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Dependence of Soviet Military Power on Economic Relations With the West

Special National Intelligence Estimate

Declassified and Approved for Release
by the Central Intelligence Agency
Date: 2001

~~Secret~~

SNIE 3/11-4-81
17 November 1981

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SNIE 3/11-4-81

DEPENDENCE OF SOVIET MILITARY
POWER ON ECONOMIC RELATIONS
WITH THE WEST

Information available as of 17 November 1981 was
used in the preparation of this Estimate.

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THIS ESTIMATE IS ISSUED BY THE DIRECTOR OF CENTRAL INTELLIGENCE.

THE NATIONAL FOREIGN INTELLIGENCE BOARD CONCURS.

The following intelligence organizations participated in the preparation of the Estimate:

The Central Intelligence Agency, the Defense Intelligence Agency, the National Security Agency, and the intelligence organizations of the Departments of State and Treasury.

Also Participating:

The Assistant Chief of Staff for Intelligence, Department of the Army

The Director of Naval Intelligence, Department of the Navy

The Assistant Chief of Staff, Intelligence, Department of the Air Force

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PREFACE

This Estimate assesses the importance of East-West economic relations to Soviet military power in the 1980s. It looks first at the West as a source of military-related technology and then at the role of East-West trade in helping the Soviet leadership to continue to expand military programs in spite of a severe economic slowdown. The Estimate concludes with a discussion of the potential impact on the USSR of increased Western restrictions on East-West trade and technology transfer.

The Estimate does not address the problem of securing Western cooperation in any expansion of controls over economic relations with the East or the impact of these controls on the Western economies. It does not consider how to stop leaks, diversions, the flow of open information, and espionage. Nor does it discuss the problem of differentiating between Eastern Europe and the Soviet Union in Western export control policy.

The broad scope of the Estimate does not permit detailed treatment of export control issues.

KEY JUDGMENTS

Acquisition of goods and technology from the West enhances Soviet military programs in two principal ways: by making available specific technologies that permit improvements in weapon and military support systems and the efficiency of military and civilian production technology; and by providing economic gains from trade that improve the efficiency of the economy and thereby reduce the burden of defense. Soviet military power is based fundamentally on the large size and diversity of the Soviet economy and the breadth of the Soviet technical and scientific base, on Soviet success in acquiring sophisticated technology in the West, and on the longstanding preferred status of the military sector.

The USSR recognizes that it will be hard pressed to maintain its relative position in the technical sophistication of its weapons compared with those of the West. Moscow will therefore continue to seek Western technology useful for its future weapon systems by all means, including those illegal means that have been successful in the past, such as clandestine acquisition, illegal imports, and third-country diversions. The Soviets will especially need equipment and technology for their electronics, aerospace, and shipbuilding industries.

Soviet economic performance has deteriorated to the point that, if military expenditures continue to expand as in the past, there will be few if any resources left with which to raise living standards. Even slow growth of the Soviet economy depends in substantial part on continued imports of Western machinery, grain, and equipment for the energy sector:

- The USSR needs large-scale imports of Western food, especially grain, to increase food supplies even in good crop years, and to keep them from falling in bad years.
- Western pipe and compressors are essential for the rapid expansion of Soviet gas production, which will be the main source of additional energy supplies and hard currency in the 1980s.

- Western equipment also is increasingly important in oil production, and imports of Western production equipment, especially advanced machine tools, would help to raise labor productivity at a time when the labor force will be growing much more slowly than in the past.

Western restrictions on nonstrategic trade, if broadly supported and sustained, would aggravate Soviet economic problems appreciably. Short of comprehensive Western restrictions on trade, a Western embargo on oil and gas equipment would have the greatest impact. A denial of new Western credits would probably force a decline in overall Soviet hard currency imports. In none of these cases would unilateral US actions have much effect. Any decision to impose additional restrictions would have to consider their impact on the West as well as on the USSR

Reduced economic capability would make allocations to Soviet military programs more painful but probably would not lead to cuts in these programs in the next several years. The Soviet military buildup has great momentum and domestic political support. Faced with what it would consider economic warfare, Moscow would be likely to turn to more autarkic economic policies, tighter internal discipline, and a more truculent foreign policy. At the same time, it is highly probable that these policies would result in increased popular dissatisfaction, reduced worker productivity, further reductions in long-term investment in order to meet short-term needs, and greater inefficiency overall in the operation of the Soviet economy.

The West could slow improvement in the performance of Soviet weapons by the late 1980s or the early 1990s by broadening controls over exports of military-related technology—and increasing its efforts to plug leakages. While there is little likelihood that even comprehensive and sustained Western economic sanctions in the near term would significantly affect Soviet military programs—many of which are already well under way—such sanctions applied for a number of years could retard qualitative improvements to Soviet weapon systems and give rise to significant pressures internally to reduce military spending at a time when the rest of the economy is in growing difficulty. This would be even more likely should the USSR's economic problems be more prolonged than the Soviet leaders expect and the remedies harder to find and slower to take effect.

DISCUSSION

Background

1. At a time when the Soviet military position vis-a-vis the West has never been stronger, the Soviet economy is under serious strain. Even before the onset of the long-anticipated labor shortages, industrial and energy growth continues to slow, agriculture has encountered one crisis after another, and shortages of industrial materials, machinery, and consumer goods are common. Soviet defense outlays, meanwhile, continue to rise, with the support of the leadership, despite troubles in the civilian economy.

The West as a Source of the USSR's Military-Related Technology

2. While the Soviet economy is large and diverse, with a broad technical and scientific base, it has only been through an extraordinary allocation of resources to defense that the Soviets have attained their present military power. Soviet weapons are designed to minimize the requirements for technologies in which the USSR is deficient, but the Soviets have turned to legal and illegal acquisitions of Western technologies (see table 1) to make up for domestic shortcomings.

3. The Soviet armed forces are being modernized in nearly every category of weapon systems. Soviet military hardware, which was at one time distinguished for its rugged simplicity, has been qualitatively improved until it is in some instances the technological equal of—if not superior to—military hardware produced in the West. Without Western technology, modernization and qualitative improvement of Soviet military equipment would have proceeded at a slower pace.

4. Through the acquisitions of Western technology and hardware, the Soviets have been able to satisfy certain R&D and production objectives:

- The reduction of engineering risk by following or copying proven Western designs.
- The reduction of R&D time and production costs by the use of Western designs and technology and equipment.

- The incorporation of countermeasures early in the Soviet weapon development process.

In addition, the Soviets have been able to upgrade critical industrial sectors such as computers, semiconductors, and metallurgy, as well as to modernize Warsaw Pact industrial manufacturing capabilities. This has also helped to limit the rise in military production costs.

5. Reliance on Western technology forces the Soviets to incur some vulnerabilities:

- Locking them into a permanent lag behind the West, especially when whole systems are copied, as with general purpose computers.
- Eschewing the better understanding of the technology of the imported system which they would obtain by doing original research from scratch.
- Directing new developments into paths that are better understood by the West than if the Soviets had originated their own designs thus enabling the West to evaluate Soviet designs more easily.

6. The Soviets historically have given high priority to the acquisition of Western technology, indicating that such technology is of great value to them. The means of transfer are shown in table 2. Of all the avenues for technology transfer, clandestine collection, illegal trade diversions, and third-country transfers of defense-related technology have had the most direct impact on Soviet weapon systems. In recent years the Soviets have increasingly tasked the East European nations to act as surrogates in clandestine and illegal acquisitions of Western technology.

7. Over the past five years, Soviet illegal trade efforts have concentrated on computers, microelectronics, air-breathing propulsion technology, guidance and navigation systems, underwater acoustical sensors, optical (including laser-related) technologies, and advanced manufacturing processes and equipment. Detected diversions and evasions over the past several

Table I

Acquisitions From the West in the Key Areas of Soviet Military Technology

Key Technology Areas	Notable Successes
Computers	Illegal and legal trade acquisitions of complete systems, hardware and software, and clandestine acquisition of proprietary information; exploitation of captured avionics and fire-control systems. A wide variety of Western minicomputers have been used in military systems.
Microelectronics	Acquisition of complete industrial processes and semiconductor manufacturing equipment through legal and illegal trade channels.
Signal processing	Illegal trade acquisition of seismic streamers and associated computers and of acoustic spectrum analyzers.
Communications	Illegal trade acquisition of low-power, low-noise, high-sensitivity receivers.
Production	Legal and illegal acquisitions of automated and precision manufacturing equipment for electronics, materials, and possibly optical and laser weapons components; clandestine acquisition of documentation on production technology of weapons, ammunition, aircraft parts, turbine blades, computers, and electronic components.
Directed energy	Acquisition of metal foils and optical components through legal and illegal channels.
Guidance and navigation	Legal and illegal trade acquisitions of [redacted] navigation receivers; illegal and clandestine acquisitions of advanced inertial guidance components, including miniature and laser gyros; acquisition of captured US equipment including terrain-following radars, antiradiation missiles, and fire-control systems; clandestine acquisitions of air-to-air and surface-to-air (SAM) missiles and of antisubmarine warfare (ASW) cruise missile and tactical ballistic missile guidance subsystems; legal acquisition of precision machinery for ball bearing production.
Power sources	Acquisition of superconducting energy storage systems and associated cryogenic equipment through legal trade.
Structural materials	Legal purchases and intelligence acquisitions of Western titanium alloys and welding equipment.
Propulsion	Acquisition of missile case filament-winding technology through legal and illegal trade, of some ground propulsion technology through illegal and legal trade (diesels, turbines, and rotaries), and of submarine nuclear propulsion plant designs by clandestine means; legal and illegal purchases of advanced jet engine fabrication technology and jet engine design information through clandestine means; acquisition of captured jet engines from Vietnam.
Nuclear weapons	Clandestine acquisition of designs for various bombs and warheads of RV-related data [redacted] (see also "production" and "chemical explosives").
Chemical explosives	Clandestine acquisition of manufacturing details of advanced high explosives for nuclear weapons.
Acoustic sensors (ASW)	Acquisition through clandestine means of underwater navigation and direction-finding equipment and of seismic streamers through illegal trade diversion.
Nonacoustic sensors (ASW)	[redacted]
Radar	Exploitation of captured terrain-following radar and airborne intercept radar; clandestine acquisition of air defense radars and antenna designs for US SAM systems.
Electro-optic sensors	Clandestine acquisition of information on US reconnaissance satellite technology; illegal trade acquisitions of laser rangefinders for tanks.

~~This table is Secret.~~

years were particularly heavy in the field of semiconductor manufacturing equipment, reflecting the Soviets' intent to improve their entire electronic components industry.

Requirements for Foreign Technology in the 1980s

8. During each of the last two decades the Soviets have deployed about 150 military and aerospace systems, newly designed or substantially modified. We

expect this rate to continue over the next decade. Thus far we have identified about 110 systems for development in the 1980s, some 60 to 70 of which we expect to be deployed by the mid-1980s. The new weapon systems reveal specific infusions of Western technology. Most current Soviet weapons are of the third or fourth generation. Because they have a well-established and sophisticated military design and production capability of their own, the Soviets pursue

Table 2

**Selected Technology Transfer Mechanisms
Used by the Soviets ***

- Direct investment in Eastern Europe
- Complete (turnkey) plant sales
- Patents and licenses with extensive teaching effort
- Joint ventures and joint production development
- Technical exchanges with ongoing contact
- "Know-how"—training, consulting in high-technology areas
- Processing equipment (with know-how)
- Technical data and engineering documents
- Proposals, presale negotiations, and sales presentations
- Commercial visits
- Governmental and industrial equipment sales
- Sales of products
- Scientific and technical and student exchanges
- Open literature (journals, magazines, technical papers, for example)
- S&T conferences, trade shows, and exhibits
- Hostile intelligence service acquisitions
- Recruited agents and industrial espionage
- Illegal arms trade
- Illegal trade in other commodities
- End-user diversions
- Third-country diversions
- Foreign signals intelligence (SIGINT)
- Capture in war

* All transfer mechanisms can be employed with or without the participation of hostile intelligence service personnel. The involvement of such personnel can range from the overt, legal collection of unclassified, unembargoed technology to the clandestine acquisition of classified, military technology by agents working pursuant to the direction of hostile intelligence service personnel. Furthermore, most of the transfer mechanisms can be legally or illegally employed.

only selected Western design elements and engineering approaches. In the aircraft industry, for example, the Soviets are applying Western designs and industrial technology to the IL-76 aircraft to be used in an AWACS program and Western numerically controlled machine tools in the production of the SU-25 ground support fighter.

9. The Soviet approach to military R&D relies in many cases on evolutionary and incremental steps to minimize technological risks and avoid production problems, although the Soviets have demonstrated the ability to develop and deploy innovative military systems when their needs could not be satisfied with the more incremental approach—for example, their A-class submarine and their antisatellite (ASAT) system. In addition to production technologies across a broad spectrum, new generations of Soviet weapons also will require critical component and subsystem

technologies. It is in these areas that Soviet legal acquisitions of dual-use technology, complemented by illegal and clandestine acquisitions, are most likely to be concentrated.

10. During the 1980s, advances in sophisticated microelectronics and materials are expected to pace the development of new weapon systems. The Soviets and their Warsaw Pact allies are also likely to need many of the new Western critical component technologies and the production equipment and technology needed to manufacture them.

11. A selection of systems projected for the Soviets in significant mission areas for the 1990s is shown in the left column of table 3. The key technologies that are required by the Soviets for these potential systems are displayed in the right column of table 3 and have been targets of known Soviet acquisition efforts. Of the key technologies listed in table 3, four—computers, microelectronics, signal processing, and production technology—have an especially broad impact. For example, microelectronics developments are critical to advances in computers, signal processing, missile guidance, and communications systems. Production technology is a critical prerequisite to advances in Soviet microelectronics, computers, marine systems, and some areas of propulsion development. Furthermore, the Soviets have attempted to upgrade their precision machining capability by importing machine tools. These imports have significantly improved Soviet precision manufacturing capabilities in military-related areas—for example, in the production of miniature bearings for strategic missile guidance.

12. The Soviets lag behind the Western state of the art in the design and manufacture of certain modern weapon components, such as microprocessors, integrated optics, and high-temperature turbine blades. They are hampered in a number of key technology areas by their inability to develop computer-aided design and integrated computer-aided manufacturing equipment.

East-West Trade and the Soviet Economy

13. The performance of the Soviet economy is worsening. Although the economy is still expanding, its rate of growth has fallen drastically. The slowdown stems mainly from rising resource costs, systemic inefficiencies, shortfalls in agriculture and in key industries such as steel, and an accumulation of plan-

Table 3

Selected Soviet Systems Projected for Initial Operational Capability in the 1990s

System/Concept	Potential New Performance	Key Technology ^a
Improved air-superiority aircraft	Advanced lockdown/shutdown; possibly control configured	Materials, guidance, computers, microelectronics
New weapon system for Typhoon ballistic missile submarine ^b	Accuracy (CEP) of 500 to 600 meters	Computers, guidance/navigation, materials
Modernized theater command, control, and communication systems (widespread deployment)	Versatile survivable equipment, automated control system	Microelectronics computers, production communication
New class of attack submarine	High speed, great depth, quietness	Production, materials, propulsion
T-80 tank follow-on ^b	Improved day/night cross-country mobility; armor protection	Sensors, materials
Advanced space station (permanently manned) ^b	Permanently manned, multimission	Sensors, signal processing
Space-based laser antisatellite system	Multiple target capability	Directed energy, power sources

^a Key technology available for systems development.
^b May reach initial operational capability in the late 1980s.

~~This table is Secret.~~

ning mistakes. As a result of these conditions, growth of labor productivity has slowed at a time when demographic trends have greatly curtailed the supply of new labor.

14. Economic growth in the 1980s, projected at 2 percent per year or less, will probably be insufficient to support past rates of increase in defense spending and also to maintain a perceptible rise in living standards; indeed many Soviet citizens believe that living standards have been declining over the past few years. If defense outlays continue to rise at about 4 percent per year as we now project, they would preempt about two-thirds of annual increments to the gross national product in 1990, as compared with one-fourth now, making leadership choices far more difficult. In particular, allocations to consumer industry, agriculture, and transportation would inevitably suffer.

Use of Imports From the West in the Soviet Economy

15. As productivity gains dwindled in the 1970s, Moscow looked increasingly to the West for technology and equipment. The leadership's decision to back President Brezhnev's program to upgrade the Soviet diet further increased the USSR's reliance on imports from the West. Between 1970 and 1980 the value of Soviet imports increased nearly eightfold (table 4), and the volume fourfold. Purchases of machinery, ferrous metal products, and foodstuffs—especially grain—dominated the USSR's import list. A large part of the Soviet imports of capital goods was financed by Western credits. As a result, the Soviet hard currency debt service ratio increased from 9 percent in 1971 to 19 percent in 1977, leading to more cautious borrowing

Table 4

Soviet Hard Currency Imports

	Value of Imports (Million Current US Dollars)			1980/1970 Ratio	Percent of Total Imports		
	1970	1975	1980		1970	1975	1980
Grain	101	2,323	4,360	43.2	4	16	17
Other agricultural products	500	1,600	4,400	8.8	18	11	17
Machinery	927	4,592	6,039	6.5	34	33	23
Ferrous metals	279	2,565	3,469	12.4	10	18	13
Chemicals	209	741	1,565	7.5	8	5	6
Other	692	2,436	6,196	9.0	26	17	24
Total	2,708	14,257	26,029	9.6	100	100	100

(Million 1970 US Dollars) *

Grain	101	920	1,770	17.5	4	13	17
Other agricultural products	500	1,130	2,540	5.1	18	15	25
Machinery	927	2,700	2,350	2.5	34	37	23
Ferrous metals	279	1,030	1,330	4.8	10	14	13
Chemicals	209	460	580	2.8	8	6	6
Other	692	1,100	1,600	2.3	26	15	16
Total	2,708	7,340	10,170	3.8	100	100	100

* Estimated.

This table is Unclassified.

and import policies through the remainder of the decade (table 5).

16. Despite difficulties in assimilating equipment, imports from the West unquestionably helped the Soviet leadership deal with major economic problems, particularly in certain manufacturing sectors:

- In the 1970s, imported chemical equipment, accounting for about one-third of all Western machinery purchased by the Soviets, was largely responsible for doubling the output of ammonia, nitrogen fertilizer, and plastics and for tripling synthetic fiber production.
- The Soviets could never have accomplished their ambitious 15-year program of modernization and expansion in the motor vehicle industry without Western help. The Fiat-equipped VAZ plant, for example, produced half of all Soviet passenger cars when it came fully on stream in 1975, and the Kama River truck plant, which is based

almost exclusively on Western equipment and technology, now supplies nearly half of Soviet output of heavy trucks.

- Large computer systems and minicomputers of Western origin have been imported in large numbers—1,300 systems since 1972—because they (a) have capabilities that the Soviets cannot match, (b) use complex software that the Soviets have not developed, and (c) often are backed up by expert training and support that the Soviets cannot duplicate.

17. At the same time, imports from the West contribute in various ways to Soviet defense capabilities:

- Some of the products of imported Western equipment and technology are used by the Soviet military—for example, trucks from the Kama River production plant.

Table 5

Million US Dollars at End of Year

Soviet Hard Currency Debt

	1971	1973	1975	1977	1979	Projected 1981
Commercial debt	400	2,000	6,900	9,800	10,500	10,800
Government-backed debt	1,400	1,700	3,600	5,900	7,800	8,500
Gross debt	1,800	3,700	10,500	15,700	18,300	19,300
Assets with Western banks	1,200	2,600	3,100	4,500	8,800	7,000
Net debt	600	1,200	7,400	11,200	9,500	12,200
Debt service	290	729	1,773	3,115	4,250	5,000
Debt service ratio *	9	10	16	19	15	17

* Debt service as percent of merchandise exports including arms and gold sales.

~~This table is Confidential.~~

- Certain imports facilitate the production of inputs for defense industries—for example, numerically controlled machine tools, specialty steels, and the facilities and technology to produce them.
 - Finally, because most defense industries also produce for the civilian economy (table 6), imports of Western machinery for the civilian sector also help to prevent greater encroachment of civilian requirements on defense production facilities.
18. Imports from the West played an increasing role in energy development in the 1970s because of Soviet deficiencies in drilling, pumping, and pipeline construction:

- The USSR bought about \$5 billion worth of oil and gas equipment.
- By the beginning of the 1970s the Soviets had settled on the gas-turbine-powered centrifugal compressor as the basic equipment for their gas transmission lines. When several domestic design and production programs failed to produce suitable high-powered compressors, Moscow turned to imports. By the end of the decade, it had ordered about 200 units at a cost of about \$800 million.

19. At the same time, grain imports in the 1970s averaged 14 million tons per year. Without Western grain, Soviet consumers would not have had the increase in meat consumption that they received in the early 1970s, and the fall in per capita consumption of meat would have been far worse in the late 1970s.

Soviet Benefits From Western Products in the 1980s

20. The resource bind facing the leadership suggests that commercial relations with the West will be even more important to the USSR in the 1980s than in the 1970s. Needing large improvements to avoid a further decline in the rate of economic growth, Soviet leaders will give a high priority to imports of Western technology and products to offset domestic shortfalls.

21. Although the USSR would benefit from increases in imports from the West during the 1980s, it may lack the necessary hard currency. With oil exports expected to decline, and exports of other major exports, such as minerals and timber, barely holding their own, the USSR's main sources of hard currency will be sales of gas, gold, and arms, along with an increase in debt to the West. The key to maintaining even the current level of Soviet trade with the West will be the Siberia-to-Europe (West Siberia) gas pipeline. If two lines are built, gas exports could amount to \$6-7 billion per year in the late 1980s, enough to repay

Table 6

Relationships Among Soviet Defense and Civilian Industries

Defense Industry	Principal Civilian Lines at Final Assembly Plants	Other Closely Related Civilian Production Technologies
Ballistic missiles	Metal consumer goods, machine tools ^a	None
Aerodynamic missiles	Metal consumer goods, excavating equipment ^b	None
Fixed-wing combat aircraft	Metal consumer goods, parts for agricultural machinery	None
Fixed-wing support aircraft	Civilian transport aircraft, metal consumer goods, hand tools	None
Helicopters	Civilian rotary-wing aircraft, metal consumer goods	None
Naval surface ships	Merchant and fishing ships, chemical storage tanks, parts for transportation and agricultural machinery	Pumps, machine tools, mining equipment
Submarines	Merchant ships, oil pipelines, parts for transportation and agricultural machinery	Pumps, machine tools, mining equipment
Tanks	Railroad rolling stock and locomotives	Construction and transportation equipment
Other armored vehicles	Agricultural machinery	Construction and transportation equipment
Artillery	Agricultural machinery, motors, and machine tools	Construction and transportation equipment

^a One ballistic missile plant produces civilian machine tools.
^b One surface-to-air missile plant produces excavating equipment.

~~This table is Secret.~~

quickly the funds advanced by Western Europe and Japan and to finance rising levels of imports. Agreement on the gas pipeline would also encourage Western participation in other major projects, providing additional sources of credit.

Potential Impact on the USSR of Western Restrictions on Trade and Technology

22. Western restrictions on economic relations with the USSR could take a variety of forms including

controls on: strategic technology; credits; nonstrategic trade; and Western imports from the USSR.

Controls on Strategic Technology

23. Existing controls have denied to the USSR very powerful computers but have not prevented the Soviets from illegally acquiring embargoed semiconductor production machinery. In addition, many types of small computers useful for research and development, including military R&D, are available at the discretion of the exporting country. An extended COCOM list would affect both civilian and military industries but would have little impact on critical military technologies which are already controlled.

24. Expanded controls would force the USSR to make even greater use of non-COCOM suppliers and illegal channels. This would result in higher costs and delays but would probably not prevent the acquisition of high-priority items. Since the USSR uses Eastern Europe as an illegal conduit for hard-to-trace technology, the value of any extension of the COCOM list would be seriously weakened if Eastern Europe were not covered.

Limits on Credits

25. Comprehensive Western sanctions on new credits, both governmental and private, would impose significant hardships on the USSR. Soviet hard currency earnings are likely to decline, at least through the mid-1980s, before the West Siberian pipeline can be completed. The extent of the decline will depend mainly on Soviet export earnings from gold, weapons, and oil. To maintain hard currency imports at recent levels and pay interest on existing debt, Moscow will have to increase its hard currency debt—perhaps rapidly. Curtailing Western credits would force a marked reduction of Soviet hard currency imports within two or three years. US action alone to limit credits would not be effective.

Controls on Nonstrategic Trade

26. A complete halt on shipment of agricultural commodities from COCOM countries and Australia would reduce Moscow's imports of grain and grain products by more than 70 percent and cut meat and butter imports far more. If the USSR could buy no grain after 1981, average annual meat production

would be cut by about 2 million tons. An embargo on meat added to the grain embargo would reduce per capita availability of meat by roughly 20 percent. The impact of a unilateral US food embargo would be small and short lived.

27. Large steel imports will be needed for the foreseeable future. Denial of all large-diameter pipe exports to the USSR would severely undercut Soviet plans to boost natural gas production. A US denial by itself would be meaningless because Western Europe and Japan account for all Soviet imports of large-diameter pipe (the USSR is a significant export market for these countries). If the Soviets are to reduce dependence on imports of Western specialty steels, they must have Western metallurgical technology. The French are helping to build the important Novolipetsk steel plant—which, when completed in the 1980s, will produce about 7 million tons of specialty steels per year.

28. With the exception of molybdenum and steel, the USSR depends on the West for little of its mineral and metals requirements. Although US producers and their subsidiaries in South America are the major suppliers of molybdenum, the Soviets could easily purchase molybdenum through multiple brokers and set up dummy corporations in non-Communist countries. The Soviets buy some tin, cobalt, tungsten, and bauxite through Western metals dealers, but the bulk of Soviet purchases are made directly from less developed countries.

29. The suspension of all contracts and imposition of a total, effective, and sustained multilateral CO-COM embargo on exports of oil and gas equipment to the USSR and Eastern Europe would substantially retard Soviet energy development, and its impact would increase over at least the next decade. Western pipe and compressors for transporting gas, high-capacity pumps for oil wells, and advanced exploration equipment could not be replaced for many years. The losses in oil and gas production could amount to 2-3 million barrels a day in oil equivalent in the middle and late 1980s, of which the larger part would be gas. The impact of a unilateral US embargo would again be much smaller and short lived.

30. A decline in oil production, coupled with a much smaller increase in gas production than is now expected, would have substantial consequences for the Soviet economy. Hard currency earnings could fall

sharply, and economic growth would probably be even slower than the rate of 2 percent or less which we now expect.

Boycott of Soviet Exports

31. Western-imposed controls on imports from the USSR would cut the USSR's hard currency earnings substantially. The bulk of Moscow's exports consist of energy and other raw materials most suited for sale to developed Western markets and not easily marketed in the less developed countries. Moscow could replace some lost sales to the European oil market with stepped-up sales to the Third World, particularly if favorable terms were offered. Natural gas could not be sold elsewhere. LDC demand for other exports—chemicals, timber, metals, and minerals—is small.

Soviet Leadership Response to a Western Embargo

32. The Soviets do not believe—particularly in light of their experience with Western sanctions after the Afghanistan invasion—that an effective economic embargo is either likely or sustainable. Their initial response to an embargo would probably be an attempt to break it up by playing up to participating countries thought to be weak links. Sustained Western economic warfare against the USSR would make Moscow more truculent in its foreign policy. Such actions would also remove some of the economic considerations that Moscow must confront in dealing with current and potential crisis situations.

33. With respect to economic policies, a broadly based embargo would force a more autarkic approach. The Western reaction to Afghanistan, in fact, has already moved the leadership in this direction. In addition, some Soviet leaders are worried about excessive dependence on the West, and others are disappointed that imports from the West have not made a greater contribution to Soviet productivity. Western economic pressure would help rally the leadership around a course of self-reliance and would provide it with a pretext for soliciting public support to implement this turn in development strategy. Western policy would be used at the same time to justify lowering consumer expectations and the need for continued economic sacrifices.

34. Although an effective embargo would narrow the range of choices available to the leadership, it

would force the Politburo to deal with several painful choices regarding resource allocations that the Brezhnev regime has avoided. No easy, risk-free solutions are readily available. At least initially, the regime is almost certain to maintain the high priority that the military has enjoyed. The tense international atmosphere and the more assertive US defense posture would politically disarm any leader who might advocate a reduction in growth of military expenditures. The high priority accorded agriculture and consumption under Brezhnev, on the other hand, is likely to be questioned. Eventually growing economic problems may spur consideration of radical changes in allocation of resources between the civilian and military sectors and in the system of economic management, but such changes are even less likely to be adopted in an environment of East-West confrontation.

Conclusions

Impact on the Soviet Economy

35. Although the Western states, acting together, have the potential to impose severe economic costs on the USSR, their ability to gain political leverage is circumscribed by two factors. First, the Soviet economy is large and self-sufficient enough to support the main thrust of its current military and foreign policies in spite of any embargo the West might implement. Second, a Western embargo must contend with the ability of the USSR to circumvent COCOM restrictions through illegal acquisitions or imports from non-COCOM countries.

36. The impact of Western restrictions could range from minimal to substantial. A unilateral US denial policy—whether focused on strategic technology, machinery, or grain—would have little impact. There are too many alternative sources of supply available to the USSR. At the other extreme, a total Western embargo

on trade with the Soviet Union with minimal circumvention would probably cause a drop in GNP in the short term and slower economic growth in the long term and force very hard choices on the leadership with regard to domestic resource decisions.

37. A total and effective trade embargo would create deeper and earlier energy imbalances than we now foresee. Faced with a total cutoff of Western trade, the leadership would be likely to adopt domestic economic policies restricting private consumption severely in order to protect essential investment sources and to allow for growth in defense spending. As a result, living standards could actually begin to fall. Lower consumption levels in turn would increase popular dissatisfaction and hinder leadership attempts to raise productivity.

Impact on Soviet Military Power

38. There is little chance that Western economic sanctions, even if comprehensive and sustained, could markedly affect Soviet military power for the better part of a decade. The Soviet response to such drastic Western actions would almost certainly be to raise even more the priority of defense programs in the allocation of resources. Should a weakening of the industrial base force some cuts in military programs, this would not happen quickly and the effects on overall Soviet military capabilities would be very gradual.

39. The main impact of Western economic sanctions would be to slow qualitative improvements in Soviet weapon systems. Given the time required to develop new or significantly modified weapon systems, the denial of Western technology would not have a major impact until the late 1980s and a maximum impact until the 1990s and beyond.

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