no direct counterpart to these organizations; studies that private "think tanks" would perform for the US Government are included in Department of Defense or State Department budgets

Foreign Information and Exchange Activities

Foreign information and exchange activities are official attempts to project a country's image abroad. The USSR has been much more active in this area than the United States. US outlays for these programs in 1983 were $0.6 billion.[7] Soviet costs were much larger—an estimated $4.0 billion.[8]

[5] This figure includes outlays for multilateral development banks, international organizations, the Agency for International Development, Public Law 480 food aid, the Peace Corps, offsetting receipts from international financial programs, and refugee assistance

[6] In this figure we attempted to exclude intelligence personnel, whose costs are counted in the baseline estimate

[7] This represents outlays for the United States Information Agency, which conducts academic and leadership exchanges as well as broadcasts the Voice of America worldwide, and Radio Free Europe and Radio Liberty, which broadcast to Eastern Europe and the USSR.

[8] This represents the estimated costs of the overseas media activities of TASS, Novosti, *Pravda, Izvestiya,* and Radio Moscow, as well as press sections in foreign embassies, clandestine radio stations, radio jamming, contributions to international Communist fronts, subsidies to foreign Communist parties, academic and cultural exchanges, and the International Department and the International Information Department of the Communist Party of the Soviet Union.

The USSR has long given support to foreign students to attend its universities as a way of enhancing its reputation abroad, and it has expanded this program rapidly. We estimate there were about 100,000 such students in the Soviet Union in 1983. We assume all of these were sponsored by Moscow, although a few less developed countries apparently made partial payments that would have reduced the cost to the Soviets. 25X1
Although the United States had many more foreign students, only about 8,000 were government supported. US costs ($0.1 billion) were therefore much lower than the Soviet Union's ($1.5 billion). 25X1

Civil Space

US and Soviet civil space activities are frequently undertaken to enhance national prestige. We estimate that the dollar costs of Soviet civil space programs were approximately equal to the outlays for NASA in 1983.[9] 25X1

Past Defense Activities

Some of the costs of maintaining military forces, such as retirement benefits, are pushed into the future. When due, they represent payment for past goods and 25X1
services and do not directly contribute to current warfighting capability. Yet, they are bills that have to be paid if the military is to keep functioning. The estimated costs of past Soviet defense activities exceeded US costs by about 10 to 14 percent in 1983.

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Veterans' Benefits 25X1

Veterans' benefits in the USSR differ considerably from those in the United States because stricter Soviet eligibility rules and higher mortality rates limit the number of beneficiaries to well below the level in 25X1
the United States. For this exercise, we estimate that 25X1
the total number of Soviet veterans in 1983 who are

[9] Soviet civil programs benefit greatly from military support through dual-use programs. There is some evidence that the military funds much of the civil effort. We allocate Soviet space 25X1
costs to civilian or military purposes on the basis of whether the US Department of Defense or NASA would fund a similar project.

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eligible for benefits under US rules was 9.8 million persons compared with 28.2 million in the United States. The dollar costs of Soviet veterans' benefits were about one-half the US costs.

Military Pensions

Soviet military pension costs valued in dollars were much larger ($43.0 billion) than US outlays ($17.1 billion) in 1983. The larger number of Soviet men under arms meant the number receiving pensions was correspondingly larger. In addition, the Soviets had relatively fewer career enlisted men, so the proportion of officers receiving pensions was over twice that of the United States, raising Soviet per capita costs to nearly twice the US level

Civilian Pensions

Civilian pensions consist of the payments to former employees of the US Department of Defense or the military services and to their Soviet counterparts. Because the Soviets use military personnel to perform many tasks that in the United States would be performed by civilians, we estimate that there were somewhat fewer Soviet defense civilians than in the United States despite the larger size of the Soviet military. Soviet dollar costs for civilian pensions ($6.6 billion) were therefore slightly less than US costs ($7.9 billion)

Legal Action

If the US Government loses a legal action brought against the Department of Defense, the award is paid from a "judgment fund" in general revenues administered by the General Accounting Office. In 1983, disbursements from the fund for this purpose were about $0.1 billion. The Justice Department bore the associated costs of administering and litigating the cases, which totaled an estimated $0.02 billion. We have no evidence of lawsuits involving the Soviet Ministry of Defense and believe that the cost of judgments is negligible.

Deficit Financing

Deficit financing is a large part of the costs of past US defense activities. Deficits raise the cost of government activities by the cost of borrowing, or the amount of interest paid. Of course, government debt is not incurred specifically for any single identifiable activity; it is the result of financing the whole array of government activities. Nevertheless, had the pattern of past defense spending been different, the level of the national debt, and the interest paid thereon, would have been different. We estimate that $52 billion in net federal interest payments could have been attributed to defense in 1983.[10] Offsetting this was $44.5 billion in new borrowing, which was defense's share of the increase in the national debt in that year

The USSR, on the other hand, has no concept of deficit financing comparable to that in the United States. The Soviet system of central planning strives to balance resource inputs and outputs and to avoid borrowing. The government owns all the banks, however, and it has access to the savings deposits of private citizens. These amounted to 25 percent of Soviet GNP in 1980. In effect, interest payments on deposits represent a kind of national debt that assists the government in financing the budget. We estimate that the dollar cost of defense's share of this Soviet "debt" was $13.5-15.6 billion in 1983. Defense's share of new deposits in 1983 amounted to an offsetting $8.6 billion.

[10] This is based on application of the annual defense share of total federal outlays to the annual increment in net federal interest payments each year during the 1953-83 period

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