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Soviet Oil Exports: Understanding the Dynamics of the Downturn

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An Intelligence Assessment

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SOV 86-10008
February 1986

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An Intelligence Assessment

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This paper was prepared by [redacted] Office of Soviet Analysis, with contributions from [redacted] SOVA, and [redacted] Office of Global Issues. Comments and queries are welcome and may be directed to the Chief, Economic Performance Division, SOVA, [redacted]

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Soviet Oil Exports: Understanding the Dynamics of the Downturn

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Key Judgments

Information available as of 3 January 1986 was used in this report.

Soviet oil production dropped by over 300,000 barrels per day in 1985. Moscow opted to absorb all of the loss through reductions in oil exports to the West while sustaining deliveries to domestic consumers and its Communist partners and soft currency customers. As a result, the Soviets probably lost as much as $3-4 billion in hard currency earnings in 1985. The decision to let exports to the West bear the brunt of the oil production decline was made easier because the USSR was in a fairly good position financially to handle a decline in hard currency earnings without endangering critical import requirements.

Because of deep-rooted problems associated with the production of Soviet oil, output will probably continue to fall. If, as we expect, domestic gains in substitution and conservation during the balance of the decade will not be sufficient to offset the production decline, Moscow will have to adjust its exports or suffer shortfalls at home at a time when Gorbachev is anxious to stimulate domestic growth. Moreover, the cost of cutting oil exports will be greater in the future, because Eastern Europe is already suffering from oil shortages, and a reduction in hard currency earnings from oil sales would come at a time when Moscow's hard currency import requirements are likely to grow.

The Communist world as a whole—particularly Eastern Europe—is heavily dependent on Soviet oil, and these nations have good reason to be concerned about the USSR's oil-export outlook. Substantial cutbacks in oil deliveries to the East European countries would cause major economic difficulties at a time when those countries are under pressure to expand deliveries of finished products to the USSR. Moscow would have to weigh carefully the attendant risk of economic instability and increased political tensions that could result from a reduction in oil deliveries to these nations.

Although the Soviets will try to reap whatever savings they can from the domestic economy, Eastern Europe, and other client states, they will be forced to further reduce oil exports to the West. Earnings from gas exports are scheduled to increase substantially by 1990 but will fall far short of compensating Moscow for the expected decline in oil-export revenues. If Moscow continues its current strategy of sustaining oil deliveries to its client states while reducing only exports to the West, hard currency losses would become enormous before 1990. This, in turn, would present Moscow with unpalatable choices, such as reducing imports of state-of-the-art technology critical for the industrial modernization program or even cutting some agricultural imports.

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The Soviets have a few options available to ease the oil-export supply situation, but not one offers substantial relief in the near term. Moscow could, for example, try to step up its imports of OPEC oil by boosting arms sales to the oil-producing nations. But these sales will probably be constrained by the OPEC nations' limited ability to absorb and/or pay for more Soviet arms. Although the Soviets are beginning to explore ways to swap other goods in return for oil, so far no such deals have been arranged. Moscow also could trim oil exports to non-Communist soft currency customers, but these deliveries are already at relatively low levels.

If Moscow is unable to offset the anticipated decline in oil revenues, it will have to cut back on planned imports or incur much higher levels of debt to the West. Its strong credit rating would allow it to rapidly increase borrowing to finance imports, but this would run against Moscow's traditionally conservative borrowing posture. The Soviets could also boost gold sales substantially and attempt to expand further their purchases from soft currency trading partners.

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Preface

Taken together, the recent downturn in both Soviet oil production and hard currency oil exports raises a number of basic questions regarding present and probably future oil-export policies of the Soviets. Using a question-and-answer format, this Intelligence Assessment seeks to provide a basic understanding of the underlying issues. It makes no attempt to forecast outcomes beyond 1990 or provide in-depth analyses of oil production and other factors affecting the outlook for oil exports. 25X1

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Soviet Oil Exports: Understanding the Dynamics of the Downturn

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The Domestic Oil Balance

What Is the Oil-Production Outlook for the USSR?

Domestic oil output fell in 1984—by 100,000 barrels per day (b/d)—for the first time since World War II. It fell again in 1985 by about 330,000 b/d—or by about 3 percent—and we judge, on the basis of the current state of the oil industry, production in 1986 could fall another 300,000 b/d (see appendix B).

In speeches given since last summer, Gorbachev has implied that he is counting on short-term gains from improved worker discipline and management to sustain production until more and better oilfield equipment is available. When Gorbachev visited the important Tyumen' oilfields in West Siberia last September, he pledged to improve both working conditions and the quality and quantity of equipment. Although this could well slow the production decline in the near term, reversing the decline would be extremely costly and difficult. Gorbachev's remarks suggest he is not counting on the future discovery of new giant oilfields as a solution, and increased output from smaller, more remote, and less productive fields will require considerably more investment than he appears to have in mind for the oil industry. Although the 1986 plan calls for a production boost of about 400,000 b/d and provides a 31-percent increase in oil-industry investment for the year, we believe that the surge in investment will be absorbed by sharply rising costs associated with providing sufficient capacity just to offset depletion.

Is the USSR Reducing Domestic Consumption?

The Soviets seem to be reducing oil use in two ways. First, they are probably reducing oil consumption through programs now under way to convert from oil to gas in industrial and residential sectors. Second, they could be saving oil by forcing conservation through rationing; there is some evidence that Moscow is using this method in a few sectors of the economy.

The USSR has made oil-to-gas conversion programs and energy conservation a national priority. There are few firm indications, however, that oil consumption has been reduced. The Soviet press—which is unlikely to pass up an opportunity to tout progress in highly publicized programs—has been relatively silent on the issue of conservation. In addition, our analysis of the electric power industry—the main target of the fuel-switch programs—indicates that the oil "saved" through conversion of some power plants to gas was effectively used to offset major shortfalls in the supply of coal to other power plants and to produce above-plan amounts of electricity.

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Prospects for conserving oil during the next several years are not bright. Gorbachev's program for retooling the industrial base with more energy-efficient equipment promises substantial savings, but only in the long run and after considerable expense. Over the next several years, the industrial modernization program, vigorously pursued, will itself consume large quantities of fuel. Moscow may seek ways to adjust the product mix of the economy that would reduce oil consumption in industry. We believe that, on balance, given Gorbachev's stated objectives, the mix of industrial output is likely to become more rather than less energy intensive.

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Can Moscow Rely on Natural Gas To Ease the Oil Pinch?

The energy outlook is not entirely bleak for the Soviets because the increased availability of natural gas will help ease some of the impact of declining oil production. The USSR has abundant reserves of natural gas and has had marked success increasing output. By 1990 annual gas production could increase by more than one-third. Such an increment in supply would satisfy steady increases in domestic gas consumption while leaving ample supplies for a potential expansion of exports to Eastern and Western Europe by roughly 50 percent.

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Moscow's plans for natural gas for the 1986-90 period include:

- Energy conservation and a conversion program that calls for increased substitution of gas for oil in industry. The Soviets hope—probably overoptimistically—to reduce domestic oil consumption by about 1 million b/d by 1990. This would add to the amount of oil available for export, but achieving this goal will not be easy.

- A new gas-export pipeline to deliver an additional 20-22 billion cubic meters (bcm) of gas annually to Eastern Europe. The pipeline would also provide capacity for supplying an increment of about 6-8 bcm to the western USSR or to Western Europe. The project could be completed by the late 1980s. Moscow has been encouraging greater use of gas in Eastern Europe to reduce the region's reliance on oil; gas deliveries currently stand at roughly 40 bcm a year.

- Greater gas sales to Western Europe. Total gas exports are scheduled to increase from about 32 bcm in 1985 to roughly 55 bcm by 1990, as deliveries increase through the pipeline from Siberia to Western Europe. Although the full potential of these plans is being limited by slack gas demand in Western Europe, the sales that do occur will provide substantial hard currency revenues. These additional earnings, however, will fall far short of compensating Moscow for the expected decline in oil export revenues.

Soviet planners, moreover, may be too optimistic about the ability of the domestic economy and the economies of Eastern Europe to absorb this much additional natural gas and the willingness of West European countries to line up for new deals. Progress in converting to greater use of gas in the USSR and Eastern Europe has been slow—far below plan—and prospects for substantial gains in the next few years are limited. Some sectors of the economy, notably agriculture and transport, are heavily dependent on liquid fuels. With resources stretched thin, further conversion of industrial facilities will be slow.

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Determining Export Allocations

How Are Oil-Export Decisions Made?

A prime consideration in allocation of oil for export is an estimate of the hard currency needed to purchase Western industrial technology and equipment and agricultural commodities. The Soviet State Planning Committee (Gosplan) annually examines the outlook for oil availability, domestic requirements, need for hard currency, and considerations affecting export to Eastern Europe and the Third World in reaching decisions on the allocation of oil for export.

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Export allocations, once made, provide the basis for the spate of oil-export contract signings by the Soviet oil-exporting agency at the beginning of each year. This agency has some flexibility to alter plans according to market conditions, but any changes must be approved by Gosplan. During periods of market instability, interaction between Gosplan and the oil-exporting agency increases. A leading Soviet economist, for example, recently asserted that, because of declining oil prices in recent years, Gosplan has had to decide on a regular basis the quantities of oil to be diverted from the domestic economy for export to the West.

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Soviet planners determine annually the amount of oil to be sent to Eastern Europe. Bilateral discussions set the amounts to be delivered to the individual nations, and Moscow usually meets these commitments. The East Europeans can buy additional oil if they need to, but have to pay hard currency for amounts beyond those specified in the protocol.

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What Is the USSR's Overall Oil-Export Policy?

Oil is the USSR's major hard currency earner, and sales to *the West* in 1984 now account for almost half of Soviet hard currency exports, compared with about 15 percent in 1970 (figure 1). Hard currency requirements figure prominently in the determination of

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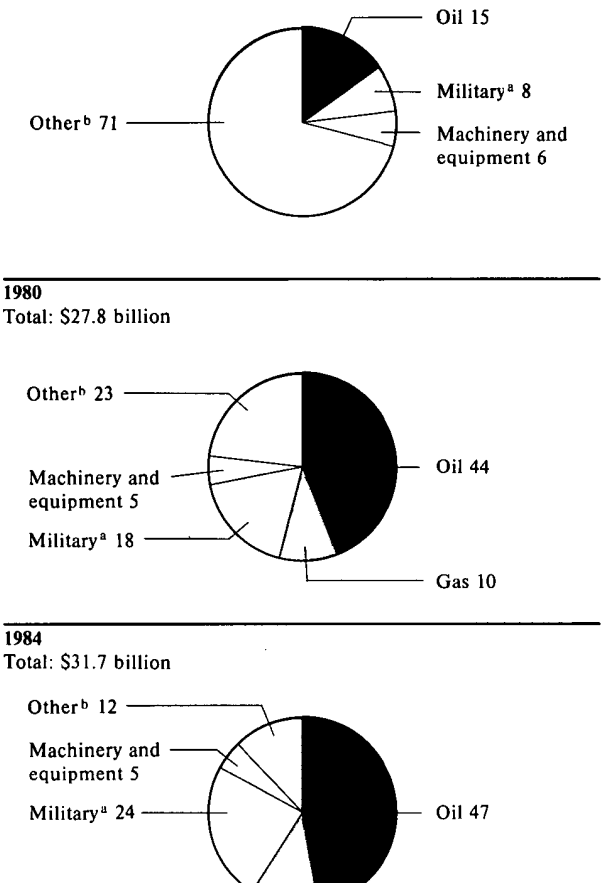
Figure 1
Oil's Share of Total Soviet Hard Currency Exports



[a] Military exports are estimated from Soviet trade statistics and include deliveries of major military hardware, spare parts, support materials, and other follow-on supplies.

[b] Other exports include chemicals, wood and wood products, agricultural products (mainly cotton), diamonds, minerals and raw materials, and small quantities of other products.

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amounts sent to the West each year. About 90 percent of Soviet oil sold in the West is exported to nations in the Organization for Economic Cooperation and Development (OECD), mostly those in Western Europe. The USSR will sell oil to any Western country willing to pay the going price. 25X1

In exporting oil to *Eastern Europe*, the Soviets must provide enough energy to avoid serious economic disruption to the area's struggling economies. In return, the USSR receives industrial machinery and equipment—most of which is inferior to that available in the West—consumer goods, and some agricultural products. In attempting to reduce its reliance on the West for quality goods, Moscow is now demanding that the East Europeans increase the amount and quality of goods exported to the USSR and has insisted on greater East European participation in Soviet energy development projects. This serves Moscow's interest in increasing integration within the Council for Mutual Economic Assistance (CEMA), and it effectively raises the cost to Eastern Europe for the same quantity of oil. 25X1

In trading with the *Third World,* the USSR sells oil to selected countries to increase economic and political ties. About two-thirds of this trade is settled through soft currency exchanges, where the USSR receives many goods not readily salable on Western markets. The rest is sold for hard currency, with a small portion of these sales on credit. 25X1

What Do We Know About Moscow's Priorities in Oil Allocations?

During the past several years, Moscow has reduced deliveries to each of the major claimants of oil at one time or another to offset either temporary production and transportation problems or liquidity shortfalls:

- In 1981-82, when the USSR was in the throes of a hard currency pinch, Moscow cut deliveries to several East European and other Communist countries by about 10 percent. The oil was diverted to Western buyers to improve the USSR's liquidity position. 25X1 25X1

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- During 1982-84 the Soviets appeared to be increasing exports, at least in part by diverting more oil from the domestic economy. Evidence suggests that Moscow was forcing "conservation" in some instances by not delivering planned allotments to domestic installations. Some factories were being sent less oil, while others were sent whatever fuel was available, even if it was not the particular type of fuel needed.

- In 1985 the USSR substantially reduced exports to the West during the first quarter—when the harsh winter drove up domestic consumption and hampered production—and probably again in the fourth quarter—evidently because of steadily declining output and a seasonal buildup of domestic stocks. During the year Moscow did not reduce deliveries to Eastern Europe.

Because Moscow has changed its allocation priorities from year to year, it is difficult to project them for the coming years. It seems clear, however, that the costs of adjustment will be greater in the future:

- Eastern Europe is already suffering from some oil shortages, and Soviet hard currency oil earnings appear to be on a permanent decline. As late as last year, Moscow told its East European allies that oil deliveries would not be cut during 1986-90 as long as reciprocal delivery obligations were met. This commitment may not bear much weight, however. The Soviets made the same promise for the 1981-85 period and then cut deliveries in 1981-82.

- Moscow continues having difficulty conserving domestic oil use. More strenuous efforts to force conservation would take a toll on economic growth.

- Moscow will not be able indefinitely to offset the loss of oil exports to the West by increased borrowing.

Oil Exports to Client States and Other Soft Currency Nations

How Dependent Are These Countries on Soviet Oil? The USSR's client states in the Communist world are, as a whole, heavily dependent on Soviet oil, and these countries have good reason to be concerned about the USSR's recent struggle to meet export commitments. All of Moscow's East European allies, except for Romania, depend on the USSR for at least three-fourths of their oil supplies. Romania depends on the Soviet Union for over one-fifth of its supplies and is seeking a large increase in Soviet oil deliveries for 1986-90. Bucharest evidently prefers the security of steady supplies from the USSR to the uncertainties of Middle Eastern oil. It also would prefer to obtain Soviet oil by bartering goods salable for hard currency rather than paying cash. Soviet oil plays a key role in the economy of Cuba, comprising all of the country's oil imports and three-fourths of its oil consumption. 25X1

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Most of Moscow's Third World clients are also heavily reliant on Soviet oil (figure 4). Angola, in contrast, buys little or no Soviet oil. 25X1

None of the non-Communist less developed countries [1] (LDCs) are heavily dependent on Soviet oil. India imports over 100,000 b/d from the USSR, but this represents less than one-sixth of its oil consumption. Nevertheless, for those financially strapped LDCs that also experience periodic energy shortages such as Madagascar, Soviet oil supplies offered on credit or at concessionary prices can become very important—both from a political and economic perspective—despite their relatively minor share of total oil supply.

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[1] In addition to countries with centrally planned economies, this group includes countries that consider themselves Marxist and that rely primarily or entirely on Communist military support to maintain their power.

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How Much Will Eastern Europe Be Paying for Moscow's Oil in the Future?

In recent years, especially since the June 1984 CEMA summit, Moscow has made clear that Soviet oil would, in effect, become more costly to the East Europeans. Taking advantage of plan coordination for the 1986-90 period, Moscow has insisted that, in return for roughly the same level of oil deliveries as in 1981-85, Eastern Europe must provide more and better quality goods (that is, goods of Western quality), improve conservation efforts, and increase investment in Soviet energy development projects. For example:

- East Germany has agreed to increase exports of consumer goods to the USSR by 40 percent during 1986-90 compared to the previous five-year period, all of which are to be of substantially higher quality than in the past.
- Poland is to build a new cosmetics plant and designate a significant portion of its production for Soviet consumption, the first time Warsaw has agreed to any such arrangement.
- East Germany is to build plants and provide equipment for the Soviet oil and gas industry.
- Romania is to invest and participate in offshore oil development in the Caspian Sea and increase deliveries of meat and grain.

As a result, Eastern Europe will, in the short run at least, potentially lose some ability to earn hard currency from sales of better quality goods to the West. This will put further pressure on the economies in the region already beset with difficulties in resolving their indebtedness to the West. Losses of hard currency earnings could lead to lower imports of Western machinery and technology, which would aggravate East European lack of progress toward industrial modernization goals. From Moscow's viewpoint, however, these circumstances could facilitate closer integration of the economies of Eastern Europe and the USSR, a goal Moscow stressed repeatedly during the 1984 CEMA summit.

Can Eastern Europe Afford Cuts in Soviet Oil Deliveries?

The East Europeans would have considerable difficulty in coping with a substantial cut in oil deliveries from Moscow. Most of the countries in the region—plagued by sluggish export growth, large debt-service obligations, and uncertain borrowing prospects—do not have enough hard currency to purchase a substantial portion of their oil requirements on the international markets. Moreover, securing more oil through barter arrangements has been made more difficult because of a reluctance on the part of Third World countries to increase such deals. 25X1

The cutback in Soviet oil deliveries to the East Europeans in 1982 was easier to cope with because the region was reexporting some Soviet oil for hard currency. Cuts during 1986-90 would be much more troublesome because they would have to be absorbed by East European domestic economies. With balance-of-payment constraints limiting East European purchases of oil from hard currency sources, reduced oil consumption would adversely affect economic productivity and growth in the region. Lower growth, in turn, would make it more difficult to meet Soviet import demands, increase the likelihood of political instability in parts of Eastern Europe, and raise public resentment toward the Soviet Union. 25X1

Can Moscow Trim Deliveries to Other Client States and Soft Currency Nations? 25X1

There is some room for the USSR to trim deliveries to other client states and soft currency customers to divert exports to the hard currency market but doing so would probably not provide Moscow with substantial savings. Moreover, such cuts would have to be balanced against potential political and economic costs to Moscow. Outside Eastern Europe, the Soviets export only about 300,000 b/d to Communist nations, with approximately three-fourths of this amount going to Cuba. Although the Soviets currently allow Cuba to sell some oil for hard currency as an incentive to trim its domestic consumption, Moscow continues

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to pressure Havana to reduce oil imports. However, a substantial reduction appears unlikely. Cuba continues to face serious economic difficulties, and lower Soviet oil deliveries in 1985 created domestic shortages—including some for the military. Soviet oil deliveries to North Korea last year ran only about half the amount stipulated in the 1981-85 bilateral protocol. Other LDC client states that depend on Soviet oil are also suffering from serious economic difficulties, and Moscow may see little net benefit in cutting these already small deliveries.

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Trimming oil deliveries to non-Communist soft currency countries—particularly Finland and India—may also be difficult for the Soviets. Moscow informed Finland to expect some "drastic cuts" in 1985; deliveries for the year were probably about four-fifths of the amount set by the bilateral protocol. Further reductions in oil trade with Finland could begin to restrict Soviet imports of Finnish high-quality goods. Cutbacks in oil deliveries to India might be a more likely option, but Moscow has shown some concern for the political and strategic aspects of Soviet-Indian relations as well as for the bilateral trade balance. The USSR has little else to sell India besides oil and arms. India's domestic oil production is expected to peak soon, and the Soviet deliveries may become increasingly important to that nation's economy.

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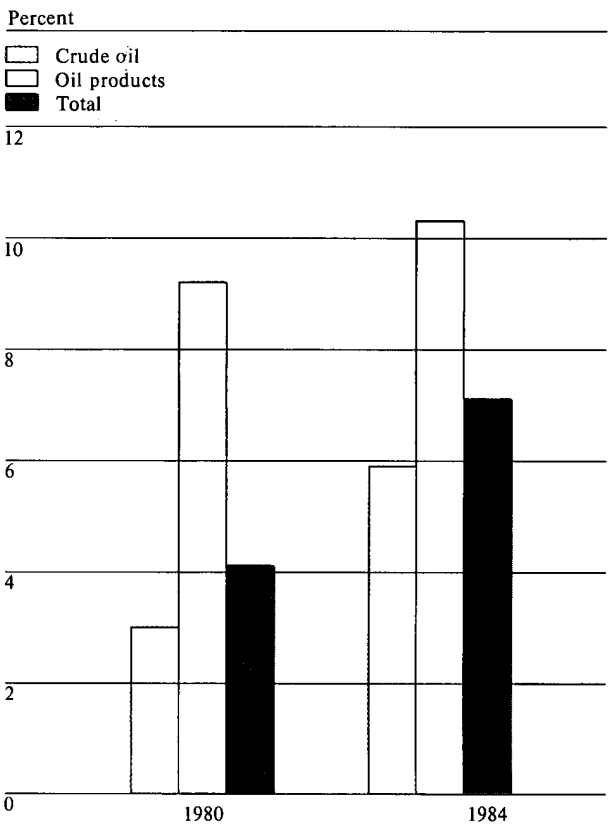
Figure 2
OECD: Soviet Share of Oil Imports



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Oil Exports to the West

What Is the Soviet Share of the Western Oil Market? Soviet oil accounted for about 4 percent of OECD oil imports in 1980 and 7 percent in 1984 (figure 2)—a remarkable increase during a period of slack world demand, explained largely by aggressive Soviet pricing. The Soviets have increased their market share largely at OPEC's expense; some of the increase has come from Soviet reexports of OPEC oil. The USSR's market share is considerably larger if only oil products are considered. With a 10-percent share of OECD oil-product imports in 1984, it ranks second in importance behind the Netherlands and is the leading supplier of several specialized products.

What Will Be the Impact on the Oil Market of the Downturn in Soviet Exports? The first-quarter 1985 decline in Soviet exports to OECD nations—to some 600,000 b/d below first-quarter 1984—contributed to the strengthening of prices in the market. But, as the harsh winter in the USSR subsided, oil exports began to increase rapidly. Aggressive Soviet marketing during the summer drew complaints from several OPEC nations that the USSR was trying to undermine the market at a time when OPEC was trying to increase internal discipline on production quotas and pricing policies.

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Soviet exports again turned downward in the fourth quarter of 1985 and were probably some 300,000 b/d below the fourth-quarter 1984 level. This development may have contributed to a firming of the overall market but only in conjunction with several other factors—a seasonal increase in demand during the winter, low world oil stocks, and continued Iraqi attacks on Iranian oil terminals. On balance, there is enough excess oil available to absorb a major decline in exports from the Soviet Union, even if substantial shortfalls persist through the next several years

How Will Soviet Hard Currency Earnings Be Affected?

The decline in the volume of oil sold to the West, combined with lower world oil prices, probably led to a reduction in hard currency earnings of about $3-4 billion for 1985 as a whole, or more than 10 percent of the USSR's total hard currency earnings. Most industry analysts expect oil market prices to fluctuate in the range of $17 to $25 per barrel in 1986. A price of $25 per barrel, combined with an export decline in the range of 100,000 to 200,000 b/d, would lead to a fall in earnings of another $2-3 billion this year. A price fall to $17 per barrel, combined with a similar drop in volume, would cost the USSR some $5 billion—a drop of more than 40 percent from 1985 oil-export earnings.

Moscow cannot compensate for this drop by expanding other exports. Soviet earnings from natural gas sales to Western Europe did not rise substantially in 1985, and gas prices on average fell somewhat. Other exports—including sales of metals, machinery, and weapons—face limited Western or LDC demand and, in some cases, constrained domestic availability. Opportunities for boosting arms sales to OPEC nations—traditionally paid for in oil that the USSR reexports for hard currency—are limited by the ability of these nations to absorb and pay for more arms.

Despite the loss in earnings last year, we believe that the USSR was able financially to satisfy most of its import requirements from the West in 1985. Doing so, however, required a sharp step-up in Soviet borrowing. Moscow was helped in 1985 by a better domestic grain crop and thus substantially reduced grain import requirements in the latter half of the year. Nevertheless, reports toward the end of the year indicated that some purchases were being postponed because of hard currency shortages.

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The USSR-OPEC Oil Relationship

How Important to Soviet Interests Is the Reexport of Oil?

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Soviet reexport of OPEC oil has facilitated the increase of oil exports for hard currency. The USSR reexports all of the oil it "imports," which in 1984 totaled an estimated 300,000 b/d (see table). Since 1981 Moscow's oil exports to the West have increased by roughly 600,000 b/d, of which OPEC oil accounts for about 200,000 b/d.

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Several OPEC nations provide the USSR with oil in payment for Soviet arms rather than market the oil themselves. Although Moscow would probably prefer to receive hard currency directly, the reexporting of OPEC oil offers a means for expanding ties to LDCs in need of a steady or reliable supplier of oil. Even though the amounts supplied to these countries are small, this oil frees up corresponding quantities of Soviet oil for other uses. Moscow also uses reexported oil to increase its total oil exports and to enhance its image as one of the world's most important non-OPEC oil exporters. Finally, to the extent that it can obtain Libyan oil, the USSR can offer crude with low sulfur content—an oil that is attractive to many West European refineries.

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Moscow recently has begun to use the OPEC oil as a way of offsetting shortfalls on its contracted obligations to specific customers. During the fourth quarter of 1985, for example, it reportedly offered the OPEC oil—particularly high-quality Libyan crude—as compensation to customers affected by shortfalls in the export of Soviet crude. Some of the customers had never received nor been offered reexported oil from the USSR before.

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USSR:
Estimated Oil Reexports, 1984

Country of Origin	Amount (*thousand b/d*)	Probable Recipients
Total	**300**	
OPEC	285	
Algeria	8	Yugoslavia, Bulgaria (1985 only)
Iran	30	India, others
Iraq	80	India, Yugoslavia, others
Libya	130	Finland, Yugoslavia, Western Europe
Saudi Arabia	37	Caribbean nations, India
Other	15	
Oman	1	South Yemen
Syria	14	Western Europe

Can the USSR Increase This Source of Supply?
In recent years the Soviets have been able to increase oil deliveries from OPEC—particularly from Libya and Iraq—almost entirely in exchange for arms shipments. But there is little opportunity for additional oil supplies through arms sales because most of these countries are not asking for, and probably could not pay for, substantial increases in deliveries of Soviet arms. Kuwait has been a recent exception. It bought several hundred million dollars worth of Soviet arms for air defense, but it appears so far that the arms will be paid for in cash, not oil.

There is, however, some opportunity for the Soviets to provide economic assistance in exchange for OPEC oil. In 1984, for example, the Soviets reportedly were considering constructing an industrial plant in Nigeria in exchange for oil. Algeria also reportedly was interested in using oil to pay for military deliveries from the USSR. Although the deal with Lagos fell through, Algeria did begin sending the USSR significant amounts of oil in late 1984; the shipments continued in 1985 as well. Libyan leader Muhammar Qadhafi visited Moscow last October to discuss among other issues a long-term economic development program. The Soviets reportedly were interested in being reimbursed in oil for some of this development.

Outlook

What Are the Oil-Production Prospects Through 1990?
By 1990 the USSR—if unable to boost investment as planned and step up drilling, well completions, commissioning of new capacity, equipment supply, and well repairs—could face a shortfall in annual oil production of more than 1 million b/d compared with the 1985 level, a decline of about 10 percent. The aging of several giant oilfields in West Siberia, combined with the inevitable decline of their crude oil output and a rapidly escalating percentage of water production, are factors Gorbachev will not be able to overcome with improvements in oil industry management and an increased supply of equipment (see appendix B for details). Only the discovery and development of new oilfields of comparable productive capacity can offset the large declines in output from aging giant fields at competitive costs. But the odds of finding additional giant fields in West Siberia have diminished rapidly over the past decade, according to Soviet geologists. During his speech in Tyumen', Gorbachev acknowledged that the USSR must turn to deposits with lower yields and increasingly use forced methods of extraction in West Siberia.

Offsetting losses from the aging fields will require the development of an increasing number of small fields—which are proving to be less productive and of poorer quality. The methods required for such development are very costly and require some technology that the USSR has not yet mastered. Another option is to continue active exploration in the Barents Sea, which has a huge potential. In our judgment, however, even if large oil deposits are found, this area will not provide much relief before the mid-1990s

What Does This Imply for Exports?
The production outlook foreshadows a steady reduction in exports for the next several years, though the Soviets may be able to ease the decline somewhat with further gains in domestic oil conservation and energy substitution. If Moscow sustains oil exports to its CEMA partners and other soft currency clients at current levels, it would have virtually no oil available

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to export for hard currency by 1990—even with some savings in domestic oil use. Only by trimming exports to its Communist clients would the USSR be able to export more than minor quantities of oil to the West for hard currency. [redacted] 25X1

How Will Soviet Imports Be Affected?

In the next year or so, the Soviets will face more difficult decisions as export earnings from oil continue to decline. How the USSR will react to a sustained drop in oil-export revenues remains unclear; in all likelihood the Soviet leadership is temporizing on the issues in hopes that the decline can be arrested. Barring such a turnaround, Moscow will have to cut back on planned imports. The degree of cutback will depend, in turn, on decisions taken in the following areas:

- A strong credit rating would allow for a rapid expansion of borrowing to underwrite continued inflows of Western plant and equipment—at least for the next year or so. Moscow, however, will probably be loath to let its debt get too high to avoid the perception—if not the reality—of becoming dependent on Western banks.

- Room exists for a sustained expansion in gold sales without substantial downward pressure on prices.

- Soviet importers will probably seek to expand purchases from soft currency trading partners both inside and outside the Communist Bloc. Options are limited, however, in the high-technology area.

- Greater flexibility on terms and raw material export prices might result in new compensation deals with West European and Japanese importers that could increase nonoil exports. [redacted] 25X1

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Appendix A

Worldwide Imports of and Dependence on Soviet Oil, 1983-84 [a]

Thousand b/d

	1983			1984 [b]		
	Imports of Soviet Oil	Share of Oil Imports (*Percent*)	Share of Oil Consumption (*Percent*) [c]	Imports of Soviet Oil	Share of Oil Imports (*percent*)	Share of Oil Consumption (*Percent*)
Total	**3,667**			**3,727**		
Non-Communist	**1,779**			**1,837**		
OECD [d]	1,569	7	5	1,626	7	6
Australia	0	0	0	1	NEGL	NEGL
Austria	30	17	15	26	14	15
Belgium	114	16	28	145	21	35
Denmark	22	10	12	24	11	12
Finland [e]	233	88	115	207	84	114
France	168	8	9	159	8	10
West Germany	211	10	11	239	11	12
Greece	53	16	23	51	17	22
Iceland	7	70	70	6	63	60
Ireland	2	2	2	3	3	4
Italy	195	11	10	242	13	16
Japan	17	NEGL	NEGL	17	NEGL	NEGL
Netherlands	270	18	47	271	18	43
Norway	10	11	7	18	18	13
Portugal	4	2	2	5	3	3
Spain	33	3	3	43	4	8
Sweden	84	15	18	50	12	17
Switzerland	46	18	19	36	15	16
Turkey	7	2	2	2	1	1
United Kingdom	62	8	4	69	6	4
United States	1	NEGL	NEGL	13	NEGL	NEGL
LDCs [d]	210			211		
Brazil	15	3	2	20	4	3
India [e]	116	30	16	115	30	16
Morocco	17	17	17	17	17	17
Others	62			59		

Footnotes appear at end of table

Worldwide Imports of and Dependence on Soviet Oil, 1983-84 [a]

Thousand b/d

	1983			1984 [b]		
	Imports of Soviet Oil	Share of Oil Imports (*Percent*)	Share of Oil Consumption (*Percent*) [c]	Imports of Soviet Oil	Share of Oil Imports (*percent*)	Share of Oil Consumption (*Percent*)
Communist and other client states [f]	**1,888**			**1,890**		
CEMA [e]	1,720	NA	NA	1,710	78	83
Bulgaria	296	88	94	296	96	103
Czechoslovakia	342	94	101	342	96	105
East Germany	342	77	95	342	75	99
Hungary	159	75	80	156	75	83
Poland	300	86	91	300	85	92
Romania	4	1	1	22	9	7
Cuba	225	100	90	200	100	75
Vietnam	33	85-90	85-90	33	85-90	85-90
Mongolia	19	100	100	19	100	100
Other [e]	168			180		
Afghanistan	9	95	95	9	95	95
Cambodia	3	95-100	95-100	3	95-100	95-100
Ethiopia [d]	17	99	116	16	99	NA
Laos	1	20-25	20-25	1	20-25	20-25
Mozambique [d]	3	50	50	5	60	60
Nicaragua [d]	1	8	8	6	55	55
North Korea	15	30	30	12	25	25
Yugoslavia	112	54	39	114	55	40
Others	7			14		

[a] Includes deliveries of oil originating from OPEC or other oil-producing countries (see p. 8). Columns may not equal totals due to rounding.
[b] Preliminary.
[c] Share of consumption may be larger than the volume of imports because of reexport.
[d] Hard currency countries except where indicated.
[e] Soft currency countries except where indicated.
[f] In addition to countries with centrally planned economies, this category includes countries that are Marxist clients, that is, countries that consider themselves Marxist and that rely primarily or entirely on Communist military support to maintain their power.

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Appendix B

The "Samotlor Disease" Is Spreading

The "Samotlor disease"—a vicious circle of flagging output from giant oilfields and ever-increasing use of manpower and equipment in an attempt to sustain total oil output—is spreading throughout the West Siberian oil region. Unless large oil finds are made, the costs of oil exploitation in the USSR will rise exponentially.

Developments associated with the aging of Samotlor, the USSR's largest oilfield, are the principal cause for last year's decline in nationwide oil output and for the incipient decline in West Siberian oil output.[2] One-third of Samotlor's wells stand idle. In the first quarter of 1985, the number of flowing wells in the field declined by nearly one-third, leading to a doubling of the number of inactive wells there. The number of inactive wells reflects the chronic shortage of pumping equipment—a shortage that becomes more acute as the proportion of water (water cut) in the oil-and-water mixture produced from oil wells rises sharply. At Samotlor, the water cut is now 55 percent, compared with about 40 percent in early 1983. The high water content in turn causes additional complications (more corrosion of piping and equipment, more need for storage facilities and separation equipment to handle the water) that boost both the labor and capital intensity of the oil-production effort.

Major Causes of the Decline in Oil Production

Two groups of factors, partly interrelated, are contributing to the spread of the "Samotlor disease." One group—often referred to as "fixable" problems—includes shortages of skilled manpower, poor quality of equipment, and inadequate infrastructure. The second group of factors embraces the aging of several giant oilfields, with the consequent decline of their crude oil output, rapidly escalating water production, and a corresponding surge in demand for pumping equipment, well workovers, and general oilfield maintenance.

[2] After reaching 12.3 million b/d in 1983, Soviet oil output slipped to 12.2 million b/d in 1984 and fell to 11.9 million b/d in 1985.

The "fixable" problems have long plagued the oil industry's production effort in West Siberia and most recently were addressed by a Politburo decision in August 1985 and by General Secretary Gorbachev in his September speech in Tyumen'. The Politburo decision calls for increasing construction and assembly work in the West Siberian oil and gas complex by 60 percent in the 1986-90 plan, and for providing new working capacity, a more reliable supply of electricity, and improved transportation facilities. The Politburo decision also calls on the factories to improve the quantity and quality of equipment produced for the oil and gas industries. Housing construction in the region—long a factor adversely affecting labor recruitment, morale, and retention—is to increase. The Gorbachev speech stressed these factors, together with greater application of science and technology, improved management, and heightened oversight by local Communist Party units.

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Implementation of these measures can do little to improve output in the short run. In the long run, they can ameliorate operating conditions in the West Siberian oilfields, but this offers only the prospect of slowing the decline in output. A spate of articles in the Soviet press has described the decline in West Siberian oil production, the increased number of idle wells, and the continuing problems with poor management. From January through July of 1985, for example, oil production by Glavtyumenneftegaz (which accounts for about 90 percent of oil output in West Siberia) was reportedly some 500,000 b/d below plan for the period (212 days) because large numbers of wells ceased flowing oil.[3] Although the productivity of well-repair crews has increased, the number of wells being idled each day outstrips the number being returned to service. Efforts to return the wells to active service are hampered by shortages of equipment. Moreover, the

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[3] The share of West Siberian oil output attributable to the Glavtyumenneftegaz production association decreased from 97 percent in 1984 to about 90 percent in 1985 as the result of the transfer of several oilfields from the operational control of Glavtyumenneftegaz to two Volga-Urals production associations.

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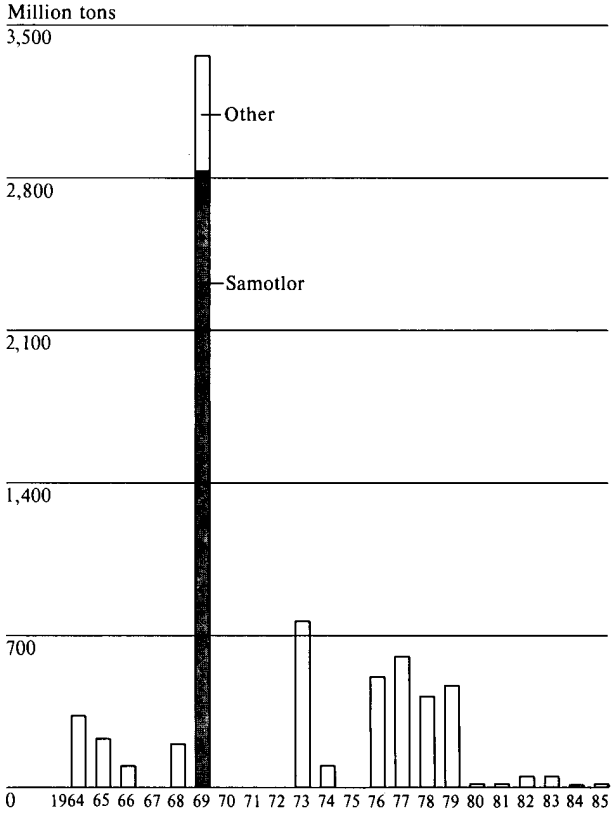
seriousness, extent, and persistence of the oil industry's production problems enumerated by the Soviet media strongly suggest that far more is involved than problems with poor management, labor, and equipment supply.

Indeed, far more is involved. The age distribution of the developed oilfields in the USSR exacerbates the effects stemming from the aging of giant oilfields. A large proportion of West Siberia's developed reserves were tapped in the 1969-79 period (figure 3). Consequently, the peaking and decline of output from these fields are occurring in a relatively short period. Samotlor, placed on stream in 1969, accounts for 40 percent of the West Siberian oil reserves tapped from 1964 to date. As illustrated by the figure, oilfield commissionings in the 1970s were smaller than Samotlor by an order of magnitude—and those in the 1980s have been much smaller yet. Because the new commissionings are not of comparable size to the aging fields introduced in the 1960s and the 1970s, the Soviet oil industry is now on a treadmill and faced with the hopeless prospect of having "to run faster to stay in place."

Only the discovery and development of new oilfields of comparable productive capacity can offset the large declines in output from aging giant fields at competitive costs. In his Tyumen' speech, Gorbachev noted that, when oil deposits pass their peak output, priority attention must be given to finding and tapping new deposits. But the odds against finding additional giant fields in West Siberia have increased rapidly since 1975, according to Soviet geologists. Indeed, the Soviet press states that these geologists no longer predict the imminent discovery of a second Samotlor. Offsetting the production losses from aging fields thus requires the development of an increasing number of small fields—which are proving less productive. For example, the average flow from new wells has decreased by 50 percent since 1980, according to the Soviet press. These circumstances are leading some Soviet oil officials to emphasize development of "difficult-to-extract" oil reserves. The methods required for such development, however, are costly and technically demanding.

Figure 3
West Siberia: Oil Reserves Tapped, 1964-85
($A+B+C_1$ Reserves in Fields Started Up)



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The Soviet oil industry has taken steps to deal with some of the "fixable" problems. Changes in managerial personnel and a large increase in the number of well-repair crews assigned to West Siberia have sped up the servicing of wells and undoubtedly have prevented a steeper decline in oil production. But the negative impact of the aging process ultimately affects all oilfields and will surely cause more wells to cease flowing in the future. Soviet emphasis on short-term production gains through more drilling and larger water-injection programs accelerates the aging process.

The Status of Tyumen' Oilfields

Because of the advanced age (12 to 20 years) of the dozen largest Tyumen' oilfields, only one of three wells in this key region flows oil naturally. Even more ominous for the Soviet oil production outlook, less than one out of seven newly completed wells flows oil; the rest need pumps. The number of old and new wells inactive for lack of pumping equipment is nearly as large as the number of Tyumen's remaining free-flowing wells and is growing.

The supergiant Samotlor oilfield provides a stark example of the downward course of oil output and the difficulties encountered in attempting to sustain production in an aging field. Currently, after 15 years of exploitation, only one of five wells at this giant field flows oil naturally. Nearly 2,000 high-yield oil wells are being converted to gas-lift operation to handle ever-increasing volumes of water. The fluid produced from Samotlor's gas-lift wells already averages 70 percent water and 30 percent oil. With the aging of other major Tyumen' fields like Fedorovo, Mamontovo, and Var'yegan, the number of wells awaiting pumps can be expected to grow at a much brisker rate, and the rate of attrition in the number of flowing wells will accelerate.

Also associated with the aging of fields is a sharp increase in problems associated with maintenance of reservoir pressure and with advanced corrosion of oilfield equipment and piping. Recently, for example, the new Petroleum Industry Minister, Vasily Dinkov, blamed below-plan performance on the inability of Tyumen' oilworkers to maintain oilfield reservoir pressures by waterflooding. Concurrently a speech by the Al'met'yevsk party chief complained about the serious pipeline and equipment corrosion problems that were encountered by the Tatar and Bashkir workers assigned to Tyumen' in January 1985. These problems apparently prevented them from making their production quotas. The speech noted that crude oil pipelines develop numerous leaks after only one or two years of service because of hydrogen sulfide corrosion. In normal Soviet experience, such pipelines last two or three times as long, according to the party official. The corrosion of water-supply and crude oil gathering pipelines poses severe operational problems that affect waterflood-pressure maintenance programs and crude oil production operations, in turn intensifying the demand for scarce labor, replacement equipment, and spare parts. 25X1

Outlook

In contrast to the 1970s, when several giant, highly productive oilfields were being tapped, the oil flow from new wells in the mid-1980s is meager (for many, less than 200 b/d)—that is, less than one-fifth the average flow from new wells in 1975. Indeed, many of the new wells in some fields reportedly do not flow. This condition—in the absence of the discovery of a "second Samotlor"—leads to a spiraling increase in commitment of manpower and equipment for well drilling and other oilfield activities in an attempt to sustain the nation's oil output. 25X1 25X1

Output from the supergiant Samotlor, the driving force behind West Siberian oil-production growth for a decade, will probably amount to only about 2.4 million b/d in 1985, down sharply from its 1980 peak level of over 3.0 million b/d. Output from the second-generation West Siberian fields—such as Fedorovo, Mamontovo, Lyantor, Agan, and Severo-Var'yegan—is beginning to decline, and the rate of decline is increasing. By the end of the decade, the aging of all major fields will pose a requirement for an added 2-3 million b/d of oil from other deposits if the Soviets intend to compensate fully for the decline of output from the major fields. Attempting to do so (which in the end may be futile) by exploitation of the smaller, poorer quality fields that have been coming on line will entail steeply escalating costs in terms of manpower, equipment, and logistic support. 25X1 25X1

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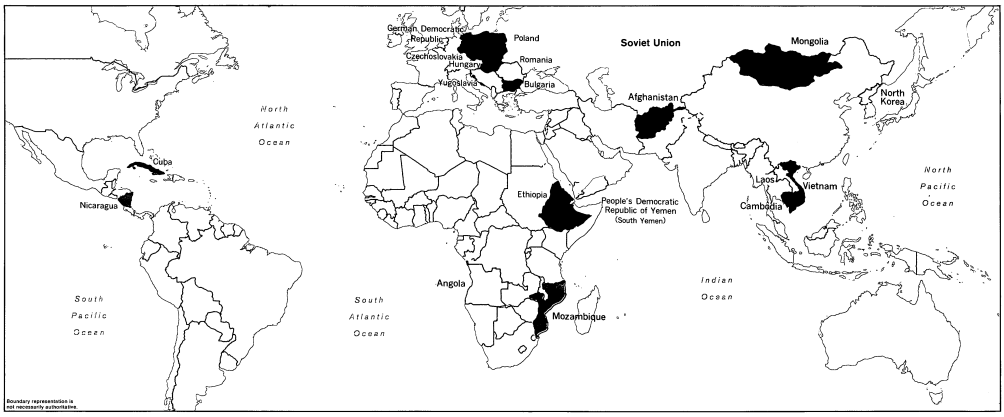
Figure 4
Client States' Dependence on Soviet Oil, 1984

Percent of dependence . . .

75 and above **50 to 75** **25 to 50** **5 to 25** **Less than 5**



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