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Central Intelligence Agency

FILE

DATE 7-27-88 FILE

DOC NO SOV M 88-20054X

OIR 3

P & PD 1

Washington, D.C. 20505

DIRECTORATE OF INTELLIGENCE

21 July 1988

EASTERN EUROPE: EXPORTS OF MACHINERY AND EQUIPMENT TO THE USSR

Summary

The purpose of this paper is to provide a comprehensive and detailed description of Soviet machinery and equipment imports from the six CEMA countries of Eastern Europe--Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania. This base of data, which represents the record of Eastern Europe's past contributions to Soviet investment, provides a framework from which to judge Eastern Europe's future role in supporting the USSR's modernization program.

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Eastern Europe has been the Soviet Union's main supplier of machinery, and the region's contribution to Soviet economic development is likely to grow. Moscow has indicated it wants to increase both the quality and quantity of machinery imports from Eastern Europe in order to supplement the output of the USSR's own machine-building industry for Gorbachev's modernization program. Soviet demands are likely to cause some shift in the composition of East European equipment deliveries from heavy equipment toward advanced machinery embodying high technology.

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Such a shift in the mix of East European machinery deliveries will probably increase the transfer of Western technology to the USSR through Eastern Europe. Although many of the East European products which Moscow is seeking embody Western technology obtained though legal Western imports and licenses, Eastern Europe is likely to increase its efforts to acquire technology clandestinely.

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EASTERN EUROPE: EXPORTS OF MACHINERY AND EQUIPMENT TO THE USSR

Machinery Deliveries in Perspective

At the beginning of the 1970s, Soviet economic planners decided to accelerate imports of capital equipment to supplement domestic production in the machine-building industry. The growth of domestic output had slowed, a result that was partly planned. Feeling the pinch of rising resource costs, the Soviets wanted to use existing plant and equipment more effectively and limit new investment rather than make indiscriminate additions of costly equipment. Moreover, the machine-building sector was plagued by problems such as raw material scarcities, transportation bottlenecks, and labor shortages that also hindered production.

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Rising imports of machinery and equipment from Eastern Europe and the West made an important contribution to Soviet economic performance between 1970 and 1986.[1] Equipment deliveries increased at an average annual rate of almost 14 percent and were consistently the USSR's leading import

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1 This study is based on data reported in the Soviet foreign trade handbook. The goods covered are those reported by the USSR in CTN (CEMA Trade Nomenclature) Category 1, Machines, Equipment, and Transportation Facilities which are imports largely destined for investment purposes. Machinery and equipment imported for consumption--consumer durables such as televisions and household appliances--are not included in this study. Although some East European countries publish more detailed figures on equipment trade, the Soviet data were chosen to provide a consistent database for comparing the equipment deliveries from Eastern Europe. In some cases, East European data are cited to supplement the Soviet figures.

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category, accounting for around one-third of total imports. Machinery and equipment imports from all sources accounted for roughly one-third of total machinery investment in the early 1980s (see inset). Without these imports we estimate that the average annual growth of Soviet investment would have been at least one-half percentage point lower in the 1970s and 0.7 percentage point lower in the early 1980s. 25X1

Eastern Europe's Leading Role

Moscow has traditionally relied on its six East European allies for the bulk of equipment imports.[2] In 1986, five East European countries--East Germany, Czechoslovakia, Bulgaria, Poland, Hungary--were the most important sources of Soviet equipment imports, accounting for two-thirds of all such Soviet imports in that year. Romania was in ninth place, following Finland, Yugoslavia, and West Germany (see figure 1). Equipment imports from Eastern Europe equalled roughly one quarter of total Soviet investment of domestically-produced machinery and equipment.[3] 25X1

The East Europeans supply the Soviets with a wide range of equipment. Trade has been weighted largely toward heavy equipment, with transportation equipment the leading category (see figure 2). Of the CEMA 6, East Germany has been the

2 These six countries as a group are referred to interchangeably in this paper as the CEMA 6 or Eastern Europe. 25X1

3 Total new fixed investment of machinery and equipment in 1982 prices, including military investment. 25X1

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Domestic and Foreign Trade Prices in CEMA

Problems arise when trying to make comparisons between imported equipment and Soviet domestic output. The first problem stems from the mechanics of the CEMA pricing mechanism. Although theoretically determined by a five-year moving average, in practice East European machinery prices have been set largely according to current, higher prices of comparable machinery on world markets. However, not only has a large share of East European equipment in general been inferior to most Western equipment, but the East European CEMA countries have made a practice of exporting their best equipment to the West and leaving poorer quality equipment for export to the Soviet Union. Thus, the ruble value of Soviet imports of East European machinery overstates the true worth to some extent.

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A second problem arises when placing a domestic valuation on these imports. While foreign trade prices are tied loosely to world market prices, most CEMA countries value their domestic economic activities in prices generally set by central planners, presumably on the basis of average production costs or other economic criteria. Because domestic and foreign trade prices are set differently, it is almost impossible to make meaningful comparisons between these countries of either domestic or foreign economic activities. Indeed, thousands of "coefficients" are often used in an attempt to equate foreign and domestic prices. The extent of this problem has been explored by several recent studies. Treml and Kostinsky, estimating the domestic value of Soviet foreign trade from data given in the 1972 Soviet input-output table, conclude that 1970 Soviet imports in general have been worth 100 to 150 percent more in domestic rubles than their reported value in foreign trade rubles.[4] However, they found that, on average, Soviet machinery imports during the 1972-79 period were worth about the same in the two categories of rubles, although the relationship varied substantially for different types of machinery. Thus comparisons in this study between Soviet imports of machinery and equipment and domestic production or investment may be roughly valid, even given the above problems.

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4 Vladimir G. Treml and Barry L. Kostinsky, Domestic Value of Soviet Foreign Trade: Exports and Imports in the 1972 Input-Output Table, US Bureau of the Census, Foreign Economic Report No. 20, October 1982.

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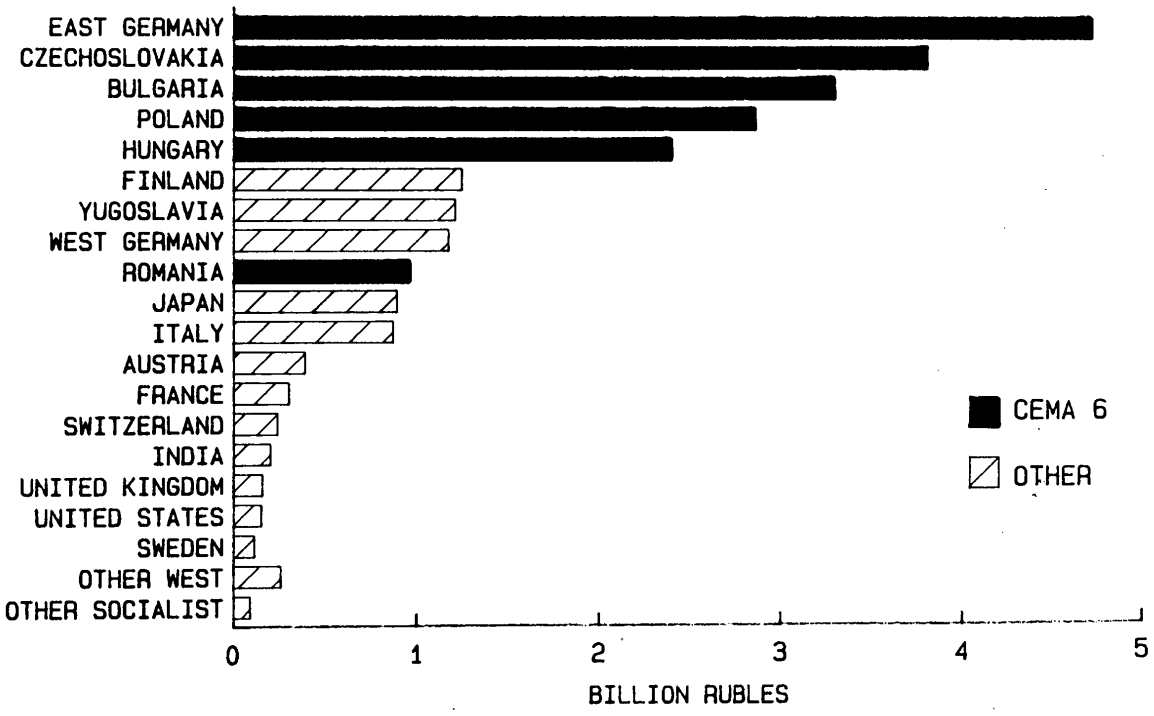
FIGURE 1
SOURCES OF SOVIET MACHINERY IMPORTS, 1986



Source: Soviet trade statistics

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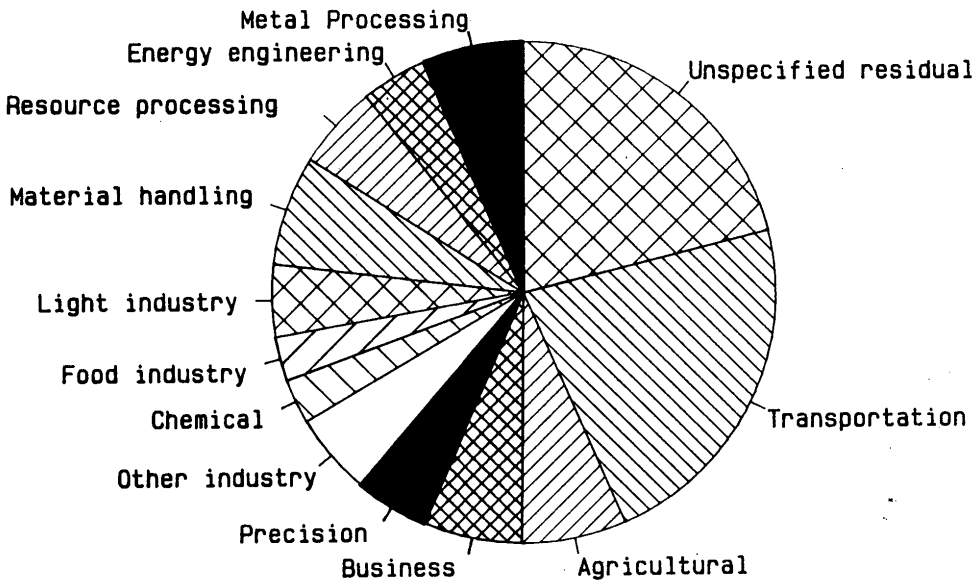
FIGURE 2
CEMA 6 MACHINERY EXPORTS TO THE USSR, 1986



Source: Soviet trade statistics

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dominant supplier of most categories of machinery (see table 1). East European machinery is generally competitive with or superior to the equipment produced by the Soviets and provides Moscow with the best way of receiving payment for the resources--mainly fuels--it exports to its allies. An examination of the basic trade trends in individual commodity categories and more detailed data on East European machinery exports to the USSR are contained in Appendices 1 and 2. 25X1

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At the beginning of the 1970s the CEMA 6 accounted for over 70 percent of the value of Soviet imports of machinery and equipment. By 1976, however, the CEMA 6 saw their share of machinery and equipment imports drop to just 55 percent as several developments led Moscow to look more to the West (see figure 3).

- Moscow decided to use imports from the West to acquire more modern technology in order to increase Soviet productivity more rapidly than could be achieved by continuing reliance on domestic and East European equipment.
- The thaw in East-West relations also encouraged Moscow to buy more from the West and, in turn, spurred Western sellers to seek access to the large Soviet market.
- Increases in the price and volume of Soviet energy exports in the mid-1970s and greater Western

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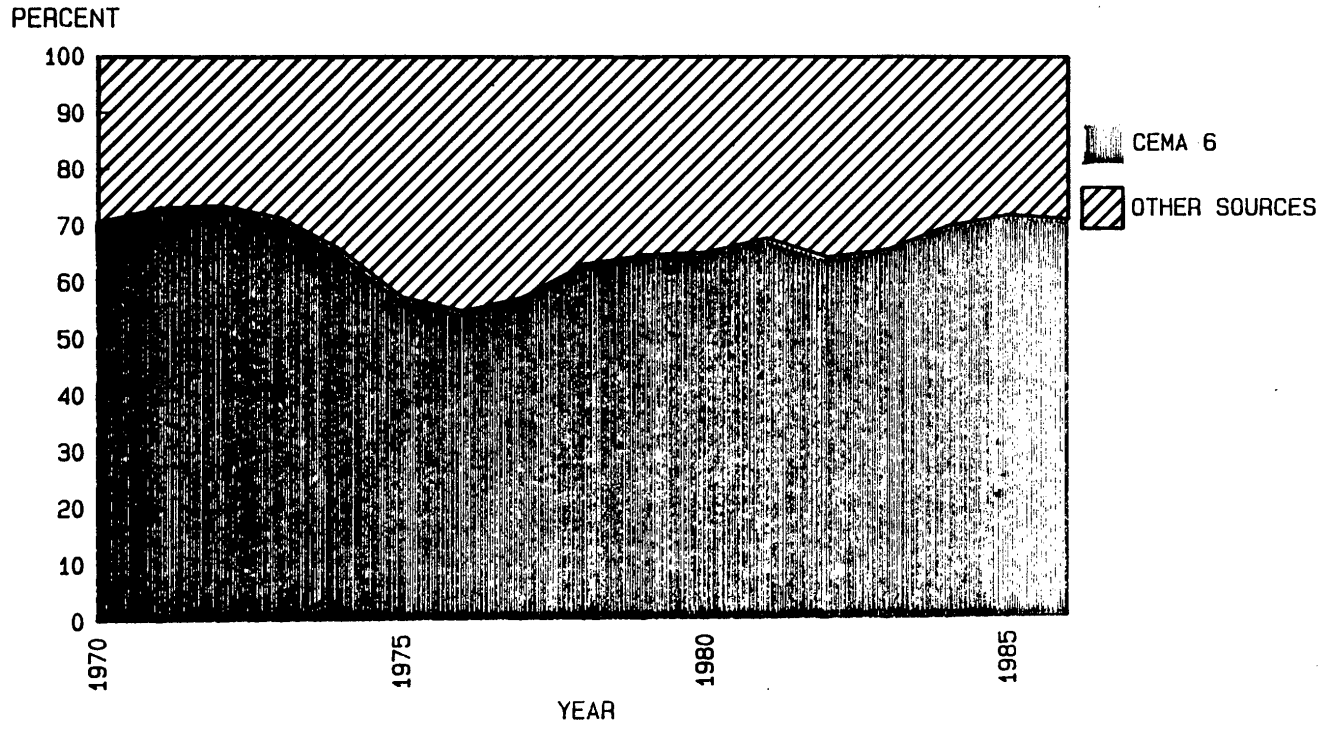
FIGURE 3

CEMA 6 SHARE OF SOVIET EQUIPMENT IMPORTS



Source: Soviet trade statistics

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willingness to lend to the USSR gave Moscow the hard currency needed to expand purchases from the West. Large increases in Soviet imports from the West occurred in most categories of equipment during the early and mid-1970s. In particular, imports of Western chemical and metal processing equipment exceeded imports of comparable equipment from the CEMA 6. Purchases of transportation equipment from the West were also substantial. 25X1

The CEMA 6 share of the Soviet equipment market began to recover in the late 1970s. Rising CEMA energy prices rapidly increased the value of Soviet exports to Eastern Europe, and the CEMA 6 had to boost their equipment exports in an attempt to keep trade balanced (see figure 4). The CEMA 6 initially tried to meet the higher cost of fuel imports through increased sales of consumer goods to Moscow, but the region's widening trade deficit soon led to stepped up sales of machinery and equipment. Between 1981 and 1985, CEMA-6 equipment sales grew by 72 percent, fast enough to match the increasing value of Soviet energy exports and help hold down the growth of East European deficits. 25X1

Import Surge Halts

In 1986 the double-digit growth in Soviet equipment purchases from Eastern Europe abruptly ended as the nominal value of imports fell by 2 percent and real imports dropped by an estimated 5 percent. The decline stood at odds with Soviet

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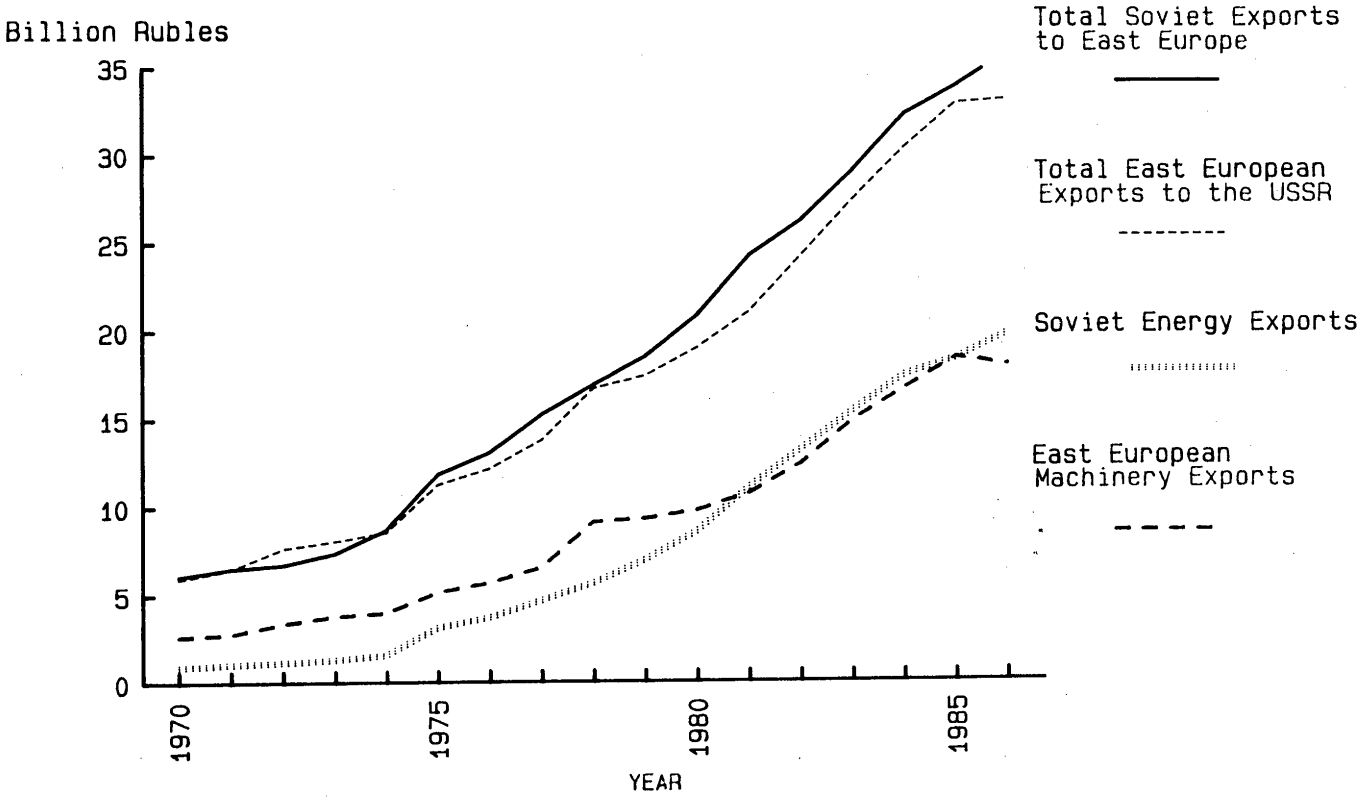
FIGURE 4
TRADING EAST EUROPEAN MACHINERY FOR SOVIET ENERGY



Source: Soviet trade statistics

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pronouncements that Eastern Europe contribute more machinery and equipment to the Soviet modernization campaign. Moreover, at least two of the three countries that reported a drop in equipment exports--East Germany and Czechoslovakia--are those best positioned to meet Soviet demands. We believe a number of factors probably accounted for the 1986 downturn:

- The Soviets finally put teeth into longstanding complaints about the quality of East European goods by rejecting some planned deliveries. Moscow's tougher attitude toward quality, in general, was shown in 1986 by large-scale rejections of domestically produced goods through gospriyemka--the State Acceptance program. Reporting suggests Soviet rejections of poor quality goods from some countries was higher in 1986 than in previous years.
- Moscow may have allowed several countries to delay deliveries so that the type and quality of some goods could be improved. For example, East Germany reportedly retained a larger portion of its annual machine tool output for the modernization of its own machine tool industry, with the understanding that deliveries to the USSR will increase sharply later.
- Soviet concern over the prospect of rising trade deficits with Eastern Europe over the next few years may have prompted a cutback in imports from the region. Moscow has publicly reported that it must

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address the problem of worsening terms of trade with CEMA as a result of declining oil prices.[5]

Data for 1987 indicate that East European deliveries of machinery to the Soviet Union were up slightly--an increase of some 5 percent in nominal terms, and probably half this amount in real terms.

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Impact on East European Economies

Both Eastern Europe and the Soviet Union have benefited from a trade relationship patterned on differences in comparative advantage. While contributing to Soviet investment and growth, East European machinery has paid for imports of Soviet energy and raw materials vital to the region's economies. Furthermore, during most of the 1970s, Eastern Europe was able to trade machinery--of low quality by world standards--for energy priced below world market levels. This Soviet subsidy contributed to the generally good economic performance recorded by Eastern Europe during this period.

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The gains for Eastern Europe diminished substantially,

5 The fall in the value of Soviet energy exports to Eastern Europe because of declining CEMA energy prices could result in large Soviet deficits with the region without adjustments in previously planned trade flows or prices. We believe Moscow's decision to impose tougher quality standards on imports from Eastern Europe in 1986 was influenced by the realization that because of declining terms of trade the USSR could no longer afford to purchase ever-growing quantities of East European machinery as during the previous 15 years.

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however, after 1978. As Soviet energy prices gradually rose to world market levels, Eastern Europe had to increase rapidly the volume of its machinery exports to maintain imports from the USSR (see figure 5). The combined impact of this adjustment in CEMA trade along with a significant drop in East European imports of Western machinery and equipment--due to hard currency balance of payments problems--reduced investment and economic growth throughout Eastern Europe in the 1980s.

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Reliance on the Soviet market also imposed a substantial cost on Eastern Europe by weakening the competitiveness of its machine-building industries. This dependence seems especially significant in the higher technology industries, where, for example, 80 percent of East German machine tool output is exported to the USSR and 70 percent of output from the Hungarian Videoton Computer Enterprise is sold to socialist countries. Although this orientation has ensured stability and employment in industries that often face highly cyclical demand in the West, East European production for the less demanding Soviet market has undermined incentives to improve product quality to remain competitive on world markets and thus has left the region increasingly vulnerable to shifts in Soviet requirements. This cost has become more burdensome as the East Europeans lose markets in the West and as Moscow presses for better quality deliveries. To upgrade production, the East Europeans need to make substantial investments in

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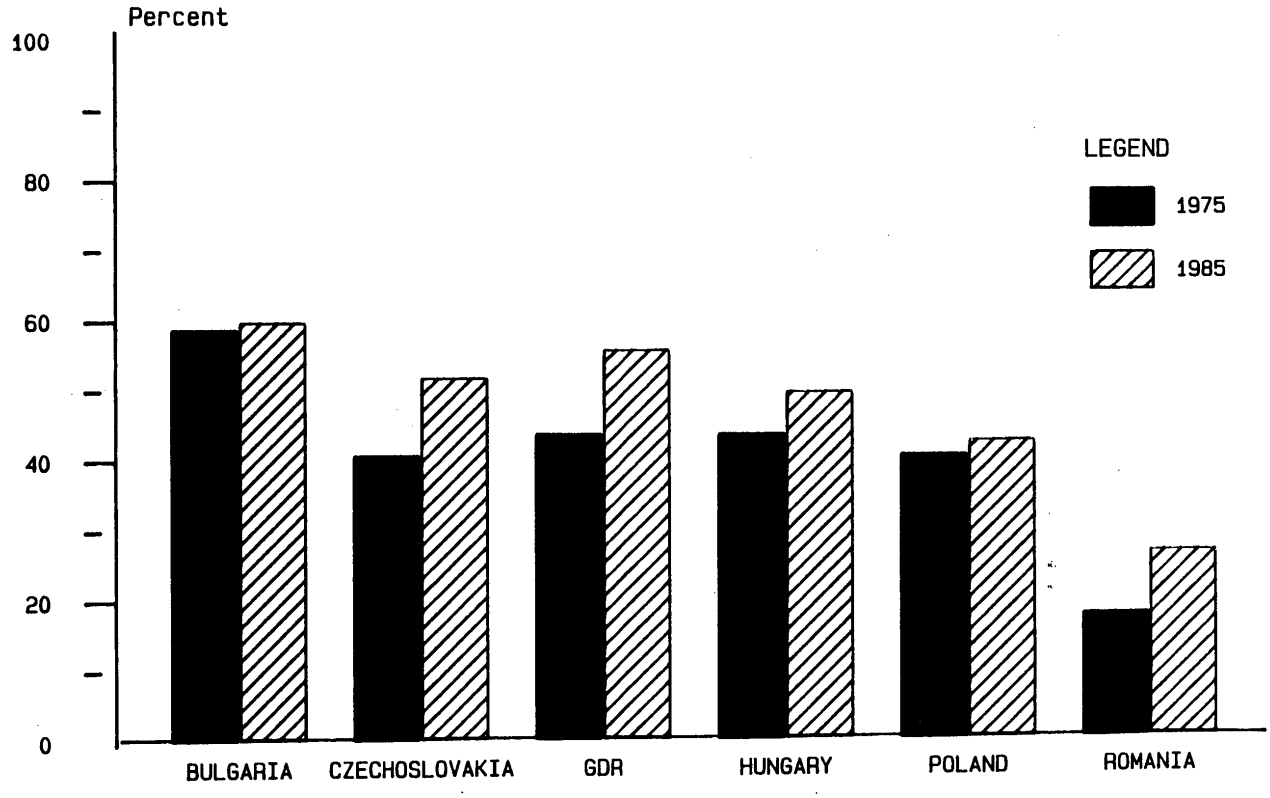
FIGURE 5
SOVIET SHARE OF TOTAL EAST EUROPEAN MACHINERY EXPORTS[a]



[a]Computed from trade data in current prices.

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their machine-building industries and import Western technologies; yet they are less able to sell goods in the West to help finance the purchase of Western equipment.

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Eastern Europe's Role In Soviet Modernization

Moscow's Goals and Motivations

Gorbachev's modernization program calls for a rapid expansion and updating of Soviet manufacturing facilities, and he clearly wants Eastern Europe to contribute more to meet that agenda.[6] The Soviets want both an increase in the total amount of equipment deliveries from Eastern Europe and better quality equipment. The weak performance of the Soviet machine-building industry in 1987 could put even more of a burden on imports. Particularly troubling for the modernization program was the fact that over two-thirds of the targets set for the production of advanced and highly efficient types of output were not met, according to recently published plan results.

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Other considerations also heighten the importance of Eastern Europe as a potential supplier of equipment to the USSR. Since late 1985, the Soviets have been rocked by the collapse of oil prices on the world market. This has not only reduced hard currency revenues from direct oil sales to the

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developed West, but also cut cash earnings from sales of arms to the oil-rich countries that have been Moscow's best customers. The decline in hard currency earnings coupled with the depreciation of the dollar make it more difficult for the Soviets to import high quality equipment from its traditional suppliers in Western Europe and Japan. Moreover, Moscow remains troubled by Western efforts to control exports of some high technology equipment. [redacted] 25X1

Moscow is looking to Eastern Europe to provide a broad array of machinery and equipment. In an internal study completed in 1984, Moscow indicated areas in which its CEMA partners are expected to develop their capabilities to deliver equipment for which Moscow now relies on the West. These areas include chemical engineering, oil equipment, automation of production in industry, agriculture, and transport, electronic equipment components, metal processing equipment, equipment for the automotive industry, large capacity trucks, heavy excavators, bulldozers and pipelayers, mining equipment, and equipment for the mechanization of materials-handling operations. [redacted] 25X1

National Efforts

The CEMA 6 countries appear to be making efforts to improve capabilities in key high-tech areas both to meet Moscow's demands and to modernize their ailing economies. National plans have highlighted computers, other

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microelectronics, computer controlled machine tools, and flexible manufacturing systems as high priorities for development during the coming years. Those countries with capabilities in these areas are apt to draw the strongest Soviet attention.

- Bulgaria probably will retain the niche it already has carved out in the computer and electronics fields. It is a leader in the production of selected computer peripherals, including magnetic disk drives generally considered superior to Soviet models, and a co-leader with the GDR in personal computer technology.
- East Germany--which sends about 70 percent of its integrated circuit output to the USSR--is the leading East European producer of microelectronics and computer equipment. Most of this equipment reportedly is more reliable than Soviet counterparts. At the end of last year, East Germany began production of a CEMA-coordinated high-performance personal computer with a storage capacity and processing speed approximately four times greater than previous products. More importantly, however, East Germany is a major producer of machine tool lines and optical equipment, some of which are also of excellent quality. The marriage of these capabilities will

almost certainly permit East Berlin to lead the CEMA 6 in the flexible manufacturing systems (FMS) field.

- o Czechoslovakia is also an important producer of conventional and advanced machine tools and has some computer capabilities. Although certain to remain behind East Germany as a supplier, Czechoslovakia probably has the greatest potential to increase substantially its exports of advanced machine tools to the USSR. Under Soviet direction, Czechoslovakia may develop a leading role in specialized areas of machinery production, such as robots or nuclear reactor-related equipment.
- o Hungary is likely to continue its leadership in software for machine tool systems, which will give it entree to specialized areas of FMS hardware development.
- o Poland supplies the Soviet Union with some computer equipment, such as minicomputers, floppy disk drives and printers that generally are on par with Soviet and East German models. Because of its serious financial problems, however, Poland is not likely to acquire the capabilities needed to become a leader in any of the high-tech fields. Despite the size of its industrial base, its position among the CEMA 6 as a supplier of machinery to the Soviet Union has been declining. In trying to regain its pre-1980

position as an exporter to the USSR, Warsaw will probably contribute some expertise to joint development projects and may benefit in the long run from the advances made by its CEMA allies.

- o Romania is likely to continue specializing in energy extraction and processing equipment, building on its own considerable experience and capacity in this area. Bucharest, however, has not been a major participant in CEMA S&T programs and may find itself more of a beneficiary than a contributor to the mainstream of CEMA machinery development and production.

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CEMA and Bilateral Efforts

These individual national efforts are being supplemented by multilateral CEMA agreements and bilateral arrangements to develop and produce technologically advanced equipment as quickly as possible.

- o In December 1985, CEMA adopted the Comprehensive Long-term Science and Technology (S&T) Program to guide research and development and new production through the year 2000.
- o The CEMA countries have also signed a series of protocols to coordinate five-year development plans to support rapid development of technology sectors in each of their economies.

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- A series of bilateral trade agreements call for increased trade turnover in computers, microelectronics, machine tools, and flexible manufacturing systems during the current five year planning period.
- Numerous production specialization and cooperation agreements have also been adopted that are aimed at avoiding unnecessary duplication of effort.

Moscow also has signed agreements with all East European countries except Romania for the creation of joint enterprises, international research, scientific and production associations, and the establishment of direct ties among existing enterprises within CEMA. The Soviets hope that these measures will also increase specialization and division of labor in order to conserve scarce technical expertise and other resources, and boost the exchange of both ideas and goods.

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The Soviets have sought other institutional changes to improve the quality of deliveries. At the first session of the newly established CEMA Commission for Legal Affairs late last year, delegates discussed amendments to the "General CEMA Delivery Conditions"--a set of guidelines and standards for deliveries of goods--that would establish better guarantees of quality. In addition, the Soviets reportedly are increasing their inspections of goods from Eastern Europe and are not accepting those that do not meet the now-higher Soviet

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standards.

Obtaining Western Technology

Despite the CEMA objective of technological independence from the West, the USSR also seeks to benefit from Eastern Europe's better access to Western knowledge and technology. For example, Hungary recently obtained COCOM approval for the purchase of a West German large capacity computer to run its new tax program, and Poland is currently seeking assistance from the IMF in computerizing its financial system.

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The East European regimes also have promoted access to Western technology by liberalizing joint venture legislation and reducing customs duties on private imports of computer-related products.

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Eastern Europe probably transfers technology to the USSR most frequently through the export of indigenously manufactured products embedded with legally obtained Western

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products and licenses. However, the CEMA S&T program may give the Soviets--in their leadership role--increased leverage in pushing Eastern Europe to acquire Western technology clandestinely, especially if these regimes believe they must satisfy their S&T obligations to secure supplies of Soviet raw materials or to share in the benefits from CEMA specialization. [redacted] 25X1

Soviet Needs Versus East European Realities

The steps that Moscow has taken indicate the seriousness of its efforts to raise the technological levels of CEMA economies and gain more advanced machinery and equipment from Eastern Europe. Nonetheless, a number of significant barriers will continue to impede progress over the next several years.[7]

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Shifting Terms of Trade. The greatest barrier to the USSR's push for an increase in the flow of East European equipment may be the shift in terms of trade against the Soviet Union. The fall in world oil prices will be reflected even more in the next few years--through the CEMA price formula--in lower Soviet ruble earnings from oil deliveries to Eastern Europe. Unless changes are made to planned imports and exports, the value of Soviet total ruble exports to Eastern Europe could drop sharply, and Moscow may begin

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running trade deficits with the region as early as this year. In an interview appearing in the Soviet publication Ekonomicheskaya Gazeta, a high-level Hungarian official said that because of the expected decline in the prices of Soviet exports during the next few years, the USSR will have to increase the volume of its deliveries in order to pay for planned imports of Hungarian goods.

Statements by Soviet officials indicate that Moscow's first move will be to increase sharply exports of machinery and manufactured goods to Eastern Europe in order to counter declining value of its exports in the face of low energy prices. This will be a difficult task for Moscow given Soviet domestic needs and the push to increase Soviet exports of manufactured goods to the West. Failing to accomplish this, the Soviets probably will cut back more than planned on imports of lower quality East European machinery while continuing to press for equipment most needed by the Soviet economy. The distribution of equipment imports from Eastern Europe is likely to shift further from heavy and unsophisticated equipment toward advanced machinery embodying high technology.

- Computers and other electronic equipment will grow in importance as will metal processing, energy engineering, and resource processing equipment. Food processing and light industry equipment may also become more important as Moscow tries to

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increase the welfare of Soviet consumers.

- The share of transportation equipment will probably decline; the same might be true for agricultural, material handling, laboratory, and chemical equipment. [redacted] 25X1

East European Priorities. Although the East European regimes want to acquire high-tech skills, their own domestic priorities have led them to respond slowly to Moscow's initiatives, especially its drive for closer cooperation under the S&T 2000 program. They are reluctant to surrender control of domestic high-technology programs to the Soviets or commit resources to projects that in the end will mainly benefit the USSR. Efforts to coordinate development plans have met strong opposition both from countries that expect relatively small gains from participation--like the GDR--and from those that feel themselves relegated to an inferior position in the community--like Romania. Most are also afraid that active participation would force a reorientation of trade relations away from the West that would deprive them of needed imports and hard-currency earnings. For their part, Soviet scientists and engineers are reluctant, either for political, ethnic or personal reasons, to keep their East European counterparts informed of developments in the Soviet Union. [redacted] 25X1

Reform Jitters. Soviet measures to grant increased autonomy to Soviet enterprises may also affect the volume of equipment imported from Eastern Europe. Enterprises--now

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required to generate profits and given more opportunities to choose their own suppliers--may no longer be as willing to accept poor quality East European machinery. [redacted] 25X1

[redacted] Soviet managers will no longer be bound by trade protocols to accept East European equipment, but will be free to look for alternatives, especially better or cheaper domestic products. [redacted] 25X1

Another problem hampering cooperation is the lack of realistic prices and exchange rates. Proposals have been put forward to reform CEMA's financial system and eventually establish convertible currencies within the Bloc, but little will be accomplished in the near term. For example, the USSR and Czechoslovakia recently signed an agreement allowing enterprises engaged in joint ties or direct cooperation to make payments to each other in rubles or crowns--the first step [redacted] in establishing complete currency convertibility within CEMA. The accord does nothing, however, to overcome the major problem of establishing realistic prices and exchange rates necessary for currency convertibility to succeed. [redacted] 25X1

Economic Woes. Serious economic problems faced by the East European countries probably will limit their ability to supply more and better quality machinery to the Soviets.

- They must continue to sell to the West to earn the hard currency needed to keep servicing the debts incurred in the 1970s as well as to buy capital

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goods that will help update their technologies.

- They need to retain a significant share of the capital goods they produce to sustain growth and to provide their own populations with the consumer goods that will help improve labor productivity.
- Soviet demands pinch the East European countries by putting additional burdens on the fledgling technology industries--many already stretched to the limit--which are key to meeting other economic priorities.

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The CEMA 6 countries are likely to have varying degrees of success in coping with Soviet demands. East Germany, Bulgaria, and Czechoslovakia will quite likely fare the best. They have the strongest economies and are the least troubled by hard currency debt. Hungary has some useful industrial capabilities, but its large hard currency debt and difficulties in implementing its reform program will probably hamper its response to Soviet requirements.

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Warsaw and Bucharest face the most serious situations. Both economies have suffered significant deterioration in the 1980s, and neither leadership seems capable of bringing about a sustained recovery.

- Poland is hampered by intractable debt problems with the West and with the Kremlin as well as by the failure of the Jaruzelski regime to fashion a reform program that will win the population's support.

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While Moscow is likely to be lenient with Warsaw, the lack of progress in correcting fundamental economic flaws will block the additional Western capital needed to modernize Polish industry.

- Romania's prospects are even less bright because President Ceausescu remains unwilling to ease the crushing austerity imposed on the economy as he presses to repay the country's hard currency debt.

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Appendix 1

Transportation Equipment

Transportation is the largest category of equipment exported by the CEMA 6 to the Soviet Union (see figures A-1 and A-2). These exports include railroad rolling stock, streetcars, buses, engines for commercial and passenger vehicles, motorcycles, vessels, and assorted other equipment required for transportation. Soviet imports of CEMA-6 transportation equipment increased steadily during the 1970s and early 1980s, accelerated during 1982-85 with an average annual growth of 16 percent, but leveled off in 1986. Imports in 1986 totaled nearly 4 billion rubles, accounting for more than two-thirds of total transportation equipment imported by the Soviets and over a fifth of equipment imports from the CEMA 6. [redacted] 25X1

By Subcategory. The main subcategories--vessels and related equipment, commercial road equipment, and rail and related equipment--each accounted for roughly one-third of total transportation imports from the CEMA 6 in 1986. Soviet reliance on CEMA was greatest in the rail and related equipment subcategory with more than 90 percent of these imports coming from Eastern Europe.

- Czechoslovakia and East Germany are the largest suppliers, accounting for 30 percent and 29 percent of total imports, respectively, in 1986. Deliveries from both countries increased steadily during the

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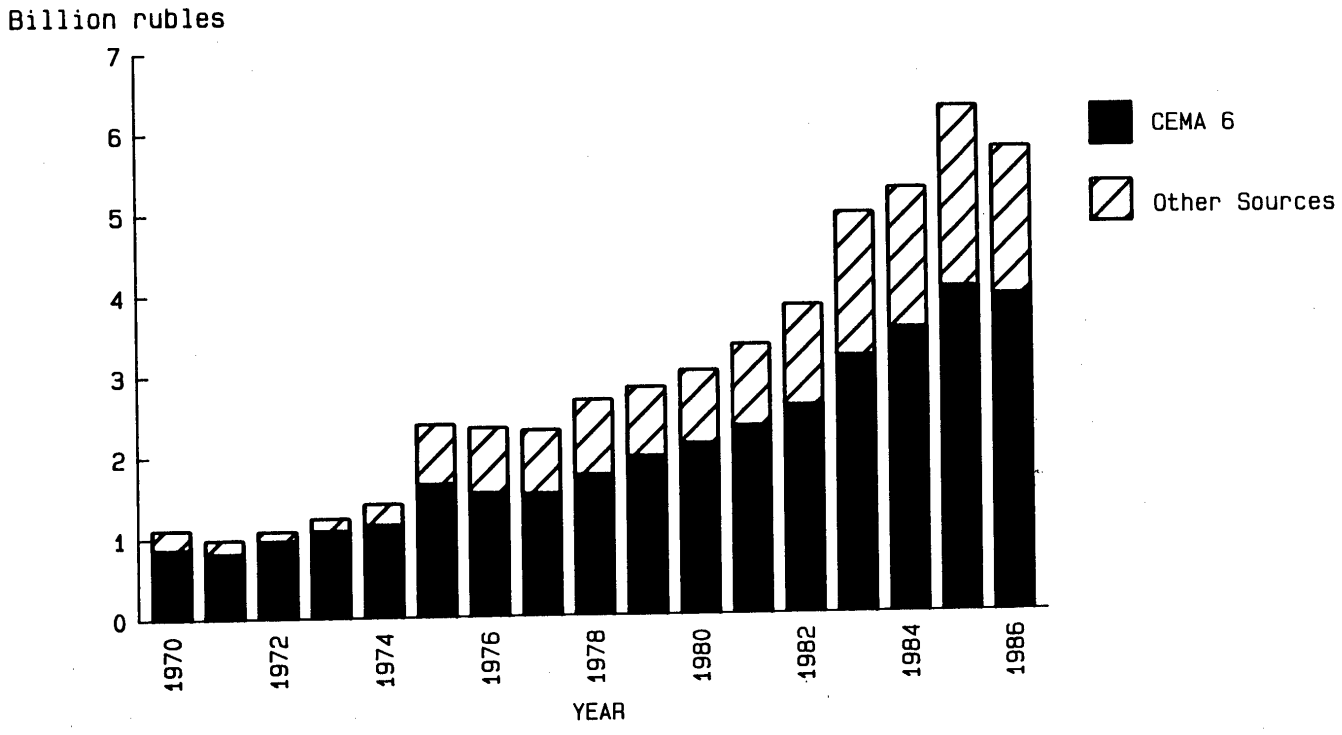
FIGURE A-1
SOVIET IMPORTS OF TRANSPORT EQUIPMENT



Source: Soviet trade statistics

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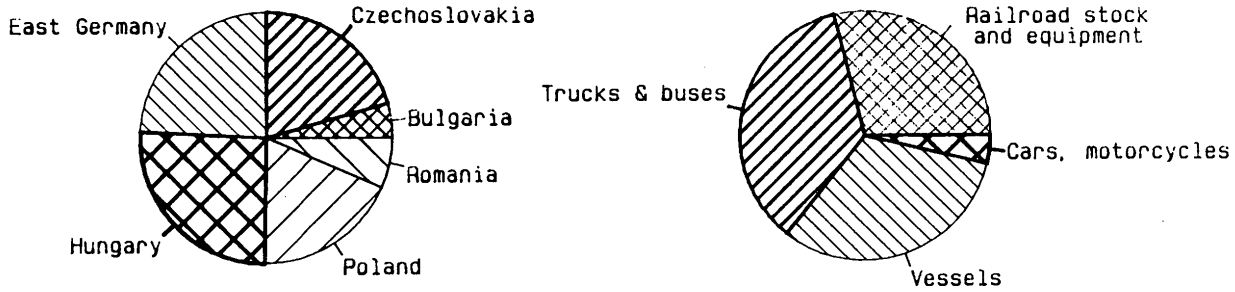
FIGURE A-2
SOVIET TRANSPORT EQUIPMENT IMPORTS FROM THE CEMA 6, 1986



Source: Soviet trade statisics

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1970s and 1980s although those from East Germany declined by 7 percent in 1986. East Germany mostly provides passenger and refrigerator cars to the USSR. Plans called for Czechoslovakia to deliver three-fourths of its production of the new CME-5 electric locomotive--described as the most powerful locomotive produced by the Czechs--to the USSR last year. Prague also was to deliver 40 CS7 locomotives designed for mainline passenger service to and from Moscow.

- Romania and Poland provided 16 and 14 percent respectively of rail equipment imports. Romanian rail equipment exports have expanded rapidly since starting up in 1981. Bucharest primarily provides freight cars to Moscow, although part of its production of new diesel-electric locomotives probably has been tagged to the USSR. Polish deliveries--consisting chiefly of freight cars--have grown slowly since the mid-1970s.

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Over three-fifths of all Soviet imports in the commercial road equipment subcategory in 1986 came from the CEMA 6. Half of these consisted of accessories, components, and spare parts--including engines--while buses accounted for one-third. The Soviets import only small quantities of specialized trucks--such as refrigeration and isothermic trucks--from their CEMA partners.

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- Hungary supplied 43 percent of total Soviet imports in this subcategory in 1986, including almost all imports of buses and 44 percent of accessories, spare parts, engines, and garage equipment. Long-term CEMA specialization agreements have made Hungary the most important supplier in the bloc of commercial road equipment during the 1970-86 period.
- Czechoslovakia rapidly increased deliveries of parts, accessories, and trucks during the 1980s to become the second leading CEMA supplier. Plans call for Czechoslovakia to export tram-cars, trolley-buses, Tatra cross-country dump-trucks, Avia trucks, and refrigerator vehicles to the USSR during the current five-year planning period.

Moscow depended on Eastern Europe for 62 percent of total imports of vessels and related equipment in 1986. Soviet data do not specify the exact nature of these ships, but East European sources indicate that a wide variety of fishing, military, cargo, and passenger ships are involved.

- East Germany is the largest supplier of vessels and related equipment to the Soviets, delivering 29 percent of total imports in this category in 1986. Deliveries fell by 16 percent in that year, parallel to the downward trend in imports from non-CEMA suppliers Yugoslavia and Finland.
- Imports from Poland--accounting for nearly one-fifth

[redacted] 25X1

of total vessel-related purchases by the Soviets in 1986--expanded rapidly from 1984 to 1986 following several years of stagnation. [redacted] 25X1

Food and Light Industrial Equipment

Imports of food and light industrial equipment--including equipment for food processing, textile production, sewing, and the leather, shoe, and fur industries--are the second largest category of Soviet imports from the CEMA 6 (see figures A-3 and A-4).[8] [redacted] 25X1

Soviet purchases grew at an average annual rate of 16 percent between 1971 and 1985 but fell 8 percent in 1986. Imports in 1986 were valued at 1.3 billion rubles and accounted for almost three-fourths of total Soviet imports of light industrial equipment and 7.3 percent of all 1986 Soviet imports of equipment from the CEMA 6. [redacted] 25X1

By Subcategory. Moscow's reliance on CEMA is greatest in the textile equipment subcategory, where 84 percent of these imports in 1986 came from Eastern Europe. This reliance, however, has declined in recent years, as Western countries such as Japan, Italy and France have made some inroads into the Soviet market.

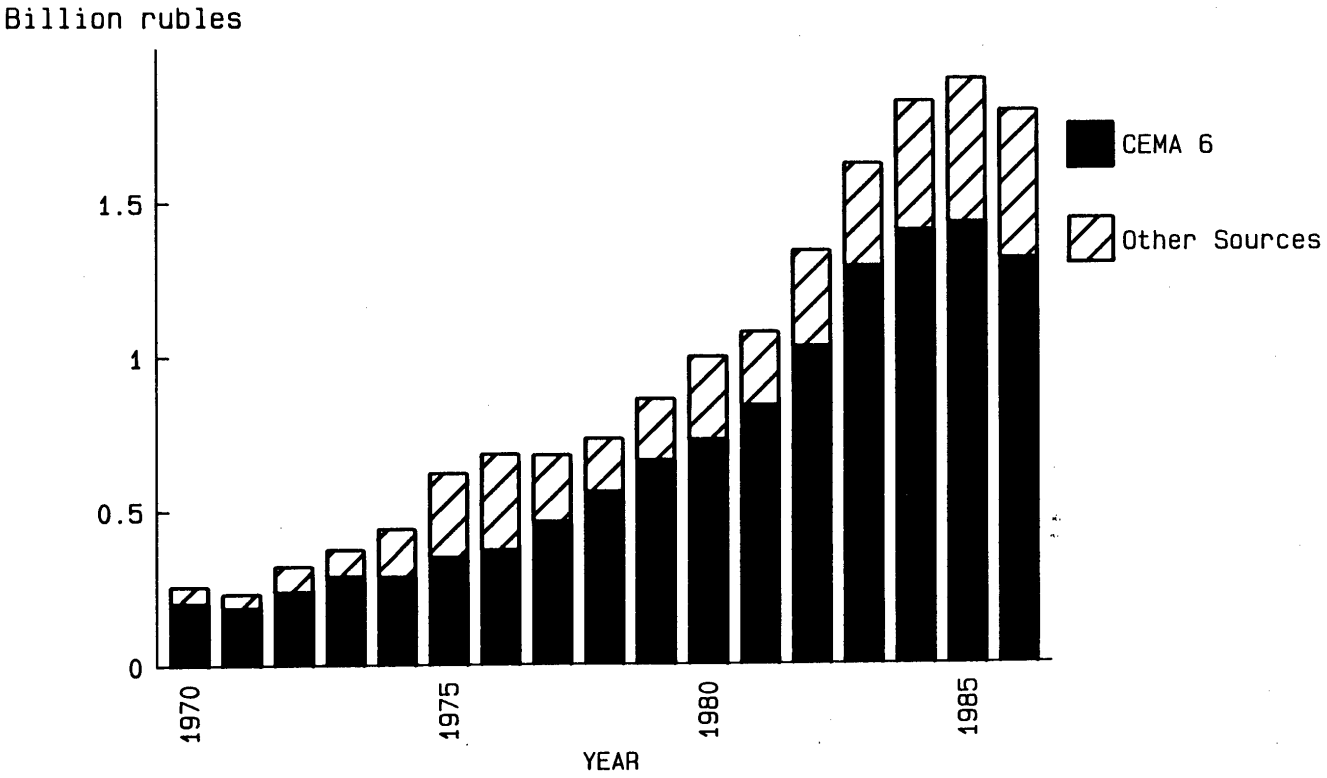
o Czechoslovakia--acknowledged as a world leader in

[redacted]

25X1

[redacted] 25X1

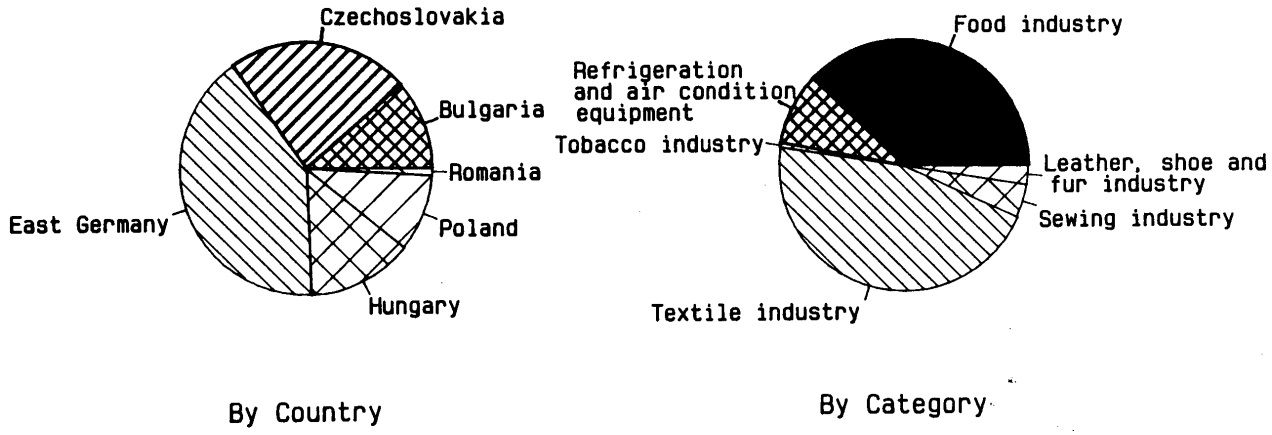
FIGURE A-3
SOVIET IMPORTS OF LIGHT INDUSTRIAL EQUIPMENT



Source: Soviet trade statistics

25X1

FIGURE A-4
SOVIET LIGHT INDUSTRY EQUIPMENT IMPORTS FROM THE CEMA 6, 1986



Source: Soviet trade statistics

25X1

25X1

textile technology--supplied more than half of all such imports in 1986. Rapid expansion of Czechoslovak textile machinery deliveries--averaging 21 percent growth annually since 1970--ended in 1984 with large reductions in imports of auxiliary textile machines and parts, and machinery for processing textile yarns, skins, and hides.

- East Germany and Poland--accounting for 13 percent and 7 percent of Soviet textile machinery imports respectively--have also delivered less in recent years while those from Bulgaria have increased to account now for 9 percent of total imports.

25X1

The Soviets relied on the CEMA 6 for nearly three-fourths of their 1986 imports of equipment for the food processing subcategory. A 13-percent downturn in 1986 contrasts with the rapid growth in imports from Eastern Europe during 1975-85. Imports from non-CEMA suppliers, however, fell even further than those from Eastern Europe in 1986.

- The East Germans and Czechoslovaks provided 30 percent and 19 percent, respectively, of total Soviet imports of food processing equipment.
- Imports from lesser CEMA suppliers--Bulgaria, Hungary and Poland--have also declined in recent years.

25X1

25X1

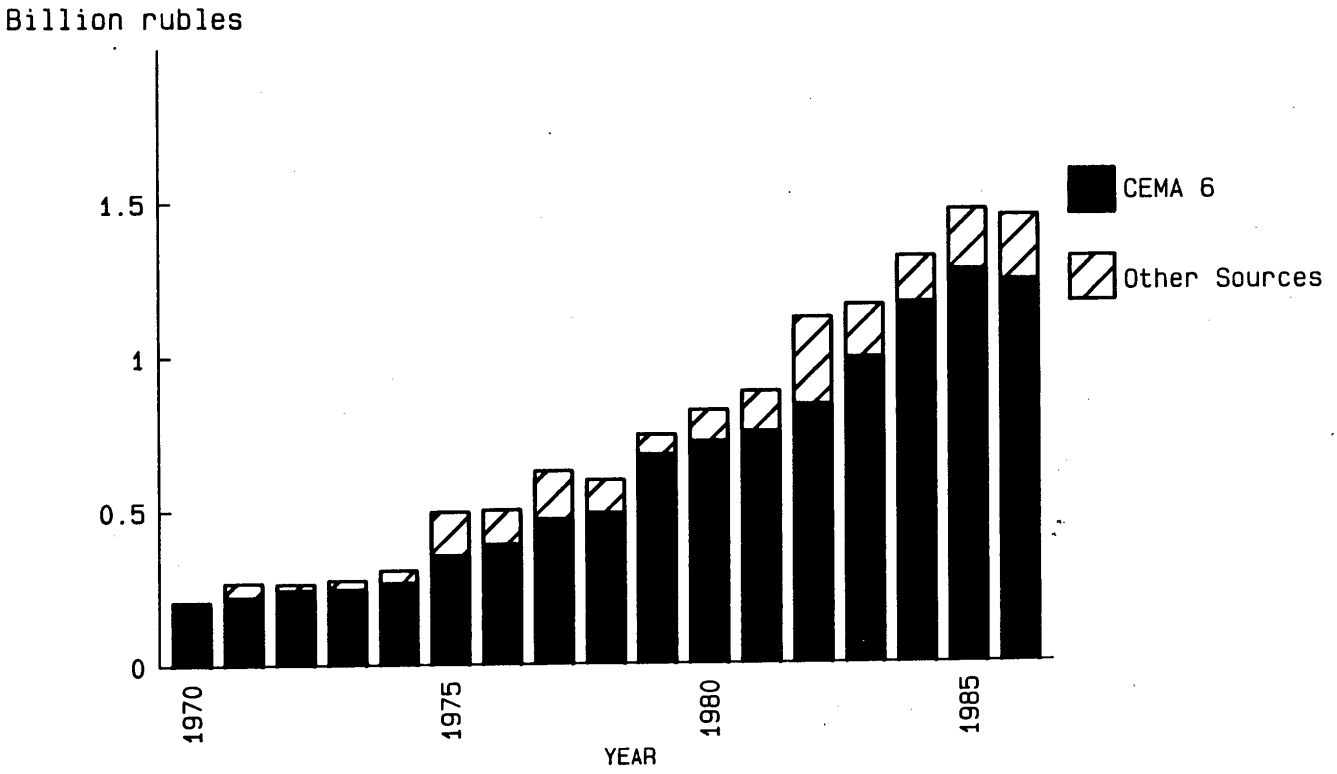
Material-Handling Equipment

Soviet imports of equipment from the CEMA 6 in the material-handling category consist largely of electric cars (fork lifts), automatic loaders, cable cars, and lifting machines (see figures A-5 and A-6). Soviet leaders have long acknowledged Soviet inadequacy in this area and have pledged to upgrade supplies of such machinery to industry. Imports from Eastern Europe increased at an average annual rate of 13 percent from 1970 to 1985 but leveled off in 1986. About 1.3 billion rubles worth of this equipment was imported from the CEMA 6 in 1986, representing 86 percent of total Soviet imports of material-handling equipment and 7 percent of total equipment imports from the region. Bulgaria accounted for half of all Soviet imports of material-handling equipment.

By Subcategory

- Fork lifts and automatic loaders accounted for 43 percent of all material-handling equipment imported by the Soviets from Eastern Europe in 1986. Bulgaria--which predominates in this area due to CEMA specialization arrangements that have made it the supplier for other CEMA countries--delivered 98 percent of total Soviet imports of this equipment, although deliveries were down 9 percent from the previous year. Bulgaria also supplied all of the accessories and spare parts for fork lifts and loaders, as well as all of the machine handling equipment and electric cable cars purchased by the

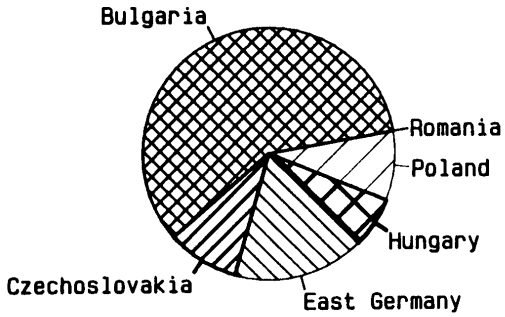
FIGURE A-5
SOVIET IMPORTS OF MATERIAL-HANDLING EQUIPMENT



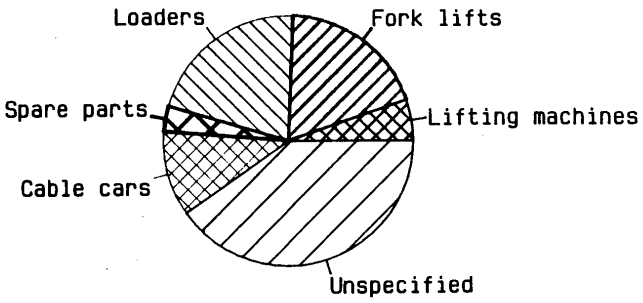
Source: Soviet trade statistics

25X1

FIGURE A-6
SOVIET MATERIAL-HANDLING EQUIPMENT IMPORTS FROM THE CEMA 6, 1986



By Country



By Category

Source: Soviet trade statistics

25X1

25X1

Soviets in 1986.

- Only about one-third of Soviet imports of lifting equipment in 1986 came from other CEMA countries--and almost all of this was from Poland.
- Soviet data do not specify the types of material-handling equipment imported from East Germany, Czechoslovakia, and Hungary; these three accounted for 28 percent of total Soviet imports of such equipment in 1986.

25X1

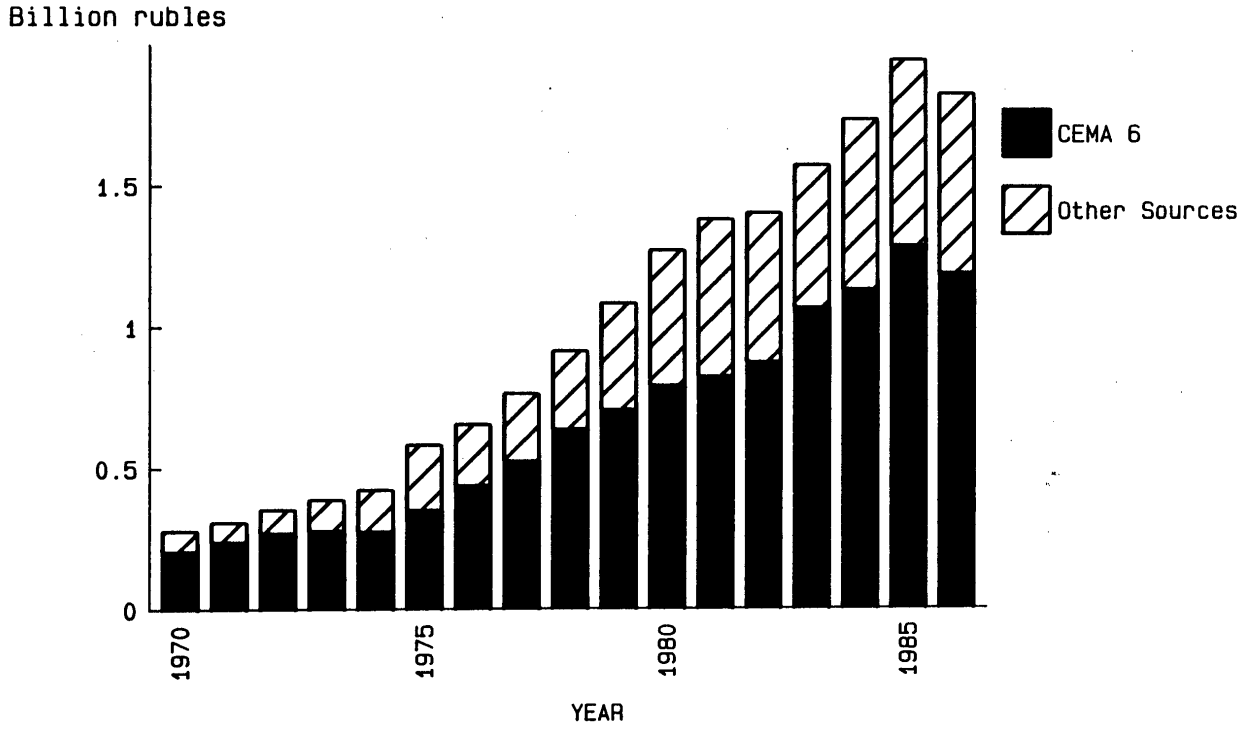
Energy-Engineering Equipment

Soviet imports of energy engineering equipment are used to produce, transport, and supply power for various industries. The ambiguous names given by the USSR to much of the equipment in this category preclude precise identification of many of the subcategories, which include power-engineering equipment such as diesel engines and parts as well as a variety of electrical equipment--motors, transformers, starters, switchboards, electromagnets, accumulators, electrodes, and cables. Soviet imports of this equipment from Eastern Europe grew at an average annual rate of 12 percent during 1970 to 1985 but declined 8 percent in 1986. The CEMA 6 supplied Moscow with 1.2 billion rubles in energy-engineering equipment in 1986--two-thirds of all such imports by the Soviet Union and 7 percent of all Soviet imports of equipment from the CEMA 6 in that year (see figures A-7 and A-

25X1

FIGURE A-7

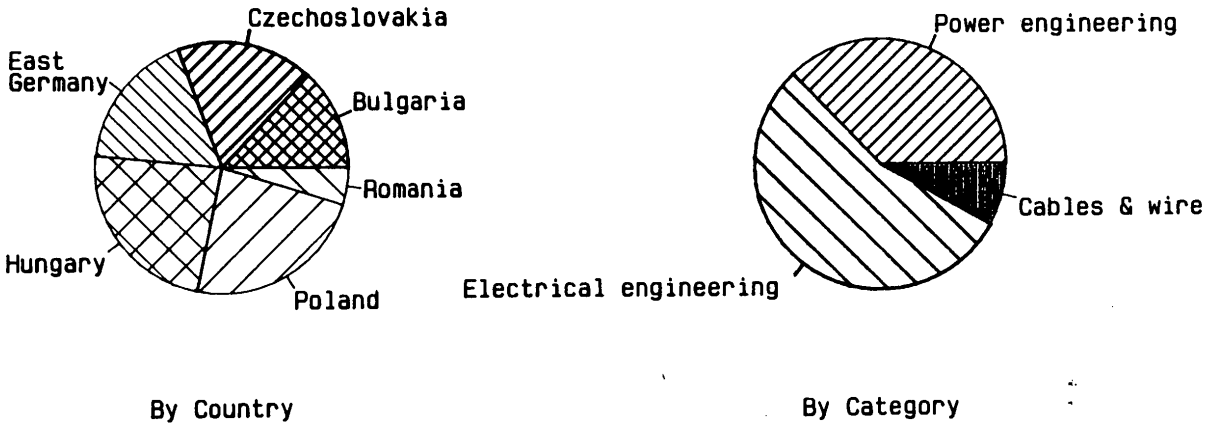
SOVIET IMPORTS OF ENERGY-ENGINEERING EQUIPMENT



Source: Soviet trade statistics

25X1

FIGURE A-8
SOVIET ENERGY-ENGINEERING EQUIPMENT IMPORTS FROM THE CEMA 6, 1986



Source: Soviet trade statistics

25X1

[redacted] 25X1

8). [redacted] 25X1

By Subcategory. Equipment in the electrical, power, and cable subcategories accounted for 55, 37, and 8 percent, respectively, of all Soviet imports of energy engineering equipment from the CEMA 6 in 1986. Moscow relied on CEMA for two-thirds of its imports in the electrical subcategory in that year. These imports declined by 6 percent overall in 1986, although they expanded by 20 percent from non-CEMA sources.

- The main CEMA supplier, Poland, supplied more than a quarter of all such Soviet imports, with large deliveries of electric motors, transformer booths, electromagnets, and other unspecified equipment.
- Deliveries from Bulgaria--accounting for 16 percent of all Soviet imports of electrical equipment--have held steady in recent years. Those from East Germany and Czechoslovakia have fluctuated widely.

[redacted] 25X1

Moscow relied on the CEMA 6 for more than four-fifths of its 1986 imports in the power-engineering subcategory. More than a third of these are not defined, with only diesel engines, electric power stations, and spare parts specified. CEMA deliveries have declined by 11 percent since 1984.

- Czechoslovakia accounted for 30 percent of Soviet imports of this equipment in 1986.
- East Germany was responsible for another 22 percent

[redacted] 25X1

[redacted] 25X1

of all Soviet imports of power-engineering equipment. [redacted] 25X1

Agricultural Equipment

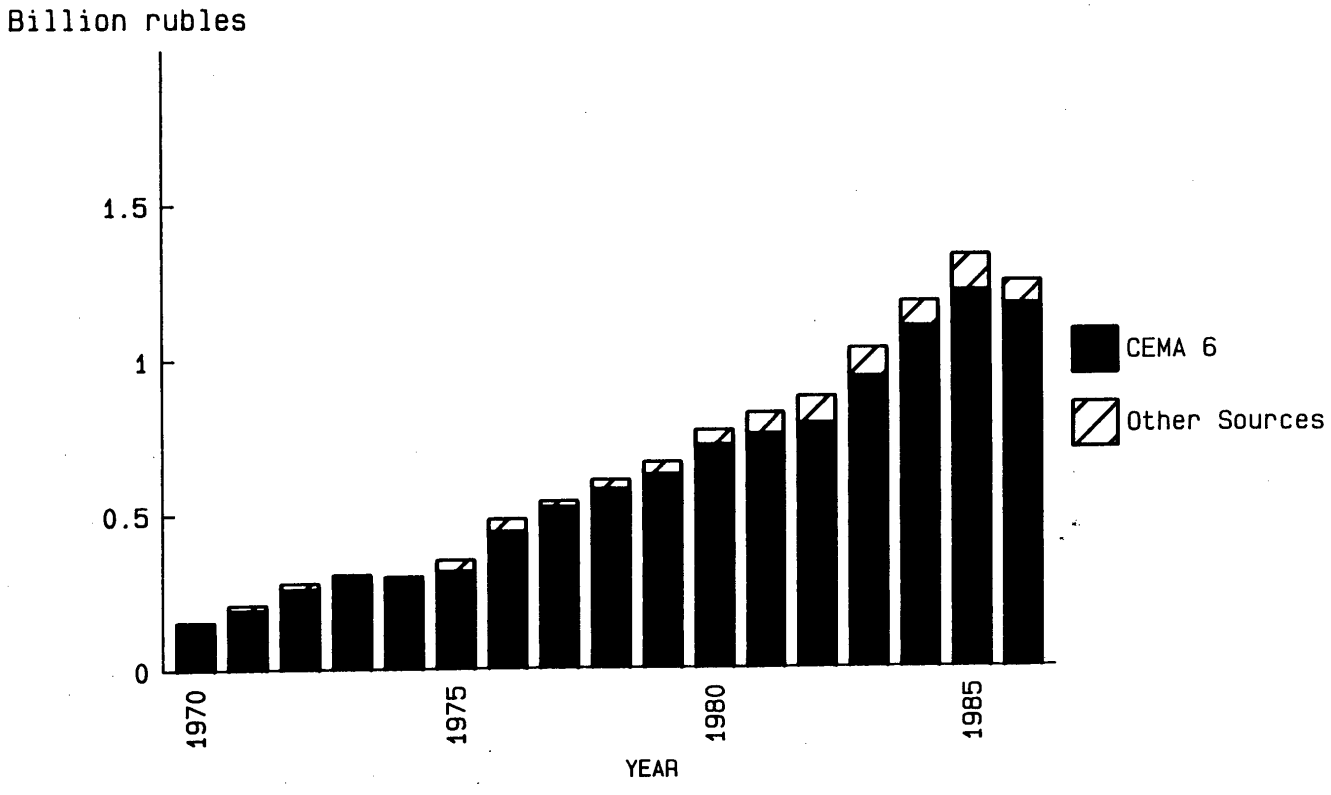
Soviet imports of equipment from the CEMA 6 in the agricultural category include tractors, combines, mowers, sowers, grain cleaners, livestock raising equipment, and motors for agricultural machinery. Imports from Eastern Europe grew an average of 17 percent annually during the 1970s, slowed, and even declined in the 1980s. In 1986 Moscow purchased 1.2 billion rubles worth of agricultural equipment from Eastern Europe, accounting for 95 percent of total Soviet purchases. More than a third of these imports in 1986 was unspecified by type in Soviet trade data and other sources of information fail to shed light on the nature of this equipment (see figures A-9 and A-10). [redacted] 25X1

By Subcategory. The Soviets relied heavily on Eastern Europe for imports of agricultural equipment in the subcategories for which we have data.

- East Germany--the largest CEMA supplier to the Soviets--was the sole source for grain cleaners, hay and straw presses, and milking units and supplied 91 percent of all combines and 72 percent of mowers imported by the Soviets in 1986.
- All of the sprinkling machines imported by the Soviets in 1986 came from Czechoslovakia, and

[redacted] 25X1

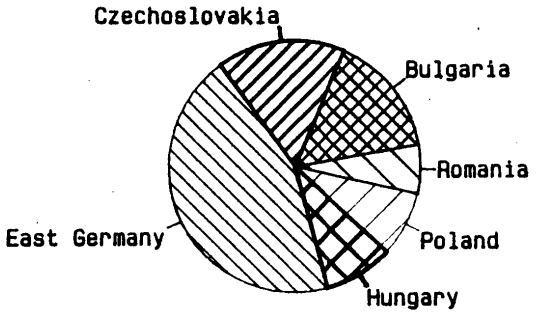
FIGURE A-9
SOVIET IMPORTS OF AGRICULTURAL EQUIPMENT



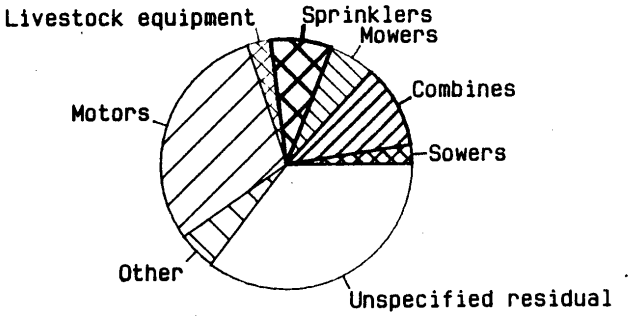
Source: Soviet trade statistics

25X1

FIGURE A-10
SOVIET AGRICULTURAL EQUIPMENT IMPORTS FROM THE CEMA 6, 1986



By Country



By Category

Source: Soviet trade statistics

25X1

25X1

Romania supplied nearly all of the imports of sowers.

- Motors for agricultural machinery--comprising more than quarter of total agricultural equipment imports--came entirely from Eastern Europe; East Germany accounted for 61 percent, Czechoslovakia for 21 percent, and Bulgaria for 18 percent of deliveries. 25X1

Business Equipment

Soviet trade data on imports of business equipment from the CEMA 6 are incomplete and vague. The Soviets lump imports of sophisticated computers together with simple adding machines and fail to report imports of computers from several CEMA countries. The subcategory also includes office machinery such as typewriters, billing equipment, and bookkeeping machines. 25X1

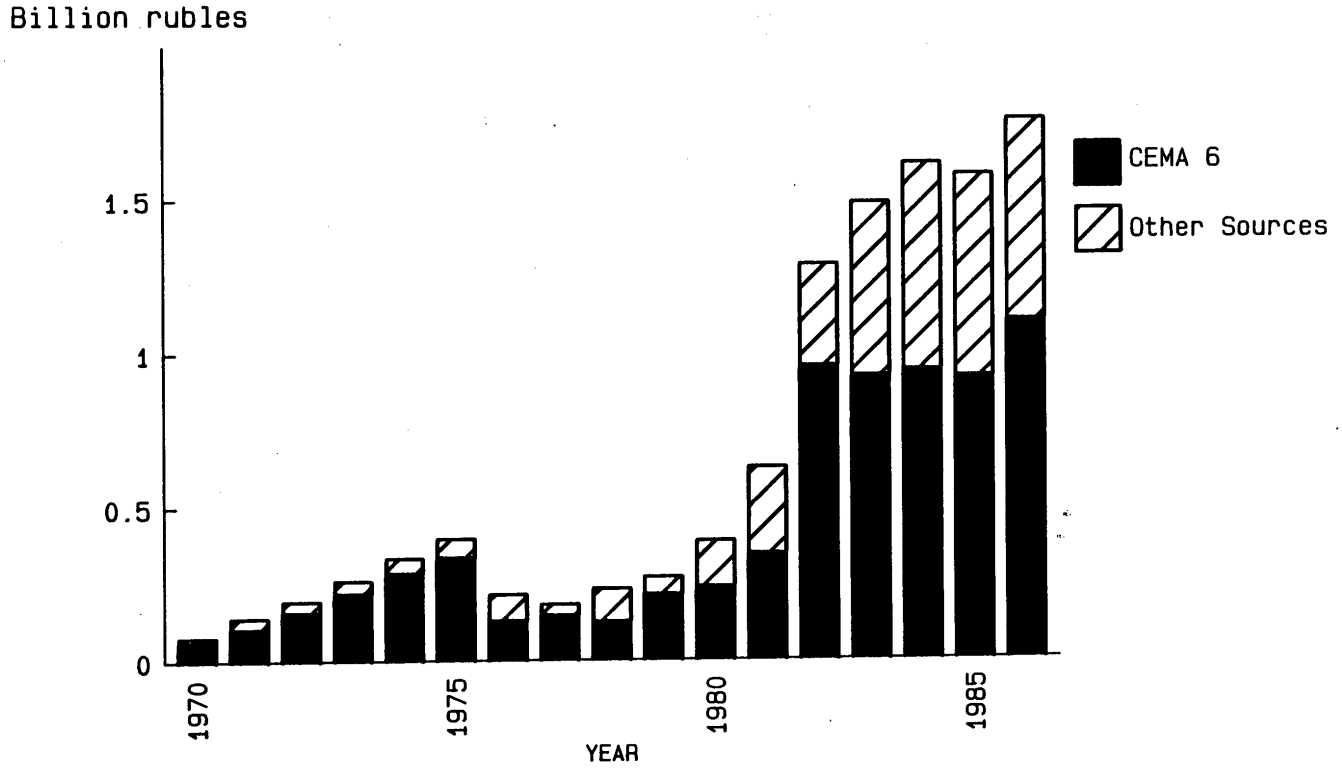
Moscow's push for computers and related equipment from CEMA is apparent from the data as business equipment imports expanded at an average annual rate of 29 percent from 1980 to 1986. CEMA-6 deliveries reached 1.1 billion rubles in 1986, accounting for nearly two-thirds of total Soviet imports of business equipment (see figures A-11 and A-12). 25X1

25X1

9 Although business equipment appears as a subcategory (noted by a 3-digit number) in Soviet trade reporting, the value and importance of this equipment merit a separate discussion. 25X1

25X1

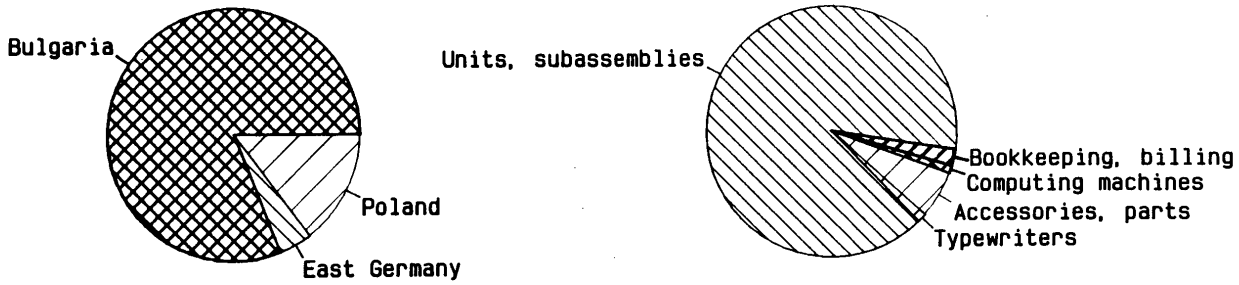
FIGURE A-11
SOVIET IMPORTS OF BUSINESS EQUIPMENT



Source: Soviet trade statistics

25X1

FIGURE A-12
SOVIET BUSINESS EQUIPMENT IMPORTS FROM THE CEMA 6, 1986



By Country

By Category

Source: Soviet trade statistics

25X1

By Subcategory. Computers, adding machines and related equipment comprised 97 percent of business equipment imports reported by the Soviets in 1986.

- Bulgaria was the largest identified supplier, delivering 84 percent of computer-related equipment from CEMA. Bulgarian deliveries consisted entirely of units and subassemblies for computers and computer accessories and spare parts. Previously large deliveries of complete machines from Bulgaria apparently have been phased out.
- Poland supplied 15 percent of computer equipment, mostly in the form of units and subassemblies for computers. The Soviets report small imports of computing machines from East Germany, but these have declined in recent years. Information on East German production and trade from other sources, however, indicates that East Germany exports substantial amounts of computer and electronic equipment to Moscow.
- Moscow reports no business equipment imports from Hungary and Czechoslovakia. Statistics from those countries, however, indicate that computers and related equipment comprise 3 to 4 percent of their total machinery and equipment deliveries to the USSR. Deliveries of computer equipment from Czechoslovakia grew by an average of more than 20

[redacted] 25X1

percent annually from 1983 to 1986, according to Czechoslovak data. [redacted] 25X1

East Germany is the sole supplier of bookkeeping and billing machines and, since 1984, of typewriters to the Soviets. However, East German deliveries declined by 63 percent between 1981 and 1986. [redacted] 25X1

Metal-processing Equipment

Soviet imports of equipment from the CEMA 6 in the metal-processing category include specific types of metal-cutting and metal-forming equipment as well as equipment lines for metal processing.[10] This category includes machines tools for cutting, grinding, boring, milling, grooving, honing, polishing, sawing, threading, pressing, hammering, and forging metal. In 1976, the Soviets stopped publishing data on individual types of metal-processing equipment and a year later combined statistics on metal-cutting, forging and press equipment into one category. In the past, the Soviets looked primarily to the West for help in tooling their machine-building industries. Since the late 1970s, Eastern Europe has supplanted the West as the USSR's major supplier of machine tools. After a lag in 1973 and 1974, Soviet imports from Eastern Europe grew rapidly through 1985 at an average annual rate of 19 percent, but leveled off in 1986. The 1.1 billion

[redacted] 25X1

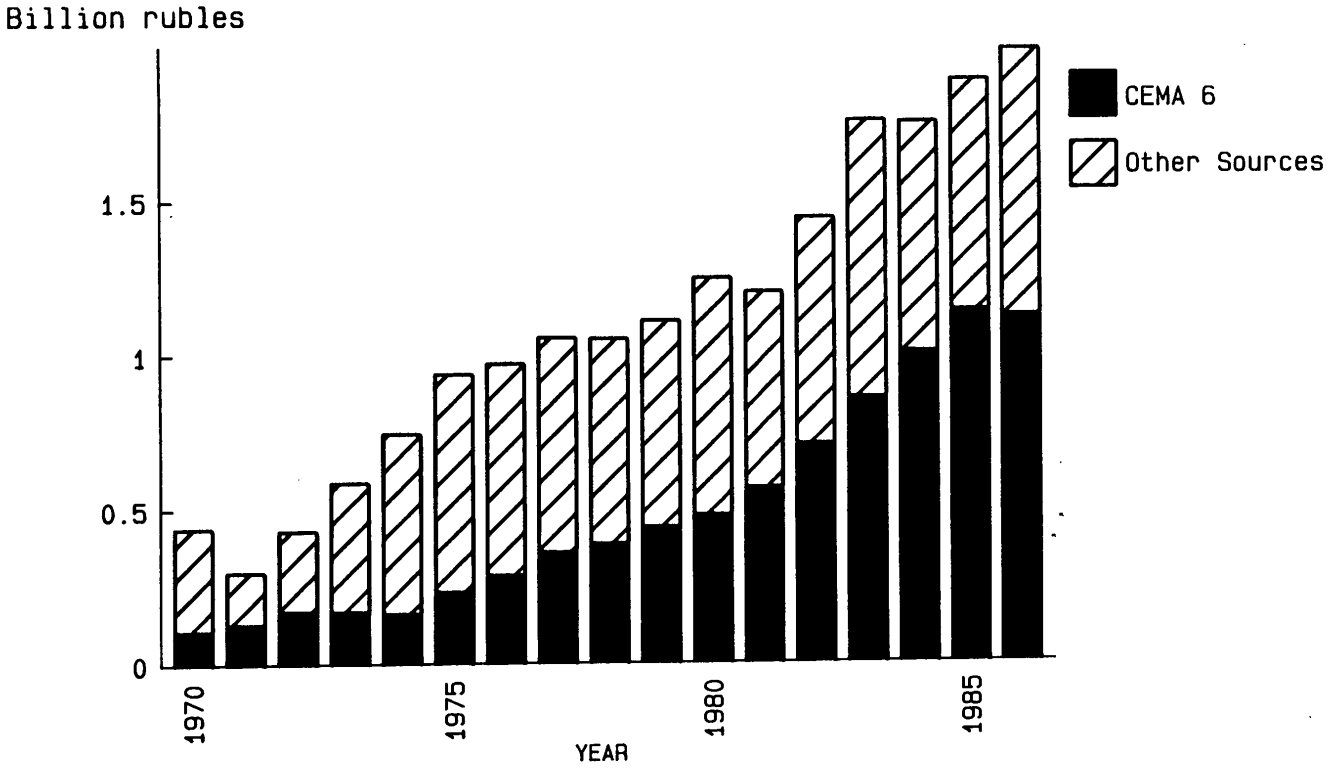
[redacted] 25X1

rubles worth of equipment imported from Eastern Europe in 1986 represented 56 percent of total Soviet imports of metal-processing machinery (see figures A-13 and A-14).

By Subcategory. Metal-cutting and metal-forming machine tools comprise nearly 90 percent of metal-processing equipment imported by the Soviets from Eastern Europe. The high priority placed by Moscow on machine tools made this one of the fastest growing categories of machinery trade in the 1970s and early 1980s.

- East Germany is the largest supplier, accounting for one fourth of total Soviet purchases. East German deliveries doubled from 1980 to 1985 but declined by 15 percent in 1986.
- Czechoslovakia was the next largest supplier until 1986 when deliveries declined sharply and it was supplanted by Bulgaria. In 1984, 37 percent of Czechoslovak machine tool exports went to the USSR; by 1986 this figure had fallen to 24 percent. Czechoslovak statistics indicate that most of the decline resulted from a 15 percent drop in deliveries of metal-cutting machine tools which comprise one half of the total. Metal-forming machine tools--accounting for one quarter of deliveries--fell by 4 percent, while parts and accessories for machine tools increased by 5 percent.

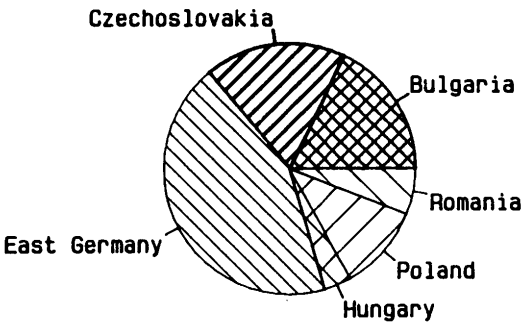
FIGURE A-13
SOVIET IMPORTS OF METAL PROCESSING EQUIPMENT



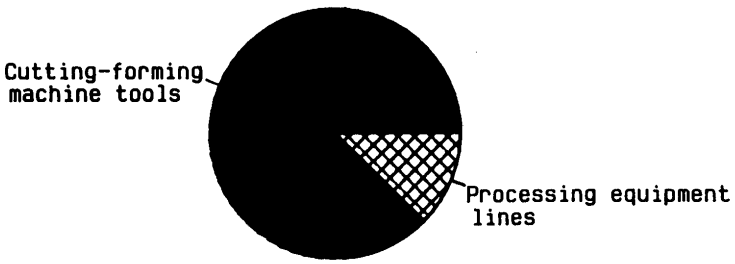
Source: Soviet trade statistics

25X1

FIGURE A-14
SOVIET METAL PROCESSING EQUIPMENT IMPORTS FROM THE CEMA 6, 1986



By Country



By Category

Source: Soviet trade statistics

25X1

25X1

- Bulgaria expanded deliveries by an average of 36 percent a year from 1980 to 1986; its share of CEMA-6 deliveries went from 7 percent in 1980 to 19 percent in 1986.
- Imports from Poland had increased rapidly from the mid-1970s until 1986 when they declined by 7 percent.

25X1

Imports of metal-processing equipment lines--accounting for 12 percent of metal-processing equipment purchases from Eastern Europe--also increased rapidly.

- East Germany tripled deliveries during the 1980s and supplied three-fourths of CEMA-6 exports to the USSR in 1986.
- Czechoslovakia began deliveries in 1985 and accounted for 21 percent of CEMA-6 exports in 1986.

25X1

Resource-Processing Equipment

The Soviets import a variety of equipment in the resource-processing category from their CEMA partners. This category includes equipment for underground surveying and extraction, drilling and pumping, crushing, grinding, and dressing, metallurgy, and petroleum refining. Soviet imports of this equipment from the CEMA 6 increased by an average of 20 percent annually from the early 1970s to 1985 but leveled off in 1986. The share of resource-processing equipment imported from the CEMA 6 has grown in recent years, but the

25X1

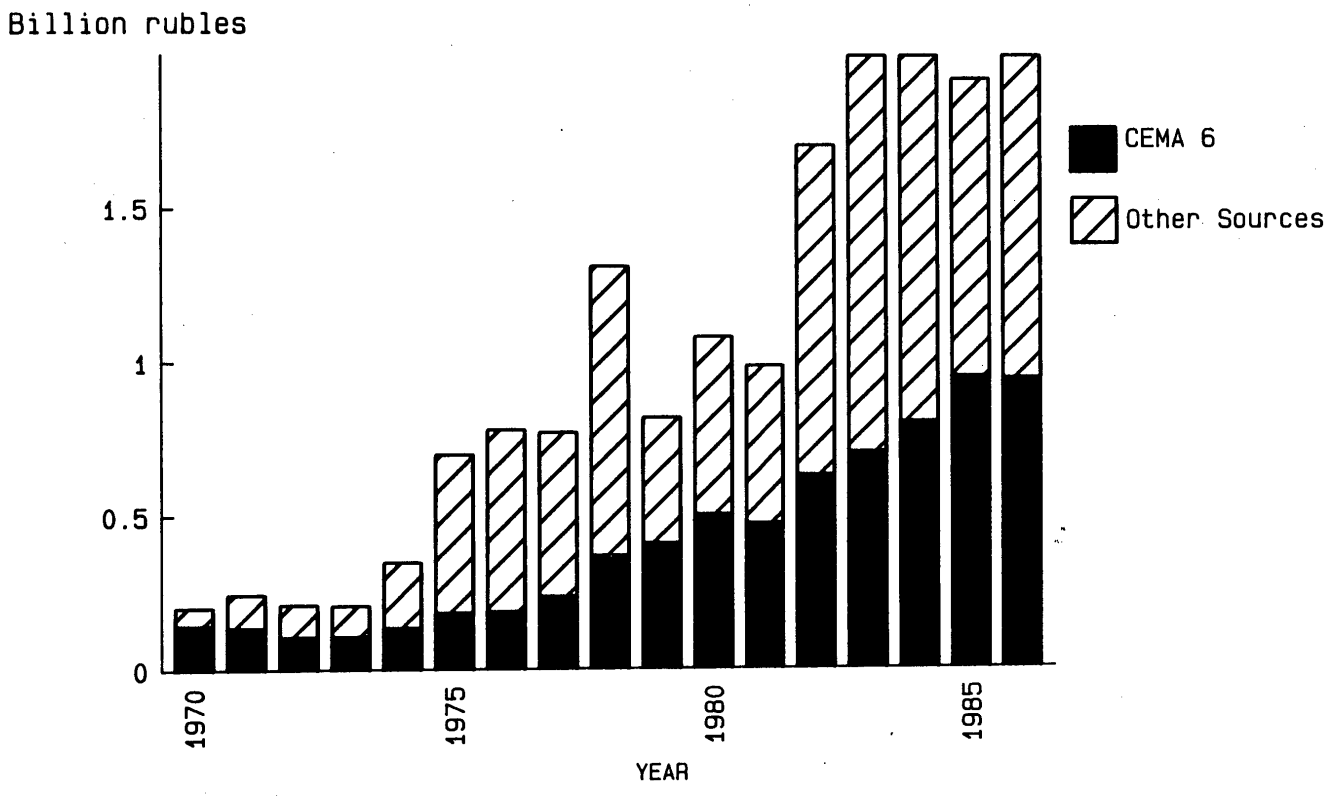
USSR still relies on other suppliers for most of the equipment in this category. The nearly 1 billion rubles worth of equipment imported by the Soviets in 1986 from Eastern Europe represented 43 percent of total Soviet purchases of resource processing equipment (see figures A-15 and A-16). 25X1

By Subcategory. Soviet reliance on CEMA 6 for drilling and pumping equipment has grown rapidly in recent years. In 1982 Moscow purchased one-third of such equipment from Eastern Europe; the CEMA-6 share had increased to two-thirds in 1986 because of stepped up East European deliveries and a sharp slump in imports from other sources.

- Romania provided half of Moscow's total purchases of drilling and pumping equipment in 1986. Romanian deliveries more than doubled in 1986 alone with large increases in exports of super deep drilling equipment, tricone bits, gusher sittings and coreheads, rockers, and preventers. Romania was the sole or major supplier of much of this equipment.
- Czechoslovakia began delivering drilling and pumping equipment in 1982 and by 1986 accounted for 11 percent of total Soviet imports. 25X1

Moscow is depending increasingly on non-CEMA sources for imports of metallurgical equipment; only one-third came from CEMA partners in 1984, and the East European share dropped to 19 percent in 1986. Imports from the major suppliers--East Germany and Czechoslovakia--declined sharply during the early

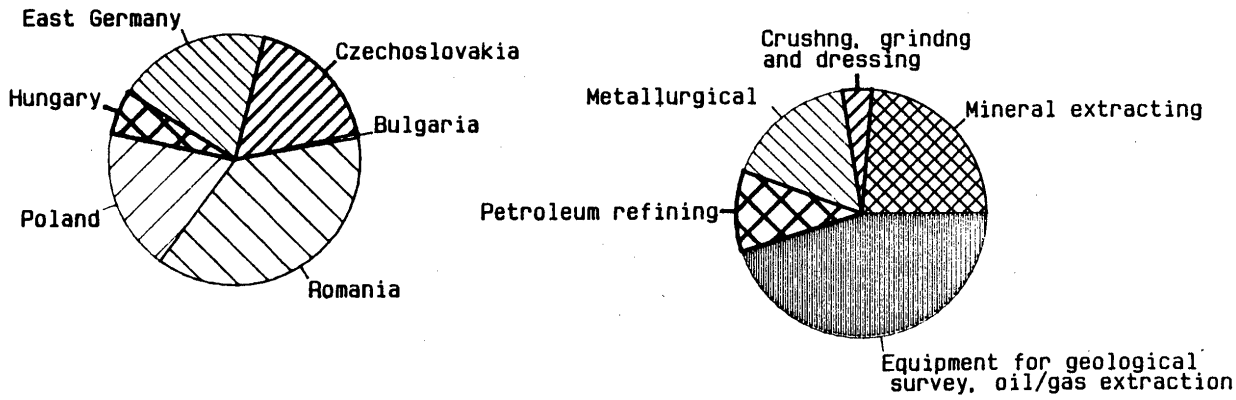
FIGURE A-15
SOVIET IMPORTS OF RESOURCE-PROCESSING EQUIPMENT



Source: Soviet trade statistics

25X1

FIGURE A-16
SOVIET RESOURCE-PROCESSING EQUIPMENT IMPORTS FROM THE CEMA 6, 1986



Source: Soviet trade statistics

[redacted] 25X1

1980s with each delivering lower quantities of rolling and drawing equipment. [redacted] 25X1

The CEMA 6 supplied about half of all Soviet imports in 1986 of underground and surface mineral extraction equipment.

- Poland is the major supplier of such equipment to the USSR, accounting for one-third of total Soviet imports in 1986. Polish deliveries increased by an average of 51 percent a year during 1980 to 1986. Polish data shows that coal-mining equipment is Warsaw's major contribution.
- East Germany contributed 12 percent of Soviet imports of mineral extraction equipment in 1986. Imports from East Germany grew an average of 29 percent a year between 1980 and 1985 but fell 48 percent in 1986. The Soviets report that about one-third of surface-mined and one-sixth of total coal output in the USSR is extracted with East German machines. [redacted] 25X1

The Soviets rely on Eastern Europe for most imports of equipment for the petroleum refining industry but deliveries have been volatile during the 1980s. Soviet purchases declined by two-thirds during 1981 and 1982 and were stagnant until expanding sharply in 1985. Imports from Eastern Europe fell slightly in 1986 but still comprised more than three-fourths of Soviet purchases. [redacted] 25X1

Soviet purchases of crushing, grinding, and dressing

[redacted] 25X1

25X1

equipment--from both Eastern Europe and the West--were also erratic during the 1980s. After declining by 45 percent in 1981, CEMA deliveries grew steadily through 1984, and slumped by almost 50 percent over the next two years. Imports from Eastern Europe in 1986 accounted for three-fifths of Soviet purchases.

25X1

Precision Equipment

Soviet imports of precision equipment include laboratory equipment, medical instruments, bearings, various tools, and abrasives. Soviet purchases of this equipment from Eastern Europe grew at a rate of 14 percent a year on average from 1980 to 1986. Eastern Europe provided 74 percent of all precision equipment imported by the USSR in 1986 (see figures A-17 and A-18).

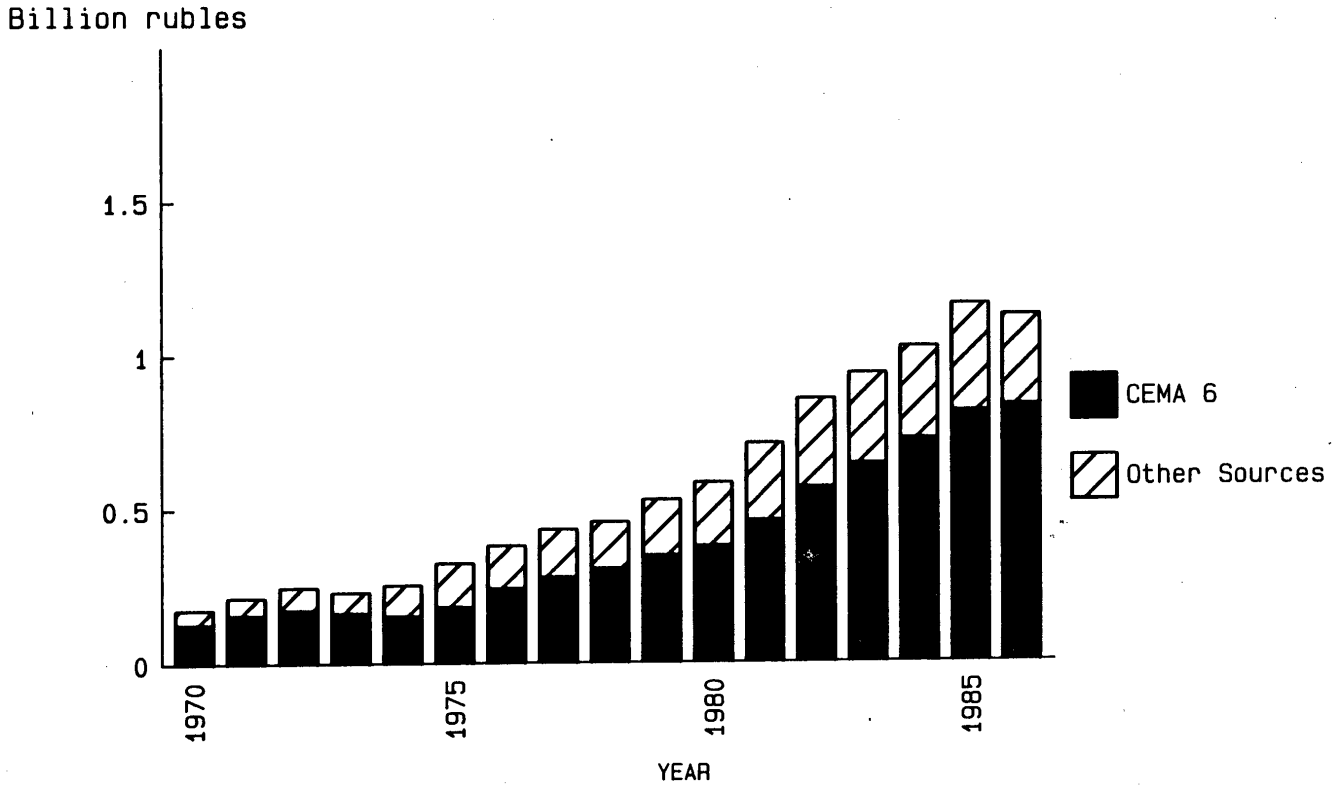
25X1

By Subcategory. More than four-fifths of instruments and laboratory equipment imported by the Soviets in 1986 were acquired from Eastern Europe. This subcategory includes electric power and radio measuring devices, optical instruments, and a broad array of laboratory measuring devices. Imports of this equipment from the CEMA 6 grew steadily during the first half of the 1980s.

- East Germany supplied one-fourth of Soviet imports of instruments and laboratory equipment in 1986. The quality of East German optical instruments is considered on par with any in the world. Deliveries

25X1

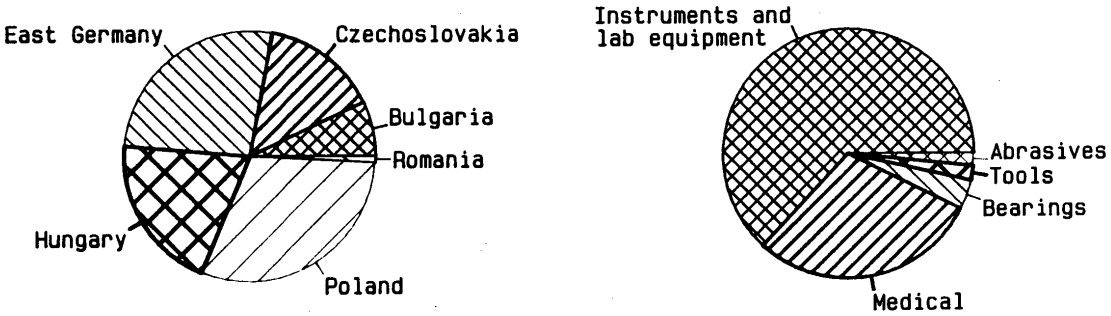
FIGURE A-17
SOVIET IMPORTS OF PRECISION EQUIPMENT*



Source: Soviet trade statistics
*Excludes Business equipment

25X1

FIGURE A-18
SOVIET PRECISION EQUIPMENT IMPORTS FROM THE CEMA 6, 1986



BY COUNTRY

BY CATEGORY

Source: Soviet trade statistics

25X1

of this equipment to the USSR declined by 6 percent in 1986 after having registered rapid growth during the previous 10 years.

- Poland increased exports to the USSR during the 1980s by more than 30 percent a year on average, becoming the largest Soviet supplier of such equipment. 25X1

The CEMA 6 accounted for almost three-fourths of Soviet imports of medical equipment and instruments in 1986. Steady growth in East European deliveries since 1974 ended in 1986 with a 5 percent downturn. Imports declined from Hungary and East Germany--the largest suppliers--by 14 percent and 6 percent, respectively, and increased only slightly from Bulgaria and Czechoslovakia. 25X1

Chemical Equipment

Most of the imports in this subcategory are not broken down in Soviet trade data. The Soviet Union imported 510 million rubles worth of chemical plant and equipment from the CEMA 6 in 1986, representing 59 percent of all chemical equipment imported by the Soviets. Imports from Eastern Europe declined by 13 percent in 1986, following rapid growth during 1982 to 1985. Moscow cut back on purchases from other suppliers even more, however, thus leading to greater dependence on CEMA. Imports fell by 4 percent and 17 percent from East Germany and Czechoslovakia, respectively--Moscow's

25X1

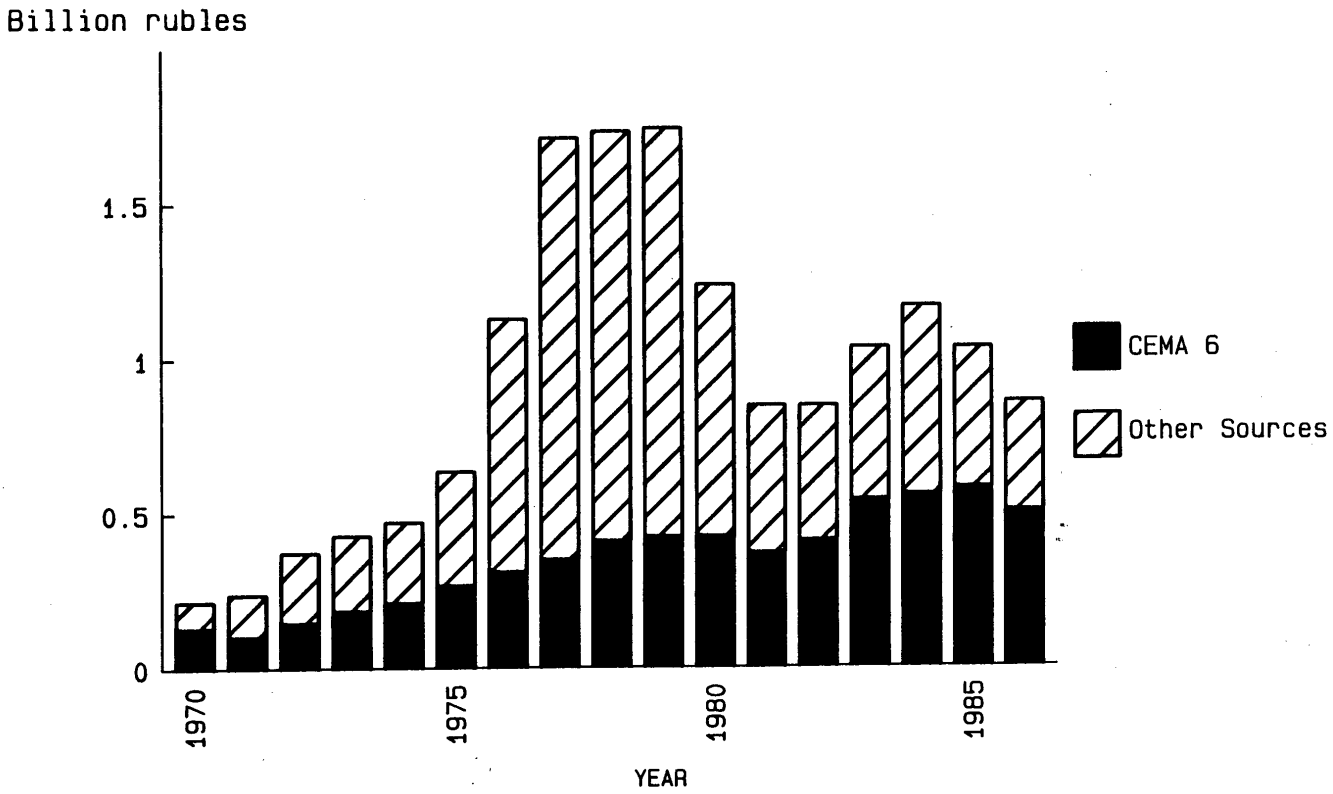
major suppliers--and other East European partners also shipped less (see figures A-19 and A-20).

Other Equipment Imports

In addition to the major areas of equipment imports discussed above, the Soviets purchase a variety of other equipment from the CEMA 6.

- Moscow imported 202 million rubles worth of road building equipment from Eastern Europe in 1986. This represented a 12 percent decline from the previous year and followed three years of level deliveries. Meanwhile, imports from other suppliers--in particular Japan, the United States, and Italy--more than doubled in 1986 to account for 70 percent of total Soviet imports.
- Soviet imports of construction materials from the CEMA 6 declined by 11 percent in 1986 to 154 million rubles. Imports from the West declined even more, however, and as a result Eastern Europe's share of deliveries to the USSR increased to 69 percent.
- Pump and compressor imports from Eastern Europe fell 14 percent in 1986 to 152 million rubles, because of a 29-percent decline in imports from East Germany. Plans for East European contributions to the Progress gas pipeline, however, suggest imports of this type of equipment will grow.

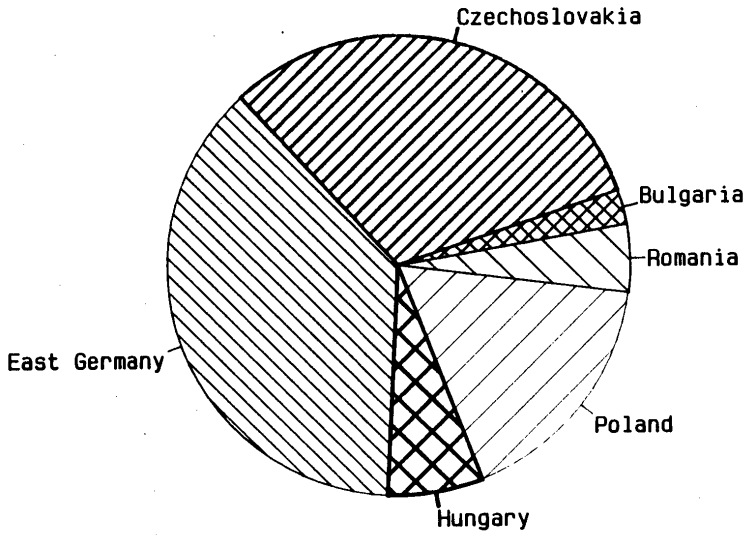
FIGURE A-19
SOVIET IMPORTS OF CHEMICAL EQUIPMENT



Source: Soviet trade statistics

25X1

FIGURE A-20
SOVIET CHEMICAL EQUIPMENT IMPORTS FROM THE CEMA 6, BY COUNTRY



1986

Source: Soviet trade statistics

25X1

25X1

- Following rapid growth during the early 1980s, imports of communal, trade, and firefighting equipment declined by 20 percent in 1986, with cuts in deliveries from all CEMA suppliers.
- Imports of printing equipment expanded by 7 percent in 1986 following two years of level purchases. East Germany and Czechoslovakia provide 55 percent and 23 percent, respectively, of total Soviet imports.
- Eastern Europe supplied only 17 percent of timber and paper equipment imported by the USSR in 1986. Poland accounted for most of the CEMA deliveries.

25X1

In addition, the Soviets imported 3.7 billion rubles worth of unspecified machinery and equipment from the CEMA 6 in 1986 which accounted for 21 percent of total machinery and equipment imports from the CEMA 6. These residuals ranged from 25 to 27 percent of equipment imports from Czechoslovakia and Hungary, respectively, to 9 percent of those from Romania. While these imports may include some military equipment, we believe that the Soviets conceal most military imports from Eastern Europe in a larger trade residual that is not attributed to any category of trade.

25X1

25X1

Appendix 2

CEMA Trade Nomenclature for Machinery and Equipment at the Two and Three Digit Levels.

CTN Code	Category/Subcategory
10	Metal processing equipment
100	Metal cutting machine tools
101	Presses
102	Hammers
103	Other forge and press equipment
104	Metal processing equipment lines
105	Equipment for metal processing industrial enterprises
11	Power and electrical engineering equipment
110	Power engineering equipment
111	Electrical engineering equipment
112	Electrodes
113	Cables and wires
12	Mining, metallurgical, and petroleum equipment
120	Equipment for underground survey and mineral extraction
121	Crushing, grinding, and dressing equipment
122	Coking equipment and equipment for the gas industry
123	Metallurgical equipment
127	Petroleum refining industry equipment
128	Equipment for geological survey, the engineering of petroleum, oil, and lubricants, and gas extraction
129	Other mining, metallurgical, and petroleum equipment
13	Material handling equipment
130	Cranes
131	Charging and caving in machines
132	Winches
133	Lifting machines
134	Electric and motor cars
139	Other material handling equipment
14	Food and light industry equipment
140	Food industry equipment
142	Refrigeration and air conditioning equipment
143	Tobacco industry equipment
144	Textile industry equipment
145	Sewing industry equipment
146	Leather, shoe, and fur industry equipment
149	Other light industry equipment

15 Chemical, timber, construction, printing, and other industrial equipment
150 Chemical industry equipment
151 Timber, cellulose, and paper processing equipment
152 Timber processing machine tools
153 Equipment for the construction materials industry
154 Roadbuilding equipment
155 Pump and compressor equipment
156 Communal, trade, and firefighting equipment
157 Printing industry equipment
158 Communication equipment
159 Equipment for other industrial sectors

16 Buildings, engineering installations, and public communications facilities
161 Industrial buildings and installations
162 Agricultural and forestry installations
163 House buildings and complexes
164 Scientific, medical, trading, and other installations
165 Communications installations
166 Hydroengineering and hydroindustrial installations
167 Pipelines
169 Other

17 Instruments, laboratory and medical equipment, bearings, abrasives, business machines
170 Electrical power and radio measuring instruments
171 Instruments for physics research and optical engineering
172 Medical equipment and instruments except those for the chemical or pharmaceutical industries
173 Bearings
174 Tools
175 Industrial diamonds, rubies, and other precious stones
176 Hard alloys and abrasives
177 Business machines
178 Equipment to control technical processes and laboratory equipment
179 Instruments for measuring mechanical quantities

18 Tractors and agricultural machinery and equipment
180 Tractors and tractor garage equipment
181 Agricultural machines
182 Minor agricultural instruments

19 Transportation facilities and auxiliary equipment
191 Trucks and garage equipment
192 Vessels, vessel lifting, diving port equipment
193 Aerial communication facilities
195 Passenger cars, motorcycles, and motor scooters
199 Other transportation facilities

Appendix 3

SOVIET IMPORTS OF EAST EUROPEAN MACHINERY 1970-86

(Millions of Rubles)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Total	**2657**	**2798**	**3395**	**3810**	**4004**	**5182**	**5718**	**6573**	**9161**	**9331**	**9816**	**10769**	**12466**	**14940**	**16724**	**18526**	**18082**
Bulgaria	280	341	418	533	604	779	908	1101	1569	1639	1730	1807	2106	2600	2960	3152	3304
Czechoslovakia	601	628	681	710	760	986	1136	1289	1871	1786	1983	2261	2586	3168	3533	3987	3815
East Germany	922	980	1217	1305	1335	1669	1768	1991	2589	2708	2794	3308	3798	4405	4962	5177	4725
Hungary	342	339	434	502	514	669	812	896	1379	1207	1284	1426	1613	1921	2220	2522	2403
Poland	417	414	513	606	645	899	917	1071	1515	1701	1714	1604	1857	2203	2415	2770	2868
Romania	95	96	132	154	146	180	177	225	237	289	311	363	511	643	734	918	967
Metal cutting machine tools, forge and press equipment (100-03)*	**74**	**94**	**122**	**109**	**101**	**138**	**181**	**326**	**346**	**413**	**439**	**523**	**652**	**777**	**919**	**1031**	**990**
Bulgaria	2	2	1	1	1	1	5	11	10	24	31	18	35	61	75	140	193
Czechoslovakia	21	27	30	21	18	31	48	83	77	102	92	103	137	164	206	201	175
East Germany	45	45	62	65	62	83	90	171	193	211	227	289	346	396	454	459	390
Hungary	3	2	3	2	2	2	3	9	7	8	7	8	7	11	29	42	41
Poland	11	15	22	17	16	16	22	37	45	52	56	66	79	109	115	134	124
Romania	3	3	4	3	3	6	13	16	13	16	26	39	48	36	46	55	67
Metal processing equipment lines (104)	**0**	**0**	**1**	**5**	**9**	**20**	**26**	**22**	**16**	**27**	**43**	**48**	**60**	**87**	**95**	**114**	**140**
Bulgaria	0	0	0	0	0	0	0	0	0	0	10	11	7	15	0	8	9
Czechoslovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	29
East Germany	0	0	1	5	9	20	26	22	16	27	33	37	53	72	95	86	102
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equipment for motor vehicle manufacturing plants (105)	**0**	**1**	**2**	**15**	**18**	**19**	**16**	**11**	**13**	**2**	**2**	**2**	**4**	**3**	**4**	**4**	**2**
Bulgaria	0	0	1	2	3	2	2	2	7	1	0	0	0	0	0	0	0
Czechoslovakia	0	0	2	13	15	17	14	9	6	1	2	2	4	3	4	4	2
East Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Power engineering equipment (110)	**62**	**74**	**71**	**70**	**61**	**69**	**107**	**124**	**181**	**220**	**270**	**301**	**318**	**435**	**498**	**485**	**444**
Bulgaria	0	0	0	0	0	0	0	0	0	0	27	20	30	38	36	29	30
Czechoslovakia	24	30	24	24	24	24	40	48	88	100	103	108	99	140	178	178	164
East Germany	21	23	24	24	20	27	34	35	42	47	59	65	81	91	129	122	118
Hungary	0	0	0	0	0	0	0	0	13	22	31	48	39	46	75	52	51
Poland	14	21	22	21	17	18	32	37	37	48	47	56	59	111	69	84	67
Romania	3	1	2	1	0	1	1	4	0	3	3	9	10	9	11	20	6

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Electrical engineering equipment (111)	98	116	144	157	163	220	271	331	381	405	434	423	473	535	530	696	656
Bulgaria	37	39	43	46	45	63	80	99	112	123	140	116	120	146	155	158	154
Czechoslovakia	1	2	6	5	5	7	8	10	12	16	19	25	42	54	58	85	65
East Germany	28	31	35	38	37	45	59	62	76	82	85	93	103	109	95	116	87
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	11
Poland	24	34	46	53	58	77	92	118	127	137	138	135	156	174	173	274	276
Romania	8	10	14	16	18	28	33	42	54	49	52	54	52	52	49	54	63
Cables and wire (113)	49	52	58	54	54	65	64	72	83	87	90	105	89	102	110	114	97
Bulgaria	0	0	0	0	0	0	0	0	4	3	0	0	0	0	0	0	0
Czechoslovakia	7	8	8	8	8	9	11	13	15	19	19	18	19	18	23	26	28
East Germany	34	36	40	37	36	41	43	45	49	52	52	60	49	66	60	63	57
Hungary	5	5	9	7	8	11	10	14	14	14	19	21	16	15	25	22	10
Poland	2	1	2	2	2	3	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	6	5	3	2	3	2
Equipment for underground and surface mineral extraction (120)	14	5	3	5	5	5	6	15	44	35	40	48	69	157	194	241	224
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	6	1	1	3	1	1	1	0	0	0	0	0	0	0	0	0	0
East Germany	8	3	2	3	3	4	6	9	33	25	26	29	31	60	82	94	58
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	6	11	11	14	19	40	97	112	147	166
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crushing, grinding, and dressing equipment (121)	2	2	2	3	3	5	8	22	25	19	20	11	36	58	74	69	36
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	8	11	8	6	5
Czechoslovakia	0	0	0	0	0	0	0	13	10	12	4	1	6	9	9	9	5
East Germany	1	1	1	1	2	2	2	2	8	1	9	2	7	21	40	36	19
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	1	1	1	1	1	2	7	7	7	6	7	8	15	17	17	16	7
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Metallurgical equipment (123)	101	104	77	62	75	98	116	124	156	135	212	246	228	185	261	217	161
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	73	79	44	38	32	52	50	46	61	63	125	119	140	95	89	105	59
East Germany	25	22	30	22	38	39	54	62	78	53	69	109	69	69	145	82	74
Hungary	2	3	2	2	4	8	12	16	17	18	18	18	19	21	28	31	28
Poland	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Petroleum refining industry equipment (127)	16	12	7	15	30	53	29	40	94	152	154	115	47	53	52	104	99
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	7	3	3	4	5	15	12	8	8	15	22	33	21	12	6	18	27
East Germany	7	8	4	11	25	38	17	32	78	117	111	70	20	24	30	37	36
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	16	15	44	36
Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	2	0	0	0	0	0	0	0	7	20	21	12	6	1	1	5	10

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Equipment for geological survey, petroleum engineering, and gas extraction (128)	13	17	21	25	26	25	31	39	52	70	78	87	210	253	222	321	427
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	0	0	0	0	0	0	0	0	0	0	0	1	58	55	67	68	79
East Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	13	17	21	25	26	25	31	39	52	70	78	86	152	198	155	253	348
Material handling equipment (13)	197	225	247	250	270	358	394	475	495	684	727	760	847	1000	1180	1287	1253
Bulgaria	91	119	133	134	153	182	203	269	290	400	407	416	488	575	714	782	734
Czechoslovakia	15	16	17	19	17	20	22	35	40	44	55	59	73	82	99	103	116
East Germany	66	68	71	75	77	113	127	130	123	135	160	188	174	195	210	224	211
Hungary	18	12	14	16	22	40	37	41	41	41	41	46	51	65	72	80	81
Poland	6	10	12	6	2	3	4	0	0	66	64	51	61	83	85	98	111
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Food industry equipment (140)	104	71	84	120	125	142	131	166	199	254	288	328	359	470	564	577	501
Bulgaria	5	4	4	4	4	4	4	6	5	10	11	8	18	32	38	40	31
Czechoslovakia	17	9	9	28	36	41	34	39	57	51	59	66	86	129	167	174	136
East Germany	37	36	41	47	45	61	59	80	87	97	108	136	148	184	208	211	211
Hungary	28	11	20	27	25	22	12	21	25	42	59	47	57	77	94	103	77
Poland	17	10	12	14	15	14	22	19	25	55	51	71	50	48	57	49	46
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Refrigeration and air conditioning equipment (142)	23	41	55	52	43	37	42	38	47	48	49	73	101	106	111	121	123
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	7	11	14	15	18
Czechoslovakia	3	9	8	6	7	7	9	8	8	10	7	11	16	15	16	19	21
East Germany	18	27	38	39	31	23	27	25	31	30	33	47	63	64	67	70	69
Hungary	3	6	9	7	6	7	6	6	8	9	9	15	15	16	14	17	15
Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tobacco Industry Equipment (143)	2	3	4	4	3	3	3	5	2	2	5	3	5	6	6	10	7
Bulgaria	0	1	1	1	1	0	2	4	0	2	5	3	5	5	6	10	7
Czechoslovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Germany	1	3	3	3	2	3	2	1	2	0	1	0	1	0	0	0	0
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Textile industry equipment (144)	56	52	73	90	98	140	165	222	276	316	343	383	487	635	650	639	603
Bulgaria	3	1	4	6	8	11	17	17	16	16	17	19	24	37	40	44	52
Czechoslovakia	29	29	40	51	56	81	91	133	173	192	213	248	318	426	427	416	392
East Germany	18	13	19	20	20	28	31	37	43	62	58	66	82	94	96	102	90
Hungary	0	0	0	0	0	0	0	0	0	0	8	10	9	10	14	13	12
Poland	8	9	10	13	14	20	27	35	45	46	47	40	45	59	64	53	48
Romania	0	0	0	0	0	0	0	0	0	0	0	0	9	9	9	11	9

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Sewing Industry Equipment (145)	14	13	15	16	12	17	21	22	26	27	29	36	44	53	53	56	57
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	5	5	5	5	4	5	8	8	11	13	13	16	19	21	18	18	19
East Germany	3	3	4	4	2	4	4	5	6	6	8	9	10	12	16	16	14
Hungary	5	6	6	7	6	8	9	9	9	9	8	12	15	19	19	23	24
Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equipment for leather, shoe and fur industry (146)	5	7	9	9	8	5	8	8	11	13	20	23	28	27	31	39	34
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	5	7	9	9	8	5	8	8	11	13	20	23	28	27	31	39	34
East Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chemical industry equipment (150)	133	104	149	187	213	269	312	353	414	426	428	374	404	546	562	585	510
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	18	17	14	12
Czechoslovakia	38	29	35	50	52	88	99	103	121	137	157	139	127	167	176	193	161
East Germany	53	43	68	83	94	105	116	134	141	124	127	117	153	201	189	199	191
Hungary	15	8	11	9	14	17	26	26	27	43	38	28	38	58	67	57	34
Poland	20	18	27	37	44	48	60	79	114	110	88	65	57	69	81	88	87
Romania	7	7	8	9	10	10	11	11	10	12	18	25	29	33	32	34	25
Timber, cellulose, paper processing industry equipment (151)	18	13	12	17	15	25	18	22	29	33	40	40	37	33	37	39	48
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	5	8	3	2	0	2
Czechoslovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Germany	0	0	0	0	0	0	1	2	0	0	0	0	0	1	0	0	5
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	18	13	12	16	15	25	17	20	29	33	40	35	29	29	35	39	41
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equipment for construction materials industry (153)	20	15	17	25	30	38	37	48	57	62	73	60	89	116	153	169	151
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	9	29	39	29	14
Czechoslovakia	6	1	1	1	1	2	1	7	15	18	12	8	6	7	15	34	29
East Germany	11	12	12	14	16	15	16	20	24	24	25	27	45	49	53	46	56
Hungary	3	2	4	4	6	5	4	7	5	7	22	14	16	16	18	18	18
Poland	0	0	0	6	8	16	15	15	13	12	14	11	13	15	28	42	34
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Road and roadbuilding machinery and equipment (154)	44	44	70	38	30	20	17	80	85	96	125	137	181	227	225	229	202
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	4	3	11	6	7	7	6	7	10	14	21	19	25	31	37	42	43
East Germany	17	9	9	5	4	6	7	4	4	5	19	39	62	87	83	80	70
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	24	32	50	27	19	8	4	69	71	78	85	79	94	109	105	107	89
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Pump-compressor equipment (155)	21	21	31	41	42	53	64	80	82	90	98	107	122	133	149	177	152
Bulgaria	8	9	11	17	20	27	28	34	35	34	37	41	45	45	50	49	50
Czechoslovakia	4	2	5	8	7	8	9	13	15	16	14	15	17	25	23	29	31
East Germany	7	8	11	11	10	13	19	22	25	32	40	44	55	55	68	91	65
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	2	2	3	5	5	6	8	10	8	7	7	7	5	8	8	8	6
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Communal, Trade, Firefighting equipment (156)	10	12	11	13	11	17	18	22	29	50	58	72	83	115	116	138	110
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	4	4	3	4	3	7	6	7	9	13	20	14	13	29	35	46	36
East Germany	5	6	5	5	3	6	8	8	10	14	15	24	33	37	42	41	38
Hungary	1	2	2	4	4	4	4	6	7	8	7	13	13	16	18	26	23
Poland	0	0	1	1	1	1	1	1	4	14	15	21	24	33	21	25	13
Romania	0																
Printing industry equipment (157)	19	21	24	20	23	25	28	28	35	40	43	47	74	102	103	104	111
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	2	4	6	5	5	6	7	8	10	10	10	15	18	35	38	33	32
East Germany	16	17	18	15	18	18	20	20	24	29	32	31	52	63	62	66	75
Hungary	0	0	0	0	0	1	1	0	1	1	1	1	1	2	1	3	2
Poland	0	0	0	0	0	0	0	0	0	0	0	0	3	2	2	2	2
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial fixtures--Computers removed (159)	45	57	66	83	86	96	66	77	91	99	96	102	111	125	132	144	120
Bulgaria	0	0	3	7	7	9	16	23	32	37	38	29	34	33	31	29	28
Czechoslovakia	11	11	13	15	15	21	18	18	21	17	17	21	18	16	19	23	22
East Germany	21	25	29	37	34	31	10	11	13	14	14	17	19	23	24	21	20
Hungary	9	14	14	16	23	28	13	16	17	18	12	20	25	32	29	36	20
Poland	2	3	4	5	6	6	8	5	4	4	7	6	9	15	17	19	18
Romania	2	3	3	2	1	1	1	5	4	10	9	9	6	5	11	14	12
Pipelines (167)	0	0	0	0	0	0	0	0	0	0	61	55	91	24	44	35	22
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	0	0	0	61	55	91	24	44	35	22
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Instruments & laboratory equipment (170, 171, 178, 179)	75	93	102	97	93	112	147	173	185	212	228	276	347	402	451	500	531
Bulgaria	2	2	4	4	4	5	8	10	13	18	17	15	14	20	24	26	35
Czechoslovakia	9	13	13	12	10	16	19	22	25	25	31	31	40	51	50	49	50
East Germany	32	42	43	38	36	40	56	66	66	78	87	113	129	137	146	165	155
Hungary	21	23	27	31	30	37	47	53	52	60	56	74	83	86	93	90	103
Poland	11	13	15	13	13	14	18	23	29	31	37	43	81	108	138	170	180
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Instruments & laboratory equipment (170, 171, 178, 179)	75	93	102	97	93	112	147	173	185	212	228	276	347	402	451	500	531
Bulgaria	2	2	4	4	4	5	8	10	13	18	17	15	14	20	24	26	35
Czechoslovakia	9	13	13	12	10	16	19	22	25	25	31	31	40	51	50	49	50
East Germany	32	42	43	38	36	40	56	66	66	78	87	113	129	137	146	165	155
Hungary	21	23	27	31	30	37	47	53	52	60	56	74	83	86	99	90	103
Poland	11	13	15	13	13	14	18	23	29	31	37	43	81	108	138	170	188
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Medical equipment and instruments excl. chemical-pharmaceutical (172)	41	51	57	51	48	55	74	86	101	112	124	158	184	199	225	261	248
Bulgaria	4	6	5	5	5	6	7	10	13	13	15	17	15	16	22	24	25
Czechoslovakia	11	9	11	11	12	13	17	21	24	26	33	35	40	50	46	56	58
East Germany	9	15	15	13	13	13	21	21	26	28	30	40	50	58	61	65	61
Hungary	15	18	20	17	15	18	25	28	29	33	32	47	56	49	61	77	66
Poland	2	4	6	5	4	4	6	7	10	13	14	19	23	26	35	39	38
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bearings (173)	6	7	7	7	8	9	13	13	13	15	17	18	23	25	32	33	32
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	3	3	3	4	4	4	6	5	4	6	7	9	8	10	11	11	11
East Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	1	1	2	1	1	1	4	3	4	4	4	4	9	10	16	17	14
Romania	2	2	2	2	3	3	4	4	5	5	6	5	6	6	6	6	7
Tools (174)	3	4	5	5	3	4	4	3	3	4	4	4	6	11	12	14	16
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	3	4	5	5	3	4	4	3	3	4	4	4	6	11	12	14	16
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hard alloy and abrasives (176)	6	5	5	5	4	5	6	6	6	7	8	9	9	11	11	12	14
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	3	3	3	4	3	3	5	5	5	5	6	7	7	8	8	9	8
East Germany	2	2	1	1	1	1	2	1	2	2	2	2	2	3	3	3	6
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Business Machines (177)	67	109	162	223	261	341	133	151	133	222	243	350	963	930	949	929	1113
Bulgaria	13	33	68	135	166	224	26	29	43	38	50	39	553	678	743	745	902
Czechoslovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Germany	51	72	79	77	73	98	104	117	81	88	97	212	310	143	90	61	47
Hungary	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Poland	2	2	13	10	22	24	2	5	9	95	96	99	101	110	117	122	164
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Tractors and tractor garage equipment (180)	17	26	15	13	13	15	23	1	2	2	4	5	4	8	0	5	6
Bulgaria	5	7	7	12	13	15	22	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Germany	12	12	9	1	0	0	1	1	2	2	4	5	4	8		5	6
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agricultural machinery and equipment (181)	153	195	262	301	289	319	447	525	583	631	723	756	802	998	1107	1221	1177
Bulgaria	58	65	65	79	78	92	100	98	109	119	142	145	143	158	161	200	185
Czechoslovakia	13	15	24	27	28	37	46	51	60	66	73	71	85	113	140	171	195
East Germany	58	81	120	132	121	131	192	254	270	279	311	368	387	451	518	544	519
Hungary	5	5	19	23	19	20	35	38	43	63	78	73	69	80	100	117	105
Poland	15	23	25	27	29	28	48	53	77	77	89	71	90	98	94	90	99
Romania	5	7	9	13	14	12	26	30	26	28	30	28	28	98	94	99	74
Railroad rolling stock and auxiliary equipment (190)	254	242	283	301	350	458	441	432	517	539	549	607	640	949	1045	1180	1146
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czechoslovakia	89	78	97	73	104	120	137	138	135	148	160	216	199	266	272	358	373
East Germany	91	92	91	109	107	139	145	148	199	224	225	251	290	321	381	386	360
Hungary	19	14	14	11	10	14	20	22	26	16	19	20	26	32	31	29	30
Poland	55	58	66	77	91	133	130	125	156	152	145	120	125	157	153	169	177
Romania	0	0	15	31	38	51	9	0	0	0	0	0	0	173	208	238	206
Trucks, Buses, and garage equipment (191)	220	281	350	371	324	416	519	509	570	563	649	752	903	1101	1231	1360	1400
Bulgaria	21	21	17	16	17	20	20	24	18	18	13	3	1	1	4	4	7
Czechoslovakia	54	73	73	74	82	99	113	65	77	86	85	136	162	222	251	266	292
East Germany	2	21	43	40	16	3	12	6	6	7	7	9	12	16	17	18	9
Hungary	102	111	144	174	177	256	330	350	383	363	439	527	620	749	837	927	940
Poland	23	29	39	34	20	30	42	64	87	90	106	78	109	114	122	145	152
Romania	18	27	34	33	13	8	1	1	0	0	0	0	0	0	0	0	0
Vessels, vessel lifting, and diving port equipment (192)	359	237	275	350	413	704	486	468	547	753	797	804	798	989	1102	1331	1269
Bulgaria	16	13	17	24	21	41	57	58	71	55	52	63	67	135	111	119	125
Czechoslovakia	24	24	23	15	28	39	38	43	35	43	54	58	54	67	54	83	70
East Germany	143	93	129	137	171	294	202	202	266	320	320	399	415	510	561	699	586
Hungary	14	11	12	11	6	5	11	12	21	25	26	24	26	32	37	44	44
Poland	136	77	77	151	172	306	150	131	134	283	316	234	209	213	288	341	391
Romania	26	14	16	14	14	19	28	23	20	25	29	26	27	32	51	45	53

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Passenger cars, motorcycles, motor scooters (195)	39	53	64	67	71	79	96	117	121	123	137	132	155	165	169	184	146
Bulgaria	1	5	10	13	15	15	22	25	26	24	28	32	34	37	38	41	41
Czechoslovakia	26	28	29	28	30	39	52	53	56	60	71	62	79	84	84	91	84
East Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	11	21	25	26	26	25	22	23	23	23	24	28	28	29	32	31	0
Poland	1	0	0	0	1	1	1	16	16	16	14	11	14	15	15	20	21
Romania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The numbers in parentheses are the CEMA Trade Nomenclature (CTN) categories.

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