

Oil Shock III?

As if to affirm that “History repeats itself,” the third oil shock in seventeen years has been threatening. But history never repeats itself exactly, and important differences exist between this incipient oil shock and the previous two, including differences in the likely magnitude of the shock, in the vulnerability of oil consumers, in the state of the world economy, and in the economic policy options open to governments in the industrial oil-importing countries. All of these differences are favorable, tending to weaken the force of the blow.

The Magnitude of the Shocks

From 1973 to 1974 the average world price of crude petroleum rose by 261 percent, from \$3.10 per barrel to \$11.20, as the members of OPEC (Organization of Petroleum Exporting Countries)¹ restrained their output in the face of strong demand (Chart 1). In relation to the average price that the oil-exporting countries and others were paying for goods from the industrial countries—one measure of the “real” price of oil—the cost per barrel rose by a significantly lower, but still dramatic, 190 percent. This real price increase meant that the quantity of goods the industrial countries had to give up in exchange for a barrel of oil was nearly three times as great in 1974 as in 1973. Never before had the world witnessed an exercise of monopoly power on such a scale and with such success.

During the second oil shock the real price of crude went up by 110 percent, from 1978 to 1980. By 1986, however, this second price increase had been reversed.

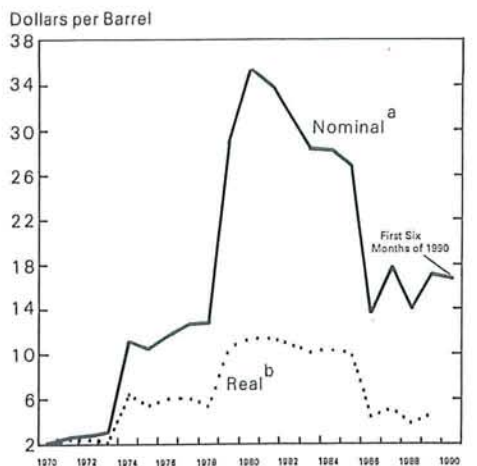
The latest shock began to develop in July 1990, as the members of OPEC undertook negotiations over a reduction in their crude oil production. On July 27 they agreed upon a reduction designed to raise the average selling price of their crude to \$21 a barrel, about 20 percent

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Chart 1

World Crude Oil Price, 1970-90



^aAverage of Dubai, United Kingdom, and Alaskan North Slope spot crude prices, reflecting relatively equal consumption of light, medium, and heavy crudes worldwide.
^bNominal price deflated by the export unit value index for industrial countries, 1970=100.

Source: IMF, *International Financial Statistics Yearbook 1989* and *International Financial Statistics*, August 1990; and IMF staff.

above the level then prevailing. Some previous OPEC agreements to cut back on production had been undermined by countries that produced in excess of their assigned quotas, but this latest agreement was bolstered by an Iraqi threat of military action against such countries, a threat aimed chiefly at Kuwait and the United Arab Emirates. On August 2 Iraq followed up its threat with the invasion and conquest of Kuwait, and on August 6 the United Nations Security Council responded by calling for, among other things, an embargo against the acquisition of oil from either Iraq or Iraqi-occupied Kuwait. In consequence of all these developments oil prices soared.

Where prices will settle remains to be seen. Barring warfare that disrupts oil production or greatly increases demand, it seems unlikely that prices will average much more than \$25 a barrel in the near future. Indeed, they might stabilize somewhat below that level, even if Iraq continues to occupy Kuwait and the embargo is fairly effective. The primary reason is that production in some countries within OPEC reportedly has been expanded to offset most of the reduction in the flow of oil from Iraq and Kuwait. Another consideration that should restrain the price

increase, at least for the near term, is the unusually large stock of petroleum in storage, a matter that is discussed more fully below.

Consequences

For oil-importing countries, a sharp reduction in the supply of oil generates the loathsome combination of price increases and higher unemployment. It is not mere coincidence that each of the previous oil shocks was followed by both recession and a surge of inflation in the industrial countries. Any analysis of these developments should recognize that an abrupt reduction in the supply of oil should, in and of itself, generate only a one-time increase in the general price level, rather than a prolonged increase in the rate of inflation. Indeed, in principle it would be possible to prevent even a temporary bulge in the rate of inflation by precipitately tightening monetary policy.

The argument against such monetary policy shifts is that they are likely to cause recessions even in the absence of oil shocks. And the vulnerability to recession is even greater following an oil shock, because the oil price increase itself entails a contractionary, as well as an inflationary, influence. The contractionary influence is twofold: the residents of oil-importing countries are obliged to devote a larger share of their spending to foreign oil rather than to goods and services produced at home, since nothing can readily take the place of foreign oil; and certain lines of activity, such as the fuel-intensive airline industry and the manufacture of "gas-guzzling" automobiles, promptly suffer a decrease in sales and lay off employees who are not immediately absorbed by other industries.

Precise quantification of even the short-term effects of such oil price increases is far from simple, as we need to know—among other things—the importance of oil in both production and consumption, as well as the possibilities of substituting other factors for it, and the stance of monetary and fiscal policies. Nonetheless, a consensus seems to have emerged about the effects on output and inflation in the industrial countries. On average, a 10 percent rise in world oil prices is believed to lower real gross national product by about 0.2 percent and to raise consumer prices by perhaps 0.3 percent. A price of \$25 per barrel would represent an increase of about 50 percent above the levels prevailing in 1989 and in 1990 just before the latest shock began.

Ten or fifteen years ago such a price increase

would have had consequences far more distressing than those foreseen today. As recently as 1986, many economists thought that a 10 percent rise in oil prices would lower real GNP in the typical industrial country by more than 0.5 percent and raise consumer prices by somewhat more, or roughly twice the magnitudes now accepted (Fieleke 1988, p. 5).

The reasons for this lessened vulnerability are straightforward. Most important is the progress made in using energy, especially oil, more efficiently. For the twenty-four OECD (Organisation for Economic Co-operation and Development) countries collectively, the quantity of oil consumed in generating each \$1 billion (at 1985 prices) of gross domestic product was reduced from 254,000 metric tons in 1973 to 154,000 in 1988, or by nearly 40 percent (Table 1). For the United States, the comparable efficiency gain was 34 percent, while West Germany and Japan enjoyed more sizable gains of 41 percent and 48 percent, respectively. Over this same period the total amount of energy (including oil) required to produce a unit of GDP was also lowered substantially: by 24 percent for all OECD countries as a group, 23 percent

for West Germany, 26 percent for the United States, and 30 percent for Japan. This progress was, of course, stimulated in good measure by the sharp increases during the oil shocks in the price of oil and of energy sources that could substitute for oil.

A second reason for the heightened immunity is that oil now supplies a smaller share of the world's energy usage than at the onset of the two earlier shocks. As reported in Table 2, the share of world primary energy production accounted for by crude oil was nearly one-half in 1973 and 1978, but had declined to slightly more than one-third by 1988.

Still another reason that an oil shock should produce less "bang for the buck" now in the industrial countries is that their economies have been less close to overheating than just before the earlier shocks—if rates of inflation and unemployment are any guide. Correspondingly less risk exists that inflationary expectations will be significantly heightened this time.

Of course, the international merchandise trade and current-account balances of the oil-importing countries will shift toward smaller surpluses or larger

Table 1

Measures of Energy Efficiency for Selected Countries, 1973–88

Thousands of Metric Tons of Oil or Oil-Equivalent per Billion Dollars of GDP

Year	OECD		United States		Japan		West Germany	
	Energy-to-GDP	Oil-to-GDP	Energy-to-GDP	Oil-to-GDP	Energy-to-GDP	Oil-to-GDP	Energy-to-GDP	Oil-to-GDP
1973	474	254	587	271	363	274	444	248
1974	465	241	580	261	372	271	430	222
1975	453	234	572	261	345	247	407	211
1976	458	237	577	265	357	258	421	222
1977	452	237	571	275	335	248	407	214
1978	447	233	562	266	324	238	411	215
1979	443	225	550	253	322	229	416	211
1980	424	205	530	230	302	199	393	188
1981	405	187	503	210	282	178	374	167
1982	394	179	497	206	268	165	363	161
1983	385	171	480	197	263	162	358	156
1984	382	166	466	189	268	158	362	154
1985	375	158	452	183	256	141	363	152
1986	367	159	439	184	253	142	357	156
1987	365	156	440	181	244	136	352	149
1988	361	154	436	179	253	143	343	146

Note: Gross domestic product (GDP) was valued at current purchasing power parities, then deflated by the U.S. GDP deflator with 1985 = 100. "Energy" is total energy requirement, and "oil" is total oil requirement.

Source: OECD, International Energy Agency, *Energy Balances of OECD Countries 1987–1988* (Paris: OECD, 1990), pp. 70, 122, 142, 186, 207, and *Energy Balances of OECD Countries 1970–1985* (Paris: OECD, 1987), pp. 10, 244, 334, 532; OECD, *National Accounts 1960–1988*, vol. 1 (Paris: OECD, 1990), pp. 139, 145.

Table 2
Components of World Primary Energy Production, 1973, 1978, and 1988

Component	Percent of Total		
	1973	1978	1988
Natural Gas Liquids	1.7	1.8	2.2
Nuclear	.9	2.3	5.7
Hydroelectric	5.5	6.2	7.0
Dry Natural Gas	17.6	17.9	20.2
Coal	26.4	26.2	27.9
Crude Oil	47.9	45.7	37.6
Total	100.0	100.0	100.0

Note: Detail may not add to totals shown because of rounding.
Source: U.S. Department of Energy, *International Energy Annual 1980*, pp. 6-12, *International Energy Annual 1985*, p. xi, and *International Energy Annual 1988*, p. 5.

deficits with the oil exporters. This result of the oil price increase should not pose a major problem, either, if previous experience is relevant. Following the two earlier, substantially greater oil price shocks, the large current-account surpluses that initially accrued to OPEC were virtually eliminated within a couple of years. In fact, OPEC has run current-account deficits half the time since the first oil shock.

U.S. Dependence on Foreign Oil

Although the United States did succeed in lowering the amount of oil used per unit of GDP, the nation has sharply increased its net imports of petroleum in recent years (Chart 2). This development was largely a response to the huge 1986 price decline, which occurred after Saudi Arabia stepped up its production in an attempt to enlarge its receipts and/or its market share in the face of relatively weak demand. The plunge in price discouraged U.S. production while enlarging consumption—and enlarging net imports, which have become almost as great as production.

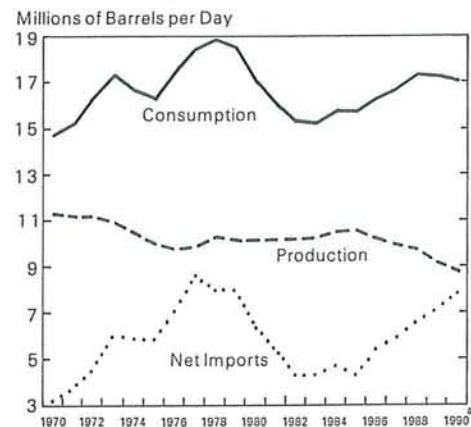
Even so, the U.S. economy is less dependent on imported petroleum than are most "Big Seven" economies. As can be seen in Table 3, Japan and West Germany each imported nearly twice as much petroleum per billion dollars of GDP as the United States did in 1988. Canada and the United Kingdom, being net exporters of petroleum, are easily the best positioned of these countries.

The embargo against trade with Iraq and Kuwait adds a new dimension to this oil shock. As detailed in

Table 4, in 1989 the United States carried on a sizable trade with the members of OPEC, including Iraq and Kuwait. The trade was dominated by U.S. imports of petroleum (included in industrial supplies and materials), but also incorporated \$4.5 billion in U.S. exports of capital goods, along with substantial U.S. exports of industrial supplies and foodstuffs. Embargo of all commerce with Iraq and Kuwait not only would suspend some \$3 billion of U.S. petroleum

Chart 2

U.S. Production, Consumption, and Net Imports of Petroleum Products, 1970-90



Note: All data for 1989 and production data for 1990 are preliminary.
a) For the first 221 days of 1990.

Source: U.S. Energy Information Administration, *Annual Energy Review 1989*, p. 115, and *Weekly Petroleum Status Report*, August 10, 1990, p. 3.

imports from those countries but would interrupt U.S. exports to them amounting to more than \$2 billion (at 1989 rates of trade), including nearly \$700 million in foods, feed, and beverages.

The Position of OPEC

By this time OPEC has become almost a household word. Like many household words, however, its full significance is not widely understood.

OPEC is not a business entity and does not engage in commercial transactions; it is an intergov-

Table 3
Net Imports of Petroleum and Products per Billion Dollars of Gross Domestic Product in Seven Major Industrial Countries, 1988

Country	Thousands of Barrels per Billion Dollars of GDP
Japan	931.3
West Germany	929.4
France	812.3
Italy	772.1
United States	494.3
Canada	-341.4
United Kingdom	-350.6

Note: GDP is measured at 1988 prices and 1988 purchasing power parities. A minus sign signifies net exports.
 Source: U.S. Central Intelligence Agency staff; OECD, *National Accounts 1960-88*, vol. 1 (Paris: OECD, 1990), p. 145.

ernmental organization registered with the United Nations Secretariat. It was founded in Baghdad, Iraq, in September 1960, by Iraq, Iran, Kuwait, Saudi Arabia, and Venezuela, countries that resented reductions in oil prices that had occurred during 1959 and 1960. (Unlike the present, at that time oil export prices were set by the international oil companies—which paid taxes to the countries from which they withdrew oil—and during 1959 and 1960 the companies had lowered prices markedly in response to diminishing demand.) Thus the stated principal pur-

pose of OPEC is to coordinate the petroleum policies of the member countries and to determine the best means for safeguarding their interests.

To qualify for membership, a country must have substantial net exports of crude petroleum and must be accepted by three-fourths of the full members, including all of the founding five. By November 1973 the membership had expanded to the current thirteen, including Algeria, Ecuador, Gabon, Indonesia, Libya, Nigeria, Qatar, and the United Arab Emirates, in addition to the initial five. All decisions at OPEC conferences require a unanimous vote.

As can be seen in Table 5, the bulk of the world's oil reserves are controlled by the major reserve holders within OPEC. And OPEC is surely a cartel in the sense that it is a combination of producers designed to limit competition. Its members have striven to coordinate their sales of crude oil so as to influence the price.

While no doubt should exist about these goals, much doubt is warranted about the Organization's success. In particular, OPEC has been riven by disputes over both economic and political issues. Economic disputes have revolved around such matters as price and output levels, and such a dispute was one reason for Iraq's invasion of Kuwait. Political differences had previously led to another war, between Iraq and Iran, which endured for eight years. Still, public conflict is not conclusive proof of cartel failure.

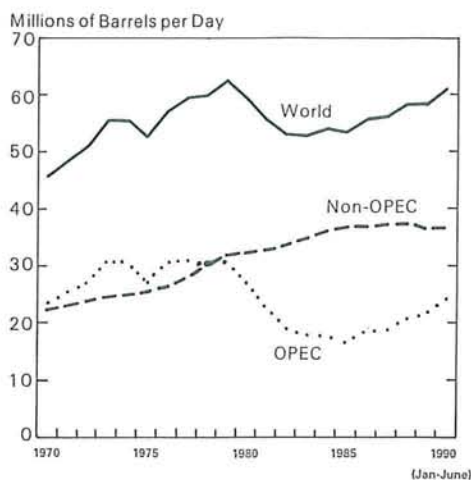
Any attempt to assess the true quantitative impact of OPEC is handicapped by the lack of an empirically verified economic model to explain either

Table 4
U.S. Merchandise Trade with OPEC Countries, by Major End-Use Category, 1989
 Millions of Dollars

End-Use Category	OPEC			Iraq and Kuwait		
	Exports	Imports	Balance	Exports	Imports	Balance
Foods, Feeds, Beverages	2,123.8	1,272.6	851.2	675.9	2.7	673.2
Industrial Supplies and Materials	3,197.4	28,073.3	-24,875.9	371.5	3,350.6	-2,979.1
Capital Goods	4,533.1	66.2	4,466.9	363.3	0.3	363.0
Automotive	1,347.5	40.1	1,307.4	403.0	0	403.0
Consumer Goods	1,276.8	971.0	305.8	126.8	1.6	125.2
Special Category (Military-type Goods)	427.6	167.2	260.4	56.1	26.2	29.9
Exports Not Elsewhere Classified and Reexports	286.8	0	286.8	25.5	0	25.5
Total	13,193.0	30,590.4	-17,397.4	2,022.1	3,381.4	-1,359.3

Note: Exports f.a.s.; general imports, f.a.s.
 Source: U.S. Bureau of Economic Analysis, machine run.

Chart 3

Production of Crude Oil, 1970-90

Source: U.S. Energy Information Administration, *Annual Energy Review 1989*, p. 249; and *International Petroleum Statistics Report*, August 1990, p. 3.

cartel behavior or changes in the market prices of petroleum. At the least, it seems clear that OPEC has tried to manipulate the price of oil. Inspection of Charts 1 and 3 discloses that OPEC's total crude oil output was reduced somewhat from 1973 to 1974, when the price was soaring and non-OPEC output was increasing, and that OPEC's output diminished further in 1975. Likewise, in 1980, while the second major price rise was still underway, OPEC production began a major decline, and continued to decline for several years while the real price of oil remained at relatively very high levels. By contrast, non-OPEC production grew steadily throughout this period. Finally, as noted at the beginning of this article, the latest oil shock was initiated by a cutback in OPEC production designed to raise the selling price.

Not only has OPEC's output diminished during periods when prices were sharply rising and non-OPEC output was growing, but OPEC's output as a percentage of its capacity has fallen when prices were soaring. These findings suggest that OPEC was restricting its production at least in part to raise the price.

Moreover, these production shifts are not attrib-

Table 5
World Crude Oil and Natural Gas Reserves in the Ten Leading Reserve-Holding Countries, January 1, 1989

Crude Oil			Natural Gas		
Country	Reserves (billion barrels)	Percent of World Total	Country	Reserves (trillion cubic feet)	Percent of World Total
Saudi Arabia ^a	255.0	25.7	U.S.S.R.	1,500.0	38.1
Iraq	100.0	10.1	Iran	494.4	12.6
United Arab Emirates	98.1	9.9	United Arab Emirates	201.5	5.1
Kuwait ^a	94.5	9.5	United States	168.0	4.3
Iran	92.9	9.4	Qatar	156.7	4.0
U.S.S.R.	58.5	5.9	Saudi Arabia ^a	152.0	3.9
Venezuela	58.1	5.9	Algeria	104.2	2.6
Mexico	54.1	5.5	Venezuela	102.2	2.6
United States	26.8	2.7	Canada	95.1	2.4
China	23.6	2.4	Iraq	95.0	2.4
All Others	129.0	13.0	All Others	866.8	22.0
World Total	990.6	100.0	World Total	3,935.9	100.0

^aIncludes half the reserves in the Neutral Zone between Kuwait and Saudi Arabia.

Note: All reserve figures except those for the U.S.S.R. and natural gas reserves in Canada are proved reserves recoverable with present technology and prices. U.S.S.R. figures are "explored reserves," which include proved, probable, and some possible. The Canadian natural gas figure includes proved and some probable. Detail may not add to totals shown because of rounding.

Source: U.S. Energy Information Administration, *Annual Energy Review 1989* (Washington, D.C.: Government Printing Office, 1990), p. 247.

Table 6
Coefficients of Correlation between Annual Crude Oil Production Levels in Selected Country Groupings, 1973–1990:Q1

Country Groupings	Saudi Arabia	Non-OPEC
OPEC		-.85
Non-OPEC	-.69	
OPEC excluding Saudi Arabia	.59	
OPEC excluding Saudi Arabia, Iran, and Iraq	.71	-.79

Source: Underlying data from U.S. Department of Energy, Energy Information Administration, *Annual Energy Review, 1989* (Washington, D.C.: Government Printing Office, 1990), p. 249; and U.S. Central Intelligence Agency, *International Energy Statistical Review*, 31 July 1990, pp. 1, 2.

utable solely to Saudi Arabia, the largest producer, or to the war between Iraq and Iran that broke out in the fall of 1980. On the contrary, Saudi production has been much more positively correlated with production in the rest of OPEC (whether or not Iran and Iraq are included) than with production outside of OPEC (Table 6). In light of such behavior, OPEC may be classified as a "partial market-sharing cartel"—one in which the members usually raise and lower production jointly, although some may make larger percentage changes than others. By this interpretation, OPEC is not a "dominant firm cartel," in which Saudi Arabia (with perhaps a few other members) acts as the residual or swing producer while other members behave competitively.

The market-sharing cartel is the weakest form of cartel arrangement, so its behavior is difficult to predict. In the case of OPEC, prediction has become especially hazardous. With (at this writing) Saudi and Iraqi troops facing each other across the border of Iraqi-occupied Kuwait, not merely OPEC's policies but the future of OPEC itself have become more uncertain.

Some Policy Considerations

If "those who cannot remember the past are condemned to repeat it," what lessons from the past are being employed to reduce the damage from the third oil shock? As already noted, the industrial

countries have significantly reduced the quantity of oil and of energy required to produce a unit of output, and the injury from this latest oil shock will be diminished accordingly. This development was not merely the predictable response of energy consumers to the previous oil shocks and the associated oil price increases; governmental taxation and other policies to promote energy conservation also played a role. If one can judge from Table 1, energy conservation policy in the United States has been less rigorous than in other OECD countries, as energy consumption in relation to GDP has consistently been substantially greater in the United States.

Another important action has involved widespread international cooperation. In November 1974, just thirteen months after the beginning of the first oil crisis, sixteen member countries of the OECD signed an agreement on an International Energy Program (IEP), and the OECD created the International Energy Agency (IEA) to oversee the program. This initiative recognized that energy security is a matter of collective security. Twenty-one OECD countries now belong to the IEA and participate in the IEP.

The chief goals of the IEA and the IEP are:

- i) co-operation among IEA Participating Countries to reduce excessive dependence on oil through energy conservation, development of alternative energy sources and energy research and development;
- ii) an information system on the international oil market as well as consultation with oil companies;
- iii) co-operation with oil producing and other oil consuming countries with a view to developing a stable international energy trade as well as the rational management and use of world energy resources in the interest of all countries;
- iv) a plan to prepare Participating Countries against the risk of a major disruption of oil supplies and to share available oil in the event of an emergency. (OECD International Energy Agency 1986, p. 2)

To attain the last of these goals, each IEA member is to maintain an emergency stock of oil sufficient to replace net imports for ninety days and is to be prepared to decrease oil consumption in the event of a supply disruption. Moreover, provision is made for the sharing of oil supplies during a crisis. As of mid-1990, total emergency stocks held by OECD countries were on the order of two billion barrels, with readily accessible stocks greater than ninety days' worth of net imports. As an active participant in the stock-building program, the U.S. government has some 587 million barrels of oil stored in its Strategic

Petroleum Reserve, mainly in underground caverns in Texas and Louisiana.

When, and how much, to draw upon these emergency stocks are judgments that should be based on the circumstances. In this latest oil shock, the imminent threat of armed conflict and still higher oil prices has tended to undermine the case for immediately tapping the reserves. Should the war threat ease, however, the case for using the reserves becomes very strong unless the supply of oil from OPEC is substantially maintained. To ameliorate oil shocks was, after all, the purpose for which the reserves were acquired, at considerable cost to the taxpayer. To deny the taxpayer the benefits would be a betrayal of trust. A danger exists that the oil reserves will become like national gold reserves—sacred, and inviolable until the economic damage becomes catastrophic.

OPEC, as well as the oil-importing countries, should have learned a lesson or two from the previous shocks. Large and abrupt reductions in the supply of oil tend to generate major recessions in the industrial countries that reduce the demand for OPEC's major export and lower the rates of return on the sizable investments that OPEC members have placed in the industrial countries. And oil consumers redouble their efforts to develop more reliable and economical sources of energy in the longer run. Surely it is in OPEC's best interest to resist the temptation to hold up its customers.

Summary

Barring a major armed conflict, the oil-importing nations should weather this third oil shock more easily than the previous two. For one thing, the percentage increase in the oil price is likely to be much smaller. For another, the major industrial economies now produce the typical unit of output with much less energy, and oil, than was the case during the 1970s. Also, these economies have not been so close to overheating as they were just before the earlier shocks, so that inflationary expectations should remain lower.

In spite of substantial progress, the United States uses considerably more energy, including oil, to produce a unit of output than do the other OECD countries as a group. Nonetheless, four of the Big Seven countries are more dependent on *foreign* oil than is the United States. The embargo against trade with Iraq and Kuwait will curtail U.S. exports to those

countries, exports that amounted to more than \$2 billion in 1989.

Although OPEC has tried to manipulate the price of oil, its success in the past over the long term is doubtful, especially in light of the huge price decline in 1986. OPEC is the kind of loose cartel whose price and output policies are exceptionally difficult to predict.

Not only the oil shocks, but also government policies in the industrial countries, have contributed to enhanced energy and oil efficiency. One important additional policy measure is the accumulation of sizable emergency stocks of oil to cope with supply disruptions. The risk exists, however, that the use of these reserves during a disruption will be delayed until an extreme emergency develops—the kind of emergency that, ironically, the reserves were intended to prevent. Another risk is that some influential members of OPEC may not yet have learned that large, abrupt oil price increases are inimical to their own interests.

¹ The 13 members of OPEC are Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

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