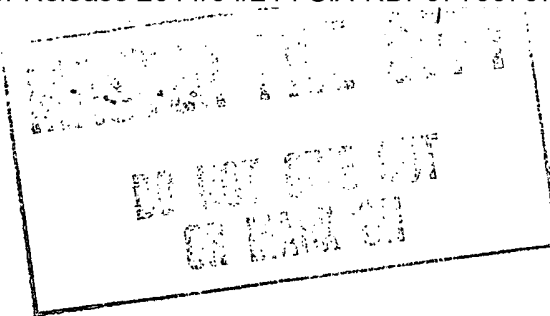




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Non-Soviet Warsaw Pact Defense Costs: 1970-84



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An Intelligence Assessment

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Non-Soviet Warsaw Pact Defense Costs: 1970-84




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An Intelligence Assessment

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**Non-Soviet Warsaw Pact
Defense Costs: 1970-84**



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Key Judgments

*Information available
as of 28 February 1986
was used in this report.*

An analysis of the defense costs of the non-Soviet Warsaw Pact (NSWP) nations indicates that between 1973 and 1983 there was little growth in these costs, whether measured in domestic currencies or dollars. In particular, the dollar costs of military procurement were almost unchanged over this period. In 1984, purchases of military equipment surged in Romania and Czechoslovakia, but this was the result of unusually high aircraft procurement and not a harbinger of a new trend. 

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The lack of growth in NSWP procurement during this period represents a significant change from the growth of the 1960s and early 1970s. Available evidence suggests that difficult domestic economic conditions and other economic factors were primarily responsible for the procurement plateau:

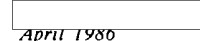
- In Poland and Romania, statements by government officials confirm that policy decisions to allocate a larger share of resources to the civilian economy were responsible for the procurement slowdown in those countries.
- East European officials  confirm that military spending is linked to economic performance, and the procurement plateau in Eastern Europe, like the slow rise in procurement that we have observed in the USSR since the mid-1970s, has occurred in a period of lower economic growth. Since the mid-1970s, the rate of increase of GNP throughout the Warsaw Pact has been the lowest in the post-World War II era. The economic slide in Eastern Europe has been even more severe than in the USSR because of its foreign debt crisis.
- The NSWP countries import most of their weapons, so problems in domestic weapons manufacturing or in research, development, testing, and evaluation would have only a limited impact on procurement. Moreover, the weapons typically imported from the USSR are older generation models unlikely to be affected by Soviet problems with state-of-the-art technology.
- Low export earnings also appear to have been a limiting factor in NSWP procurement plans. The repayment of foreign debt has claimed an increasing share of East European export earnings that would otherwise go to purchase much needed imports, including weapons from the USSR. The need to expand hard currency exports to the West, especially, conflicts with higher exports to the USSR in payment for arms.

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- Declining equipment operating rates in all the Warsaw Pact countries also point to decisions to hold down defense costs. [Redacted]

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Direct and indirect evidence suggests that, in Eastern Europe, defense has had a lower priority and consumption a higher priority than in the USSR. The USSR and the East European countries appear to be satisfied with a defense share of GNP in the NSWP countries that is half or less than half that of the USSR. Our estimates in domestic currencies indicate that the NSWP countries allocate 5 to 8 percent of GNP to defense spending, a share that is probably declining. In contrast, the Soviet defense burden is gradually increasing and is estimated at 15 percent. [Redacted]

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Moscow's willingness to countenance a lower defense burden for Eastern Europe does not mean it is satisfied with its allies' efforts—it has continuously pressed the allies to spend more on defense. But, despite Soviet control over Pact military planning and procurement, [Redacted]

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[Redacted] all of the East European countries have opposed this Soviet pressure, often successfully. Since the inception of the Pact's current military planning system in the early 1970s, the East Europeans have scaled down the ambitious spending plans Moscow has attempted to impose and, for the most part, have failed to meet even the reduced objectives. The challenges to Soviet wishes appear to come most often from Romania, Poland, and Hungary—countries for which our estimates generally show the least procurement growth after 1975.

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[Redacted]

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The Soviets continue to exert pressure on the NSWP nations to spend more on defense because the slow rate of military modernization in the region has serious implications for the Warsaw Pact. In the late 1960s and early 1970s, the NSWP countries were assigned significant offensive missions in Pact military plans. Since the mid-1970s, however, NSWP forces have only slowly modernized, widening the gap in military capabilities between Soviet and NSWP forces. What may well be most disturbing to the Soviets is that NSWP forces are falling behind in precisely those categories of equipment most critical to Soviet conventional strategy in Europe—self-propelled artillery, modern tanks, tactical aircraft, and surface-to-air missiles. Prospects for material improvement that would satisfy Soviet requirements hinge on a broad and sustained economic recovery in Eastern Europe, but the region's economic prospects through the rest of the decade are bleak. [Redacted]

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[Redacted]

[Redacted]


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The Soviets' options for improving their allies' capabilities are few and unappealing:

- The Soviets could pay more of the East European defense bill, but, because they are in the midst of their own costly force improvement program and are launching a broad industrial modernization program, they are unlikely to offer the expensive, long-term support necessary to close the gap in force capabilities.
- They could, and probably will, offer some older equipment on concessionary terms, but this also would fall short of closing the gap.
- They could give the East Europeans a bigger stake in the production of new Soviet weapons. This, however, goes against Moscow's longstanding efforts to specialize, rather than diversify, NSWP defense industry and would require an expensive and lengthy upgrading of the industry. In addition, NSWP production runs would probably be smaller, raising unit costs significantly over those of Soviet-produced items. 

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Even with these measures, the Soviets may have to take on a greater share of the Pact's wartime missions. The Soviets have apparently experimented with the precombat deployment of some of their own forces from the western USSR to Eastern Europe. These forces would compensate for some of the NSWP's shortcomings, but such a move in effect would concede defeat in Moscow's efforts to narrow the increasing discrepancy between Soviet and NSWP capabilities. Ultimately, the Soviets may have to consider a return to their earlier strategy of more limited use of NSWP forces in an offensive role. 

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**Non-Soviet Warsaw Pact
Defense Costs: 1970-84** [redacted]

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Introduction

In 1949, with the postwar Communist regimes firmly entrenched in Eastern Europe, Stalin moved to rehabilitate and expand their military forces. His objectives were to add the military potential of Eastern Europe to that of the Soviet forces opposing NATO and simultaneously to tie the satellite armies into the Soviet system of control in Eastern Europe. During the early 1950s, the national defense forces were organized according to the Soviet model, politically unreliable personnel were purged, Soviet officers took over staff and sometimes command roles, and large quantities of equipment were received from the USSR. This laid the basis for eventual standardization under the Warsaw Pact (officially, the Warsaw Treaty Organization), which was formed in 1955. [redacted]

offensive missions against frontline NATO forces. As a result, current Pact strategy calls for the NSWP countries to supply about half the first-echelon forces in the Western Theater of Military Operations, generally on the less critical flanks of the main Soviet offensive. This shift in war plans entailed a much greater reliance on the NSWP forces, and a new Soviet emphasis on modernizing those forces and improving their war-fighting capabilities. [redacted]

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The Soviets also increased their control over NSWP military and defense-industrial planning. The Pact's current planning system is based on the March 1969 Peacetime Statute, which gives Moscow a high degree of control over the military affairs of its East European allies, including their defense industries and procurement of military hardware.¹ [redacted]

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Little was done, however, to make the Pact an integrated military alliance. In the first six years of its existence, there were no joint exercises, and the non-Soviet Warsaw Pact (NSWP) forces remained hardly more than national defense forces with minimal responsibility in Pact plans for offensive operations against NATO. Moscow's strategy for war in Central Europe relied almost entirely on Soviet forces and reinforcement of those forces in Europe from the USSR before an attack on NATO. [redacted]

The NSWP countries made notable progress in modernizing some parts of their forces in the 1970-84 period.³ They:

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- Increased the number of armored troop carriers by 80 percent, to include a large number of BMPs.
- Increased tube artillery by 40 percent and multiple rocket launchers by 70 percent.

In 1960, Khrushchev began to stress closer military integration with Eastern Europe. Joint exercises, organizational changes, and a major arms modernization program lasting through the early 1970s substantially upgraded NSWP capabilities for theater operations. T-55 tanks, MIG-21 Fishbed aircraft, and surface-to-air missiles (SAMs) were provided—at least initially on concessionary terms. The emphasis in this upgrading was on the northern tier countries—Czechoslovakia, East Germany, and Poland, the USSR's key allies in the western theater. [redacted]

¹ Ratified by the Warsaw Pact nations on 17 March 1969, the Peacetime Statute formally created the administrative structure of the Warsaw Pact. [redacted]

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In the late 1960s, while this equipment was being acquired, there was a marked change in the wartime role of NSWP forces—they began to be assigned key

[redacted]

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- Replaced much of their towed antitank artillery with vehicle-mounted and man-portable antitank guided missiles and began replacing towed antiaircraft guns with mobile SAMs.
- Began deployment of a new strategic SAM, the SA-5.
- Upgraded tactical aircraft by replacing early model MIG-21 Fishbeds with more advanced versions and are beginning to acquire MIG-23 Floggers. [Redacted]

- The East Europeans do not have the latest Soviet tank (T-80), and only Czechoslovakia has even a division's worth of T-72 tanks. Only a few have improved T-55s or T-62s, and several still have World War II-vintage T-34s in active units.
- Most still rely on towed antiaircraft guns rather than mobile surface-to-air missiles.

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Despite these accomplishments, the overall pace of military modernization has been slow, widening the quality gap between Soviet and NSWP forces rather than closing the gap as the Soviets had hoped. The Warsaw Pact system appears to have been a mixed success from Moscow's perspective. On the one hand, Pact forces have been used effectively by the Soviets as an instrument for exercising political control over Eastern Europe, and the Warsaw Treaty Organization has from the outset provided Moscow with the means for transmitting its foreign policy and military requirements to its East European allies. On the other hand, its allies have been able to resist and scale back what they have considered to be burdensome Soviet procurement goals. [Redacted]

- Most NSWP divisions do not have attack helicopters.
- As of 1984, only 40 percent of the NSWP aircraft represented models introduced since 1970, compared with 80 percent for Soviet aircraft opposite NATO. [Redacted]

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At the height of NSWP modernization, in the mid-1970s, NSWP forces were well behind the standards for Soviet units in Eastern Europe. The northern tier ground forces lagged forward-deployed Soviet forces by five to 10 years or more in many categories, while the southern tier nations were equipped with even fewer modern weapons. Since the mid-1970s, the gap between Soviet and NSWP forces has widened. [Redacted]

The lagging modernization of NSWP forces during the 1970-84 period occurred in the context of lower economic growth within Eastern Europe and opposition within NSWP countries to Moscow's ambitious spending plans. To explain how defense priorities have changed in response to political and economic pressures, we must go beyond the trends in the size and composition of NSWP forces, important as they are to assessments of each country's military capabilities. In countries where political debate is closed to the public eye, an index of defense outlays is a useful indicator of real, rather than announced, priorities and also measures the impact of defense activities on a nation's economy and the resource levels a country devotes to defense. This paper examines the burden of defense within the NSWP countries, compares the trends in their contributions to the defense effort of the Warsaw Pact, and analyzes the reasons for those trends. Defense costs in both indigenous currencies and dollars are used for these purposes for the period 1970-84, the last year for which we have estimated defense costs. [Redacted]

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Most disturbing to the Soviets is the fact that NSWP forces are falling behind in precisely those categories of equipment most critical to the Soviet conventional strategy, which is based on integrated firepower and combined-arms maneuver (see figure 1). For example:

- Some NSWP countries still field mainly World War II-vintage towed artillery, and none approach Soviet standards of employing modern self-propelled artillery.

Assessing NSWP Defense Spending

To assess the impact of defense spending on a country's economy, we need a measure in that country's own currency. An indigenous currency measure also indicates the domestic perception of the cost of defense activities and of the trade-offs as seen by

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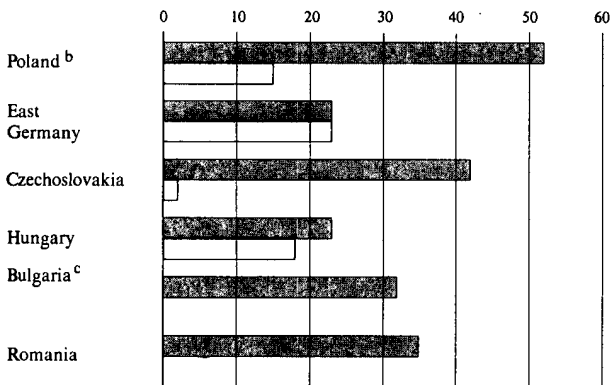
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Figure 1
Modernization of Non-Soviet Warsaw Pact
Ground Forces as of 1985

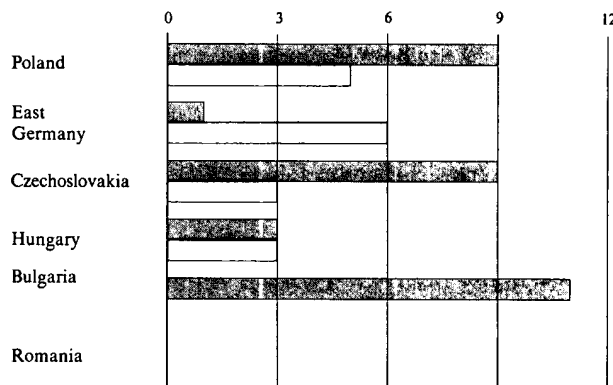
Regiments With Air Defense Units^a

AAA equipped
 SAM equipped



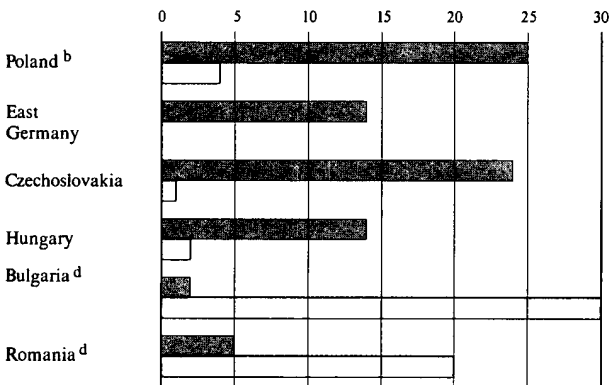
Divisions With Air Defense Units

AAA equipped
 SAM equipped



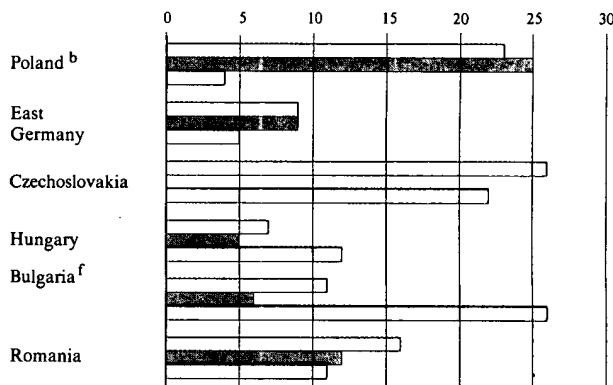
Motorized Rifle Regiments, by Type of Troop Carrier

Equipped with APCs or IFVs
 Equipped with trucks



Regiment-Level Artillery^e

Regiments without artillery
 Regiments with six-gun battery
 Regiments with 18-gun battalion



^a Does not include hand-held SAMs such as the SA-7.

^b Poland's airborne and amphibious landing divisions are not included.

^c Bulgaria's five tank brigades are not included.

^d Reflects equivalent number of APC-equipped MRRs; Bulgaria and Romania distribute small numbers of APCs in all MRRs rather than concentrate them in a few units.

^e Pact goals are to equip all regiments— tank as well as motorized rifle—with a battalion of 18 guns.

^f Bulgaria's five tank brigades, which are equipped with artillery battalions, are not included.

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national leaders. Unfortunately, the published defense budgets of the NSWP countries have grave weaknesses. (They are discussed in appendix A). There is evidence, for example, that the budgets in several of the countries significantly understate the true costs of defense activities. In addition, the activities included in the published budgets are not defined, and the budgets cannot be reliably adjusted for inflation. Despite the lack of reliable domestic spending data, however, public and closed discussion of the defense budget by the national leadership can provide valuable clues to spending trends and leadership views on defense priorities. [Redacted]

Even if we had reliable NSWP defense spending data, we would not be able to answer questions about the comparative resource levels and trends of the various countries, the relative importance of each member to the alliance total, or the trends in costs of individual weapon programs. To make defense cost comparisons, we use dollar costs to provide a common resource index, even though dollars do not reflect actual spending. Dollar costs are based on what it would cost the United States to equip, man, and operate the Warsaw Pact forces as the Warsaw Pact does, using a detailed compilation of all known Pact equipment, facilities, and manpower.⁴ (See appendix B for an explanation of the procedures followed in estimating these dollar costs.) The "building block" approach, which prices all of these items individually, allows us to take into account the different physical, manpower, and operating characteristics of each military force. Since dollar costs reflect what it would cost US manufacturers to produce Soviet weapons, however, they are based on US production efficiencies and do not measure relative manufacturing efficiencies. [Redacted]

Dollar costs are thus an artificial index of resource inputs. They allow us to aggregate disparate activities and items, make cross-country comparisons, show trends over time, and adjust for inflation. Because

⁴ In this paper, we do not present estimates of costs for NSWP military research, development, testing, and evaluation (RDT&E) because of a lack of information. Preliminary estimates based on hypothetical shares of published spending for total RDT&E are presented, however. RDT&E averaged about 11 percent of total dollar costs in the USSR from 1970 to 1984 and may account for a comparable share in Czechoslovakia, Poland, and Romania, which have well-developed defense industries. [Redacted]

dollar costs are based on US prices, growth rates measured in dollars will be different from growth rates measured in domestic currencies. However, since all defense activities carry some cost regardless of currency, dollar costs do indicate the presence or absence of growth in actual spending. [Redacted]

It must be emphasized that dollar valuations are not indexes of military capability. The dollar cost comparisons in this report represent the resource inputs to the NSWP defense effort, not output. They are useful as general indicators of changes over time in a country's emphasis on military forces but are not sufficient to measure the overall capabilities of the forces. Capabilities depend on the utility of both the existing stock of military hardware and personnel and that of newly purchased inputs. Assessments of capability must take into account a host of considerations, including military doctrine and battle scenarios; the tactical proficiency, readiness, and morale of forces; the numbers and effectiveness of weapons; and logistic factors. [Redacted]

An assessment of how well we estimate the dollar costs of defense activities must necessarily be subjective, but some statistical techniques are available to analyze this problem. Using these techniques leads us to believe that the dollar cost estimate for the USSR's total defense activities is unlikely to be in error by more than 10 percent. Our confidence in the NSWP dollar costs is equal to or better than our confidence in the Soviet estimates. The margin of error can be much wider for some individual items; hence, lower levels of aggregation have more uncertainty. Further, we are generally more confident in trends rather than absolute levels, especially if only a single year is involved. [Redacted]

Dollar Costs of Warsaw Pact Defense Activities

Total Costs

We estimate the total cost of Warsaw Pact defense activities in 1984 at \$278 billion in constant 1983 dollars, of which \$42 billion, or one-seventh, represented the NSWP contribution (see figure 2). In the

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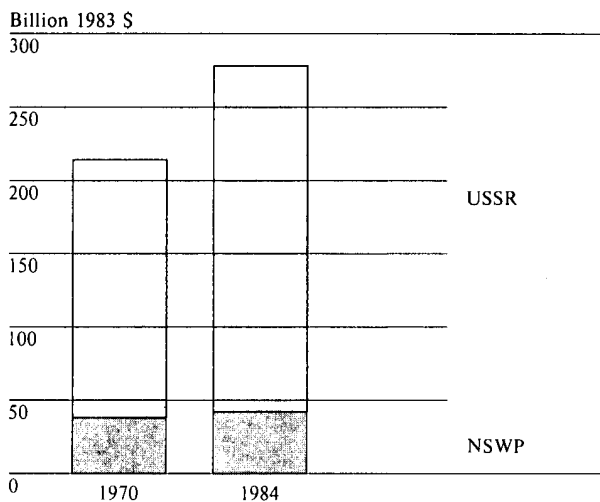
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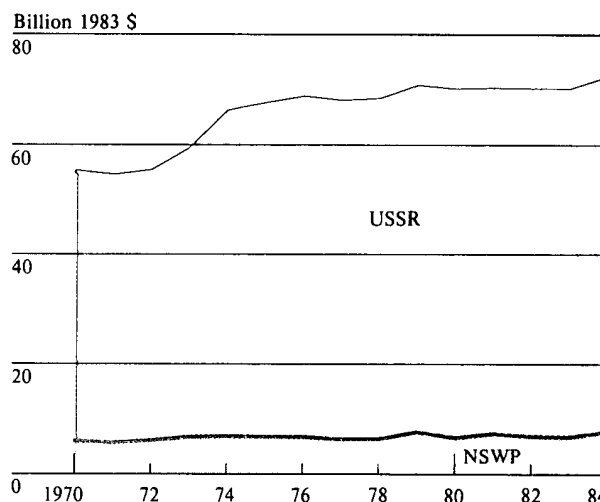
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Figure 2
Dollar Costs of Warsaw Pact
Defense Activities, 1970 and 1984



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Figure 3
Dollar Costs of Warsaw Pact Defense
Procurement, 1970-84



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years 1971-84, total Pact costs rose at an average annual rate of 1.9 percent. Soviet costs, however, grew two and a half times faster than NSWP costs (2.1 percent versus 0.8 percent a year), reflecting both much greater force expansion and more rapid modernization. Consequently, the share of NSWP costs in the Pact total fell from 18 percent in 1970 to 15 percent in 1984.

Both Soviet and NSWP costs show similar trends during the period 1971-84, with costs growing more slowly after 1975. The main reason for the slowdown was the virtual halt in the growth of both Soviet and NSWP procurement (see figure 3). Through 1975, Warsaw Pact procurement grew at an average annual rate of 4 percent; after 1975, there was practically no growth. NSWP procurement actually leveled off earlier, at its 1973 total of about \$7 billion.⁵

⁵ Occasionally, annual increases of as much as 5 to 10 percent above this level were recorded (usually because of a rise in aircraft procurement), followed by a return to the \$7 billion level. Such surges took place in 1979, 1981, and 1984.

A second reason for the slower growth in defense costs has been slower growth in operations and maintenance (O&M) costs. Through 1975, Warsaw Pact O&M costs rose at an average annual rate of 3 percent; after 1975, at less than 2 percent. This deceleration primarily reflects the trend in Soviet procurement. Because the weapons inventory increased less rapidly, the cost of maintaining it also grew more slowly. There is also an accumulation of evidence that the Warsaw Pact countries have cut equipment usage as a cost-saving measure, although this is not reflected in our current estimates. If

the mandated cuts were actually achieved, O&M costs may actually be declining in some countries, or at least growing more slowly than we presently estimate.

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Table 1
Warsaw Pact Defense Costs by Country in 1984
and Growth Since 1970

	Total Costs in 1984		Growth in Defense Costs ^a (average annual percent)	
	(billion 1983 US \$)	Share of NSWP Total (percent)	1971-75	1976-84
USSR	236.1		3.4	1.5
NSWP total ^b	42.0	100	1.0	0.7 (0.5 ^c)
Poland	12.1	29	0.3	-0.1
East Germany	7.8	19	1.5	1.1
Czechoslovakia	7.9	19	2.1	1.4 (0.7 ^c)
Romania	6.8	16	1.4	1.3 (0.6 ^c)
Bulgaria	4.4	10	0.5	0.3
Hungary	2.9	7	-0.3	0.1

^a Because military activities in the Warsaw Pact economies are probably more expensive compared with civilian activities than in the United States, growth rates in domestic currencies are probably higher than those measured in dollars.

^b Because of rounding, columns may not add to the totals shown.

^c Figures in parentheses are for the 1976-83 period. A major surge in 1984 aircraft procurement in Czechoslovakia and Romania, almost certainly a one-time event, distorts average growth indicators.

NSWP Costs by Country

The estimated dollar costs by country show the relative size of each nation's defense activities (tables 1, 2, and 3). Poland's defense costs are the highest, reflecting the larger Polish force levels. East Germany's and Czechoslovakia's costs are next in size and almost equal. Together, the three northern tier countries account for two-thirds of NSWP costs.

Each country's share of total NSWP costs has changed little since 1970. Beginning in the early 1970s, the already modest rates of increase in NSWP defense costs fell off. Only Czechoslovakia, East Germany, and Romania averaged more than 1-percent annual growth during the entire period, and no country showed any acceleration. Growth in the costs of defense in Poland, Hungary, and Bulgaria—which account for almost half of the NSWP total—was almost zero.

Procurement

Figure 4 compares NSWP costs by resource category with the costs of comparable Soviet activities over the 1970-84 period. While procurement accounted for about 30 percent of the total Soviet costs in the 1970-84 period, it was only 17 percent of the NSWP costs. The lower NSWP share for procurement reflects the stability in NSWP force levels and a slower pace of weapons modernization. A pattern of slower procurement growth after the mid-1970s applies to all of the NSWP nations except Bulgaria:

- In 1971-84 *Poland* and *Hungary* had the lowest average annual growth rates of total defense activities—only 0.1 percent. Before 1976, the acquisition of substantial numbers of MIG-21s, helicopters, and OT-64 armored personnel carriers (APCs) resulted

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Table 2
NSWP Defense Costs by Country, 1970-84

Billion 1983 US \$

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
NSWP total ^a	37.7	37.6	38.3	39.3	39.6	39.6	39.7	39.5	39.6	41.2	40.4	41.3	41.0	41.0	42.0
Poland	12.0	12.1	12.3	12.5	12.8	12.2	12.5	12.3	11.9	12.2	12.0	12.2	12.2	12.1	12.1
Czechoslovakia	6.3	6.1	6.1	6.9	6.8	7.0	7.2	7.2	7.3	7.2	7.2	7.2	7.2	7.4	7.9
East Germany	6.6	6.6	6.9	6.7	7.0	7.1	7.0	7.1	7.1	7.6	7.3	7.6	7.9	7.9	7.8
Hungary	2.9	2.9	2.9	3.0	2.8	2.9	2.9	2.9	2.8	3.1	3.0	3.0	3.0	2.9	2.9
Bulgaria	4.2	4.1	4.3	4.4	4.2	4.3	4.2	4.1	4.5	4.6	4.5	4.6	4.4	4.5	4.4
Romania	5.6	5.6	5.7	5.8	6.0	6.1	6.0	5.9	6.0	6.5	6.4	6.6	6.3	6.3	6.8

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

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Table 3
NSWP Defense Procurement by Country, 1970-84

Billion 1983 US \$

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
NSWP total ^a	6.1	5.7	6.1	6.8	6.9	6.8	6.8	6.4	6.4	7.7	6.6	7.4	6.9	6.8	7.7
Poland	1.7	1.6	1.6	1.8	2.2	1.7	2.0	1.7	1.5	1.7	1.5	1.8	1.8	1.6	1.7
Czechoslovakia	1.0	0.9	0.9	1.3	1.1	1.2	1.3	1.2	1.3	1.2	1.2	1.0	1.1	1.3	1.8
East Germany	1.1	1.1	1.2	0.9	1.2	1.3	1.1	1.2	1.2	1.6	1.2	1.4	1.6	1.4	1.3
Hungary	0.6	0.6	0.6	0.8	0.6	0.7	0.7	0.6	0.6	0.9	0.7	0.8	0.7	0.6	0.7
Bulgaria	0.8	0.7	0.9	0.9	0.7	0.8	0.8	0.6	0.9	1.0	0.9	1.0	0.8	0.9	0.8
Romania	0.9	0.8	0.9	1.0	1.0	1.1	1.0	0.9	0.9	1.3	1.1	1.3	1.0	1.0	1.5

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

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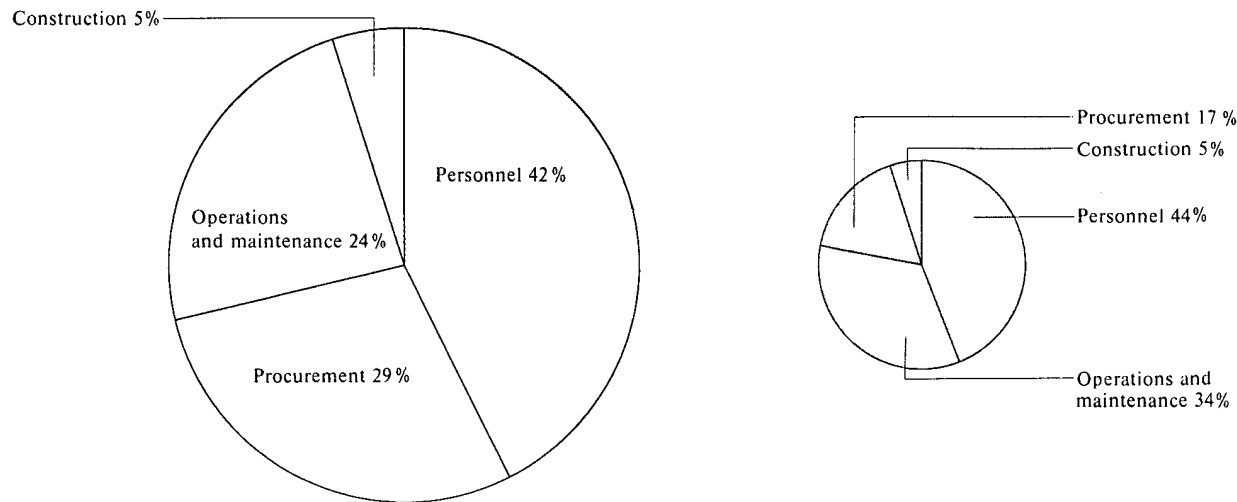
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Figure 4
Cumulative Dollar Costs of Soviet and Non-Soviet
Warsaw Pact Defense Activities, 1970-84^a

Billion 1983 \$
 USSR
 Total: \$3083

NSWP
 Total: \$598



^a The costs of RDT&E activities are excluded from this comparison.

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in procurement growth of 1 percent per year in Poland and 4 percent per year in Hungary. After 1975, procurement growth and the growth of total defense costs stopped. Procurement and total costs in 1984 were equal to their 1975 levels in both countries.

- *Bulgaria* showed almost no increase in total costs in the 1971-84 period but did maintain steady procurement growth of about 2 percent a year. (The small share of procurement reduced its impact on total costs). The procurement of two regiments of costly MIG-23 Floggers was responsible for most of the rise in procurement during the last five years.

- Defense procurement in *Czechoslovakia* and *Romania* averaged 5- to 6-percent growth in the early 1970s as the two countries replaced their MIG-15/17 Fagot/Frescos with MIG-21s and acquired modern APCs. Romania replaced its aging T-34 tanks with T-55s. Procurement growth slowed to only 1 percent annually as modernization programs for both land arms and aircraft lost momentum. Procurement surged by 40 percent in both countries in 1984, but this almost certainly was a one-time event and not a change in the long-term trend. Similar dramatic upturns in NSWP countries during the last decade have been followed by a return to previous levels of growth.

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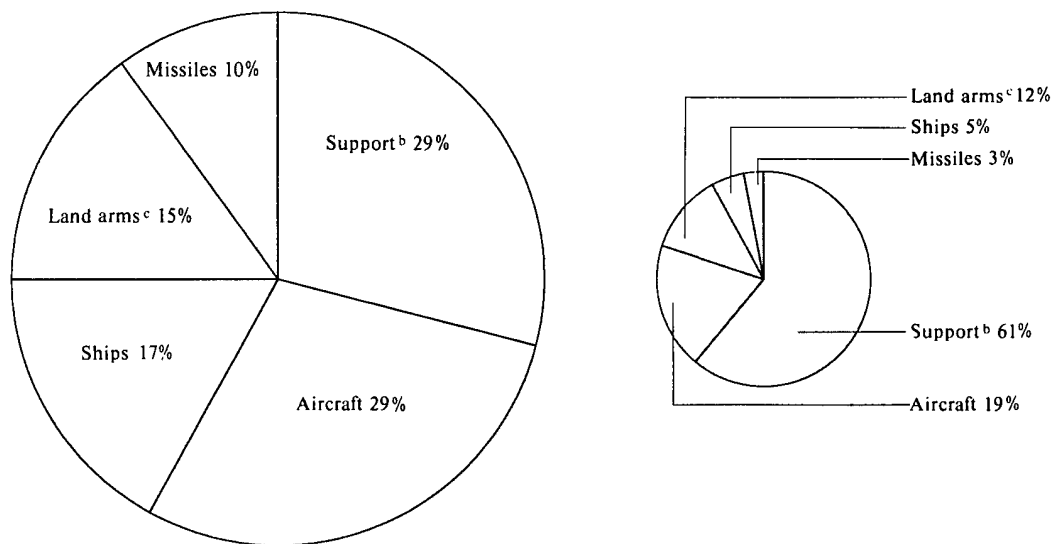
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Figure 5
Cumulative Dollar Costs of Soviet and Non-Soviet Warsaw Pact
Defense Procurement by Category, 1970-84

Billion 1983 \$
 USSR^a
 Total: \$624

NSWP
 Total: \$101



^a USSR data exclude strategic offense, military space, and nuclear weapons for better comparability.

^b Organizational equipment, aircraft ground support equipment, naval supplies and equipage, noncombat vehicles, engineering equipment, and electronics.

^c Includes ammunition.

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• *East Germany* has maintained the most consistent, albeit moderate, rate of increase in total defense activities of any East European country—a steady 1.3 percent throughout the 1971-84 period. Procurement growth slowed substantially after 1975, but O&M costs continued to rise and military manpower increased. Despite the brake on procurement, East Germany has sustained a relatively rapid rate of modernization and now has the fastest growth of total defense costs of all the NSWP countries.

Weapons account for a little less than half of total NSWP procurement costs, with the remainder going for electronics, support vehicles, and miscellaneous equipment (see figure 5). Aircraft, by far the largest single component of procurement costs, accounts for almost 20 percent of the total. Land arms, including ammunition, is the next largest component, with 12 percent of the total.

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In contrast, weapons account for more than 70 percent of Soviet procurement.⁶ This reflects in part the much heavier Soviet investment in missiles and ships, weapons the NSWP countries have not emphasized, and in part Soviet force expansion. The larger weapons share of Soviet procurement also is the result of the stronger Soviet commitment to force modernization during the period 1970-84. A comparison of Soviet and NSWP procurement per man shows that, although per-man procurement of support equipment is roughly similar, Soviet weapons procurement per man was three times the NSWP level. [Redacted]

and reduce the use of equipment in Soviet forces have been cited:

- The continuing expansion of Soviet Ground Forces equipment opposite NATO without corresponding manpower increases suggests that average usage rates are probably declining. For example, we estimate that in 1970-83 Soviet manpower in the Western Theater increased by about 20 percent, while the number of armored troop carriers increased by 130 percent, tube artillery by 80 percent, multiple rocket launchers by 40 percent, and general purpose trucks by 60 percent in tank divisions and by 80 percent in motorized rifle divisions.

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Operations and Maintenance

About half of the NSWP O&M costs are incurred for operating and maintaining equipment and facilities. The rest provide mainly for civilian personnel, reflecting what we believe is a relatively high NSWP use of civilians, compared with Soviet practices. The USSR relies more on uniformed personnel made available by universal conscription. Although the NSWP countries also have an official policy of universal conscription, they do not routinely conscript at such high levels, depending more on civilians employed by the military. [Redacted]

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Aircraft and land arms account for about one-third of the total costs of maintaining equipment and facilities. O&M for ships and missiles together constitute only 3 percent—reflecting the small size of these forces—while electronics and support vehicles⁷ each account for about 10 percent. [Redacted]

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Evidence of Declining Operating Costs

[Redacted]

[Redacted] all the Warsaw Pact countries have scaled down equipment operating rates as a cost-saving measure—direct evidence of policy decisions to hold down defense costs. Numerous measures to cut fuel costs

Similar developments have been reported in the NSWP countries:

- NSWP manpower stayed about the same after 1970, while inventories of troop carriers increased by 80 percent, tube artillery by 40 percent, and multiple rocket launchers by 70 percent.

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⁶ For comparability with the NSWP, the costs of strategic offense, military space, and nuclear weapons are excluded from these Soviet procurement figures. [Redacted]

⁷ Includes general purpose and special-purpose noncombat vehicles, engineering equipment, and trailers. [Redacted]

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last 10 years, preliminary 1985 figures show a return to sluggish growth, and the likelihood of a sustained revival in growth is low. External constraints and systemic weaknesses will make it difficult for the region to return to its generally good performance of the early 1970s, keeping average growth through 1990 at 2 percent or less. [Redacted]

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- In 1980, Romania also announced cutbacks in ammunition and materiel consumption, training time, and equipment operation

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[Redacted]

The East Europeans' greater dependence on foreign trade made them more susceptible to the Western recession than the USSR was. Most of their problems, however, lay in their failure to make efficient use of the massive amounts of Western equipment imported on credit during the 1970s (by all but Czechoslovakia and Bulgaria) and their inability to boost exports to repay the credits. The East European hard currency debt, just \$6.1 billion in 1971, reached \$66.8 billion 10 years later. Most of the countries—especially Poland and Romania—had overborrowed. As Western banks drastically cut back on lending in response to the faltering economies, those countries were caught in a serious credit squeeze. The lack of new credits combined with poor export performance forced Eastern Europe to slash hard currency imports by about 30 percent during 1981-82. This produced a hard-won trade surplus for the region in 1982, but at the cost of lower domestic investment and consumption. [Redacted]

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Personnel Costs

Military personnel costs increased only marginally during the 1971-84 period because growth in NSWP manning levels was almost negligible. Only East Germany increased its manpower levels—by about 10 percent in the late 1970s. [Redacted]

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The Economic Context of Warsaw Pact Defense Activities

The procurement plateau in Eastern Europe, like the slower growth in the USSR, has occurred during a period of slower economic growth. Since the mid-1970s, economic growth throughout the Warsaw Pact has been at its lowest since World War II. In the USSR, the rise in GNP was relatively robust through the mid-1970s, then decelerated to an average annual rate of growth of only 2 percent from 1979 to 1985 (see table 4). The slide was even more severe in the NSWP countries, which averaged only 1 percent for the same period, because of the additional problem of the foreign debt crisis.⁸ Growth throughout the NSWP generally slowed after 1975, and in 1980 and 1981 the region showed negative growth. Although the region's performance in 1984 was the best in the

Economic problems in Eastern Europe vary widely from country to country. *Poland* remains in the worst shape. The Polish economy all but collapsed in 1981 and has improved only slightly and selectively since then. Poland plans to continue its practice of covering only a small portion of its financial obligations and probably will receive only a small portion of the new credits requested from Western governments. Sustainable economic growth would require major changes to the economic system, but these are unlikely, given the political problems of the Jaruzelski regime. Party leaders endorsed greater centralization of economic decision making in June 1985, backtracking on earlier commitments to decentralize. And 1985 was the second consecutive year the government backed away from stringent austerity measures in order to generate popular support and show economic progress. [Redacted]

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Table 4
Growth in Real Gross National Product
in the USSR and the NSWP Countries

Average annual percentage increase

	1966-70	1971-75	1976-78	1979	1980	1981	1982	1983	1984	1985
USSR	5.3	3.8	3.8	0.5	1.6	1.9	2.4	3.5	2.0	2.1
NSWP total	3.8	4.9	2.9	1.0	-0.3	-1.0	0.9	1.6	3.3	1.5
Bulgaria	5.1	4.7	1.4	3.8	-2.9	2.8	3.0	-1.6	3.5	-0.8
Czechoslovakia	3.4	3.4	2.5	0.9	2.3	-0.5	1.9	1.0	2.6	1.8
East Germany	3.1	3.5	2.2	2.8	2.1	2.1	-0.4	1.6	3.2	2.4
Hungary	3.0	3.3	3.0	0.3	1.0	0.7	3.7	-1.2	2.4	-0.8
Poland	4.0	6.5	2.6	-1.8	-2.4	-5.4	-0.9	4.6	3.4	2.3
Romania	4.9	6.7	6.0	3.7	-1.5	0.3	2.6	0.2	4.7	1.2

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Like Poland, *Romania's* prospects are bleak. Romanian living standards were already the lowest in Eastern Europe, and, since 1980, worker productivity and welfare have worsened as food and fuel shortages have intensified. Although Romania has succeeded in reversing its hard currency trade deficit, it has done so at the cost of drastic cuts in imports. Apparently confident in his powerful security apparatus, President Nicolae Ceausescu has squeezed the domestic economy to boost export earnings and pay off foreign creditors as quickly as possible to prevent their interference in domestic policies. In its effort to generate exports, however, Romania probably has aggravated its structural economic problems. Despite its reliance on exports requiring energy-intensive production, it has failed to achieve greater industrial energy efficiency, and cutbacks on imports of spare parts and of investment goods needed to modernize the industrial base are undermining the potential for future growth.

After several years of painful austerity and major foreign trade adjustments, *East German* economic growth in 1985 was 2.4 percent, and prospects for maintaining at least 2-percent growth per year are good. This is the best growth outlook for any East European country, and the country's average of 2-percent annual growth from 1979 to 1985 was easily

Eastern Europe's best. Foreign debt remains large, requiring continued austerity, but East Germany's relative success in managing its financial problems is likely to make it even less willing to undertake decentralizing reforms that would increase long-term growth prospects.

Although *Czechoslovakia* is not suffering from the debt problems of the other East European countries and therefore has a better outlook than most, it is in difficult straits nonetheless. GNP growth during 1979-85 averaged little more than 1 percent per year. The list of structural problems is typical for Eastern Europe—transportation bottlenecks and energy inefficiency, rigid management, an obsolescent industrial base, and an unmotivated labor force. There has been some talk by the government of limited economic reforms, but, in the absence of a substantial change in the way the country is managed, growth prospects remain low.

Bulgaria also has a more promising outlook because of its strong foreign trade position, but it faces discouraging problems, too—economic growth has averaged only 1.1 percent a year since 1979. Although

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1984 showed an encouraging 3.5-percent growth, growth in 1985 was negative. Consistently conservative economic policies and generous economic support from the USSR have been the key to growth in the past, but mounting structural problems—resource constraints, an obsolescent industrial base, and bureaucratic inflexibility—are taking their toll. In addition, Moscow has tightened the terms of trade and demanded higher quality consumer and industrial goods, making it harder for Bulgaria to compete with Third World countries in the Soviet market. Given declining Soviet economic support and Sofia's reluctance to relax central planning, slower growth will probably continue for the rest of the decade. [Redacted]

In addition, direct evidence and defense cost data show that the NSWP countries place a lower priority on defense than the USSR does and have a long record of opposing Soviet pressure to spend more. Reinforcing this resistance is the remoteness of the NATO "threat," the supposed reason for the Warsaw alliance. Even if the NSWP countries were not in economic trouble, the soaring costs of modernizing their weapons stocks would also make them think twice about going along with Soviet demands to upgrade their forces. Development and manufacturing problems also sometimes affect procurement trends. This factor has been significant in some areas of the NSWP defense industries, but it has played only a minor role in affecting total procurement trends, primarily because Eastern Europe imports most of its weapons. [Redacted]

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After six years of austerity to stabilize Hungary's balance of payments, Budapest's 1985 plan called for increased accommodation of domestic demand and no further cuts in real wages or investment. To accomplish this, Hungary counted on the success of market-oriented reforms, but GNP fell by 0.8 percent. Its economy remains extremely sensitive to external shocks and dependent on support from both the West and the East. Like the other East European countries, Hungary must reconcile Soviet demands for more and better quality exports in payment for vital raw materials with the need to finance its hard currency debt by exporting to the West. [Redacted]

Defense Spending and the Economy
Statements by East European officials [Redacted] confirm that, within the NSWP countries, military spending is linked to economic performance. For example, the defense burden is taken into account in setting military spending goals.

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Factors Behind the Slow Growth of NSWP Procurement

In short, East European economic policies have—with the notable exception of Romania—generally favored consumption over investment in adjusting to foreign debt problems. They have been designed to avoid domestic unrest and to overcome worker apathy, frequently cited as a leading cause of low productivity and quality. In addition, because Eastern Europe depends on export earnings to obtain most of its weapons, economic problems constrain weapons procurement. Evidence from official sources in Poland and Romania, the two countries with the worst economic problems, shows that defense spending has indeed been subordinated to more pressing economic priorities. [Redacted]

Warsaw Pact proposals that limits be placed on NATO and Pact defense spending have elaborated the economic benefits of spending reductions. [Redacted]

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It seems unlikely the East European leaders in the mid-1970s could have foreseen that economic growth would gradually slow and that, unless growth in defense outlays also slowed, the burden of defense would begin to rise. Economic plans did not anticipate the economic slowdown, and the growth record of the early 1970s had been nearly equal to or higher than [Redacted]

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that of the previous decade. By the late 1970s, however, economic growth in all six countries had taken a definite turn for the worse, and by 1980 the region was in serious trouble. Hence, the region's declining economic prospects were probably not a major factor in the early years of the procurement growth slowdown, but they were undoubtedly uppermost in resource decisions by 1980. [Redacted]

By 1980, the resource choices confronting Eastern Europe were acute, and serious sacrifices had to be made. Austerity programs had slowed both consumption and investment growth in all of the NSWP countries and lowered absolute levels in most. Living standards had stagnated or declined, except in Bulgaria. Consumers in the USSR have generally seen modest growth in levels of consumption in the 1980s, albeit slower than in the 1970s. But servicing foreign debt has taken priority in East Germany, Poland, Romania, and Hungary, while structural problems have largely occupied Czechoslovakia and Bulgaria. [Redacted]

In all NSWP countries, arms imports compete with imports of investment and consumer goods. Paying off foreign debt has claimed an increasing share of East European export earnings, which would otherwise go to purchase much-needed imports, including weapons from the USSR. With the growing Soviet reluctance to subsidize trade deficits in Eastern Europe and mounting Soviet pressure for more and better quality goods in trade, the allies face rapidly mounting demands on their trading abilities. They must improve their balance of payments with both the West and the USSR from the same overtaxed export industries, many of which produce for domestic consumption as well. In this situation, the incentives to hold down military spending are very strong, especially if further declines in living standards increase the likelihood of political unrest. [Redacted]

The Soviets have recognized that NSWP economic problems are sufficiently serious to constrain defense spending. [Redacted]

[Redacted]

[Redacted]

The Soviets have also tried to a small degree to reduce the cost of NSWP defense modernization. They have granted licenses for East European production of the BMP, the T-72 tank, T-55 upgrades, self-propelled artillery, and other less complicated systems, and they have also purchased some of these items from the East Europeans. [Redacted]

[Redacted]

Against this background, it is significant that Bulgaria and East Germany are the only ones maintaining some growth in defense procurement (Bulgaria) and in total costs (East Germany). GNP growth is down in both, but debt to the West is relatively small and living standards have continued to improve slowly. This is partly attributable to conservative financial policies, but also to Soviet economic support—especially Moscow's willingness until recently to tolerate Bulgaria's profitable reexport of Soviet oil for hard currency. Bulgaria and East Germany are Moscow's most loyal allies, and their relatively fortunate economic circumstances allowed a modest response to Soviet desires for a greater defense effort. [Redacted]

In the future, Bulgaria may not sustain even this level of commitment. [Redacted]

[Redacted]

East Germany also supports defense spending for domestic political motives. The government has long been sensitive to competition for legitimacy from

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West Germany and has used the military in an attempt to create an independent national identity and to inspire popular pride in Prussian military traditions. Although this has not created real enthusiasm for the regime, the military plays a heavy role in the regime's public image—a role that, until the imposition of martial law in Poland, was unique in Eastern Europe. [Redacted]

Political Decisions in Poland, Romania, and Yugoslavia

Although *Poland* has the highest defense costs of the NSWP nations, its response to political and economic problems has been to try to avoid spending as much as requested by the Soviets. Since 1970 the Polish Government has faced a series of progressively more serious economic and political crises. Its responses typically favored consumption and limited real growth in defense costs. Poland and Hungary are the only NSWP countries for which our estimates show 1984 defense costs still at 1970 levels. The delivery of a large number of aircraft in 1974 raised Polish procurement temporarily to a high of \$2.2 billion, but it fell to \$1.7 billion the following year and has averaged that amount ever since. [Redacted]

The impact of the economic crisis has been openly acknowledged. In a recent press interview, the Chairman of the Sejm National Defense Commission stated that military spending "has been restrained for many years . . . because of our economic possibilities." He also said that inflation was the "primary" cause of a 15-percent increase in the 1985 defense budget and that state planning explicitly linked growth in military spending to overall economic growth, implying that in real terms the military had received minimal increases. [Redacted]

An article in the military press took a more conservative line. Responding to a Radio Free Europe broadcast about increases in the Polish military budget, the article asserted that recent increases were purely inflationary and that, in real terms, the defense budget had actually declined. Touching on what was probably the real concern, the article claimed that

[Redacted]

Radio Free Europe was using the issue to cause unrest in Poland as people prepared for food price increases.

[Redacted]

Romania has resisted Soviet domination more consistently and vocally than any other current Pact member, including publicly opposing Soviet calls for higher military spending. Bucharest announced a reduction in defense spending (zero growth in 1979 and a 16-percent cut in 1980) as part of a general austerity program, supposedly to provide more for the consumer. In fact, the overall austerity measures have become increasingly severe for both the military and the consumer. President Ceausescu explained that Romania must "achieve a balance and an adequate ratio between the growth of national income and the rise in military spending." Subsequent statements by Romanian officials have elaborated on the trade-off between consumption and military spending, but the military cuts have probably offset little of the drastic cuts in consumption. [Redacted]

Announced defense spending has not surpassed its 1978 level. Since the budget is not adjusted for inflation, this suggests a major reduction in real terms. The military has openly announced major cutbacks in operations and maintenance, and our estimates show a falling off in arms imports and a decline in procurement in 1980-83. The Romanians have also reduced the defense burden by assigning conscripts to civilian labor projects for at least four months out of their 16-month terms. The massive use of conscripts as civilian labor probably will continue until the economy improves. [Redacted]

Although procurement costs in 1984 showed a dramatic rise, this was almost certainly a one-time event and highly unlikely to be sustained. Because of the low NSWP procurement levels, dollar costs frequently show wide variations if equipment deliveries are bunched in a particular year. In the past, in Romania and elsewhere in Eastern Europe, abrupt increases have been followed by large procurement declines.

[Redacted]

Although *Yugoslavia* is not a member of the Warsaw Pact, a major decline in its defense spending since 1979 illustrates the role played by slower economic

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growth in resource allocation decisions. It also may give an idea of the course that NSWP defense spending might have taken in the absence of pressure from the Soviet Union. [Redacted]

The absence of such measures during this period implies that decisions were made to either hold procurement level, not to devote more resources to key exports and defense industries, or a combination of both. The military balance and the state of the economy probably figured prominently in such decisions, as did Soviet influence and the interplay between differing Soviet and NSWP attitudes about defense. The fact that the relative weight of these issues has been in flux further complicates the search for an explanation of the procurement plateau. [Redacted]

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Beginning in 1980, Yugoslavia was hit hard by the foreign credit squeeze. External debt and structural weakness, which limited annual real GNP growth to less than 1 percent during 1980-85, remain serious problems. Real investment and incomes declined five years in a row in 1980-84, and inflation has averaged over 40 percent a year. Another constraint on defense spending is the unique Yugoslav political culture, in which debate on national issues fragments along regional and ethnic lines. The military, whose career ranks have a heavy share of Serbs and Montenegrins, is seen as a potential instrument of repression by some of the other ethnic groups. Since President Tito's death, some of these groups have resisted higher military spending in part to restrain what they see as Serb and Montenegrin influence. [Redacted]

Because the slowdown predates Eastern Europe's economic troubles, it may, at least initially, have been the result of decisions to lower the relative priority for defense and raise the priority of consumption. [Redacted]

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The result, described in a recent speech by Defense Minister Branko Mamula, has been that in 1981-85 the defense share of national income averaged only 4.7 percent instead of the 5.8 percent set by the government as a goal in 1981. Mamula stated that spending per soldier declined by 25 percent in real terms. [Redacted] a slowdown in weapons procurement and a decline in living standards and amenities for military personnel. [Redacted]

[Redacted]

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Although there are frequent reports of Soviet pressure on East Europeans to spend more on defense, the evidence also suggests Soviet acceptance of a lighter defense burden in Eastern Europe than in the USSR.

NSWP Defense Priorities

The procurement plateau in Eastern Europe started earlier than in the USSR—between 1973 and 1975, depending on the country. Over a period of 10 years or more, the leaderships of those countries could have used their central economic control to ensure additional resources for the military if that had been the priority. Because Eastern Europe relies heavily on imported arms rather than domestic production, increasing procurement would primarily entail shifting priorities in export industries to pay for weapons imported from the USSR. This could be achieved by expanding capacity in key sectors or by redirecting exports from other countries to the USSR. Only secondarily would it involve resources for domestic defense industries. [Redacted]

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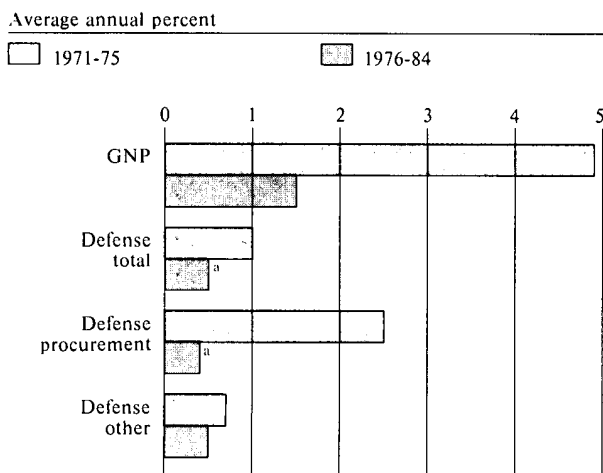
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Figure 6
Growth in Non-Soviet Warsaw Pact
GNP and Defense Costs, 1971-75 and 1976-84



^a Data for 1976-83. A major surge in 1984 in Romanian and Czechoslovak procurement distorts average growth rates, raising the 1976-84 average to 0.7 for total costs and 0.7 for procurement.

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A lower priority for defense in Eastern Europe than in the USSR is also implied by estimates of defense spending in domestic currencies, by the trends in dollar costs, and by trends in the published defense budgets. The domestic currency data show a low and declining NSWP burden and a high, slowly rising Soviet burden. Although the estimated defense share of NSWP GNP, 5 to 8 percent, is more than twice the level suggested by the published budgets, it is much lower than the 15 percent share in the USSR. In real terms, estimated defense growth in domestic currencies lagged GNP growth in the NSWP countries, suggesting that the collective defense burden declined during the 1970s.¹³ [Redacted]

¹³ See Thomas W. Clements, "The Costs of Defense in the Non-Soviet Warsaw Pact: A Historical Perspective," in US Congress Joint Economic Committee, *East European Economies: Slow Growth in the 1980s*, Volume 1, pp. 451-474. [Redacted]

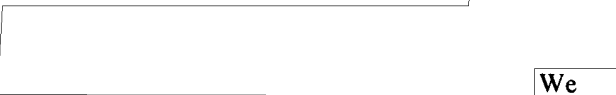
Estimates in dollars also suggest a declining burden over time. During the first half of the 1970s, although economic growth in Eastern Europe was a rapid 5 percent per year, the rise in defense costs averaged only about 1 percent per year. Regional economic growth after 1975 slowed to 1.5 percent, while defense costs hardly increased (see figures 6 and 7). In contrast, estimated Soviet defense spending growth was roughly comparable to GNP growth, whether measured in rubles or dollars, during both favorable and unfavorable economic periods. Hence, even in times of rapid economic growth, the East Europeans had put a lower priority on defense, and, during prolonged economic stress, defense growth remained well below economic growth. [Redacted]

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Perceptions of the Threat

The reluctance to support higher defense spending on economic grounds is reinforced by Eastern Europe's appraisal of the NATO threat. Warsaw Pact military plans are based on a conflict with NATO [Redacted]

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We have little information on the views of key NSWP leaders, other than those in Romania, on the strategic "threats" to their countries, although we believe they do not seriously entertain the possibility of a NATO attack either. [Redacted]

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These leaders may feel that the Warsaw Pact and their contribution to it would deter NATO from carrying out aggressive intentions. If this were the case, we would expect the NSWP leaders to be more "prodefense" than they appear to be, although they might still disagree on the best way to share the burden of defense. A more realistic view, perhaps, is that they are more concerned about Soviet intervention, especially if domestic unrest is allowed to erode regime stability. East European governments recognize the Warsaw Pact's role in enforcing Soviet political control in Eastern Europe, and the Soviet use of force in East Germany (1953), Hungary (1956), and

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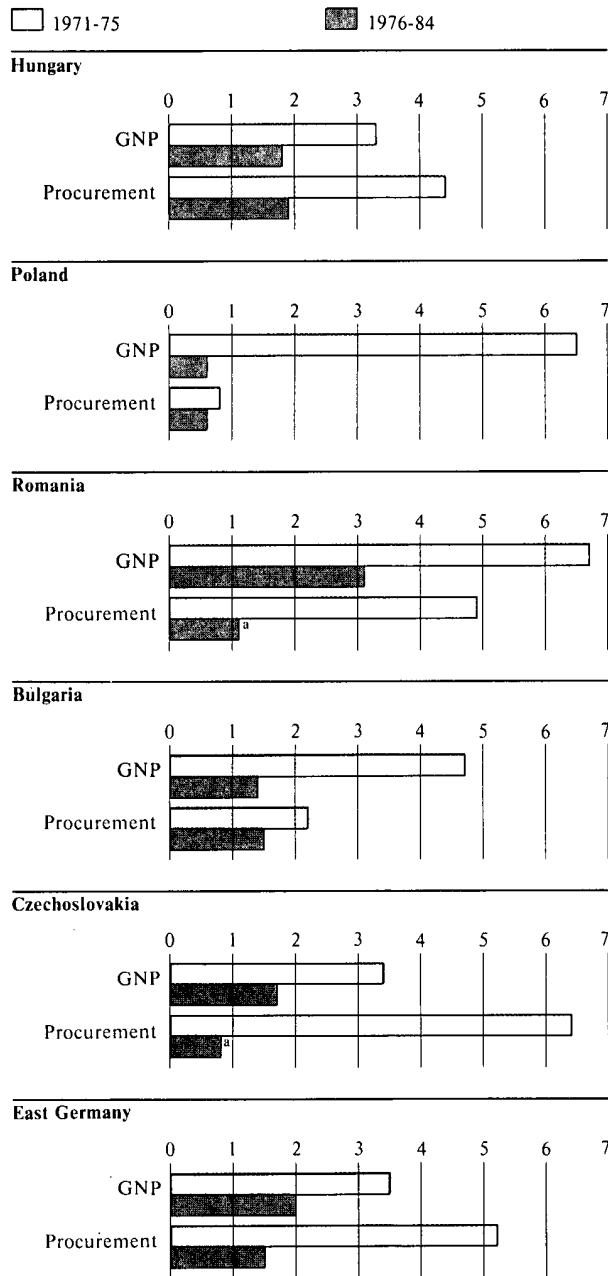
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Figure 7
Growth of GNP and Defense Procurement
in Non-Soviet Warsaw Pact Countries,
1971-75 and 1976-84

Average annual percent



Czechoslovakia (1968) and the threat to use it in Poland (1980-81).¹⁵ Indeed, because Romanian and Yugoslav leaders hold this view, their military forces are organized against a Soviet, rather than a NATO, threat.¹⁶ Although the other NSWP countries are not as openly opposed to Moscow's military planning, the likelihood of Soviet intervention probably reduces their support of Soviet demands for a strong defense against NATO, except insofar as it enhances regime prestige, stability, or industrial development.

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The High Cost of Military Modernization

Another obstacle to upgrading NSWP arms is the high cost of new generations of weapons, particularly those with advanced technology. The basis on which a prospective East European buyer evaluates prices for Soviet weapons is unclear. CEMA (Council for Mutual Economic Assistance) trade prices for civilian goods are often based on prevailing prices for the same goods in the West, with an adjustment for quality if necessary. Setting a price for Soviet weapons, which do not have close Western counterparts, is more arbitrary.

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Although we do not know the prices that an NSWP country pays for Soviet equipment, we can estimate the magnitude of the increase in costs across weapon generations. Estimated Soviet production costs in constant rubles show a dramatic escalation. The land arms that the NSWP is acquiring (T-72 tanks, BMP infantry combat vehicles, self-propelled artillery, antitank missiles, and self-propelled anti-aircraft weapons) are on average three to five times more

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^a Data for 1976-83. Including the 1984 procurement surge would raise annual growth to 5.7 percent in Romania and 5.2 percent in Czechoslovakia.

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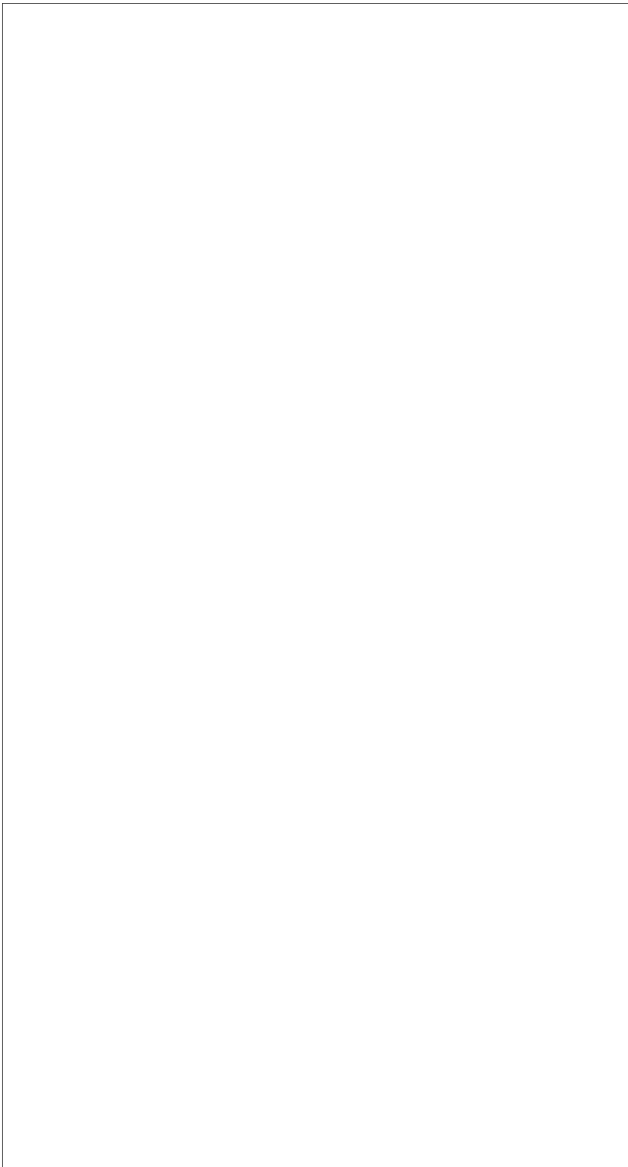
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price indexes, they may be forced to rely on current prices, making the cost of modernization appear even more formidable than it really is.) [Redacted]

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Using dollar costs, we can illustrate the impact of different rates of modernization on NSWP procurement costs. For instance, the cost of replacing the NSWP's T-54/55s with T-72s would be equivalent to its procurement of *all* land arms in the last decade. Similarly, the cost of upgrading NSWP MIG-15/17s to MIG-21s and current MIG-21s to MIG-23s would equal NSWP procurement of all types of aircraft during the last 10 years. [Redacted]

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If NSWP procurement growth returned to its pre-1975 rate of about 3 percent per year, achieving the above goals would take 13 years. (At current rates of growth, it would take 34 years.) Even so, by the time this hypothetical program could be completed in the late 1990s, NSWP forces would be equipped with weapons first deployed in the early 1970s. As a result, Eastern Europe is understandably reluctant to undertake ambitious modernization programs. [Redacted]

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Other Factors

Although there is strong evidence that policy decisions related to economic difficulties and the high cost of modernization slowed East European military procurement, other factors played a contributing role. Weapons manufacturing problems clearly pushed land arms procurement below intended levels. Contrary to Soviet intentions in providing designs and technology, NSWP tank modernization was slowed for several years by T-72 production problems in Poland and Czechoslovakia, and the tank is still only in limited series production there. Problems encountered in manufacturing the Czechoslovak 152-mm self-propelled howitzer delayed its serial production also. Other problems that have afflicted Eastern Europe generally, such as materials and energy shortages and transportation bottlenecks, could have slowed procurement of support equipment, much of which is produced domestically. [Redacted]

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costly than the weapons now in NSWP inventories. Some systems, like the ZSU-23-4 and the SA-6 surface-to-air missile (SAM), are even more costly. Replacing the strategic SAMs and tactical aircraft in NSWP inventories would cost perhaps two to three times as much as those countries paid for their current equipment. (A comparison in *current* prices, which include inflation, gives a much greater apparent spread in costs than one in *constant* prices. Given the difficulties NSWP buyers would have in constructing

We believe, however, that the impact of development and manufacturing problems was only an ancillary cause of the NSWP procurement slowdown. Because

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of the region's dependence on imported weapons, even widespread production delays would have only a limited impact on total procurement. The region's defense industry concentrates on land arms and support equipment. Aircraft and missiles, accounting for one-quarter of NSWP procurement costs, are the key drivers behind procurement swings and are almost all imported. Decisions on aircraft and missile purchases from the USSR, not domestic defense production, have the most impact on trends in total procurement.

Development delays are also unlikely to have played a major role. NSWP defense industry depends heavily on proven Soviet designs rather than new technology. Hence, there are few research, development, testing, and evaluation (RDT&E) problems that would interfere seriously with total procurement over an extended period of time. Moreover, because the Soviets typically export or license for production weapons that are one or more design generations behind the Soviets' own, NSWP modernization traditionally has not depended on the success of the Soviet RDT&E establishment in getting the latest weapons ready for production.

Finally, there are wide differences in the size, complexity, and composition of each country's defense industry and each would be affected differently by development and manufacturing delays. It is unlikely that such problems could cause a nearly simultaneous and relatively even slowdown of procurement costs in five countries.

Implications

Economic Growth and Defense Spending

The relatively low shares of GNP accounted for by East European defense activities compared with those of the Soviet Union, and the much slower annual growth rates of those activities, suggest not only that the East Europeans have given a lower priority to defense than has the USSR, but also that they have successfully resisted longstanding Soviet pressure to spend more. In effect, the East European governments have arrived at a relatively stable balance between the defense and civilian sectors, although the exact balance varies from country to country. Economic problems have reinforced this tendency in most of the

NSWP countries, but the experiences of Bulgaria and East Germany, whose procurement and total defense costs, respectively, did not appreciably slow despite slower economic growth, show that political decisions can sometimes run counter to economic pressures. However, even in East Germany, apparently the most "pro-defense spending" of the NSWP countries, defense costs are growing only half as fast as in the USSR.

We do not know whether the procurement plateau in the NSWP will persist in the future. If the slower growth of NSWP defense costs after 1975 was an accommodation to slower economic growth and changing priorities, we would not expect a return to faster growth in defense activities soon. The East European economies suffer from serious structural problems—rigid central planning, poor management, rising energy and raw material costs, obsolescent industrial plants, and an unmotivated labor force—which make an appreciable acceleration in GNP growth unlikely. The economic prospects for East Germany, Czechoslovakia, and Bulgaria are better than for Poland, Hungary, and Romania. Improved performance for the first three would make a modest upturn in defense procurement more likely, but only East Germany's and Bulgaria's priorities have consistently favored defense procurement in the past.

Future growth in NSWP military procurement will probably hinge on acquisition plans for aircraft, which historically have accounted for one-fifth of all procurement costs. If the NSWP continues to emphasize savings by buying upgraded models of 20-year-old aircraft rather than modern aircraft, cost growth probably will remain restrained. Land arms costs, which have accounted for 12 percent of NSWP procurement, will be heavily influenced by the pace of tank modernization programs.

Military Capabilities

Even with little or no growth in procurement costs, the NSWP countries have made notable progress in modernization in 1970-84 (see p. 1). Nevertheless, Eastern Europe's deteriorating economic performance and the lower priority given to defense have increased the quality gap between NSWP and Soviet forces.

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The gap will almost certainly widen given the nature of Eastern Europe's economic problems and the political difficulty of squeezing consumers to pay for major defense increases. [Redacted]

require an expensive upgrading of the East European defense industry—which, for example, has been plagued with difficulties in producing T-72 tanks. In addition, NSWP production runs would probably be smaller, raising unit costs significantly over those of Soviet-produced items and reducing the number of weapons that could be procured. [Redacted]

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The current emphasis on improving Soviet conventional forces threatens to leave the NSWP forces further behind, with military and economic implications for the USSR. Although we expect the NSWP forces to make important gains in the future in selected areas, they will have great difficulty adopting some of the most promising Soviet combined-arms tactics, such as the operational maneuver group, which requires all-tracked combat systems, or in developing the integrated fire support viewed by the Soviets as the key to defeating NATO's air and armor defenses of the future. [Redacted]

Finally, the Soviets may take on a greater burden of the Warsaw Pact's wartime missions. The Soviets are apparently experimenting with the option of relieving the East European forces of responsibility for portions of their missions and may be practicing the precombat deployment of some Soviet forces from the western USSR to Eastern Europe. These forces might be intended to augment or possibly even replace some NSWP forces. Moscow has also substantially increased its logistic base in East Germany, lessening its dependence on the rail network in Poland. [Redacted]

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Soviet alternatives are few and unappealing. Since the mid-1970s, the Soviets have consistently pressured the East Europeans to spend more on defense, but only in East Germany and Bulgaria do our estimates show consistent growth in procurement, and neither has increased its procurement growth rate. The Soviets have made some concessions with respect to the East European defense bill, but additional help will probably be limited. They have been reducing their subsidies of the East European economies, and they have their own costly force improvement program to maintain. As in the late 1960s, the Soviets might offer some of their older equipment—now being replaced by newer models—on concessionary terms. This would result in some improvement, but even if given on a large scale, the equipment provided would not narrow the gap in force capabilities appreciably. [Redacted]

Such changes would provide short-term solutions to Moscow's problems, but over the long term, Soviet and East European force disparities are likely to continue to increase. Given the difficulty and expense of significantly improving Eastern Europe's capabilities and the constraints on the USSR's own military budget, the Soviets may ultimately have to consider a return to the former strategy of more limited use of NSWP forces in an offensive role. [Redacted]

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The Soviets could break with their past policies and give the East Europeans a bigger stake in the production of sophisticated weapons, sharing some of their more sensitive designs and manufacturing processes. This is the least likely alternative because the Soviets have reaped important benefits from their longstanding efforts at tightening the integration and specialization of NSWP defense industries.¹⁸ This would also

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Appendix A

The Published NSWP Defense Budgets

Although the coverage of officially acknowledged defense figures is uncertain and no detailed break-downs are provided, the announced NSWP budgets seem to include more military activities than the USSR's budget, and thus they provide a more valid indicator of overall trends in resource allocation. Uncertainty about coverage and pricing is too great to make reliable estimates of the burden of defense on the economy from the published figures. [Redacted]

and the costs of military-related activities in the civil sector. Ordinarily, we would not be concerned with investment in defense industries, because in Western economies it is usually included in the price of defense products. [Redacted]

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[Redacted] In the NSWP countries with the largest defense sectors—Poland, Czechoslovakia, and Romania—investment in defense industries and R&D costs are probably equal in value to a large fraction of the published defense budget.

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The Content of NSWP Defense Budgets

Like the USSR, the NSWP countries reveal very little about their defense spending. Bulgaria has published no defense budget data since 1970. Poland has only two entries, one for "current outlays" and one for "investment."¹⁹ The remaining countries have only single-line entries in their annual budgets.²⁰ However, unlike the Soviet budget, the announced NSWP budgets are large enough to cover much of the costs of personnel, operations and maintenance, and investment. The major drawback is that none of the NSWP countries defines the activities included in its defense budget, and therefore we believe the budgets are a better index of trends than of levels. The trends shown by NSWP budgets generally follow observed differences in the modernization, expansion, or reduction of the armed forces. For example, Hungary's defense budget declined in the early 1970s and Romania's in the 1980s because of military personnel and force cutbacks. Similarly, the steady growth in the East German budget reflects continuous and relatively rapid modernization since 1970. [Redacted]

[Redacted] The significance of defense investment and R&D in Czechoslovakia and Romania is unknown, but, judging from the size of their defense sectors, it may be about the same as in Poland. Preliminary estimates of military R&D spending in the remaining countries, on the basis of a share of published government R&D spending, suggest that it is considerably smaller, between 5 and 10 percent of the announced defense budgets. [Redacted]

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Numerous military-related costs are borne by civilian ministries. [Redacted]

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Omissions

Three categories of costs are probably omitted from the announced defense budgets: investment in defense industries, research and development (R&D) costs, [Redacted]

[Redacted] There is too little information on the details of these activities to determine their economic significance, but it, too, may be [Redacted]

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¹⁹ The Poles define "investment" as housing, amenities, and other facilities for armed forces personnel, not weapons-related spending. [Redacted]

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²⁰ The Czechoslovak budget includes internal security forces. [Redacted]

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substantial in comparison with the published defense budgets. [Redacted]

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In addition, the defense budgets probably do not include income derived from services performed by the military in the civilian economy and charged to the recipient ministry at rates intended to produce a profit for the defense ministries.

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The impact of these omissions varies from country to country and over time. In East Germany, Bulgaria, and Hungary, countries with only small defense industries, the published budgets are probably closest to total defense spending. In the remaining countries, with larger defense sectors, these omissions probably result in a substantial understatement of defense outlays. Moreover, because industrial investment rises temporarily when new production lines are built and decreases thereafter, not only do the published budgets understate actual levels of defense spending, but also at times they may not reflect actual year-to-year changes. Therefore, the published budgets are useful only to indicate minimum levels and long-term trends.

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Pricing Biases

[Redacted] the central planning system sets the prices of domestically produced military goods well below their actual cost.

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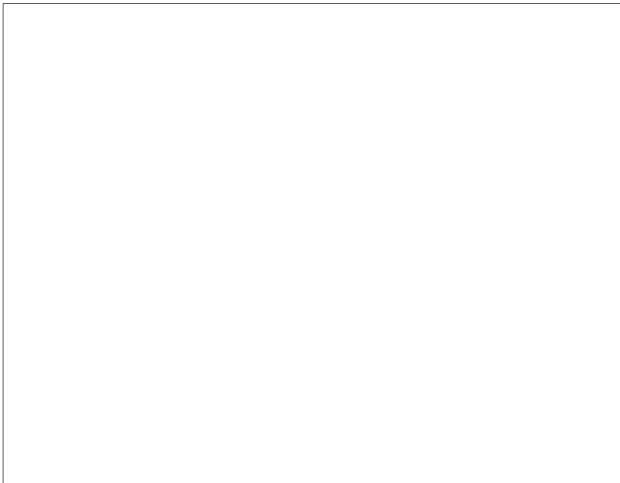
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The existence of pricing biases for military goods is another reason to view the published defense budgets as minimum levels of effort. The net impact of these practices on NSWP defense planning is unclear. Although it obviously encourages more defense procurement from domestic industry, it may, by creating the appearance of relatively high costs for imported equipment, discourage procurement from abroad. It may also serve to heighten NSWP interest in licensing arrangements with the USSR despite the higher real cost domestic production might entail. [redacted]

Impact of Pricing Problems and Omissions

To illustrate the probable impact of pricing problems and omissions, we have estimated defense costs in domestic currencies for Poland in 1975 and 1980; for Hungary in 1970, 1973, 1975, and 1980; and for Romania in 1975 from the dollar costs presented earlier, using purchasing power parities. (The method is explained in appendix C.) The converted dollar costs are considerably larger than the published budgets in all three countries—from 1.6 times (Poland) to 3.6 times (Romania) larger—suggesting that the published budgets represent only one-third to two-thirds of total costs. The discrepancy for Hungary appears to be roughly stable over time, between 1.8 and 2.3 times the published budgets for 1970, 1973, 1975, and 1980. [redacted]

Table 6
Growth in NSWP Published
Defense Budgets, 1961-84^a

*Average annual
percent growth*

	1961-70	1971-75	1976-80	1981-84
Northern tier				
Czechoslovakia ^b	5.7	5.8	3.1	2.0
East Germany	10.2 ^c	4.5	5.8	6.7
Poland	9.3	7.1	7.0	40.9 ^d
Southern tier				
Bulgaria ^e	6.8	NA	NA	NA
Hungary	13.5	4.0	7.1	7.6
Romania	7.8	6.5	1.9	2.8

^a Measured in domestic currencies, not adjusted for inflation.

^b Includes internal security costs.

^c Data for 1963-70.

^d A national price revision in 1982 roughly doubled prices, raising the defense budget from 77 to 176 billion zloty. Otherwise, the annual average would have been 9.7 percent.

^e Bulgaria has published no data since 1970.



Trends in NSWP Defense Budgets

Table 6 shows the average annual growth in the published NSWP defense budgets, unadjusted for inflation. During the 1960s, when the NSWP countries were modernizing their forces along Soviet lines and taking a new offensive role in Warsaw Pact planning, published defense spending showed rapid growth. After this expansion and reorganization, growth slowed: In Czechoslovakia and Romania, it continued to decelerate through the early 1980s, while in East Germany and Hungary, it increased in the last half of the 1970s but did not return to the rapid rates of the 1960s. [redacted]

There are no generally accepted measures of price change in NSWP defense budgets, and these countries do not publish the data needed to adjust for inflation. In an attempt to roughly adjust for inflation, we compare growth in the defense budgets with [redacted]

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Table 7 *Average annual percent*
Growth in NSWP Consumer
Prices, 1961-84

	1961-70	1971-75	1976-80	1981-84
Northern tier				
Czechoslovakia	3.2	2.1	2.6	1.7
East Germany	1.2	0.4	1.9	1.3
Poland	2.5	5.4	9.2	37.9
Southern tier				
Bulgaria	3.2	3.0	6.8	2.5
Hungary	2.1	4.1	6.5	7.0
Romania	NA	3.0	2.5	6.9

growth in consumer prices (see table 7).²² In such a comparison, a different picture of resource trends emerges. In Czechoslovakia and Romania, the slow-down in nominal prices becomes even more pronounced if we take inflation into account. In Romania, the defense budget in 1984 in current prices was the same as in 1978, evidence of a major decline in real terms. The steady 2- to 3-percent growth in the Czechoslovak military budget in current prices in the last 10 years almost matches the inflation in consumer prices, suggesting little or no growth in real terms. Of the countries showing accelerated growth in defense budgets during the 1970s in current prices, only East Germany clearly shows growth in real terms, at a rapid rate of perhaps 4 to 5 percent. Hungary and Poland show little or no real growth.

In inflation-adjusted terms, then, only East Germany's budget suggests a pattern of consistent growth after 1974. The remaining countries (except Bulgaria) suggest either negligible gains or actual declines in real terms.

²² Given the probable difference between established prices for defense goods and services and their real resource cost, it would be difficult even for the NSWP governments to derive a meaningful index. The governments tend to restrain growth in conscript pay and to fix the prices of military equipment, giving the appearance of little inflation. But, since the costs of civilian labor and inputs are rising, so is the real cost of defense.

Table 8 *Percent*
NSWP Announced Defense Spending
as a Share of GNP^a

	1965	1970	1975	1982
Northern tier				
Czechoslovakia	4.0	3.4	3.3	3.5
East Germany	3.0	4.2	3.9	4.2
Poland	3.4	3.8	3.0	3.1 ^b
Southern tier				
Bulgaria	2.6	2.4	NA	NA
Hungary	2.7	2.8	2.3	2.2
Romania	2.2	2.4	2.2	1.4

^a In current prices, domestic currencies.

^b Reflects data for 1981. The burden rose to 4 percent in 1982 because of a major decline in GNP.

Source: Thad P. Alton, et al., "East European Defense Expenditures, 1965-82," in US Congress Joint Economic Committee, *East European Economies: Slow Growth in the 1980s*, pp. 475-495.

The NSWP Defense Burden

Even though the official budgets understate total defense spending, we present in table 8 the defense share of GNP that the budgets imply to help illustrate the probable range within the NSWP countries. After allowing for budgetary understatement, the defense share (excluding RDT&E) of NSWP GNP is probably about 5 to 8 percent, still much less than the 15 percent estimated for the USSR. The northern tier countries have the highest defense burdens, reflecting their better equipped and better trained armed forces. There are significant differences in the trends among the six countries. Romania's declining burden in 1982 reflects the freezing of defense spending at the 1978 level. Hungary and Poland also show a falling burden during the 1970s; changes over time in Czechoslovakia and East Germany are minor. Only East Germany's burden appears to have increased, turning up in the late 1960s.

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Appendix B**Definitions and Methods**

Dollar estimates of Warsaw Pact defense activities measure what it would cost, using prevailing US prices and wages, to produce and man a military force of the same size, armed with the same weapons, and operated in the same manner as the Soviet and NSWP forces. In principle, we could use any currency to make cross-national comparisons, but for practical reasons we use dollars. We already have a comprehensive estimate of Soviet dollar costs, and we can directly use a great deal of data from that estimate to develop the NSWP costs. Because so much NSWP equipment is Soviet manufactured or designed, Soviet unit procurement costs are often applicable. []

countries provide support in the form of infrastructure and certain price subsidies. []

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These definitions are similar to those NATO uses to monitor the defense spending of its member countries, with the main exception that NATO includes military pensions. In addition, the definitions of resource categories are similar to NATO's, although NATO has a narrower definition of research, development, testing, and evaluation costs. This paper does not give estimates of NSWP RDT&E costs because, even with direct evidence of RDT&E programs, it is difficult to develop a reliable cost estimate. (An effort is under way to estimate the defense share of the NSWP science budgets and apply a currency conversion factor, but it is only in a preliminary stage.) []

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Definitions

In this paper, defense activities are defined to include:

- National security activities funded by defense ministries (other than those noted below).
- Border security forces that have a wartime mission of border defense.
- Premilitary training performed by civilian schools.
- Pay for reservists funded by civilian enterprises.

They exclude:

- Military pensions and veterans' programs, which reflect costs of past rather than present defense activities.
- Space activities that in the United States would be performed by the National Aeronautics and Space Administration.
- Military assistance to foreign nations (except for the costs of uniformed personnel) and foreign military sales.
- Civil defense.
- Internal security troops or uniformed labor troops who do not have wartime missions of national defense.
- Stockpiles of strategic reserves such as fuel, spare parts, and raw materials. []

The costs of stationing Soviet military personnel in NSWP countries are considered part of Soviet defense costs, although there is evidence that host

Methods

The methods used to estimate NSWP defense costs closely duplicate those used in the Soviet estimate. The costs for all NSWP defense activities (except RDT&E) are developed by identifying NSWP military forces and weapons. Order-of-battle, weapon inventory, and supporting production estimates are made for each individual type of ship, ground force division, aircraft, and so forth. Support and command and control activities are also estimated. Dollar cost estimates are then applied to these physical quantities. []

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Procurement costs are based on what it would cost to manufacture the NSWP weapons and equipment in the United States at prevailing prices for materials and labor (including overhead and profit), using US manufacturing technology. Generally, the average unit cost used in our Soviet estimate is used for the same item in the NSWP inventory. For a limited number of items that recently began production in Eastern Europe, such as the Czechoslovak BMP or the Polish T-72, a unit cost is derived using estimated Soviet learning curves. Since most NSWP equipment

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is one or more design generations behind the equipment being produced in the USSR, these prices are fairly well researched and considered quite reliable.

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The trend in procurement for support equipment²³ is uncertain, however. This category is difficult to monitor closely and is estimated to account for slightly over half of NSWP procurement. If the growth of major weapons procurement has slowed, procurement of support equipment has probably slowed also. Unfortunately, the available evidence does not permit a reliable estimate of year-to-year changes in this category.

Construction is the only category not based directly on NSWP activities. Lacking detailed information on NSWP construction activity, it is assumed that for a given type of facility, NSWP construction is similar to observed Soviet activity. The NSWP estimate uses 15 separate types of facilities costs derived from the Soviet estimate, allowing adjustments for the different mix of military forces (and facilities) in each country.

Operations and maintenance (O&M) costs assume that NSWP and Soviet practices are the same except for land arms, whose operating rates are adjusted for the different levels of division readiness in NSWP countries. This is a good assumption for maintenance practices, since virtually all NSWP equipment is Soviet designed or produced, but a weak assumption for operating practices, because NSWP training and exercises differ. Refinement of this estimate will require detailed information on operating practices in the NSWP countries. Civilian pay is calculated by multiplying the estimated number of civilian defense workers by the average pay of their US counterparts. Although we do not have a detailed estimate of NSWP civilians, we believe there are proportionately more than in the USSR, which relies more on uniformed personnel provided by universal conscription. Our estimate of Soviet civilian personnel yields a ratio of civilian to military personnel of one to six, and we

²³ Includes electronics, vehicles, engineering equipment, naval supplies and equipment, organizational equipment, and aircraft ground support equipment.

believe that for the NSWP, a ratio of one to four is more appropriate. If we had used the Soviet ratio of one to six, estimated NSWP costs in 1984 would have been \$3 billion (or 7 percent) less than our estimate.

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Personnel costs are based on the estimated rank of the person the United States would assign to carry out functions similar to those in the NSWP military. The US pay rates used include all pay and allowances. For each country, a US rank was assigned to each of six categories of personnel—officers, warrant officers, career enlisted men, conscript sergeants, conscript privates, and cadets—in each military branch. The NSWP conscripts' rank, and thus dollar pay, was based on the rank of the US personnel with the same average time in service, taking into account the different terms of service in each country. To account for the fact that the United States would use enlisted men for many positions in which the NSWP would use officers, dollar pay for NSWP officers is an average of US noncommissioned officer and commissioned officer pay, which takes into account the differing average tenure in each country. Average officer pay is derived from models of occupational tenure corresponding to known recruitment, promotion, and retention practices in each country. Separate estimates are made for food and travel costs.

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Level of Confidence

Our confidence in the estimate for total NSWP defense costs is at least as high as our confidence in the estimate of total Soviet defense costs:

- We believe that estimated NSWP procurement costs are better than those for the USSR. NSWP procurement rates are derived from order-of-battle data that are as good as or better than those for the USSR because of [redacted] the smaller geographic area, and the slower pace of weapons deployment. In addition, compared with Soviet equipment, NSWP weapons are older and well known to Western analysts and have been exploited more thoroughly for cost analysis. Thus we have higher confidence in their estimated prices.

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- We are less confident in our estimate of NSWP construction costs, but this category is a relatively small one.
- NSWP personnel costs are as good as or better than those for the USSR, since we have equal confidence in total estimated manpower and have used an improved costing method in the NSWP case. After further study, we intend to apply this method to the Soviet estimate as well.
- In general, the lack of detailed operating rates makes the O&M estimate for any one country less certain than for the NSWP as a whole. However, we believe the assumption of Soviet-like O&M practices leads to a good estimate for the NSWP as a whole.
- We do not have an estimate of NSWP RDT&E costs. On the basis of our experience at estimating Soviet RDT&E costs, we know that such estimates are among the most difficult to make. However, since NSWP RDT&E costs are lower than Soviet levels—both absolutely and as a share of total defense costs—the exclusion of NSWP RDT&E costs probably has only a small impact on our total NSWP estimate. []

Because dollar costs are based on the prices of personnel and physical inputs in the United States, however, they will not show the same levels and trends as actual spending in a domestic currency. Because the cost of Pact weapons relative to, for example, manpower and construction costs is lower in dollars than in domestic currencies, procurement costs measured in domestic East European currencies are higher as a share of total defense costs. Hence, dollar costs cannot be used to show the domestic perception of defense activities, particularly the relative emphasis on procurement versus personnel. []

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Among the NSWP countries, our confidence varies. It is highest for the estimates for the northern tier countries and Hungary, and lowest for Romania and Bulgaria. Our lack of country-specific information on operating rates and our lower confidence in the manpower estimates for Romania and Bulgaria make our cost estimates for those two countries more uncertain. []

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Interpreting Dollar Costs

Dollar costs can be used to compare the overall magnitudes and trends of defense activities of various countries. For example, the use of a common currency permits comparisons of growth rates of military procurement or of the various procurement shares of defense activities. We can also use dollar costs as a general indicator of the varying emphasis on specific military forces or services. []

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Appendix C

Estimates of Defense Spending in Domestic Currencies

To estimate the probable magnitude of pricing biases and the actual defense burden, we convert dollar costs to domestic currencies using purchasing power parities (PPPs) for Poland in 1980 and 1975; Hungary in 1970, 1973, 1975, and 1980; and Romania in 1975. PPPs are a measure of purchasing power, rather than an exchange rate. They represent the ratio of prices of identical products in two economies, and they measure the comparative advantage of one country over another in producing those products. A comparison of the actual prices of goods and services in two countries is the ideal index to convert one country's defense costs into another's currency. It is preferred over the exchange rate because, even among countries with market-determined exchange rates, the exchange rate applies only to goods and services that are traded. A hypothetical use of a PPP would be as follows: If the price of product X is 100 country A units and 50 country B units, an illustrative PPP would be 2.0. If the PPP for the two countries' gross domestic products is 4.0, this indicates that country A has a comparative advantage in producing product X.

The PPPs are based on prices provided in detail by the countries participating in the United Nations International Comparison Project. Because the PPPs are based on prevailing prices in civilian production, they largely, but not completely, overcome the problem of defense pricing biases (they will reflect any pricing distortions present in the centrally planned civil economies). An estimate of defense spending that would be free of these distortions, the "factor cost" estimate, is unavailable at present. One important advantage of PPPs is that they give us personnel costs valued closer to their factor cost by using the average nondefense government wage rather than the artificially low pay of military conscripts.

Because PPPs are not available for defense activities, the dollar cost estimates of defense programs were divided into categories corresponding to the sectors of the civil economy for which PPPs are available: procurement (including spare parts), construction, pay

(civilian, reserve, and military active duty), and the remaining operating and personnel costs. The PPPs for the following sectors were applied, respectively: producer durables, nonresidential construction, government compensation, and consumption (see table 9).

The converted dollar costs are not strictly comparable to defense spending because they are based on observed deployment of weapons and personnel, not the actual flow of funds presumably reflected in the published budgets. In addition, the dollar costs exclude RDT&E, possibly a significant omission in Poland and Romania. We do not know if the converted dollar costs would be higher or lower than an actual spending measure. Because of this and other uncertainties, we believe that actual defense spending in these countries lies within the range bounded by the converted dollar estimates—1.6 to 3.6 times the published budgets.

The probable range of NSWP defense burdens is different from the range in defense spending because Romania and Hungary, for which our estimates are highest relative to published spending, had the lowest burdens according to the published budgets (see table 8). The burdens for these countries that correspond with our estimates of defense costs are about 5 percent in Hungary and 8 percent in Romania, well below the USSR's 15 percent. Unless the actual burdens in Bulgaria, Czechoslovakia, and East Germany are understated by as large an amount as in Romania, the burden for the NSWP as a whole is probably in the 5- to 8-percent range.

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Table 9
Conversion of Defense Costs
From Dollars to Domestic Currencies

	Estimated Defense Costs (billion current dollars)	Purchasing Power Parities ^a (domestic currency per dollar)	Estimated Defense Costs (billion domestic currency)	Published Defense Budget (billion domestic currency)	GNP ^b (billion domestic currency)
Poland					
1980^c	9.8		116.2	70.4	2,533
Procurement	1.8	18.1	32.8		
Construction	1.0	13.3	13.0		
Pay	6.2	9.0	55.5		
Operating	0.8	17.9	14.8		
1975^c	6.9		80.7	50.2	1,673
Procurement	1.3	27.1	34.6		
Construction	0.6	18.9	11.7		
Pay	4.5	6.0	27.2		
Operating	0.5	14.1	7.1		
Hungary					
1980^c	2.4		29.3	16.4	773
Procurement	0.8	19.0	15.8		
Construction	0.2	16.1	3.3		
Pay	1.2	6.3	7.5		
Operating	0.2	12.6	2.7		
1975^c	1.6		21.4	11.8	513
Procurement	0.5	23.2	12.1		
Construction	0.1	22.8	2.9		
Pay	0.9	5.8	5.0		
Operating	0.1	11.2	1.4		
1973^c	1.4		21.9	9.5	452
Procurement	0.5	33.1	15.9		
Construction	0.1	16.1	1.6		
Pay	0.8	4.2	3.2		
Operating	0.1	13.9	1.2		
1970^c	1.1		17.4	9.8	350
Procurement	0.3	33.5	11.3		
Construction	0.1	18.5	1.6		
Pay	0.6	5.3	3.3		
Operating	0.1	15.0	1.1		
Romania					
1975^c	3.4		35.0	9.7	441
Procurement	0.8	23.7	18.8		
Construction	0.3	9.8	3.2		
Pay	2.0	5.3	10.8		
Operating	0.3	8.0	2.2		

^a Units of domestic currency per dollar in current prices. The 1980 parities are from United Nations, *World Comparison of Purchasing Power and Real Product for 1980*, forthcoming. The 1975 parities are from Irving Kravis et al., *World Product and Income, International Comparisons of Real Gross Product* (Baltimore: Johns Hopkins University Press, 1982), pp. 260, 276, and 277.

The 1970 and 1973 parities are from Kravis, et al., *International Comparisons of Real Product and Purchasing Power* (Baltimore: Johns Hopkins University Press, 1978), pp 180-181 and 202-203.

^b Alton, et al.

^c Because of rounding, columns may not add to the totals shown.

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