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National
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CIA HISTORICAL REVIEW PROGRAM
RELEASE AS SANITIZED

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CIA SR-77-10140

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A Dollar Cost Comparison of Soviet and US Defense Activities, 1966-76

Central Intelligence Agency
National Foreign Assessment Center

October 1977

Key Judgments

This publication is a detailed classified supplement to an unclassified paper issued under the same title in January of this year. The key judgments are the same as those presented in the earlier paper. The reader is cautioned that the dollar cost estimates used in this comparison of Soviet and US defense activities must be viewed in terms of the limitations, reliability factors, and conceptual framework explained in the introduction.

Total Defense Programs

For the 1966-76 period, the cumulative estimated dollar costs of Soviet defense activities—that is, the costs of reproducing them in the United States—are about the same as US outlays for defense. The trends of the defense activities of the two countries, however, are quite dissimilar.

- When expressed in constant US prices, the trend of the dollar costs of Soviet activities is one of continuous growth throughout the period, averaging about 3 percent per year. Growth is evident in nearly all the major elements of the Soviet defense establishment.
- Despite increases in current dollar terms, US outlays in constant dollars show a continuous decline after 1968, and since 1972 they have been below the 1966 level. This decline reflects reductions in nearly every major component since the Vietnam buildup of the late sixties.

Note: As a result of a reorganization, effective 11 October 1977, intelligence publications formerly issued by the Directorate of Intelligence and by the National Intelligence Officers are now being issued by the National Foreign Assessment Center.

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As a result of these diverging trends, the estimated dollar costs of Soviet defense activities exceed US defense outlays by a widening margin in every year after 1971. For 1976 they are about \$120 billion (1975 prices)—about one-third higher than total US outlays. If pensions are excluded from both sides—leaving only the costs of current defense activities—the estimated dollar costs of Soviet activities in 1976 exceed US outlays by about 40 percent.

If personnel costs are removed from both sides, US defense outlays exceed the estimated dollar costs of Soviet defense activities by about 10 percent over the 1966-76 period, although by 1976 the Soviet level is about 30 percent higher than the US. Alternatively, if research, development, testing, and evaluation (RDT&E)—for which estimates are considerably less reliable than those for other activities—and pensions are subtracted from each side, the estimated Soviet figure in 1976 is about 35 percent higher than that for the United States, and the cumulative totals are about the same.

Resource Category Comparisons

Investment

The estimated costs of reproducing Soviet military investment—the procurement of weapons and equipment (exclusive of RDT&E costs) and the construction of facilities—are about 20 percent greater than comparable US outlays for the 1966-76 period. They exceed US outlays by increasing proportions after 1970, and in 1976 are about twice as large.

Operating

US outlays for operating military forces exceed the estimated dollar costs of operating Soviet forces until 1973. Since then the Soviet activity level has been higher in dollar cost terms. For 1976, the estimated dollar cost of operating Soviet forces, exclusive of pensions, is about 15 percent above US outlays.

RDT&E

The estimated dollar costs of Soviet military RDT&E grow over the period, while US outlays in this category decrease. For the period as a whole, estimated Soviet costs exceed US outlays by almost 10 percent.

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Military Mission Comparisons

Strategic Attack

The estimated dollar costs of Soviet strategic attack programs for the 1966-76 period are twice those of the United States. For 1976, the Soviet figure is almost three times the US total. The Soviet figure, however, includes a large peripheral attack force for which the United States has no direct counterpart. For intercontinental attack forces only, the estimated costs of Soviet activities in 1976 were about twice the US total.

Strategic Defense

For the 1966-76 period, the estimated costs of Soviet strategic defense forces were almost four times US outlays. Moreover, US outlays have been declining, and in 1976 the Soviet level was 10 times the US.

General Purpose

US outlays for general purpose forces are about 10 percent larger than the estimated dollar costs of comparable Soviet forces for the period. Since 1971, however, the Soviet level has been higher than that of the US—one-third higher in 1976—reflecting the post-Vietnam reduction in US forces.

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PRÉFACE

This report presents the latest dollar cost estimates of Soviet defense activities and compares them with corresponding US defense outlays. The dollar cost estimates reflect the cost of reproducing the Soviet activities in the United States, using US cost factors and pay rates.

The Soviets, however, would view the distribution of their total defense effort quite differently from the way it is shown in this report. Neither the system of accounts nor the structuring of expenditures by military mission or resource category is the same for the Soviet Ministry of Defense and the US Department of Defense. Most important, the price structures in the two countries are substantially different. The Soviet view, of course, would influence program choices in the USSR.

This report is a detailed supplement to the unclassified study issued under the same title in January of this year. It supersedes a study issued in July 1976 titled *A Dollar Cost Comparison of Soviet and US Defense Activities, 1965-75*]

The report contains three major sections and four appendixes. The first section summarizes the overall trends in US and Soviet defense activities. The second compares these activities by resource categories—investment, operating, and RDT&E. The third section compares the activities by major military missions. The missions as defined in this report—strategic forces, general purpose forces, and support forces—agree with the guidelines given in the US Defense Department's *Defense Planning and Programming Categories* of April 1976.

Appendix A presents US and Soviet production data for selected military weapon systems. Appendix B contains an explanation of the methodology used to cost Soviet activities and to structure the cost estimates to achieve comparability with US authorizations. Appendix C discusses changes to the data base and methodology since last year's study. Appendix D presents summary tables of the costs of defense activities.

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A Dollar Cost Comparison of Soviet and US Defense Activities, 1966-76

Introduction

The military establishments of the Soviet Union and the United States are difficult to compare because they differ considerably in missions, structure, and political environment. The common denominator used here to measure the defense activities of the two countries is dollar cost. The approach is to estimate how much it would cost to produce and man in the United States a military force of the same size and with the same inventory of weapons as the Soviet force and to operate that force as the Soviets do. These estimated dollar costs are then compared year by year with US outlays for similar activities.

This approach provides a means of comparing the overall magnitudes and trends of defense activities in the two countries. Dollar cost data also provide a means for aggregating dissimilar elements of each country's military activities into comparable categories and thus can show trends and relationships that are difficult to discern and measure in other ways. This approach, however, does not give an appreciation of the size of the weapons inventories in any particular year, nor does it reveal changes in the inventories over time.

The data presented here are expressed in average calendar year 1975 prices. A constant price base is used so that trends in the cost estimates will reflect changes in military forces and activities rather than the effects of price changes. The US data are for fiscal years, while the dollar costs of Soviet activities are for calendar years.

Defense activities used in this comparison are (1) those that in the United States would be funded by the Department of Defense (less foreign military aid), (2) defense nuclear activities such as those which have been funded in the

United States by the Department of Energy (DOE), and (3) the activities of the US Selective Service System, the US Coast Guard, and the Soviet militarized security forces (border guards and internal security troops). Excluded from this definition are (1) space activities that in the United States would be funded by the National Aeronautics and Space Administration (NASA), (2) civil defense except for the pay and allowances of uniformed personnel engaged in such activities, and (3) veterans' benefits.

US dollar cost data are in terms of outlays. They include outlays derived from the Total Obligational Authority (TOA) series in *The Five-Year Defense Program* issued by the Department of Defense in October 1976. They also include Coast Guard and Selective Service outlays and DOE outlays related to nuclear weapons and military reactors. The US data have been converted to constant prices and have been adjusted somewhat to achieve accounting coverage comparable with the dollar estimates made for the USSR. The US figures in this report, therefore, do not match actual budget authorizations or appropriations.

The estimates of the dollar costs of Soviet activities presented in this report have a margin of error which could be substantial for some items. Our confidence is highest in the aggregate totals but is considerably less at the lower levels of aggregation. Moreover, the reliability of our dollar cost estimates varies from category to category, depending on the reliability of our estimates of the size and characteristics of Soviet military forces and on the accuracy of the cost factors applied to those estimates.

We have our greatest confidence in estimates in the investment category—procurement of

weapons and equipment and construction of facilities—which makes up about one-third of the total estimated dollar costs of Soviet defense activities for the period.

Manpower costs, constituting about 40 percent of the total estimated dollar costs of Soviet activities, are the largest and most reliable component in the operating category. For other operating costs, representing some 15 percent of the total, both the quantity and quality of information are less reliable.

The estimated dollar costs of Soviet RDT&E should be regarded as significantly less reliable than estimates for either investment or operating.

On balance, we believe that the overall dollar cost estimate for Soviet defense activities as defined is unlikely to be in error by more than 15 percent. This judgment, while informed, is nonetheless subjective and not the result of rigorous statistical measurement.

Because of the problems of comparing such disparate activities, the uncertainties of the estimates of Soviet costs, and the organization of the US data, the comparisons in this paper should not be considered precise measurements. Any common denominator used for comparative sizing is imperfect, and its limitations must be understood in interpreting such comparisons. Any conclusions drawn from this dollar cost analysis must be tempered by an appreciation of what it does *not* do:

- It cannot be used alone to draw inferences about the relative military effectiveness or capabilities of US and Soviet forces. Other data, such as the size and technical characteristics of the forces, the geographical locations of the two countries, their allies' capabilities and requirements, strategic doctrine and tactical concepts, morale, and command and control capabilities must also be considered for such judgments.
- It does not measure actual Soviet defense expenditures or their burden on the Soviet economy. These questions are addressed by

different analytical techniques yielding estimates of the ruble costs of Soviet military activities.

- It does not reflect the Soviet view of the distribution of the USSR's defense effort. The price structures in the two countries are substantially different. Additionally, neither the system of accounts nor the structuring of expenditures by military mission or resource category is the same for the Soviet Ministry of Defense and the US Department of Defense.

Finally, dollar cost calculations tend to overstate Soviet defense activities relative to those of the United States because of a basic measurement problem common to all international economic comparisons and known to economists as the index number problem. Given different resource endowments and technologies, countries tend to use more of the resources that are relatively cheap—and less of those that are relatively expensive—for a given purpose. A comparison drawn in terms of the prices of one country thus tends to overstate the relative value of the activities of the other. This tendency is more pronounced the greater the disparity between the economies.

The degree of overstatement of Soviet defense activities relative to the US that is inherent to the dollar cost comparison cannot be measured with precision. An appreciation of the magnitude of the index number problem can be obtained, however, by calculating the other extreme—that is, by examining the ratio of Soviet to US defense activities measured in ruble cost terms, which overstates US activities relative to Soviet. The dollar cost comparison shows Soviet defense activities to exceed those of the United States by about 40 percent in 1976. If both are measured in terms of estimated ruble costs, the Soviet activities are about 25 percent larger than the US. Thus, the effect of the index number problem is not large enough to alter the basic conclusion that Soviet defense activities overall are currently larger than those of the United States.

Total Defense Activities

For 1976 the estimated dollar cost of Soviet defense activities, about \$118 billion expressed in 1975 prices, is more than 40 percent higher than the US defense outlay of \$84 billion. If the costs of pensions for retired personnel are included on both sides, the dollar cost of Soviet activities is still about one-third greater than outlays for JS activities. For the 1966-76 period as a whole, the total dollar cost of Soviet activities is roughly equal to the total US outlay. After 1971, however, the Soviet total exceeds that of the United States by over 25 percent (see figure 1).

Throughout the period the dollar cost estimates of Soviet defense activities grow at a rate of about 3 percent a year—from an estimated \$87 billion in 1966 to \$118 billion in 1976. This trend is evident in nearly all major components of the Soviet defense establishment.

Quite a different picture is seen for the United States. Despite increases in the current dollar costs of US defense activities, defense outlays expressed in constant dollar terms decline continuously after the peak of 1968, and after 1971 are below the 1966 level.

Resources

For 1976, estimated dollar costs of Soviet activities exceed US outlays in all three major resource categories. In investment, the category in which we have the highest confidence, they are 100 percent greater than the US figure; in operating costs, nearly 15 percent greater; and in RDT&E, just over 65 percent higher. This contrasts with the Vietnam-era peak US spending year of 1968, when US outlays exceed estimated dollar costs of Soviet activities in all three categories by 30 to 40 percent.

For the period 1966-76 as a whole, the composition of the dollar costs for the two countries is similar: roughly 60 percent for operating, 30 percent for investment, and 10 percent for RDT&E. The Soviet share for investment is remarkably constant over the period, while the share for RDT&E has risen (see figure 2). The US

share for investment and RDT&E both decline after 1968.

Military Missions

For 1976 the estimated dollar costs of Soviet activities exceed US outlays in all major military missions. For strategic forces they are more than three and one-half times US outlays, for general purpose forces, one-third greater, and for support forces almost 10 percent higher.

Over the 1966-76 period, support forces account for the bulk of total costs for both countries—about 40 percent of estimated Soviet dollar costs and almost 50 percent of US outlays. General purpose forces costs constitute about 30 percent of the total for both countries, with the strategic programs taking less than 20 percent for the Soviet and less than 10 percent for the US activities.

Military Manpower

Military manpower trends parallel those for total costs in the two defense establishments. Estimated Soviet military manpower grows throughout the period, increasing by more than 800,000 men between 1966 and 1976. The level of US military manpower has fallen steadily since the peak of the Vietnam buildup in 1968, and in 1976 is less than in 1966 (see figure 3).

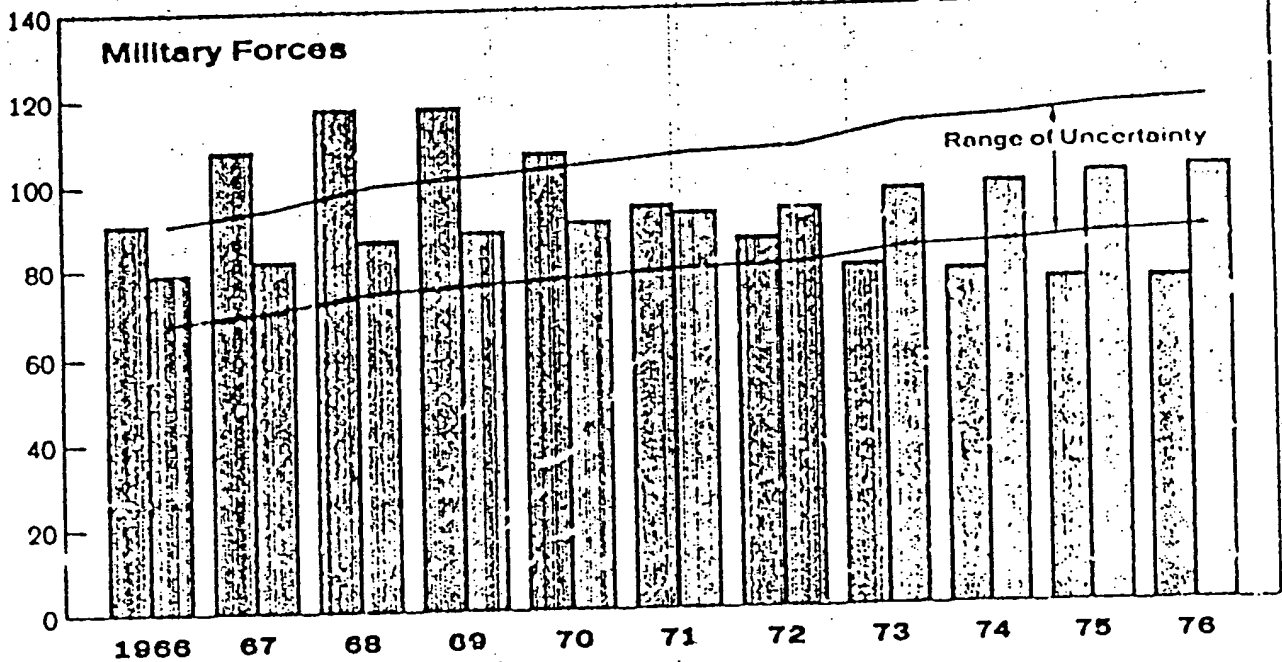
Over 60 percent of the estimated growth in Soviet military manpower occurred in the ground forces, although all elements of the Soviet defense establishment have grown during the period. Several factors have contributed to these increases. A general modernization and expansion of all force elements played a part, as did the emergence of China as a potential enemy and the attendant increase in the number of troops deployed along the Sino-Soviet border. Periods of heightened tensions—for example, the invasion of Czechoslovakia in 1968—have also served as an impetus for growth.

The Soviets historically have assigned their military a broader range of responsibilities than the United States. As a result, their "military"

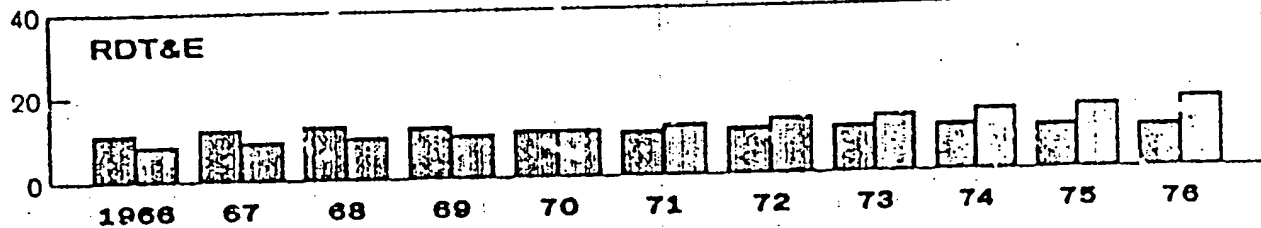
TOTAL US AND SOVIET DEFENSE ACTIVITIES

A Comparison of US Outlays with Estimated Dollar Costs of Soviet Programs if Duplicated in the US

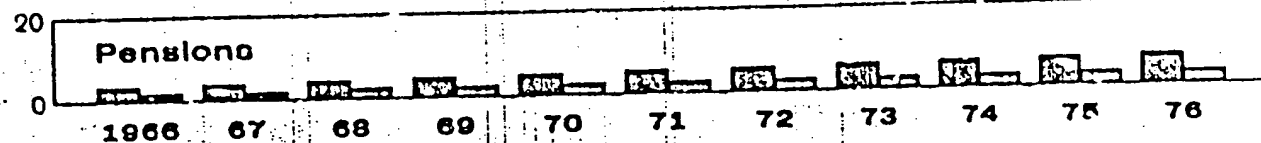
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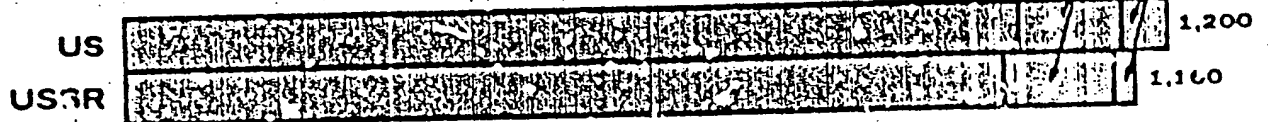
BILLION 1975 DOLLARS



BILLION 1975 DOLLARS



Cumulative 1966-76



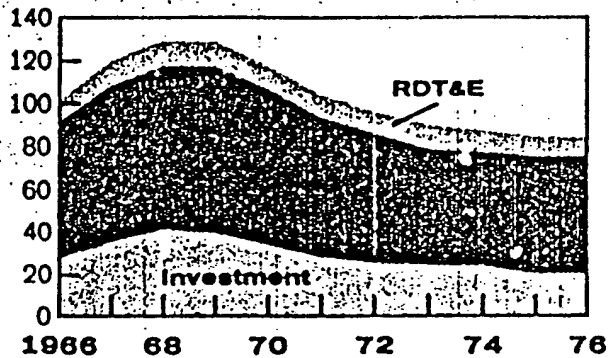
The dollar cost estimates reflect the cost of producing and manning in the US a military force of the same inventory of weapons and size as that of the Soviets, and operating that force as the Soviets do. The costs for Soviet investment and operating are best estimates, with possible error margins of 15 percent displayed. The estimated costs of Soviet RDT&E are derived in the aggregate, using a less certain methodology, and should be viewed only as rough measures. For this reason, they have been excluded from the totals and are shown separately. Military pensions, which reflect payments for past rather than present defense activities, have also been excluded from the totals and are shown separately. The US defense costs are in terms of outlay; based primarily on Department of Defense Total Obligational Authority (TOA) in *The Five-Year Defense Program*, October 1976. The US data are for fiscal years, and the estimated dollar costs of Soviet programs are for calendar years.

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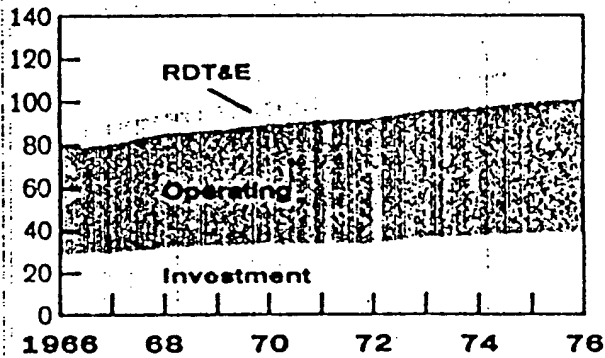
DISTRIBUTION BY RESOURCE CATEGORY OF US AND SOVIET DEFENSE PROGRAMS

A Comparison of US Outlays with Estimated Dollar Costs of Soviet Programs if Duplicated in the US

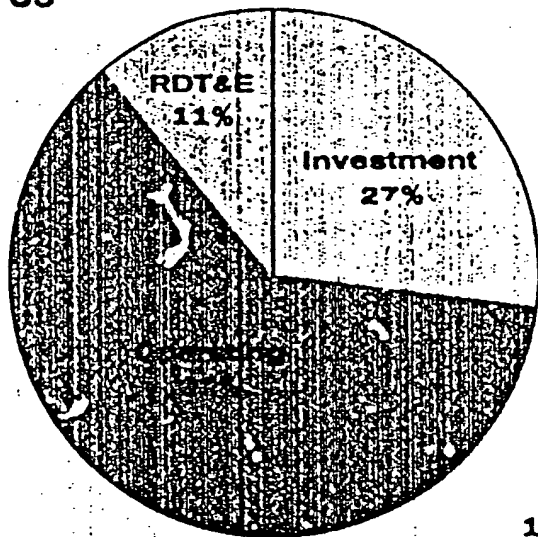
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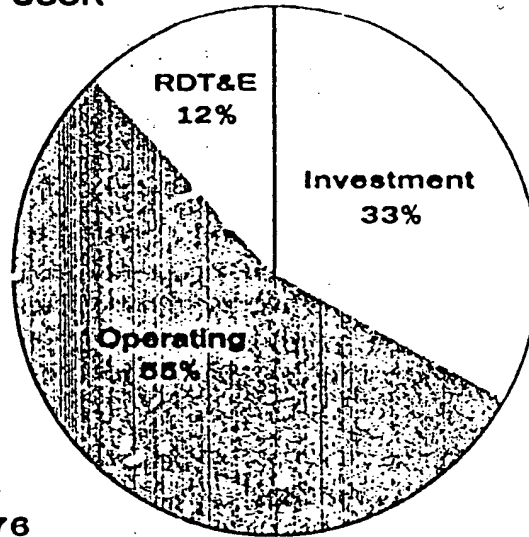
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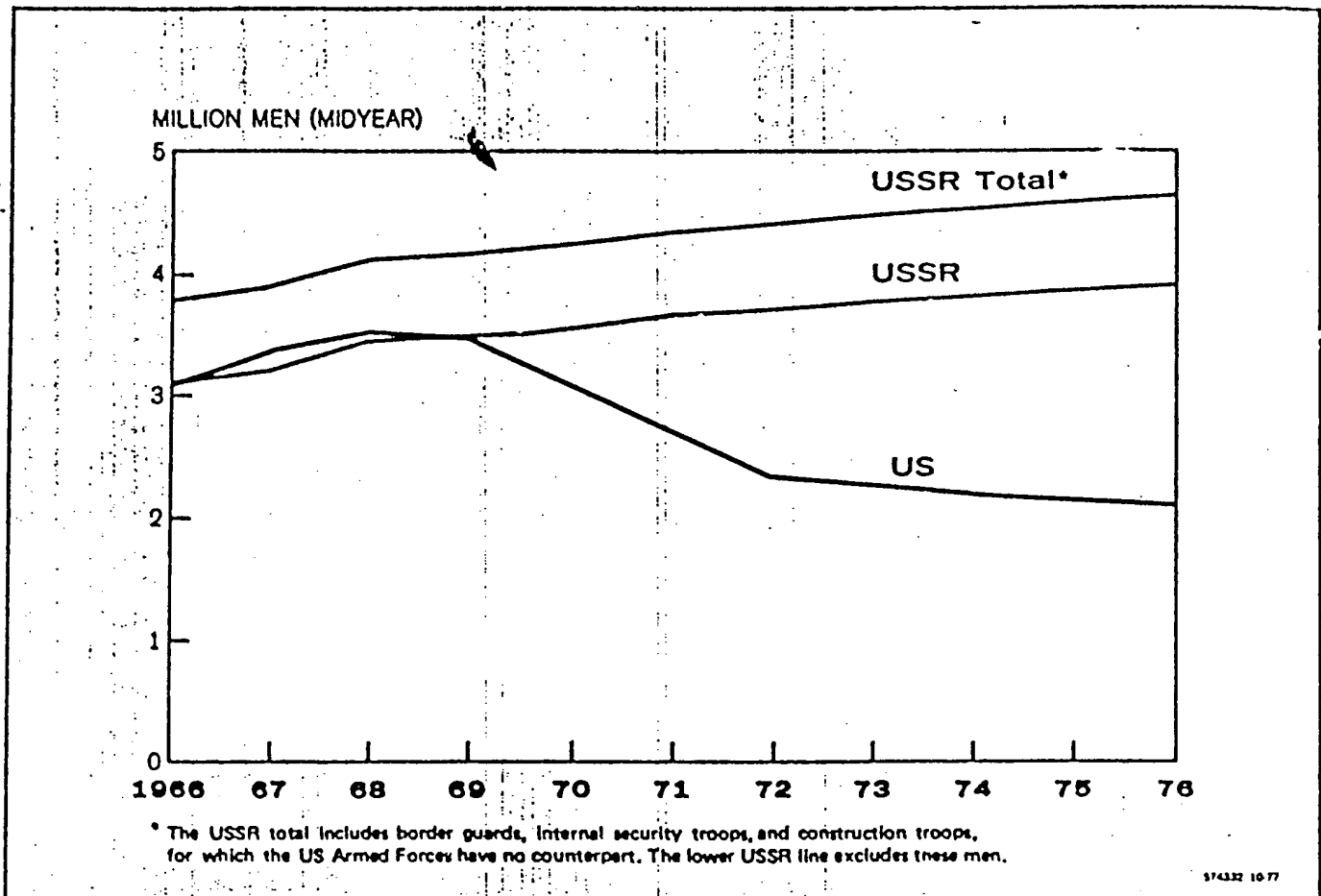


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US AND SOVIET ACTIVE MILITARY MANPOWER



manpower includes border guards, internal security troops, and construction troops—forces for which the United States has no direct counterparts. Even if these forces are excluded, Soviet military manpower is nearly double the US total in 1976.

Effect of Manpower Costs

In estimating the dollar costs of Soviet military manpower, 1975 pay rates for the US all-volunteer force have been used for the entire 1966-76 period. The higher level of Soviet military manpower results in dollar cost estimates for military manpower that are more than 60 percent higher than US outlays in 1976. If 1968 (prevolunteer force) pay rates converted to 1975 prices were used, the Soviet figure would be 35 percent greater than that for the United States, and the total estimated dollar cost for all Soviet defense

activities would be 30 percent greater than total US defense outlays in 1976.

Regardless of which pay rates are used, the estimated dollar costs of the overall Soviet defense effort remain higher than US outlays from 1972 to 1976. If all costs for military personnel are subtracted from both sides, total estimated dollar costs for Soviet defense activities are almost 30 percent higher than total US outlays in 1976.

Impact of Pension Costs

The cost of US and Soviet military pensions has been excluded from the comparative calculations made elsewhere in this paper. If they are added to each side, the estimated dollar costs of Soviet activities in 1976 exceed US outlays by about 30 percent.

The estimated dollar cost of Soviet pensions is a small share of the total that grows slowly over the

1966-76 period. The US military retirement activities, however, are broader in coverage, and over the period the portion of US outlays devoted to pensions more than doubles. In 1976, US retirement costs, at \$7 billion, represent about 8 percent of US outlays.

The impact of including pensions in the comparative calculations of dollar costs of defense activities for both countries is insignificant until 1970. From 1970 onward, adding retirement costs has the effect of decreasing in each year the proportion by which the dollar cost of Soviet defense activities exceeds US outlays.

Resource Categories

The comparisons of estimated dollar costs for Soviet defense activities and US defense outlays are presented in this section by resource category—investment, operating, and RDT&E.

- The investment category covers the dollar costs of activities to modernize or expand forces through the procurement of equipment, including major spare parts, and construction of facilities. Investment cost represents the flow of equipment and facilities into the defense establishment. It is not an indication of the size of the force in any given year.
- Operating costs are those associated with maintaining current forces, including personnel costs. Operating costs are directly related to the size of the forces and to their level of activity.
- Dollar costs for RDT&E are those for activity devoted to exploring new technologies, developing advanced weapon systems, and improving existing systems.

Within the investment and operating categories, the shares of US outlays are shown by major missions. For illustrative purposes we have arrayed the estimated dollar costs of Soviet activities in a similar format, but it should be emphasized that the shares shown for Soviet missions within resource categories are only very rough

approximations. At this level of detail, the decision to assign Soviet costs to a particular mission often becomes arbitrary. This is particularly true in assigning costs among the support forces.

Investment

For 1976 the estimated dollar cost of Soviet investment activities is nearly \$40 billion, about twice the amount of the US outlay for investment. Weapon system procurement is the driving component for both countries, accounting for about 90 percent of the investment totals for each throughout the 1966-76 period (see figure 4).

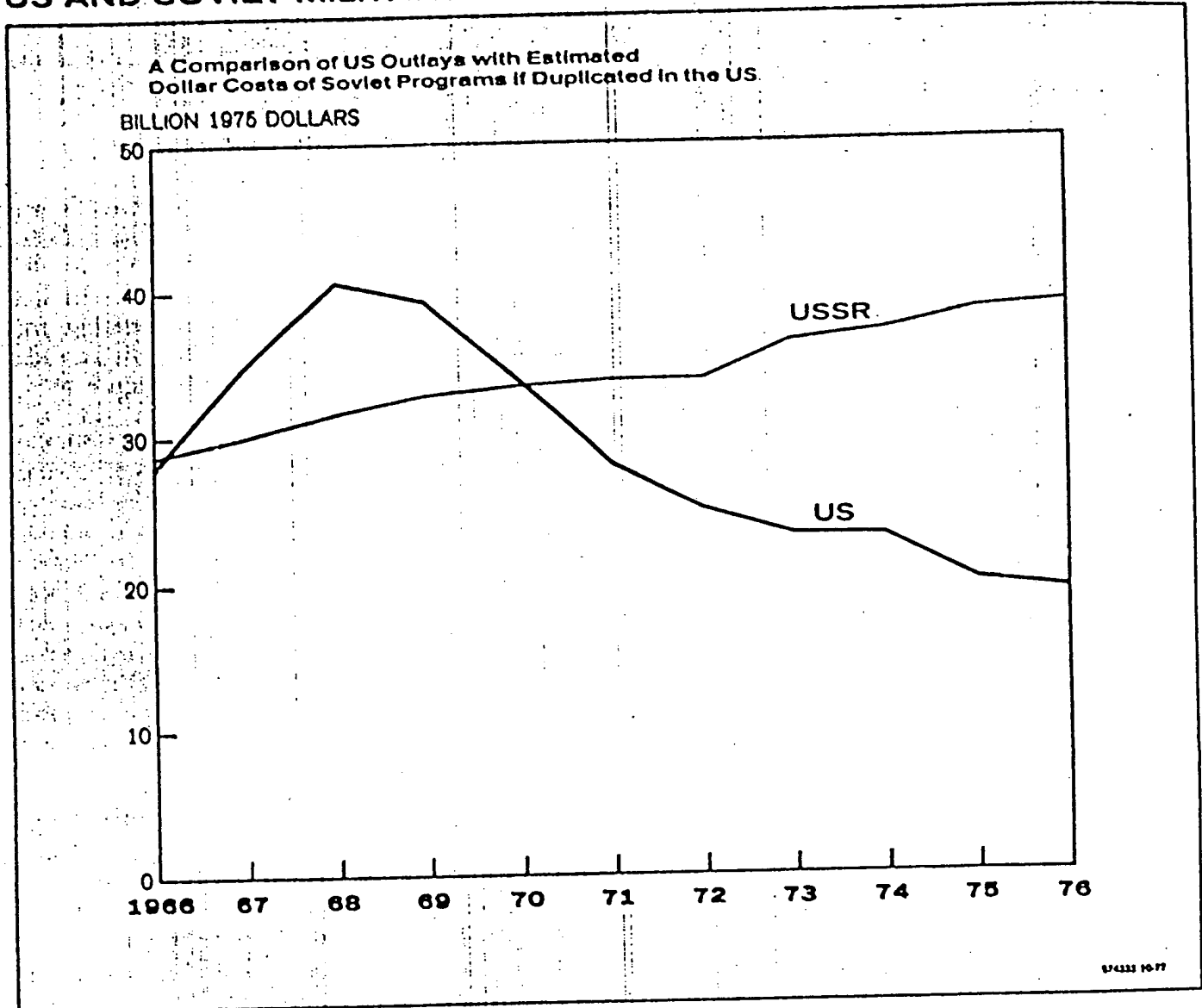
The estimated total cost of Soviet investment for the entire period is about 20 percent greater than the US outlay, but the total for the last five years is about 65 percent greater. Soviet investment activities between 1966 and 1976 reflect an increase of about 20 divisions in the ground forces and the construction of more than 80 major naval surface combat ships, over 50 nuclear-powered ballistic missile submarines, about 3,000 intercontinental ballistic missiles (ICBMs), 270 heavy and medium bomber-type aircraft, and 8,000 fighter aircraft.

The estimated dollar costs of Soviet investment grow at an average rate of about 3 percent per year throughout the 1966-76 period, surpassing US outlays in 1971, and continuing at levels higher than those of the United States through 1976. US outlays for investment during this period reach their peak in 1968 and fall by 1976 to about 70 percent of the 1966 level.

If dollar costs for investment are categorized by mission—strategic, general purpose, and support—the greatest difference between the United States and the USSR in this period is in investment for strategic forces. Estimated dollar costs for Soviet investment in this category are about two and one-half times US outlays from 1966 through 1976 (see figure 5).

For both countries, the dollar costs of investment in general purpose forces are much higher than those for the other two mission categories—about 50 percent of estimated dollar costs for

US AND SOVIET MILITARY INVESTMENT



Soviet investment and about 55 percent of US investment. Cumulative and average US outlays for general purpose forces investment over the period are close to the comparable estimated dollar costs for the Soviets.

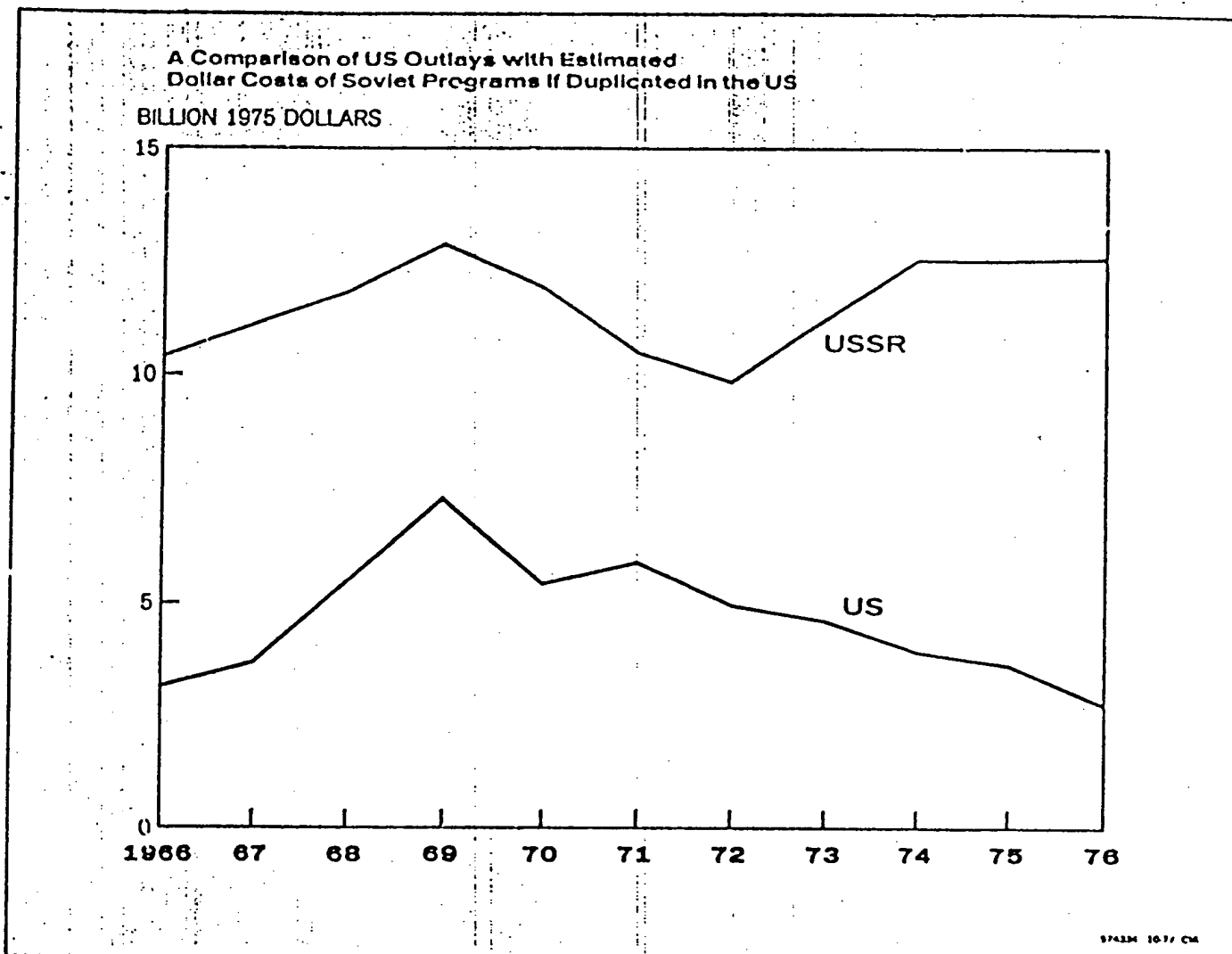
The US and Soviet trends over the period, however, are quite different (see figure 6). From 1966 through 1968, US outlays rise considerably more rapidly than Soviet dollar costs, reflecting heavy US investment in ordnance and equipment for general purpose forces in Southeast Asia. From 1968 through 1971, annual US outlays fall by \$10 billion, and by 1971 are below the level of

comparable Soviet dollar costs. The trend of US outlays since 1971 has been more gradually downward, but Soviet investment has grown more rapidly after 1971 than before. By 1976, the estimated dollar cost of Soviet investment in general purpose forces is about \$20 billion, over 80 percent above the comparable US outlay.

Operating

The largest portion of operating activities for both the United States and the USSR for the 1966-76 period is that associated with military

US AND SOVIET INVESTMENT IN STRATEGIC FORCES



personnel. Dollar costs for personnel include pay and allowances for active and reserve military manpower but exclude pay and benefits for military retirees. The remaining portion of operating costs covers the operation and maintenance (O&M) of military equipment and facilities.

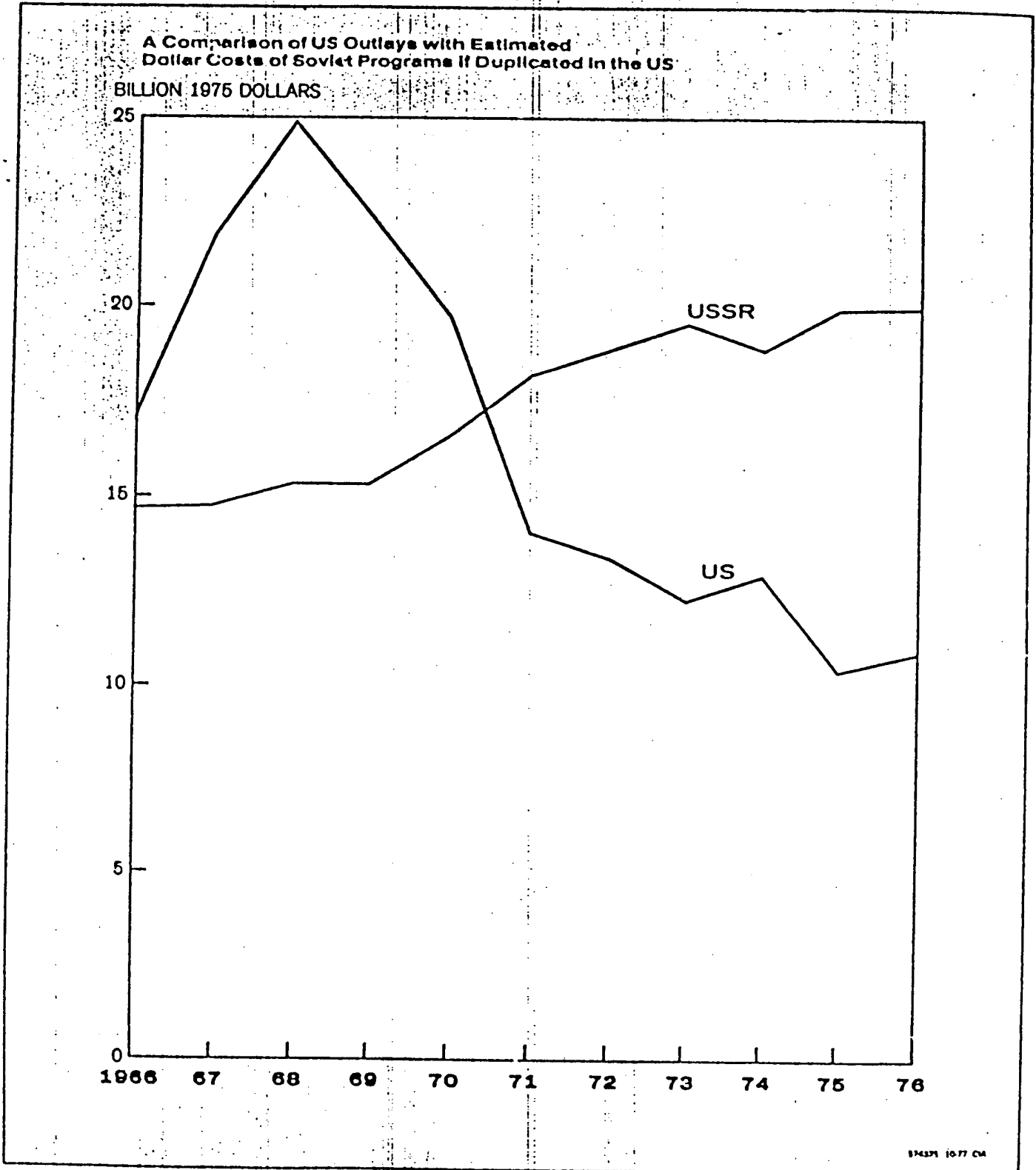
For 1976 the total estimated dollar cost of operating all Soviet defense forces is \$63 billion, nearly 15 percent greater than comparable US outlays. For the 1966-76 period as a whole, US outlays exceed the estimated Soviet operating costs by almost 15 percent. For the seventies, however, they are about the same for both countries (see figure 7).

Estimated dollar costs for operating Soviet forces increase by more than 25 percent between 1966 and 1976. This upward trend reflects an increase in manpower and in the equipment holdings of the Soviet armed forces.

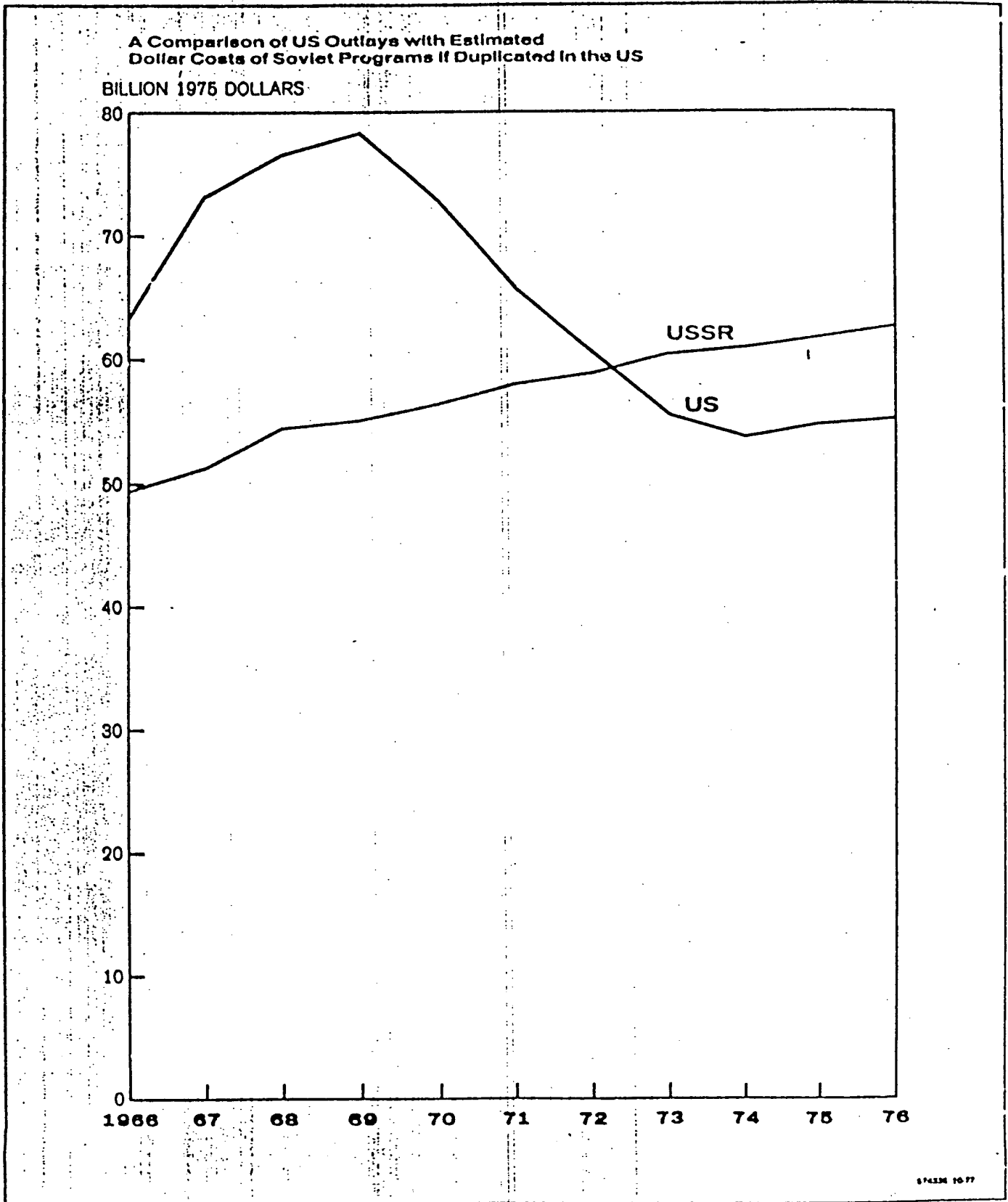
US outlays for operating, on the other hand, decline sharply after peaking in 1969. The downward trend ends in 1974, and there are slight increases in both 1975 and 1976.

Dollar cost estimates for Soviet military personnel show sustained growth throughout the 1966-76 period. The trend for the United States is one of declining outlays for military personnel from

US AND SOVIET INVESTMENT IN GENERAL PURPOSE FORCES



OPERATING COSTS FOR US AND SOVIET FORCES



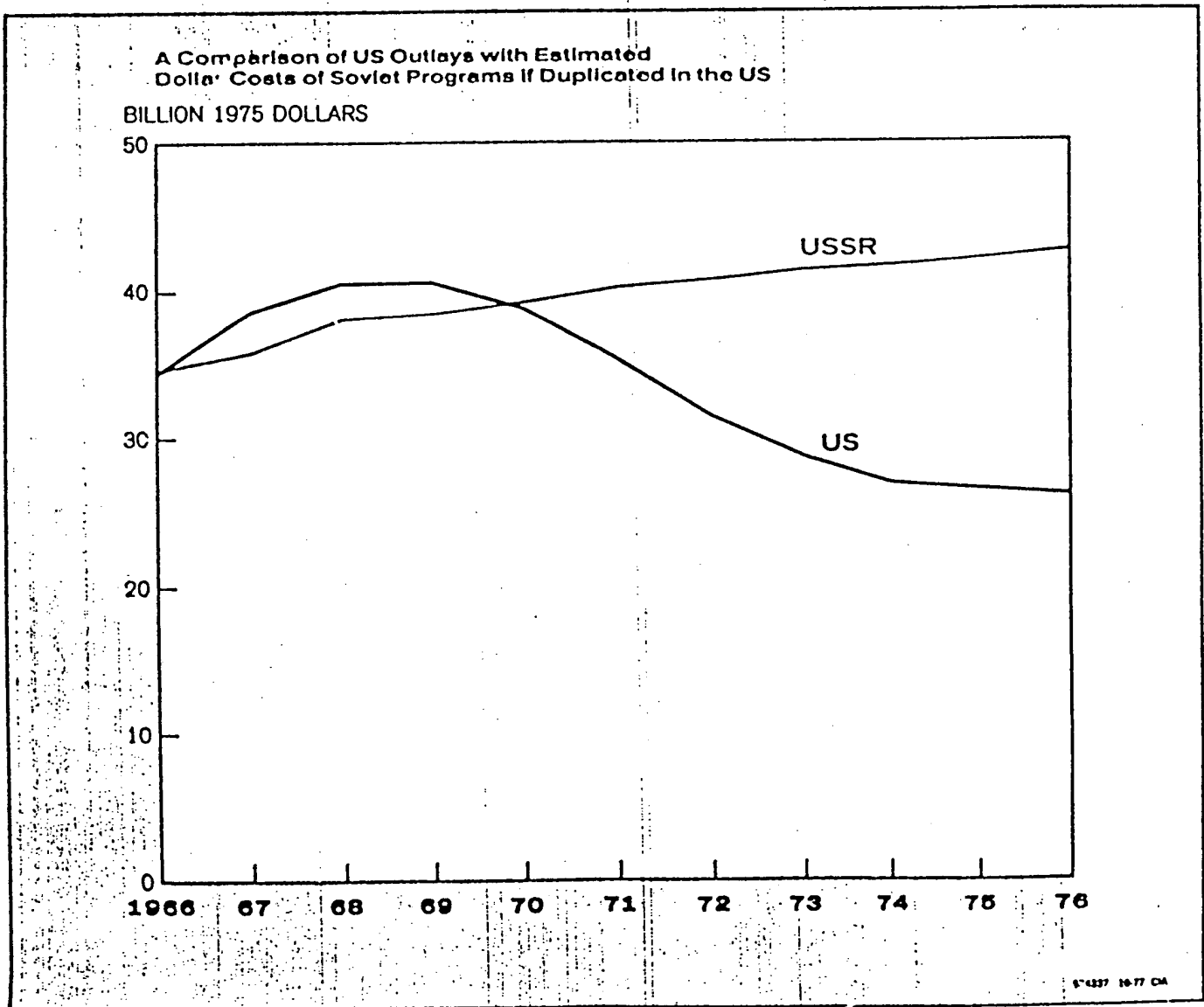
1969 through the end of the period (see figure 8). As Soviet forces are more manpower intensive, estimated dollar costs for Soviet personnel account for a larger portion of operating costs.

US outlays for O&M, unlike those for other resource categories, are larger every year than the estimated cost of Soviet activities (see figure 9). In the sixties this is largely a result of the involvement in Southeast Asia. There is also a difference in operating concepts that has an effect throughout the period—in general, the

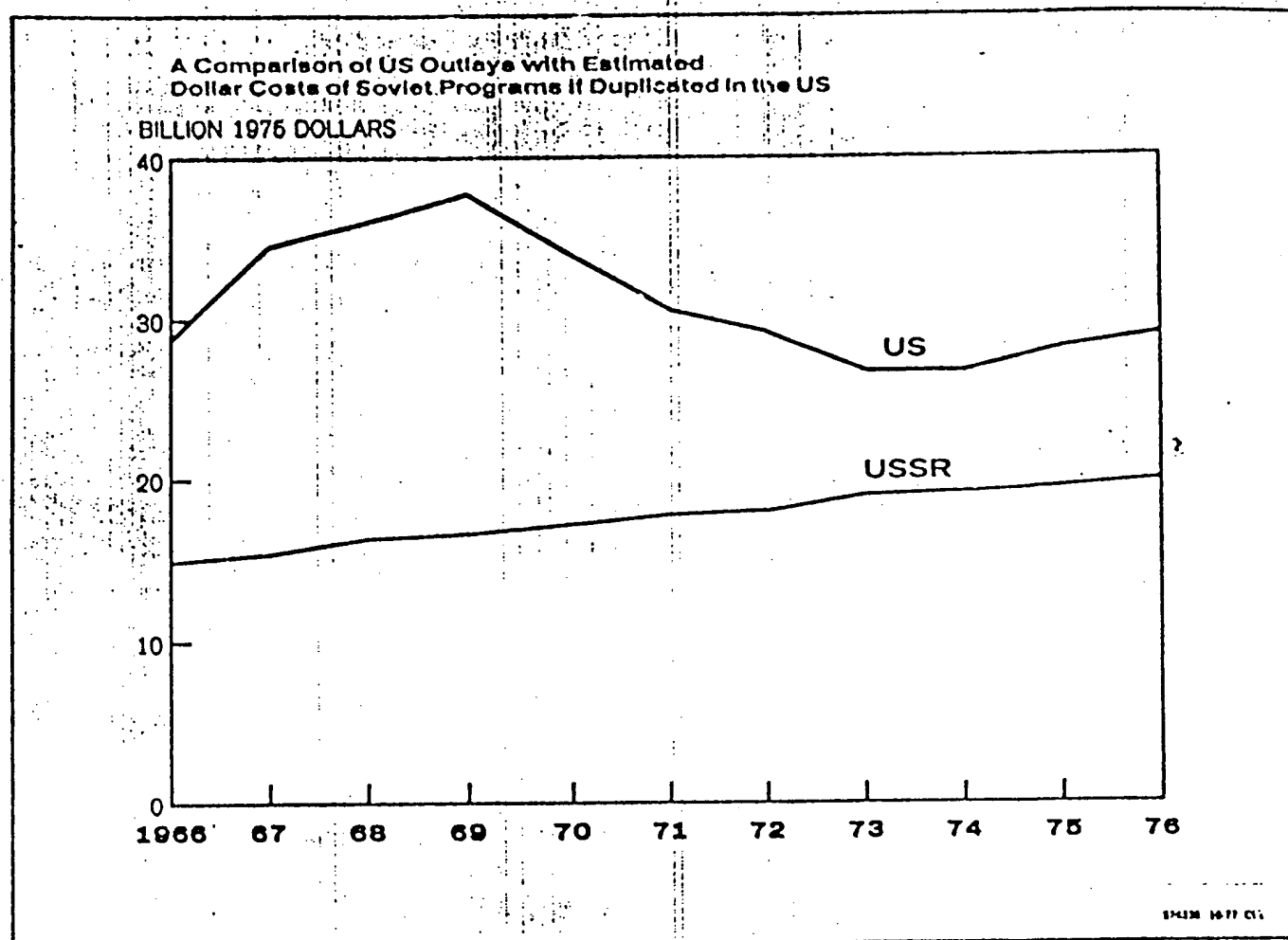
United States tends to operate its equipment more than the Soviets, who, for example, use more simulation in training.

Although in absolute terms the US level for O&M is higher than that for the Soviets, the trends for both countries are the same as those for total operating costs. For the period as a whole, US outlays for O&M are about 75 percent higher than estimated Soviet costs. In 1976, however, the US level is only about 45 percent higher than that of the Soviets.

PERSONNEL COSTS FOR US AND SOVIET FORCES



O&M COSTS FOR US AND SOVIET FORCES



A comparison, by mission, reveals that for the 1966-76 period as a whole the largest portion of operating costs for both the United States and the USSR is for the support forces. The second largest share for both countries is for general purpose forces, and the smallest share is for strategic forces. There is a marked contrast, however, between US and Soviet operating costs for each mission.

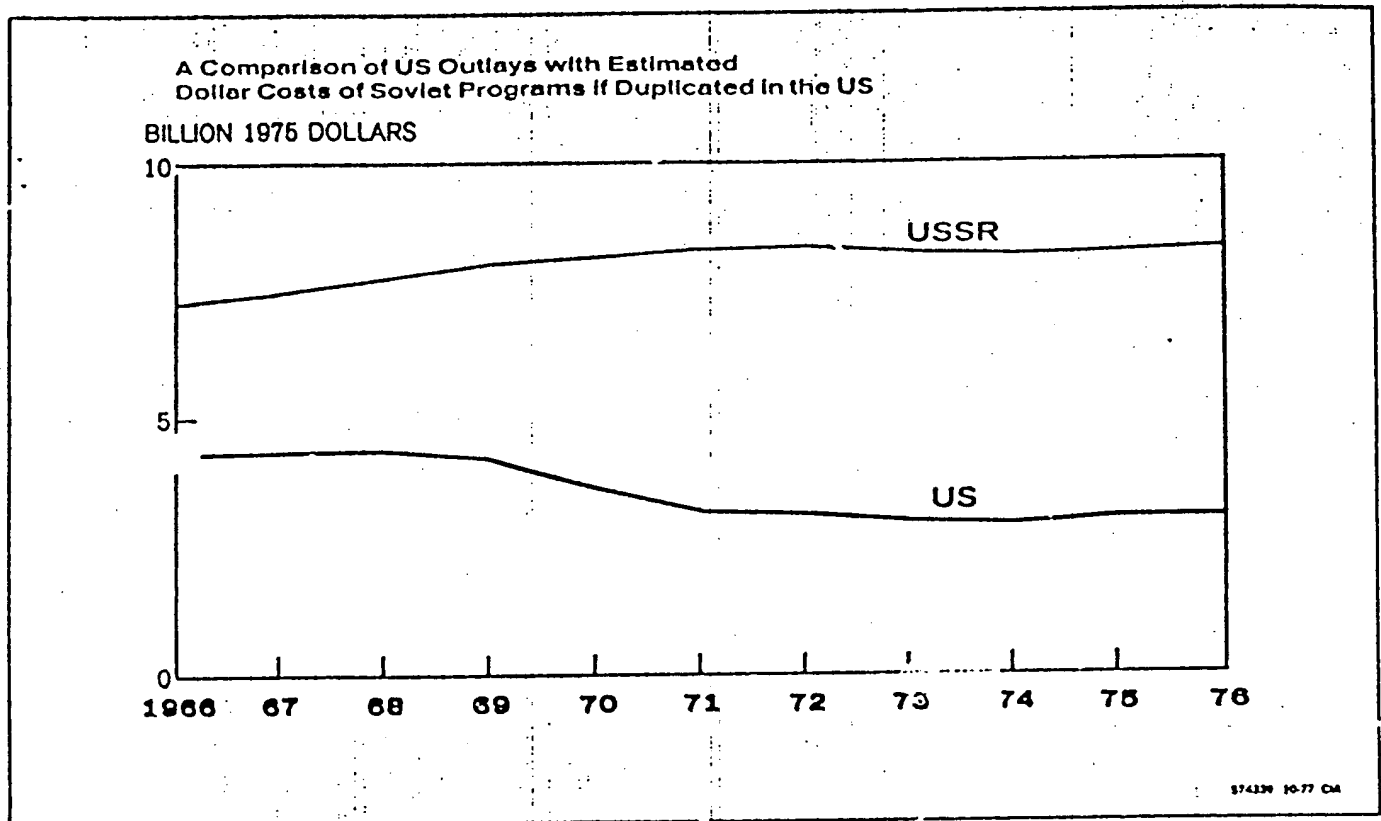
The estimated dollar cost of operating the Soviet strategic forces is more than twice as large as US outlays for the 1966-76 period. The Soviet level is greater than that of the United States throughout the entire period, and in 1976 is over two and one-half times greater (see figure 10). Within the strategic mission, personnel costs make up about 80 percent of total operating costs

for the Soviets and about 50 percent for the United States.

In the general purpose forces, US outlays for operating exceed estimated Soviet costs for the period as a whole by about 30 percent (see figure 11). Personnel costs again account for the largest portion of total operating costs for both countries—about 70 percent for the United States and almost 90 percent for the USSR.

US outlays for operating the support forces exceed the estimated dollar costs for the Soviets by about 20 percent for the period. Estimated Soviet costs rise steadily throughout the period, however, while US outlays decline rapidly from 1969 to 1974 and then level off. Soviet costs surpass those of the United States for the first time in 1974, and in 1976 are about 10 percent

OPERATING COSTS FOR US AND SOVIET STRATEGIC FORCES



higher. For the USSR, estimated costs for personnel make up about 60 percent of total operating costs for the period, while for the United States the share is about 45 percent.

RDT&E

Estimates of dollar costs for Soviet RDT&E activities are based on analysis of published Soviet data and are considerably less reliable than any other body of data in this report (see appendix B). They are derived only in the aggregate and include RDT&E activities for military uses of nuclear energy. These costs grow throughout the 1966-76 period and exceed comparable US outlays by increasing amounts in the seventies (see figure 12). To achieve comparability, the US data include all Department of Defense outlays for RDT&E and defense-related RDT&E outlays of the DOE.

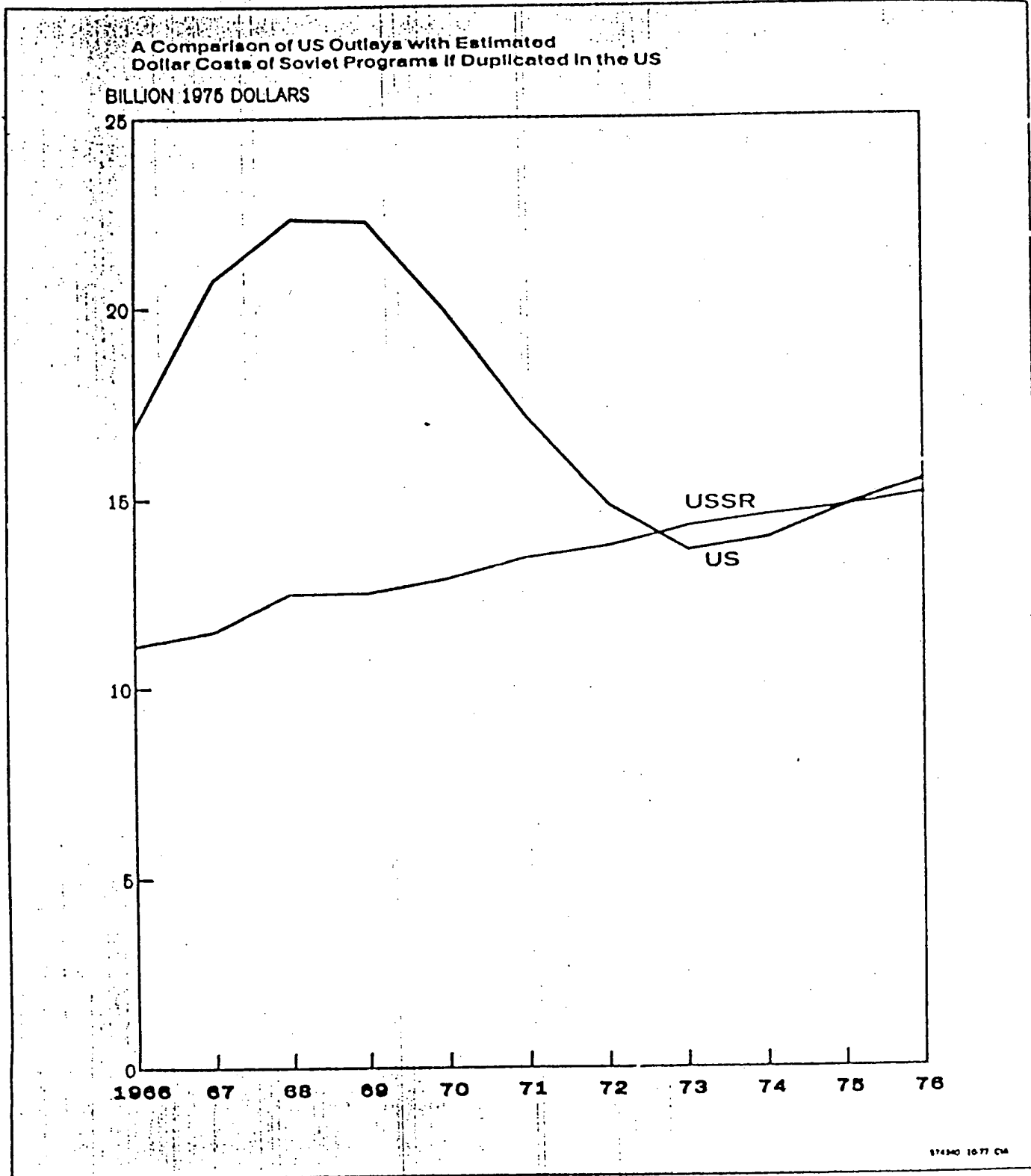
Military Missions

In this section the costs of military activities for the US and USSR are separated and discussed in detail according to mission—strategic forces, general purpose forces, and support forces. This is not the way the Soviets themselves organize their military missions, nor does it represent the way they would view the allocation of their resources for defense. Mission cost estimates are organized in accordance with the Defense Department's *Defense Planning and Programming Categories*. This categorization permits comparison of the estimated dollar costs of Soviet defense activities with categories often used in US defense analysis.

Strategic Forces

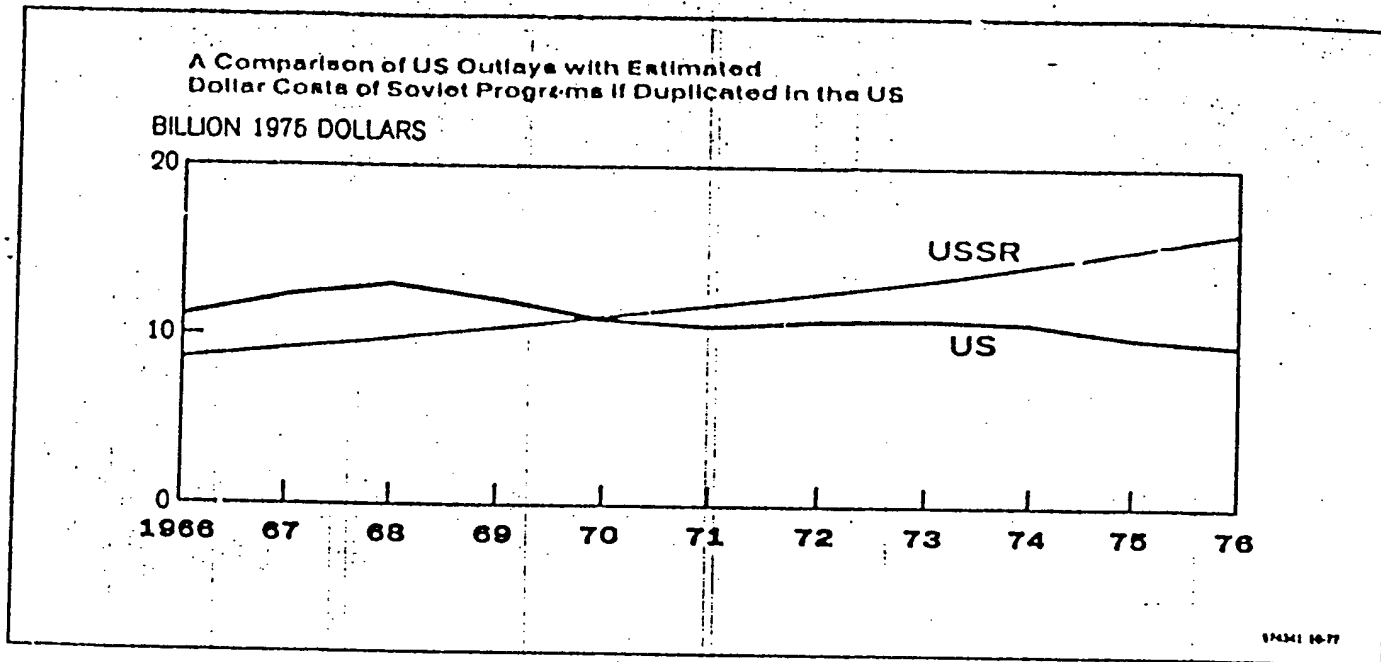
Strategic forces include all forces assigned to intercontinental and peripheral attack, strategic defense, and strategic command, control, and

OPERATING COSTS FOR US AND SOVIET GENERAL PURPOSE FORCES

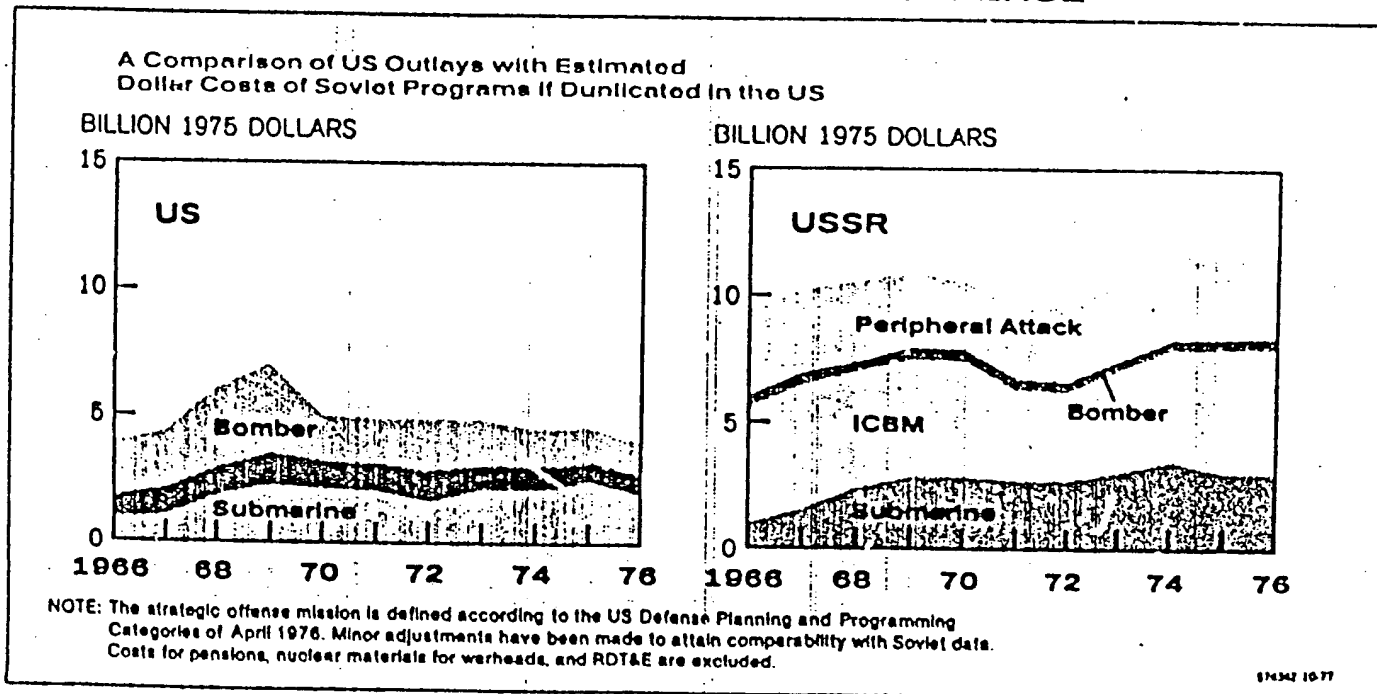


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US AND SOVIET RDT&E PROGRAMS



US AND SOVIET FORCES FOR STRATEGIC OFFENSE



warning. Over the 1966-76 period, the level of Soviet activity for strategic forces measured in dollars is almost two and one-half times that of the United States, with the difference growing since 1969. In 1976, the Soviet level is over three and one-half times that of the US.

Intercontinental Attack

This mission includes the strategic weapon systems and manpower which are designated for an intercontinental attack role. Land-based ICBM systems, ballistic missile submarines for intercontinental attack, and intercontinental bombers are the components of this mission. Over the entire 1966-76 period, the Soviet intercontinental attack activities account for 10 percent of the total estimated dollar costs of Soviet defense activities. In 1976, Soviet ICBM activities account for about 60 percent of the estimated dollar costs for this mission, missile submarine activities for about 35 percent, and bombers for the remainder.

At \$8.3 billion, the estimated dollar cost of activities allotted to the Soviet intercontinental attack mission in 1976 is more than twice the outlays for comparable US activities. For the period as a whole, estimated dollar costs for Soviet intercontinental attack forces are nearly one and one-half times US outlays. US outlays for intercontinental attack activities are at about the same level in 1976 as in 1966 (see figure 13).

ICBMs

The estimated dollar cost of Soviet land-based ICBM activities in 1976 is about \$4.9 billion, compared with about \$0.8 billion in US outlays. Estimated dollar costs of Soviet ICBM activities for the entire 1966-76 period are over four times US outlays for ICBMs. Early in the period, the Soviets began to deploy the SS-9, SS-11, and SS-13, and estimated dollar costs—reaching about \$4.8 billion in 1967—reflect this activity. Deployment of these missiles was complete by 1972, and in that year estimated dollar costs for Soviet ICBMs reached their low point for the period. In 1973, early efforts for the new generation of ICBMs—the SS-17, SS-18, and SS-19—caused an

upturn in estimated dollar costs which continued through 1976.

By comparison, the United States had nearly completed its planned ICBM deployment by the beginning of the period. US outlays since 1966 have remained relatively steady at close to \$1 billion, reflecting operating costs and upgrading of the Minuteman force

Ballistic Missile Submarines for Intercontinental Attack

This element includes all US ballistic missile submarine systems and the Soviet ballistic missile submarines which are estimated to have an intercontinental attack role. Soviet ballistic missile submarines which are believed to have a peripheral attack function are included in the strategic peripheral mission. For both countries, nonstrategic or attack submarines are included with the general purpose naval forces.

At \$2.9 billion, the estimated dollar costs of Soviet ballistic missile submarine activities for 1976 are 50 percent higher than US outlays. For the entire 1966-76 period, Soviet activities exceed those of the United States by about 40 percent.

Rising dollar costs for Soviet activities in the late sixties are caused by production of the Y-class submarine with the SS-N-6 missile. In the early seventies costs again increase, reflecting the D-class program with its longer range missile, the SS-N-8. These costs begin to decline again after 1974, as Y-class production comes to an end.

The United States, in contrast, completed production of its Polaris force in the early sixties. Operating expenditures and costs associated with improvements to the Polaris system and the shift from Polaris to Poseidon missiles determine the trend through 1972, with outlays for the Trident program beginning after that.

Intercontinental Bombers

This category includes the heavy bomber systems and other aircraft which have an intercontinental attack role as their primary mission. Costs of heavy bomber operations are included here even though the operations may have been

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nonstrategic in nature—such as the use of the US B-52 fleet in Southeast Asia. Estimated dollar costs of the Soviet Badger, Blinder, and Backfire bombers are included under strategic peripheral attack.¹

In 1976 the estimated dollar costs of Soviet intercontinental bomber activities are just over one-third of outlays for US heavy bombers. Over the 1966-76 period, estimated costs for Soviet activities are about one-fourth of US outlays for comparable activities.

The relatively low level of estimated dollar costs for the Soviet intercontinental bomber program reflects the static nature of the force. As no new heavy bombers were produced over the 1966-76 period, only operating costs of the existing Bear and Bison bomber fleet were incurred.

Costs associated with US bombers decreased as use of the bomber fleet in Southeast Asia ceased, production of the FB-111 came to an end, the B-58 was phased out, and older B-52s were retired. US bomber outlays remain nearly three times the estimated dollar costs of the Soviet program, reflecting the larger size of the US force, more intensive US operating and training schedules, and the B-52 modernization program.

Strategic Peripheral Attack

Included in peripheral attack are the Soviet forces—medium-range ballistic missiles (MRBMs), intermediate-range ballistic missiles (IRBMs), medium bombers, and some ballistic missile submarines—whose mission is largely confined to attacking targets along the periphery of the USSR.² Under current definitions, the United States has no direct counterpart to these peripheral attack forces.³

¹ All intelligence agencies except DIA, the Air Force, and the Army believe it unlikely that the Backfire bomber will be specifically assigned to intercontinental attack missions.

² A portion of the G- and H-class ballistic missile submarine force was assigned intercontinental attack missions until the early seventies, and the dollar costs associated with these submarines are included in the intercontinental mission until that time.

³ US forward-based attack aircraft are included in the tactical air portion of the general purpose force mission.

In 1976, total estimated dollar costs for the peripheral attack mission are \$3.2 billion, about 40 percent of the amount estimated for the intercontinental attack effort. This relationship is true for the period 1966-76 as a whole. The estimated dollar cost of Soviet peripheral attack activities rises moderately after 1970 as a result of the procurement of the Backfire bomber and the SS-20 IRBM program. This upward trend follows a period of decline during the latter half of the sixties, when there is relatively little investment in new peripheral attack systems and operating costs dominate the total (see figure 13).

Land-based missiles and peripheral bombers account for nearly all the dollar costs during the period. The SS-4 MRBM, whose deployment reached its peak in 1965 with some 600 launchers, has substantial operating costs. Dollar costs of operating over 600 medium bombers are another significant part of the peripheral attack total. Costs for the G- and H-class submarines—largely operating costs but also including costs for conversion and procurement of missiles—constitute an insignificant share of the peripheral attack program.

Strategic Defense

The strategic defense mission includes all US and Soviet elements assigned the role of defense against strategic air or missile attack. Costs of this mission include those for strategic surface-to-air missiles, interceptor aircraft, and ABMs. The mission does not include systems whose purpose is to provide protection in a tactical role; these are accounted for in the general purpose forces mission.

For the 1966-76 period, estimated dollar costs of Soviet strategic defense are about 5 percent of the total dollar cost of defense activities. This contrasts with US outlays, which are just over 1 percent of the total. In 1976, estimated dollar costs for Soviet activities are \$5.7 billion, more than 10 times the level of US outlays. For the period as a whole they are about four times as great.

US strategic defense activities are markedly different from those of the Soviets—both in magnitude and trend—reflecting the differing perceptions of the bomber threats to the two countries. US outlays decline sharply after 1971, and in 1976 are about one-fourth their level in the peak year of 1969.

Interceptors

Estimated dollar costs for Soviet interceptor activities are \$3.4 billion in 1976, about 60 percent of the total for the strategic defense mission. Over the entire 1966-76 period, Soviet interceptor costs are \$37 billion, nine times the US total. Soviet interceptor activities fluctuate moderately over the period, with peaks in the late sixties and in 1974 reflecting procurement of new aircraft such as the TU-128 Fiddler, the SU-15 Flagon, and the MIG-25 Foxbat.

SAMs

Estimated dollar costs of Soviet strategic surface-to-air missiles also peak in the late sixties as a result of an intensive effort to improve low-altitude and long-range defense capabilities against bomber attack. High costs for operation and maintenance of the extensive SAM network along with continuing SA-3 and SA-5 deployment are responsible for keeping the level relatively high throughout the period despite the phasing out of some older systems.

ABMs

Both Soviet and US costs for ABM activities decline sharply to an insignificant portion of the total defense effort after the early seventies, when the agreement limiting ABM deployment was reached. Over the 1966-76 period, US outlays are about 20 percent higher than Soviet costs, reflecting the more advanced technology of the US system.

Command, Surveillance, and Warning

This category includes central communications systems and command centers for strategic

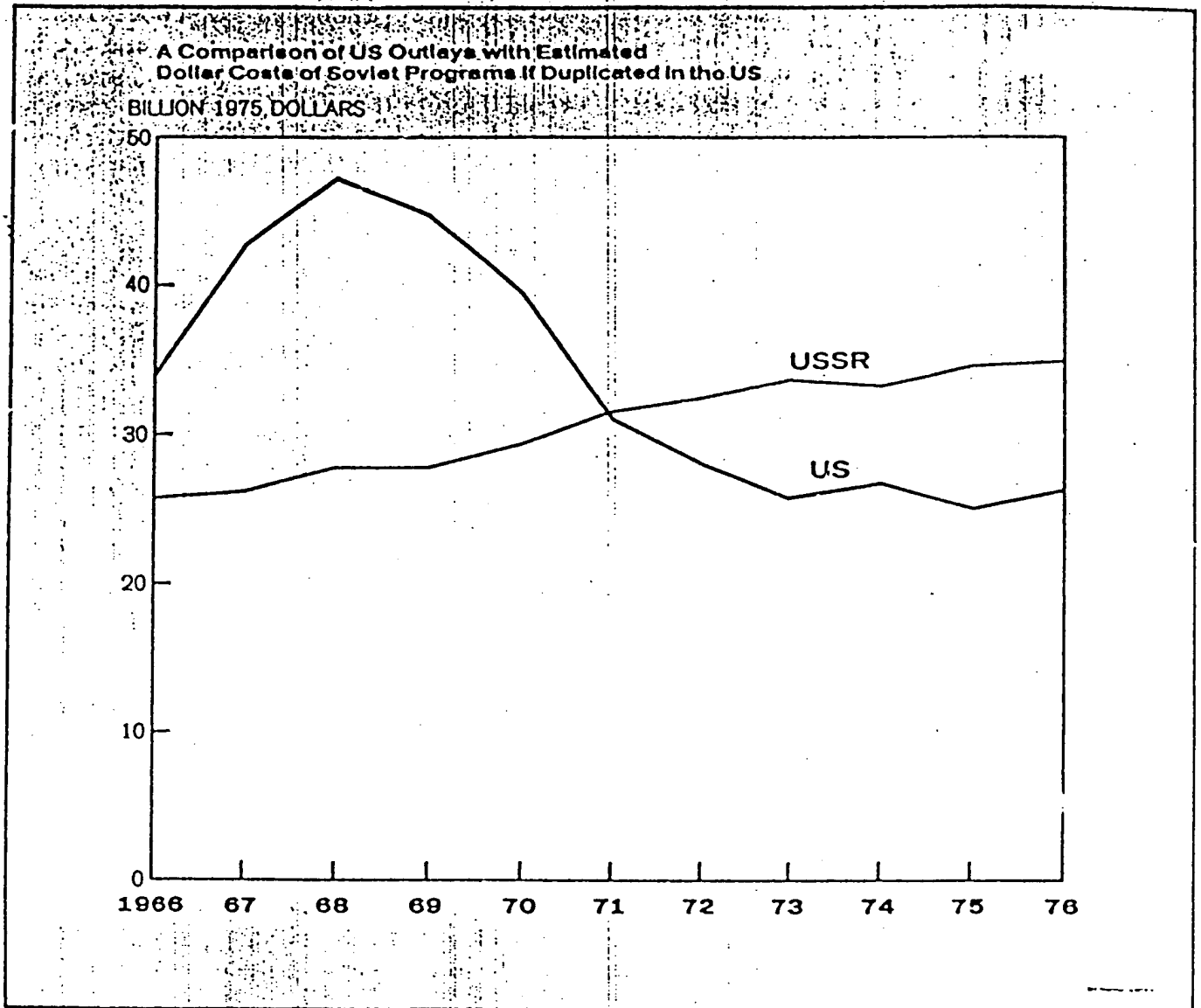
forces, early warning radar systems, and airborne command posts. Estimated Soviet dollar costs for these elements are more than two-and-one-half times US outlays for the 1966-76 period as a whole. During the period, Soviet costs rise while US outlays decline, and in 1976 the Soviet level is more than four times that of the US.

General Purpose Forces

The general purpose forces mission includes the ground forces, tactical air forces, and those naval forces that do not have a strategic attack mission. This mission accounts for a greater portion of dollar costs than any other combat mission. The dollar costs for Soviet general purpose forces exceeded US outlays for similar forces by some \$9 billion in 1976. In contrast, during the height of the war in Vietnam the US outlays exceeded the Soviets' by nearly \$20 billion. Following 1968, US outlays for general purpose forces begin to decline. This development, coupled with the steady increase in estimated dollar costs for Soviet forces, reverses the relative positions after 1970. Cumulative US outlays for the entire period, however, are some 10 percent more than comparable estimates for Soviet activities (see figure 14).

The largest component of Soviet general purpose force dollar cost estimates is the ground forces. Ground force activities, estimated at about \$15 billion annually, average just over 50 percent of total general purpose force dollar cost estimates. Naval force costs average about \$9 billion and constitute about 30 percent of annual general purpose force costs for the period, with costs for 1975 and 1976 somewhat higher. Dollar costs for the tactical air mission in general increase from 1966 to 1976. The average annual cost of the tactical air mission over the period is just under \$5 billion, amounting to about 15 percent of total general purpose force costs. Mobility forces (airlift and sealift) are at a low level throughout the period in both absolute and relative terms, with their average annual cost approaching \$2 billion and the average annual share of total general purpose force costs about 5 percent.

US AND SOVIET GENERAL PURPOSE FORCES



For the United States, the ground forces are also the largest component of the general purpose force mission, averaging about \$13.5 billion annually for the 11 years. At the beginning of the period ground forces accounted for more than 40 percent of the outlays for the general purpose mission. The post-Vietnam cutback reduced the share of land force outlays to an average of about 35 percent for the 1971-76 period. As with ground forces, tactical air and mobility forces outlays increase during the height of the Vietnam war and generally decline thereafter. In 1976, US tactical air outlays still amount to over \$7.5

billion. The Navy generally acquires a growing share of the general purpose mission over the period, increasing from over 20 percent in 1966 to more than 30 percent in 1976. Mobility forces decline slightly to under 5 percent by 1976.

Ground Forces

US and Soviet ground force components of the general purpose forces follow the same general pattern exhibited by the totals. US outlays exceed Soviet costs through 1970 when, because of US withdrawal from Vietnam and Soviet expansion

and modernization, the Soviet costs become larger. By 1976, the additional forces along the Sino-Soviet border as well as general force modernization drive the estimated dollar cost of Soviet activities to some \$17 billion, nearly \$8 billion more than comparable US outlays.

Tactical Air

US outlays for tactical air forces are greater than Soviet costs throughout the period. The US margin is greatest during the mid- to late-sixties, peaking at about \$10 billion in 1968. A sharp US decline comes at about the same time that Soviet tactical air costs begin to increase, decreasing the US margin to between \$1 billion and \$2 billion for the rest of the period. The increase in dollar cost estimates for Soviet tactical air forces results from the introduction of new and more expensive systems—such as the SU-17 Fitter, MIG-23 and MIG-27 Flogger, MIG-25 Foxbat, and the SU-19 Fencer—to improve their capabilities against NATO and the Chinese.

The comparisons of US and Soviet tactical air costs include US naval carrier forces as part of the US force. This Defense Department accounting practice adds an element to the US force that does not exist for the Soviets, and any comparison must take account of the impact of these forces. The US carrier forces average about 35 percent of the total tactical air mission, with annual outlays of about \$3.5 billion.

General Purpose Naval Forces

The general purpose naval forces include all major and minor surface combatants, attack submarines, antisubmarine warfare (ASW) aircraft carriers and aircraft, land-based naval air forces, amphibious warfare ships, and support ships. Ballistic missile submarines and US attack carriers and their aircraft are not included in this category.

In 1976 the estimated dollar cost of Soviet general purpose navy programs, at \$9.6 billion, is some 20 percent higher than comparable US outlays. For the period estimated Soviet dollar costs of these activities are nearly 10 percent

greater than the US outlays, and exceed the US level in every year except 1970 and 1972. For both the USSR and the United States, the dollar costs of the general purpose naval forces represent less than 10 percent of total defense costs throughout the 1966-76 period.

Soviet forces with the primary mission of ASW and fleet air defense⁴ account for over 80 percent of the estimated dollar costs of the general purpose navy mission in 1976, and average nearly \$7 billion annually from 1966 to 1976. During the period several new naval systems were introduced, including the Moskva-class guided-missile helicopter ships; the Kara and Kresta-II guided-missile cruisers; the Krivak guided-missile destroyer; the first Soviet ASW carrier, the Kiev; and the C- and V-class attack submarines. Comparable US general purpose navy outlays for 1976 are \$6.3 billion. For the 1966-76 period US outlays for ASW and fleet air defense average about \$5.7 billion annually, or 70 percent of the general purpose navy total. Prominent among the US naval activities during this period are the construction programs of the California- and Virginia-class nuclear-powered guided-missile cruisers, the gas turbine-powered Spruance destroyers, and the Sturgeon- and Los Angeles-class nuclear-powered attack submarines.

With the exception of the small costs associated with amphibious forces, the remainder of the Soviet general purpose navy costs during the period are associated with auxiliary ships. US outlays for amphibious and auxiliary ships decrease over the period in both absolute and relative terms. In 1976, US outlays for amphibious forces are \$0.6 billion, 9 percent of general purpose naval outlays. US outlays for auxiliaries amount to over \$1 billion in 1976—14 percent of general purpose naval outlays.

Mobility Forces

US outlays for mobility forces, consisting of airlift and sealift elements, are greater than comparable Soviet costs for the first six years of the

⁴ These forces include major and minor surface combatants, attack submarines, land-based naval aircraft, and ASW carriers and associated aircraft.

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period.⁸ Both US and Soviet forces increase over that time, after which the US force begins a sharp decrease resulting in a Soviet margin in each of the last three years of about \$0.7 billion. Although Soviet costs are higher at the end of the period, the cumulative US outlays are more than \$4 billion greater than Soviet costs.

Support Forces

Auxiliary Support

Auxiliary support consists primarily of intelligence and military space activities, the US Coast Guard, and the Soviet border guards. US outlays for auxiliary support forces have exceeded the estimated Soviet dollar cost in every year of the 1966-76 period. Over the entire period US costs for this mission exceed dollar cost estimates for Soviet auxiliary support forces by over 75 percent. The Soviet level, however, has been rising continually throughout the period, while the US level has been declining since 1969. In 1976 US outlays are only about 15 percent higher than estimated Soviet dollar costs for these forces.

⁸ Research needed to compute the cost of Soviet sealift forces on a comparable basis with the US has not been completed. The comparison given here is nevertheless indicative, since the cost of US mobility forces is dominated by airlift; sealift costs average about 1 percent of the annual total for mobility forces over the 11-year period.

Mission Support

The mission support category includes most major headquarters and support activities from specific missions. Estimated Soviet dollar costs for mission support exceed US outlays in every year of the 1966-76 period, and are about 50 percent higher for the entire period. The difference has grown over the period, however, and in 1976 the Soviet level is twice that of the US.

Central Support

This mission encompasses all logistics-related activities, other activities of a central support nature,⁹ the Soviet internal security troops, and the costs of uniformed military personnel engaged in civil defense activities. During the 1966-76 period, US outlays for this mission have exceeded estimated Soviet dollar costs by over 45 percent. As with auxiliary support forces, however, the Soviet level has been rising throughout the period, while the US level has been declining since 1969. In 1976, US outlays for central support forces exceed estimated Soviet dollar costs by less than 15 percent.

⁹ Central support activities include, for example, basic training, family housing, recruiting, medical care, printing and publishing, and telex communications.

The author of this paper is

Office of Strategic Research, Comments

Appendix A

PRODUCTION DATA

Data on US and Soviet production of military weapon systems are useful in comparing the size of each country's military activities over time. This information, taken with other measures, can increase our understanding of Soviet defense activities. Production comparisons, however, cannot be used by themselves as measures of capability. No net assessment of US and Soviet activities can be drawn exclusively from these data.

Production comparisons can complement dollar cost comparisons, but caution must be exercised in relating the two bodies of data. The costs for some systems, such as those for ships, are phased over several years and are not as directly related to production as those for smaller systems.

Although the following comparisons of US and Soviet weapons production are far from comprehensive, we have attempted to address those systems which were prominent and dynamic. The production data discussed in this annex represent only the production of weapon systems by the United States and the USSR for the direct use of their own military forces. Production for RDT&E and for military aid to other countries has been excluded.

Missiles

ICBMs

The Soviets are estimated to have produced over 3,000 intercontinental ballistic missiles between 1966 and 1976, more than twice the number produced in the United States during this period. During the late sixties, the Soviets were building up their SS-9 and SS-11 forces and introducing a small force of SS-13s. Estimated Soviet ICBM production supporting this buildup

averaged between 300 and 400 missiles per year. In the early seventies, production dropped sharply as deployment of the SS-9 and SS-13 ended, but rose again near the end of the period with the introduction of the new-generation ICBMs.

The United States, on the other hand, had nearly completed its planned ICBM deployment by the beginning of the period. Although the United States deployed no new ICBM launchers after 1967, more than 1,300 missiles were produced during the period as the Minuteman system was improved.

MRBMs and IRBMs

In addition to their ICBM forces, the Soviets maintain an extensive force of medium- and intermediate-range ballistic missiles. The United States has no counterpart for these systems. Because there was virtually no new deployment of MRBM and IRBM systems during the 1966-76 period, production of these missiles dropped from about 100 per year at the beginning of the period to only a few each year by the late sixties. There was a marked increase starting in 1973, however, as the SS-20 IRBM neared deployment.

SLBMs

Soviet production of submarine-launched ballistic missiles is estimated to have been about 80 percent greater than that of the US during the 1966-76 period. Estimated annual Soviet SLBM production, driven largely by the introduction of the SS-N-6, rose steadily from less than 100 in 1966 to about 200 in 1971 and 1972. At that time, production of the SS-N-6 began to decline, although the decrease was somewhat offset by the

introduction of an improved SLBM system with a considerably longer range, the SS-N-8. Total estimated SLBM production declined gradually to about 120 in 1975 but then increased slightly to about 150 in 1976.

The pattern of US SLBM production is clearly delineated by the two major activities under way during the 1966-76 period. Production of Polaris missiles, which marked the early part of the period, had essentially ended in 1968. The Poseidon system entered production in 1971, and, though declining from a peak of about 150 in 1972 to less than 30 in 1976, averaged over 100 missiles a year for the seventies.

ASMs

US production of air-to-surface missiles during the 1966-76 period is about 25 percent higher than that estimated for the Soviets. US production rates peaked in 1968 at 7,000 per year, reflecting the heavy use of ASMs in Vietnam. Afterwards, the level dropped sharply to less than 500 in 1971 and 1972, but increased again, regaining the 7,000-per-year rate in 1976 with the introduction of the short-range attack missile (SRAM) and Maverick.

We estimate that Soviet production of ASMs rose steadily from about 600 at the beginning of the period to about 7,500 in 1976.

SAMs

Estimated Soviet production of surface-to-air missiles was nearly five times US production during 1966-76. Except for a pause in 1971, annual production of SAMs for the Soviets increased steadily from about 10,000 in 1966 to about 24,000 in 1976. In recent years, added emphasis has been placed on tactical SAMs, notably the SA-7, SA-8, and SA-9, the largest contributors to the high levels of production in the mid-seventies.

The US has also emphasized tactical surface-to-air missile (SAM) systems. Redeye and Chaparral production exceeded 11,000 in 1969 and totaled about 37,000 for the period. In the seventies, a

considerable number of Hawk missiles was produced. Unlike the Soviets, however, the United States has not devoted much effort to strategic SAMs, and virtually ended production of these missiles in 1970.

ASW Missiles

Over the period, US production of missiles for antisubmarine warfare—nearly 6,000—was more than two and one-half times that estimated for the Soviets during the period. ASROC and SUBROC production reached over 1,700 in 1967, but declined thereafter, and by 1973 had ended entirely. The pattern of Soviet production of ASW missiles is the opposite of the US pattern; Soviet production began in 1967 and has increased each year to nearly 500 annually in 1976.

Aircraft

Comparison of US and Soviet aircraft production can be misleading because of the extensive qualitative differences in the aircraft produced by each country. In this report, dollar cost comparisons are based on the role or mission of the aircraft for consistency with the other mission comparisons. Comparisons of production are more appropriately based on similarity of operational capabilities.

Heavy and Medium Bombers

The Soviets produced about 270 heavy and medium bomber-type aircraft (including reconnaissance and support models) during the 1966-76 period. At the beginning of the period, they were producing the Blinder at an estimated rate of between 30 and 40 a year. Production of this aircraft declined sharply after 1968, however, and ended in 1970. Annual production of the Backfire, which began in 1971, has steadily increased to about 25 per year. The Backfire is the only bomber currently being produced by the Soviets, although an ASW version of the Bear is still in production.

The only US bomber produced during this period was the FB-111, with fewer than 80 built between 1968 and 1971.

Fighters and Tactical Attack Aircraft

The Soviets produced just over 8,000 fighters and tactical attack aircraft during the 1966-76 period—about a third more than the United States. An interesting aspect of production in this category is the change, for both countries, in the type of aircraft produced. During the sixties, the Soviets concentrated on producing aircraft designed for a specific mission, introducing several new interceptors—including the Flagon, Fiddler, and Firebar—to enhance their air defense capabilities. During the seventies, they began to produce more versatile multipurpose aircraft. They introduced the Flogger and the later variants of the Fishbed—the J, K, and L—all of which have both interceptor and ground attack roles.

For the United States the trend was reversed. Large numbers of the F-4 multipurpose fighter were produced during the sixties, but beginning in the seventies the production of aircraft designed for a specific role, such as the F-14 all-weather high-performance interceptor, predominated.

Helicopters

Annual Soviet production of helicopters rose steadily from just over 100 in 1966 to more than 900 in 1975. The increase has been highlighted by production of the Hip, running at about 600 per year near the end of the period.

Once again, the trend for US production is the reverse of that estimated for the Soviets. US production of helicopters, as with the fighters and attack aircraft, strongly reflects the requirements of the Vietnam conflict. Annual production reached a peak of over 2,700 in 1968 but declined rapidly in subsequent years, and by 1976 had fallen below 100. Despite the downward trend, however, US production of helicopters over the 1966-76 period was nearly two and one-half times that estimated for the Soviets.

Land Arms

Limitations of the data available at this time restrict our comparisons of US and Soviet land arms production to armored vehicles—tanks and

armored personnel carriers (APCs). The USSR produced more than 65,000 armored vehicles between 1966 and 1976. During the same period, the United States produced just over 18,000.

Tanks

The Soviets produced about six times as many tanks as the United States during the 1966-76 period—about 30,000 compared with 5,000. Emphasis was on the production of medium tanks (approximately 40 tons)—the T-55 with a 100-millimeter gun, the T-62 with a 115-mm smooth-bore gun, and the T-72 with a large-caliber, smoothbore weapon. On the US side, most of the deliveries were the 16-ton Sheridan M551 armored reconnaissance vehicle with a 152-mm gun, and the 52-ton M60A1 tank with a 105-mm gun.

Armored Personnel Carriers

The Soviets produced nearly 37,000 APCs during the period, nearly three times more than the United States. Among the Soviet carriers were the BTR-50 and BTR-60 series, which carry about a squad of infantry troops, BRDM wheeled amphibious armored reconnaissance vehicles, which carry four to five troops, and BMP tracked amphibious armored infantry combat vehicles, which carry a squad. US production was dominated by the 11-ton tracked M113 vehicle, which can carry about a squad of troops.

Naval Combatant Ships

Although many types of ships were delivered to each country's fleets during the 1966-76 period, only naval combatants and submarines—the ships that contribute most directly to naval warfare capabilities—are discussed in this section.

The Soviets built about 830 surface combatant ships and submarines during the period, while the United States built about 215. The disparity is not as great, however, when considered in terms of ship tonnage. The Soviets tended to build smaller ships than the United States, and total Soviet production amounted to about 1,400,000 tons. This is about 80 percent greater than the US

production of about 800,000 tons. The Soviet preference for smaller ships, however, is true only for surface combatants. Attack submarines are about the same size for both countries, and Soviet ballistic missile submarines tend to be somewhat larger than those of the United States.

Surface Combatants

During the period, the Soviets delivered about 690 surface combatants to their active fleet, versus about 160 for the United States.⁷ The tonnage for both countries, however, was nearly equal at about 550,000.

The United States added two new attack carriers during the period. While the Soviets have no equivalent, they did build two Moskva-class ASW helicopter ships in the late sixties, and in 1975 completed the first Kiev-class ASW carrier, which has a complement of fixed-wing vertical and short takeoff and landing (V/STOL) aircraft.

The Soviets built 18 guided-missile cruisers during the 1966-76 period—five of the Kara class, four of the Kresta-I class, and nine of the Kresta-II class. US guided-missile cruiser production during the same period consisted of six ships of the conventionally powered Belknap class and four nuclear-powered cruisers—one Truxtun, two California, and one Virginia class.

Both the United States and the USSR added destroyers to their deployed forces during the period. The Soviets built 13 ships each of the

⁷ Includes major and minor surface combatants (including Coast Guard cutters and patrol craft) but excludes amphibious warfare ships and assault helicopter carriers.

Kashin and Krivak classes. The United States added five Spruance-class destroyers to its fleet. The Soviets had three active frigate programs—the Petya, Mirka, and Jaguar classes—with a total production of 35 ships. The United States also had three frigate programs—the Knox, Garcia, and Brooke classes—totaling 57 ships.

The Soviets added 19 Nanuchka-class guided-missile patrol gunboats, 30 Grisha-class guided-missile escorts, 44 Osa-class guided-missile boats, and a number of other minor combatants to their inventory. The United States added 17 patrol gunboats during the period.

Attack Submarines

During the period, the USSR built 87 attack submarines, 48 of which were nuclear powered. The Soviets pursued both nuclear and diesel submarine programs; the US built only nuclear submarines. The E, C, and V nuclear classes and the F, T, and J diesel classes accounted for most of the attack submarines produced in the USSR. The United States built 46 nuclear-powered attack submarines; all except the latest—the Los Angeles—were of the Permit and Sturgeon classes.

Ballistic Missile Submarines

During the 1966-76 period, the Soviets completed 56 submarines of the Y and D classes. Completion in 1966 and 1967 of the final eight nuclear-powered ballistic missile submarines of the Benjamin Franklin class accounted for the US deliveries.

Appendix B

COSTING METHODOLOGY

Definition of Dollar Estimates

Dollar costs of the Soviet defense effort are estimates of what it would cost the United States to purchase the same military equipment and supplies, pay the same number of people, carry on the same types of RDT&E, and pursue the same operations and maintenance activities as the Soviets. These estimated dollar costs are compared year by year with US outlays for similar activities.

Constant and Current Prices

The dollar cost data presented in this report are expressed in terms of average calendar year 1975 US resource prices. A constant price base is used so that all changes in spending from year to year reflect changes in the military forces and activities themselves, rather than price changes resulting from inflationary factors. Dollar costs expressed in current prices show trends that are quite different. A current price series would reflect, for example, the increase in US military pay authorizations related to the transition to the all-volunteer army, as well as the inflation that has affected the US economy.

The US and Soviet data bases were converted to constant 1975 resource prices by the application of resource input indexes. Resource input indexes were used in the absence of appropriate output price indexes for military items.

The US and Soviet data were indexed this year by a more detailed methodology than was used for past defense cost comparisons. Indexing has been extended to a greater number of producers' material and labor inputs, and provision was made for changing the relative proportions of

labor and materials through time. The impact of the new methodology will vary throughout the timespan of these comparisons.

Estimating the Dollar Costs of Soviet Activities

The dollar costs of Soviet defense activities are developed for the most part on the basis of a detailed identification and listing of Soviet military forces. The force components listed are multiplied by estimates of what they would cost in the United States in dollars. The results are then aggregated both by military mission and by resource category.

The reliability of the estimates depends on the precision and accuracy of our estimate of the Soviet activities and of the cost factors applied to that data base. The data base on forces and weapons reflects the combined collection and analytical efforts of the intelligence community. Available intelligence information has made it possible to develop a detailed inventory of the numbers and kinds of weapons and units that make up the Soviet armed forces. This extensive data base includes information on such items as physical and performance characteristics of Soviet weapons and equipment and their production; deployment levels of Soviet strategic attack, strategic defense, and general purpose forces; and the manpower levels of these forces and their support elements.

Investment

Investment costs are those for procurement of equipment and spare parts and for construction of facilities. While the specific technique varies according to the information available, the procurement costs of most weapons—aircraft, mis-

siles, and ships—are derived through the use of cost estimating relationships (CERs). These CERs—equations which relate US weapon characteristics (for example, weight, thrust, or speed) to costs—are applied to Soviet weapon characteristics which can usually be ascertained with reasonable confidence through intelligence methods. For a few items of Soviet equipment which have become available, cost analysts from US weapons manufacturers have been contracted to estimate, part by part, the production costs. In addition to a more detailed estimate for the items examined, these cost analyses in some cases have provided the basis for adjusting the CER-derived costs estimated for similar weapons.

The lack of necessary data on some systems makes it impossible to use either of the two approaches described above. In these cases, direct analogy—using the cost of similar US equipment—or some other gross approximation of cost, such as estimating total cost as a function of total weight, is used. Some ammunition items, for example, are costed using these less refined methods.

Construction cost estimates are based on a good knowledge of Soviet construction practices and ruble construction costs. These estimated costs are converted into dollars by the use of a ruble-to-dollar ratio based on the cost of similar construction in the United States.

Operating

Operating costs are the sum of personnel costs—pay, subsistence, and other allowances—and operations and maintenance costs. O&M costs include those which support the functioning of the defense establishment, and cover such diverse items as fuel consumption and maintenance of facilities.

Dollar costs for Soviet military personnel are estimated by applying US factors for pay and allowances to estimates of Soviet military manpower. Average factors are derived for each US service by dividing total pay and allowances for each service by total manpower in that service. The appropriate factor is then applied to the

manpower estimated for each Soviet military unit.

Some O&M cost estimates are based on US analogy. The costs of overhauls for armored vehicles, for example, are related to the original procurement costs of the equipment using percentage factors based on US experience. Adjustments are made, however, to reflect Soviet operating rates when they are known to differ from US practices. The cost of petroleum, oils, and lubricants (POL) is based on estimated Soviet consumption rates for each weapon system. For example, the estimated fuel consumption rate of a particular model of Soviet aircraft is applied to the average number of flying hours for that type of aircraft. The resulting quantities of POL are then costed at US prices. In general, the information on operating rates is not as complete in quantity or quality as the physical—manpower and equipment—data on the forces.

Facility maintenance costs are based on the assumed life of the facility and are a function of the cost of constructing it. US and Soviet experience is believed to be similar in this area.

RDT&E

The direct costing approach described above is not used to estimate the dollar cost of Soviet military RDT&E because the type of data needed for direct costing of observed activities is not readily available. Instead, published Soviet statistical data and descriptive material about scientific activities are used as a basis for estimating military RDT&E and space activities in rubles. The dollar costs of these activities are obtained by converting the ruble estimate into dollars with a ruble-to-dollar ratio. The estimate corresponds in coverage to the categories of US RDT&E activity funded by the Department of Defense and the defense-related portion of the Department of Energy (DOE) research program.

For several reasons, the estimated dollar costs presented for Soviet RDT&E should be regarded as less reliable than the dollar costs estimated for investment and operating. First, because the basic information comes from Soviet publications,

there is an element of uncertainty about its reliability and about our understanding of it. Second, the distribution of Soviet RDT&E expenditures between military and civil applications continues to be a difficult problem. Finally, the conversion from rubles to dollars presents a number of theoretical complexities as well as practical problems.

Organization of the US and Soviet Data

The definition of defense activities used in this comparison encompasses those activities that in the United States would be funded by the Department of Defense (less all but the personnel costs of foreign military assistance and civil defense), defense nuclear activities such as those funded in the United States by the DOE, the activities of the US Coast Guard and the Soviet militarized security forces (border guards and internal security troops), and activities of the Selective Service type.

US dollar cost data are in terms of outlays. They include outlays derived from the Total Obligational Authority series in *The Five-Year Defense Program* issued by the Department of Defense in October 1976. Because the data have been converted to outlays in constant price terms and have been adjusted to achieve accounting

coverage comparable with the dollar estimates made for the USSR, they do not match actual budget authorizations or appropriations.

The organization of the US and Soviet military mission comparisons follows the mission structure outline in the Defense Department's *Defense Planning and Programming Categories*. Utilization of the DPPC guidelines has permitted a more complete allocation of entities which in previous estimates were included in the category of "command, support and other."

This report also presents comparisons of US and Soviet defense efforts on a resource category basis. These data were structured in accordance with current FYDP and budget resource accounting definitions. Because these definitions have varied over time, adjustments were required to achieve consistency of the resource category definitions throughout the period of analysis.

The comparisons in this report—both by mission and by resource category—are subject to a degree of uncertainty and therefore should not be considered as precise measurements. This is particularly true in areas where the difference between US and Soviet levels is estimated to be small or where the comparisons are made at a low level of aggregation.

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Appendix C

REVISIONS IN DATA AND METHODOLOGY

A number of important changes have been made in this year's comparisons on both the Soviet and US sides.

On the Soviet side:

- The estimates of Soviet defense manpower were completely reexamined during the past year, resulting in an overall downward revision of about 6 percent in the estimated total manpower of the Soviet defense establishment, including civilians working for the Ministry of Defense. This resulted in a reduction in estimated costs of about \$3 billion per year.
- To remove an element of double counting in previous estimates, Soviet construction troops have been excluded from military manpower. These costs are more properly captured in construction costs, which are estimated directly and carried under investment costs. This resulted in an estimated reduction of about \$4 billion per year.
- New intelligence information and improved costing methodologies have caused numerous changes in estimates of production and dollar costs of Soviet military equipment. On balance, however, these changes had little effect on the total dollar cost estimates.

On the US side:

- The price deflators used to convert US data from current to constant dollars have been improved. The use of new deflators has, on balance, raised the constant price costs, with

the largest effect in earlier years and almost no effect in recent years.

- Coast Guard and Selective Service outlays—about \$1 billion per year—have been included to achieve better comparability.
- The conversion of Total Obligational Authority figures to outlays makes the US data more compatible with the data used for estimating the dollar costs of Soviet activities. For the period of this report, outlays have averaged about 3 percent lower than TOA. The difference, however, fluctuates in any given year. Most of the difference is in the investment category, because money authorized for investment in one year is generally spent over several years. Investment TOA in 1976, for example, is \$3 billion higher than for 1975. Investment outlays, however, decline almost \$1 billion between 1975 and 1976 because some of the authorized amount will be spent in 1977 and later (see figure 6).

Changes affecting both sides:

- This year the mission categories follow the definitions outlined in the *Defense Planning and Programming Categories*. This revision provides mission categories that are more familiar to US planners than those used last year.
- This year's comparison is in constant 1975 dollar prices instead of 1974 prices. The change in base year results in an apparent, not real, overall increase in dollar costs for both sides throughout the period.

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Appendix D

STATISTICAL DATA

The financial data in this appendix are based on a detailed single-value statement of the Soviet and US forces which was specified solely for costing purposes. Key elements of the forces used for costing are shown in summary form in tables 11 and 12.

Figures for all activities are expressed in constant 1975 resource prices. Figures for the USSR are for calendar years and those for the United States are for fiscal years.

The estimated dollar costs do not include costs for Soviet civil space activities, costs for retired pay (unless otherwise specified), or costs for military assistance or civil defense (except for the pay and allowances of uniformed personnel engaged in such activities).

TABLE 1

Estimated Costs of Soviet Defense Programs
If Duplicated in the United States, by Mission¹

	Billion 1975 \$										
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Strategic forces	17.6	18.6	19.6	20.9	20.1	18.8	18.2	19.4	20.7	20.7	20.9
General purpose forces	25.8	26.2	27.8	27.8	29.4	31.6	32.6	33.8	33.3	34.7	35.0
Support forces	34.8	36.5	38.7	39.3	40.3	41.4	41.9	43.6	44.0	44.8	45.6
RDT&E	8.5	9.1	9.7	10.3	11.0	11.8	12.6	13.4	14.3	15.2	16.3
Total ¹	86.7	90.4	95.8	98.3	100.9	103.6	105.3	110.2	112.3	115.4	117.8

¹ These estimated dollar costs are designed to indicate the general size of the Soviet forces and programs by showing what they would cost if purchased and operated in the United States. The costs shown for the major force missions include costs for personnel, other operating costs, procurement of hardware, and construction of facilities. Estimated dollar costs for military RDT&E have been aggregated and are included in the RDT&E mission (excluding military personnel costs). All costs for civil space, nonpersonnel military assistance programs, and civil defense activities except for the pay and allowances of uniformed personnel engaged in such programs have been excluded. Costs for strategic forces and general purpose forces include only those costs associated with combat or combat support units. Those costs not associated with combat or combat support units (except RDT&E) have been aggregated within the "support forces." This mission also includes all costs for civilian and retired personnel as well as costs which, because of present data limitations, cannot be assigned for both countries to other missions. Data are for calendar years.

¹ Because of rounding, components may not add to the totals shown.

TABLE 2

US Defense Outlays by Mission¹

Billion 1975 \$

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Strategic forces	7.5	8.0	9.9	11.5	9.1	9.1	8.1	7.6	6.8	6.7	5.8
General purpose forces	34.0	42.6	47.2	44.7	39.6	31.1	28.2	25.9	26.9	25.1	26.3
Support forces	49.6	57.2	60.2	61.5	58.0	53.7	49.3	45.1	43.1	43.0	42.3
RDT&E	11.1	12.2	12.9	12.1	11.0	10.6	11.0	11.1	10.8	10.0	9.7
Total ²	102.0	120.1	130.2	129.7	117.6	104.5	96.6	89.7	87.6	84.8	84.2

¹ The outlays shown are developed from appropriate editions of The Five-Year Defense Program, the Budget of the United States, and related data. To achieve as high a degree of comparability as possible, US program data have been reaggregated and converted to constant calendar 1975 dollars. Data are for fiscal years.

² Because of rounding, components may not add to the totals shown.

TABLE 3

Estimated Costs of Soviet Strategic Forces
Programs If Duplicated in the United States, by Element¹

Billion 1975 \$

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Intercontinental attack	6.0	6.9	7.4	7.9	7.8	6.7	6.6	7.4	8.3	8.4	8.3
Peripheral attack	3.4	3.3	3.2	2.9	2.8	2.9	3.0	3.2	3.1	3.1	3.2
Strategic defense	5.1	5.4	5.9	7.1	6.4	5.9	5.3	5.5	5.9	5.7	5.7
Command, surveillance, and warning	2.0	1.9	1.9	2.0	2.1	2.2	2.3	2.4	2.4	2.4	2.5
Nuclear weapons	1.1	1.1	1.1	1.0	1.1	1.1	1.1	0.9	1.0	1.1	1.1
Total ²	17.6	16.6	19.6	20.9	20.1	18.8	18.2	19.4	20.7	20.7	20.9

¹ These estimated dollar costs are designed to indicate the general size of the Soviet strategic forces by showing what they would cost if purchased and operated in the United States. The estimated costs shown include costs for military personnel, other operating costs, procurement of hardware, and construction of facilities for strategic attack systems and for systems assigned to the defense of the USSR against air, missile, and space attack, except the antisubmarine warfare forces, which are included in general purpose naval forces. This mission also encompasses the regional control and warning network and all SAMs, ABMs, antisatellite systems, and aircraft assigned to the National Air Defense Forces. No RDT&E costs are included. Data are for calendar years.

² Because of rounding, components may not add to the totals shown.

TABLE 4

US Strategic Forces Outlays by Element ¹

	Billion 1975 \$										
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Intercontinental attack	4.0	4.4	6.0	7.0	5.0	5.0	4.9	4.9	4.5	4.6	4.1
Strategic defense	1.8	1.8	1.9	2.4	1.9	2.3	1.6	1.0	0.9	0.6	0.5
Command, surveillance, and warning	1.0	0.9	0.9	0.9	0.9	0.9	0.7	0.8	0.6	0.6	0.6
Nuclear weapons	0.7	0.8	1.0	1.1	1.2	1.0	0.8	0.8	0.9	0.8	0.7
Total ^a	7.5	8.0	9.9	11.5	9.1	9.1	8.1	7.6	6.8	6.7	5.8

¹ The outlays shown are developed from appropriate editions of The Five-Year Defense Program. To achieve as high a degree of comparability as possible, US program data have been reaggregated and converted to constant calendar 1975 dollars. Data are for fiscal years.

^a Because of rounding, components may not add to the totals shown.

TABLE 5

Estimated Costs of Soviet Intercontinental
and Peripheral Attack Programs If Duplicated
in the United States, by Element ¹

	Billion 1975 \$										
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Strategic intercontinental attack:											
ICBMs	4.4	4.8	4.5	4.6	4.4	3.5	3.3	3.8	4.3	4.8	4.9
Submarines	1.0	1.5	2.4	2.8	2.9	2.7	2.7	3.1	3.4	3.0	2.9
Bombers	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5
Total ^a	6.0	6.9	7.4	7.9	7.8	6.7	6.6	7.4	8.3	8.4	8.3
Strategic peripheral attack:											
MRBMs and IRBMs	1.9	1.8	1.7	1.6	1.6	1.5	1.5	1.7	1.6	1.6	1.7
Submarines	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bombers	1.4	1.4	1.4	1.2	1.1	1.3	1.3	1.4	1.4	1.4	1.4
Total ^a	3.4	3.3	3.2	2.9	2.8	2.9	3.0	3.2	3.1	3.1	3.2

¹ These estimated dollar costs are designed to indicate the general size of the Soviet strategic intercontinental and peripheral attack forces by showing what they would cost if purchased and operated in the United States. The estimated costs shown include costs for military personnel, other operating costs, procurement of hardware (excluding nuclear warheads), and construction of facilities for long-range attack weapon systems. No RDT&E costs are included. The United States has no force with an assigned mission comparable to the Soviet strategic peripheral attack mission. For this reason, the intercontinental and peripheral attack missions have not been totaled together to obtain a single dollar cost estimate for strategic attack. Data are for calendar years.

^a Because of rounding, components may not add to the totals shown.

TABLE 6

US Strategic Intercontinental Attack Outlays by Element¹

Billion 1975 \$

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
ICBMs	0.9	1.1	1.1	1.3	1.2	1.1	1.2	1.0	1.0	0.8	0.8
Submarines	1.0	1.1	1.8	2.2	2.0	2.0	1.6	2.1	2.0	2.4	1.9
Bombers	2.1	2.3	3.1	3.5	1.8	1.8	2.1	1.8	1.5	1.4	1.4
Total ²	4.0	4.4	6.0	7.0	5.0	5.0	4.9	4.9	4.5	4.6	4.1

¹ The outlays shown are developed from appropriate editions of The Five-Year Defense Program. To achieve as high a degree of comparability as possible, US program data have been reaggregated and converted to constant calendar 1975 dollars. The United States has no force with a mission comparable to the Soviet strategic peripheral attack mission. Data are for fiscal years.

² Because of rounding, components may not add to the totals shown.

TABLE 7

Estimated Costs of Soviet General Purpose Forces If Duplicated in the United States, by Element¹

Billion 1975 \$

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Ground forces	11.8	12.2	14.1	14.1	14.7	15.7	16.2	16.7	16.8	17.0	17.2
Naval forces ²	9.0	9.2	8.8	8.8	8.8	9.0	8.6	8.4	8.4	9.3	9.6
Tactical air forces ³	3.6	3.5	3.2	3.1	4.1	5.1	6.0	6.5	6.2	6.4	6.2
Mobility forces ⁴	1.4	1.3	1.7	1.7	1.8	1.8	1.8	2.2	2.0	1.9	2.0
Total ⁵	25.8	26.2	27.8	27.8	29.4	31.6	32.6	33.8	33.3	34.7	35.0

¹ These estimated dollar costs are designed to indicate the general size of Soviet general purpose forces by showing what they would cost if purchased and operated in the United States. These estimated dollar costs include costs for military personnel, other operating costs, procurement of hardware (excluding nuclear warheads), and construction of facilities for systems assigned to Soviet general purpose forces. No RDT&E costs are included. Data are expressed in calendar years.

² These costs are for surface combatants, naval aircraft, and general purpose submarines. The estimated dollar costs for ballistic missile submarines are included within the strategic intercontinental or peripheral attack missions.

³ These costs are for fixed-wing aircraft that are assigned a tactical combat support role. ASW aircraft and ASW carrier costs are allocated to the general purpose naval forces in accordance with the fiscal guidance category allocation of the US Department of Defense.

⁴ These costs are for airlift forces.

⁵ Because of rounding, components may not add to the totals shown.

TABLE 8

US General Purpose Forces Outlays by Element ¹

	Billion 1975 \$										
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Ground forces	14.2	18.0	21.7	20.3	16.0	11.6	9.2	8.5	9.4	9.2	9.5
Naval forces ²	7.7	8.7	8.3	7.9	9.1	8.3	8.8	7.6	8.0	7.3	8.0
Tactical air forces ³	9.6	13.1	13.9	13.5	11.2	8.8	8.5	8.5	8.3	7.6	7.6
Mobility forces ⁴	2.4	2.9	3.3	3.0	3.3	2.4	1.7	1.3	1.2	1.1	1.2
Total ⁵	34.0	42.6	47.2	44.7	39.6	31.1	28.2	25.9	26.9	25.1	26.3

¹ The outlays shown are developed from appropriate editions of The Five-Year Defense Program. To achieve as high a degree of comparability as possible, US program data have been reaggregated and converted to constant calendar 1975 dollars. Data are for fiscal years.

² These outlays are for surface combatants, aircraft, and general purpose submarines. Outlays for attack carriers and their aircraft are considered as part of tactical air forces outlays. Those for ballistic missile submarines are included in the strategic intercontinental attack mission.

³ These outlays are for land- and sea-based fixed-wing aircraft that are assigned a tactical combat support role. In accordance with the Defense Department's fiscal guidance category structure, outlays related to attack carriers are included in tactical air forces outlays. Those for ASW carrier and ASW aircraft are included in general purpose naval forces.

⁴ These costs are for airlift and sealift forces.

⁵ Because of rounding, components may not add to the totals shown.

TABLE 9
Estimated Costs of Soviet Defense Programs
If Duplicated in the United States, by Resource Category¹

	Billion 1975 \$												
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1966-76 Cumulative Total	1966-76 Average
RD&E	8.5	9.1	9.7	10.3	11.0	11.8	12.6	13.4	14.3	15.2	16.3	132.2	12.0
Investment	28.7	29.9	31.5	32.7	33.3	33.8	33.8	36.4	37.1	38.4	38.8	374.5	34.0
Procurement	25.8	27.1	28.6	29.5	30.2	31.0	31.2	33.8	34.6	35.8	36.4	344.0	31.3
Facilities	2.9	2.9	2.9	3.2	3.1	2.8	2.6	2.6	2.5	2.6	2.4	90.5	2.8
Operating	49.5	51.4	54.6	55.2	56.5	58.0	58.9	60.4	61.0	61.8	62.7	629.8	57.3
Active and reserve military personnel	34.5	35.8	38.1	38.4	39.2	40.2	40.8	41.4	41.8	42.2	42.7	435.2	39.6
Operations and mainten- ance	15.0	15.6	16.5	16.7	17.3	17.8	18.1	19.0	19.2	19.5	19.9	194.6	17.7
Total	86.7	90.4	95.8	98.3	100.9	102.3	105.3	110.2	112.3	115.4	117.8	1,136.6	103.3
Retired military	2.7	1.7	1.8	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.3	21.8	2.0

¹ These estimated dollar costs are designed to indicate the general size and overall trends in Soviet defense programs by showing what they would cost if purchased and operated in the United States. They do not represent precise resource allocations as the Soviets would see them. To achieve as high a degree of comparability as possible, adjustments have been made to the basic data available for both the United States and the USSR. All estimated costs for RD&E activities (excluding military personnel pay and allowances) associated with military pro-

grams have been aggregated and are included under RD&E. All costs for nuclear weapons (excluding RD&E) have been accounted for in procurement. All costs for civil space activities, all nonpersonnel costs for military assistance programs, and costs of civil defense except for the pay and allowances of uniformed personnel have been excluded. Data are for calendar years.

² Because of rounding, components may not add to the totals shown.

Table 10
US Defense Outlays by Resource Category¹

	Billion 1975 \$												
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1966-76 Cumulative Total	1966-76 Average
RDT&E -----	11.1	12.2	12.9	12.1	11.0	10.6	11.0	11.1	10.8	10.0	9.7	122.4	11.1
Investment -----	27.7	34.7	40.6	39.2	33.8	28.0	25.0	23.2	23.1	20.0	19.2	314.5	28.6
Procurement -----	24.9	32.0	38.0	36.7	31.6	26.1	23.0	21.2	21.0	18.1	17.0	289.5	26.3
Facilities -----	2.8	2.7	2.6	2.6	2.1	2.0	2.0	1.9	2.1	1.9	2.2	25.0	2.3
Operating -----	63.3	73.2	76.7	78.4	72.8	65.8	60.6	55.4	53.7	54.8	55.2	710.0	64.5
Active and reserve military personnel -----	34.4	38.5	40.5	40.6	38.8	35.3	31.4	28.8	27.1	26.6	26.2	368.2	33.5
Operations and maintenance -----	28.9	34.6	36.2	37.8	34.0	30.5	29.2	26.7	26.6	28.2	29.0	341.8	31.1
Total ² -----	102.0	120.1	130.2	129.7	117.6	104.5	98.6	89.7	87.6	84.8	84.1	1,148.9	104.3
Retired military -----	3.2	3.5	3.9	4.3	4.7	5.1	5.4	5.8	6.2	6.6	7.0	55.7	5.1

¹ The outlays shown were derived from the total obligational authority series in the Five-Year Defense Program, the Budget of the United States, and related data. To achieve as high a degree of comparability as possible, adjustments have been made to the basic data available for both the United States and USSR. All outlays for RDT&E activities (excluding military personnel pay and allowances) associated with military programs have been aggregated and are included under

in The Five-Year Defense Program, the Budget of the United States, and related data. To achieve as high a degree of comparability as possible, adjustments have been made to the basic data available for both the United States and USSR. All outlays for RDT&E activities (excluding military personnel pay and allowances) associated with military programs have been aggregated and are included under

² Because of rounding, components may not add to the totals shown.

TABLE 11

Deployment of Major Soviet Strategic Weapon Systems ¹

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Strategic intercontinental attack:											
ICBM launchers ²	239	514	796	1,018	1,291	1,489	1,527	1,461	1,393	1,385	1,380
Ballistic missile submarines	18	18	19	24	30	38	35 ³	44	48	48 ³	54
Ballistic missile submarine launch tubes	54	54	70	150	259	387	443	573	621	700	788
LRA heavy bombers and tankers	200	200	200	200	195	195	195	195	195	194	189
Strategic peripheral attack:											
MRBM and IRBM launchers ⁴ ..	693	677	673	653	633	594	587	583	583	583	571
Ballistic missile submarines	19	19	18	17	15	15	23 ³	23	21	28 ³	27
Ballistic missile submarine launch tubes	51	51	48	46	42	42	66	67	63	85	82
LRA medium bombers tankers ⁴	760	740	735	730	725	710	675	675	650	665	655
Strategic defense											
SAM launchers	8,460	8,550	8,820	9,100	9,460	9,820	9,950	9,840	9,660	9,620	9,693
Interceptors	3,610	3,450	3,355	3,370	3,310	3,205	3,075	2,820	2,655	2,620	2,595
ABM launchers	—	—	24	43	64	64	64	64	64	64	64

¹ These single-value estimates have been developed for costing purposes and are consistent with the appropriate National Intelligence Estimates. Although they fall within the ranges of likely alternative force structures presented in the National Intelligence Estimates, they do not necessarily match any particular force. Data are expressed in midyear terms.

² Excludes systems under construction, being dismantled, or off line for conversion or retrofit.

³ Reflects transfer of ballistic missile submarines from intercontinental to peripheral attack.

⁴ Includes Backfire.

TABLE 12
 Numbers of Soviet Ground Forces Units and
 Selected Items of Equipment for General Purpose Forces¹

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Ground forces:											
Category I ²	34	34	55	48	48	49	51	54	57	60	60
Category II ³	56	56	42	49	51	55	55	54	52	49	50
Developing ⁴	8	15	16	15	13	8	3	0	1	2	2
Category III ⁵	52	52	47	51	51	52	55	56	57	58	59
Total	150	157	160	163	163	164	164	164	167	169	171
Naval forces:											
Aircraft	790	800	871	899	944	986	1,030	1,036	1,054	1,059	1,080
Major surface combatants	208	227	234	241	245	249	256	255	261	259	263
Minor surface combatants	1,640	1,629	1,579	1,531	1,523	1,494	1,403	1,336	1,294	1,290	1,278
General purpose submarines	340	353	355	361	348	336	343	351	352	355	355
Tactical aircraft	3,195	3,303	3,390	3,513	3,654	3,878	3,927	4,030	4,121	4,389	4,688

¹ These single-value estimates have been developed for costing purposes from the appropriate National Intelligence Estimates. Although they fall within the ranges of likely alternative force structures presented in the National Intelligence Estimates, they do not necessarily match any particular force. Data are expressed in midyear terms.

² Divisions estimated to be maintained at nearly full strength and to have all their critical combat and support equipment.

³ Divisions estimated to be manned at about two-thirds wartime strength and to have all critical combat equipment. Some are deficient in support equipment.

⁴ Divisions used primarily during the buildup of forces along the Sino-Soviet border. They are those units that are between cadre and reduced-strength status but in which available equipment is concentrated in one or two maneuver units to provide some immediate combat capability.

⁵ Divisions estimated to be manned up to one-third of wartime strength and to have all critical combat equipment but some deficiencies in support items.

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