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WORLD OIL SUPPLIES AND THE IRANIAN-IRAQI WAR: A FORECAST TO MID-1981

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Overview

The Iraqi-Iranian war is now in its 10th week. During this period it has caused a gross loss in world crude oil supplies on the order of 4.0 million B/D, equal to nearly 10% of Non-Communist world crude oil production; of this total about 3.1 million B/D is Iraqi crude and 0.9 million B/D Iranian. The net loss to the world has been substantially smaller since Saudi Arabia has increased its production by at least 500,000 B/D in direct response to the oil interruption while other OPEC nations are collectively producing an estimated 1 million B/D more oil than would have been required in the absence of the Iranian-Iraqi supply interruption to maintain adequate supplies and keep 4th quarter inventory reductions at the rate expected before the interruption occurred. Furthermore, since the beginning of December Iraq appears to have resumed pipeline exports via Turkey at the initial rate of about 400,000 B/D and Iran is reported to have resumed exportation of crude at the rate of 150,000-200,000 B/D, mainly from its Lavan oil terminal in the southern part of the Persian Gulf but also sporadically in small quantities from the damaged Kharg Island terminal.

As the following table shows, prior to the export resumption the net shortfall in OPEC oil supplies caused by the war amounted to 2.2 MM B/D. If we assume an increase in supplies of about 600,000 B/D in December as a result of the announced export resumptions, the current (December) net shortfall would amount to 1.6 MM B/D.

ESTIMATED OPEC CRUDE PRODUCTION, OCTOBER-NOVEMBER 1980, TWO SCENARIOS

(MM B/D)

	Estimated Actual Production Under War Conditions	Hypothetical Production Under Peace Conditions	Difference
Iran/Iraq	0.4	4.1	-3.7
Saudi Arabia	10.0	9.5	+0.5
Other OPEC	12.9	11.9	+1.0
Total OPEC	23.3	25.5	-2.2

Requirements for OPEC crude in the 1st and 2nd quarters of 1981 will remain at approximately the current level of 25.5 MM B/D (see Table V, p. 14). Thus, assuming a continuation of our estimated December 1980 OPEC production level (including the 600,000 B/D of Iranian-Iraqi exports) the net shortfall in required OPEC oil supplies would amount to about 1.5 MM B/D in the 1st and 2nd quarters of 1981.

In the absence of an unanticipated increase in non-OPEC production, the supply shortfall can only be met through additional inventory draw-downs or reduced inventory build-ups, depending on the seasonal variations in inventory movements.

By the end of the 10th week of the Iranian-Iraqi export interruption the cumulative net loss in oil supplies has been about 140-150 million barrels, or about 30% of the estimated 500 million barrels of surplus stocks (i.e. above normal requirements; Table II, p. 6) which existed at the beginning of the war.

Given the transportation time lag from the Persian Gulf to major markets of at least 45 days (but probably more because of the current slow-steaming practice of many tankers to save fuel) the physical impact of this loss is only beginning to affect the world market. Since this development is coincidental with the partial resumption of Iraqi-Iranian exports, which has of course the opposite effect on market forces, spot market prices have actually declined somewhat from the peak they had reached just before news of the export resumption became known.

The current Iraqi-Iranian export level, while certainly helpful, still leaves of course a substantial world oil supply deficit which must be met out of existing inventories if demand is not curtailed. It can be calculated that the end-third quarter surplus stock cushion will be exhausted by approximately mid-year 1981 if Iraqi-Iranian exports remain at 600,000 B/D and OPEC collectively does not increase its crude oil production from the current level of about 24 MM B/D. Under those conditions, market dislocations, preceded by further spot price increases, could be felt by early next spring, given the uneven distribution of stocks among countries and companies.

This is not to say that such a development is the most likely. Current Iraqi-Iranian exports are only 15% of what they were immediately preceding the war. Available evidence suggests that war damage to oil export facilities are such that a significantly higher level of exports could be attained fairly soon, although nowhere near the prewar volume. There are also recent unofficial reports

that the Iraqi pipeline to Syria, with a ready capacity of at least 400,000 B/D, is being prepared for resumption of exports, notwithstanding the current political tension between Iraq and Syria. Finally, the possibility exists that some OPEC countries may well increase their output next quarter, if necessary. Collectively, the 10 OPEC countries, other than Saudi Arabia, Iraq and Iran, produced over 14 MM B/D in the 1st quarter of 1980, or over 1 MM B/D more than their estimated 4th quarter production. In particular, Kuwait, which is reported to have agreed in early October to raise its production level to 1.75 MM B/D but has apparently remained 400,000-500,000 B/D below this volume in October and November, could move to the higher level, if required.

However, there are also several negative possibilities. (1) The two countries are still at war and are therefore likely to continue to try to prevent each other from exporting oil. Iranian air attacks on the Kirkuk oil fields and attempts to capture the Al-Bakr oil terminal, both following Iraq's announcement of the resumption of exports, may be indicative of this intent. (2) Kuwait's physical proximity to the battle zone and political support of Iraq could under some conditions cause a reduction in Kuwaiti oil exports; two recent Iranian air attacks on Kuwait are indicative of this possibility. (3) It is possible that following the resumption of Iraqi-Iranian oil exports even on the present low level, some OPEC countries may overreact in cutting production levels to avoid another market surplus such as existed for the six months prior to the war. Abu Dhabi's announcement of an 80,000 B/D production reduction beginning in January 1981 may, in part, reflect this concern.

To sum up, current OPEC crude oil production of about 24 MM B/D, including the resumption of 600,000 B/D of Iraqi-Iranian exports, is not so low as to cause supply constraints in the immediate future, say, the next 2-3 months, but not high enough to avoid constraints after this period. The potential for a sufficient OPEC production increase by then clearly exists and, in the absence of counterveiling extraneous factors, can be expected to take place. However, in the last two years "counterveiling extraneous factors" have been more prevalent than predictable trend developments. Hence, the possibility of their recurrence in the near future cannot be ignored, particularly since the still comfortable inventory cushion to soften their impact is rapidly shrinking.

If we make the somewhat optimistic assumption that the level of Iraqi-Iranian exports will increase from now on to reach about 2.4 MM B/D within 4 months, or 60% of pre-war exports, no market shortage and, hence, no further upward pressure on spot prices, is likely. However, since such a level of exports would still require a substantial reduction of the excess inventory cushion, a return to the price softness of the pre-war market is unlikely during this period. If and when Iran and Iraq are able to resume exports at full capacity (5.0-5.5 MM B/D), available world oil supplies may once again be in excess of demand since both countries are likely to attempt to maximize their exports to make up for the lost revenue and to finance the repair of war damages.

The Question of Stock Levels

Global on-shore inventories at the outbreak of the war (end-September) stood at an estimated 4.7 billion barrels, about 12% above the year-ago level which, in turn, was 10% above the comparable 1978 level, as shown below.

TABLE II

GLOBAL OIL INVENTORIES--END-3RD Q
(Billion Bbls)

1980	4.70 (est'd)
1979	4.19
1978	3.80
1975-79 Average	3.86

Source for historical data: DOE

In addition, nearly one billion barrels of oil is afloat in tankers. By definition, this oil cannot be counted as inventory, since it is in transit and, hence, not available for stock purposes. However, more oil than normal is currently kept afloat because of the growing prevalence of speed reduction in tanker traffic. Hence, some of this oil could more quickly be converted to inventory just by increasing the speed of tankers.

Altogether, then, world oil stocks at the beginning of the war were probably at least 500 million barrels above what could be considered normal inventory levels at that time of the year. The indicated 140-150 million barrels extraordinary decline since the beginning of the war has therefore reduced the remaining excess stock to about 350 million barrels, as of end-November 1980.

Comparing the current stock situation with that of the beginning of the Iranian oil interruption of 1979, one finds the principal difference to be the complete absence of excess stocks in the earlier interruption. In fact, stocks were slightly below normal at the end of 1978, while the draw-down in the first quarter 1979 was above normal.

Recent Price Movements

Official sales prices (OSP's) set by the governments of oil exporting countries have shown almost no increase so far. The one exception is Abu Dhabi which retroactively raised its prices by $2/Bbl in mid-October. The purpose of the increase was to bring its prices in line with the notional OPEC marker price of $32, agreed to in Algiers last June. The increase may be a belated adjustment to the realities of the pre-war market, or a reaction to the changed market environment following the outbreak of the Iraqi-Iranian war. The only other OSP change since then has been a $2 increase of Saudi Light to $32 for the incremental volume of crude produced to offset the war losses. Since this crude is meant primarily to displace lost Iraqi crude of similar quality whose OSP was $32, the new Saudi price cannot be condidered a real price increase.

Spot market prices have of course moved quite differently from OSP's. Saudi Light spot crude prices moved up by 27%, or about $9 in the past ten weeks. It is now quoted at about $40. The upward move began within less than two weeks after the outbreak of the hostilities and continued steadily until late November when it dropped slightly. African sweet crudes which were traded at $32-33 in August and September are now quoted at about $41.

The behavior of both OSP's and spot crude prices in the current interruption is similar to that of early 1979 when spot prices soared while OSP's remained relatively unchanged.* There are, however, some differences. The current spot price rise is a sudden reversal of a declining trend. The price increases in early 1979, by contrast, were an acceleration of a movement that had started the previous October. More importantly, the actual volume of all oils currently traded in the spot market is substantially smaller than it was in early 1979. One reason is that current inventory levels are so high that potential buyers are faced with storage containment limitations. This was clearly not the case in early 1979. The relatively low current volume of spot market transactions has of course restrained the impact of the price increase on the composite cost of oil.

Still another significant difference between the current spot market movements and those of the 1st quarter of 1979 is that while this time light and middle distillate products price increases abroad are lagging behind crude price increases, last time the converse was true. On the other hand, residual fuel oil prices, especially for the high-sulfur grade, have risen more rapidly than light products prices since September which is a reversal of the relationship during the previous oil interruption.

There are several reasons for the worldwide $7-9/Bbl price increase in high-sulfur fuel oil since the outbreak of the war.

*OSP surcharges ranging from $1.20 to $1.40 were officially imposed in mid-February and March 1979 by more Persian Gulf and African producers. Currently, Kuwait and Indonesia, among other OPEC members, have put premiums on their incremental oil sales.

In part it represents a recovery from an excessively depressed previous price level (relative to the cost of crude), with the cessation of Iranian-Iraqi oil exports providing the trigger for the expected upward price adjustment. Another reason is that the oil interruption has affected only relatively heavy high-sulfur crude oils which yield a higher share of fuel oil in distillation than lighter crudes. Finally, the damage done to Iran's Abadan refinery has indefinitely and perhaps permanently ended Iranian residual fuel oil exports which amounted to 150,000-180,000 B/D just before the war and were of significance in the Persian Gulf and Far East markets.

Despite the increase in heavy fuel oil prices, the composite spot price of refined products in the world market has risen much less than crude oil spot prices. In fact, refiners processing crude oil bought in the spot market into products sold in the spot (or contract) market currently do not break even. This applies to both foreign and U.S. refiners. It is another reason the volume of crude oil traded in the spot market is significantly less than it was in early 1979 when the refining of spot market crude was very attractive.

TABLE III

SPOT PRICES
($/Bbl)

Location:	Saudi Light Crude Oil (FOB Persian Gulf)	Regular Gasoline (Rotterdam)	Gas Oil (Rotterdam)	Residual Fuel Oil (U.S. East Coast-Imports)
December 1978	14.50	23.73	19.82	11.60
February 1979	20.00	32.97	34.36	15.80
September 1980	31.50	36.79	36.62	24.50
November 1980	40.00	43.76	42.55	33.10

Note: Mid-month prices.

Source: Petroleum Intelligence Weekly and Oil Buyer's Guide.

The War and War Damages

The world oil market situation over the next six to eight months will of course be strongly influenced by the duration of the Iraqi-Iranian war, the ability to export oil on a sustained basis if the war continues, and how much time it takes to repair the war-damaged oil export facilities in the two countries. The timing of the end of the war is unpredictable at this point. But the current consensus among Middle East and military experts seems to be that a protracted low-key war is a strong possibility. In this case, probably not much oil is likely to be exported from Persian Gulf terminals because of the danger to tankers and the likely continued refusal of insurance companies to cover voyages to and from the warring countries' terminals. Furthermore, all of the terminals appear to have been damaged. Hence, even after the war has ended, tanker exports will be limited for some time.

It has been reported that the two Iraqi terminals have been damaged more than Iran's Kharg Island terminals. Also, Kharg Island's designed capacity is so large (5 million B/D) that if it should be able to operate at only 25-30% of capacity, more than twice as much oil could be exported through it than was done in the several months preceding the war. Hence Iranian oil exports could probably be resumed at least at the immediate pre-war level of just under 1 MM B/D within a relatively short time after the cessation of hostilities, according to informed judgments.

Repairing Iraq's oil port facilities might take considerably longer. However, Iraq exported 1 million B/D by pipeline to Turkey and Syria until the war. Apparently, the pumping stations of these pipelines have not been severely damaged, as evidenced by the resumption of limited exports to Turkey and reports from Beirut that there are no major technical obstacles to the resumption of exports via Syria.

Thus, within 90-100 days after the cessation of hostilities the two countries together might be able to export nearly 2 million B/D, or about half the amount cut off by the war, provided there is no further major damage to oil installations. Exports from both countries just prior to the war are shown in the table on the following page.

If Iraq should be able again to obtain use of the pipeline spur to Lebanon which has been idle since 1976, its export level could reach 1.5 million B/D. The 450,000 B/D of unused pipeline capacity to Syria shown in the table may not be available since it is used by Syria. Whether Syria, which supports Iran, will permit any Iraqi oil to transit through its territory remains to be seen. It is a reasonable assumption that after the cessation of hostilities, Syria will have no reason to bloc Iraq oil exports. However, reasonable assumptions are not a very firm ground for predicting Middle East developments.

TABLE IV

RECENT PRE-WAR OIL EXPORTS FROM IRAN AND IRAQ

(Thousand B/D)

	Iran	Iraq	Total
Tanker			
Crude	700	2,100	2,800
Products	200	-	200
	900	2,100	3,000
Pipeline			
Crude	-	1,000	1,000
Total	900	3,100	4,000

Addendum: Iraqi Pipeline Exports and Capacity (M B/D)

	Capacity	Exports
To: Turkey	700	650
Syria	800	350
Lebanon	500	-
	2,000	1,000

Supply and Demand Balance to Mid-1981

If the war continues and OPEC crude production remains limited to about 24 million B/D, how long will it take before supply constraints become visible? In order to answer this question we start out with a brief analysis of the world oil outlook for the 4th quarter of 1980 and the 1st and 2nd quarters of 1981, as it appeared on the eve of the war. We will then examine how the war-induced reduction in OPEC oil exports throughout this period could change the outlook.

The following table shows our supply/demand estimate for the quarter just ended as well as our forecast for the current and the

next two quarters. Before the war we had forecast a decline in both supply and demand in all three quarters relative to a year ago. However, we had expected supply to be limited by demand requirements throughout the period. In 1979 the reverse was true, i.e. available supplies limited consumption. The expected much smaller stock increases and larger stock reductions relative to a year ago, shown in Table V, reflect the abnormal market conditions during 1979 and early 1980 and a subsequent return to more normal inventory management.

The stock build-up in the 3rd quarter 1980 was probably more than 1 million B/D in excess of what was required for normal seasonal stock increases. Thus, it may be said that surplus production of at least that much existed in that period. In addition, OPEC members other than Iran produced about half a million B/D less than their official production ceilings would have permitted, while Iran produced some 600 M B/D less. In both cases this underproduction was due to demand constraints at prevailing prices. Thus, altogether some 2.0 million B/D more oil was produced or readily available in the 3rd quarter of 1980 than was required to meet demand and provide adequate stock additions.

Table V

WORLD OIL SUPPLY AND DEMAND FORECAST*
AS OF MID-SEPTEMBER 1980

(Million B/D)

	3rd Q		4th Q		1st Q		2nd Q	
	1979 (actual)	1980 (est'd)	1979 (actual)	1980 (forecast)	1980 (actual)	1981 (forecast)	1980 (est'd)	1981 (forecas
Supply								
U.S.	10.7	10.8	10.7	10.8	10.7	10.8	10.8	10.6
OPEC	32.0	27.7	31.8	26.3	30.2	26.2	28.2	26.2
Other	10.7	11.6	11.0	11.8	11.7	11.7	11.5	11.8
Total Supply	53.4	50.1	53.5	48.9	52.0	48.7	50.5	48.6
Demand								
U.S.	17.6	16.3	18.4	17.0	18.2	17.7	16.5	16.3
W. Europe	13.1	12.6	15.1	14.3	15.0	14.2	31.1	31.3
Other	18.4	18.1	19.5	19.4	19.1	19.6		
Total Demand	49.0	47.0	53.0	50.7	52.3	51.5	47.6	47.6
Stock Change	4.4	3.1	0.5	(1.8)	(0.3)	(2.8)	2.9	1.0

*Excludes Soviet Bloc and China except for net exports; includes natural gas liquids, includes processing gains for the U.S.

This surplus was expected to be reduced but not eliminated by mid-1981. The expected 1 million B/D reduction in the Saudi production ceiling by January 1, 1981 plus the (since rescinded) 10% production reductions by some OPEC members following the Vienna meeting would of course have curtailed the potential excess production. But this would have been partly offset by the decline in the requirement for OPEC oil, due primarily to lower world demand. The principal factor in the 4th quarter demand decline will be the U.S. while in the 1st half of 1981 it will be Western Europe, which appears to be entering a period of recession (or at least economic stagnation).

Under this scenario market pressure on world oil prices would have been downward throughout the period, although it was assumed that the price of the OPEC marker crude would rise moderately in the 1st half of 1981 under OPEC's new long term strategic pricing formula which would probably have been adopted last November had there been no war.

Let us now introduce the Iraqi-Iranian oil interruption into this scenario for the 4th quarter 1980 and the 1st and 2nd quarters of 1981 and let us assume that OPEC will continue to produce at the estimated current level of about 24 million B/D of crude (including 600,000 B/D of Iraqi-Iranian exports) plus some 800,000 B/D of natural gas liquids. The difference between that supply level and the one shown in the forecast in Table V must be closed through additional stock withdrawals if consumption is to remain unaffected. The volume of these withdrawals required to offset the oil supply interruption can be calculated and is shown below.

	million Bbls	million B/D
4th Quarter 1980	184	2.0
1st Quarter 1981	135	1.5
2nd Quarter 1981	137	1.5
	456	1.7

Thus, mathematically, given our assumptions, available excess stocks would be sufficient to offset the current shortage caused by the war until mid-1981.

The required stock withdrawal would of course be less if OPEC countries were to produce more than 24 MM B/D. About 1 MM B/D more could be produced if the 10 OPEC members* raised their output to the quarterly

*Other than Saudi Arabia, Iraq and Iran.

peak levels of 1979-1980. However, as of now, there is no indication that any intend to so so. If there are further increases in OPEC output for the purpose of offsetting the impact of the Iranian-Iraqi oil interruption, they are likely to be accompanied by the imposition of premiums or surcharges on the official sales prices.

One might conclude from the above calculations that for the next six months the market will remain in balance if there is no further supply deterioration. But this conclusion could be misleading. What can be mathematically demonstrated on paper may be very different from the perceptions and motivations of individual buyers and sellers in the very uncertain real world. We have seen how the uncertainty over continued Iranian supplies, together with the expectation of higher prices, caused frantic inventory accumulation throughout the last nine months of 1979, even though Iranian output remained at about 3.5 million B/D throughout that period, and total OPEC production was nearly 1 million B/D higher than in the previous year.

It is unlikely that a similar inventory hoarding will take place in the current situation, partly because of the experience learned from 1979. But if there is no increase in total OPEC output above the 24 MM B/D level (excl. NGL's), the perception is likely to gain ground that the present situation makes price increases far more likely than price declines and that the security of new oil supply has been significantly reduced by the latest turmoil in the Middle East. Thus, inventory owners at all levels may become progressively more reluctant to let their inventories decline. Obviously, this would cause market prices to rise further.

OPEC Pricing Policy

If spot prices do rise further because of market conditions we may see first a substantial increase in products prices, followed by higher crude prices as refiners begin to realize positive margins from running incremental spot crudes. How high these crude spot prices would go and to what extent they will once again be incorporated into OSP's--which makes the increases permanent--is difficult to predict.

Regarding the second question, which is clearly more important than the first, the following points should be considered: OPEC OSP's have generally followed upward trends in spot market prices but mostly with a substantial lag. Thus, it is quite unlikely that OPEC marker crude and other Persian Gulf OSP's will approach current spot prices by early next year, as has been predicted in some recent press comments. Furthermore, the trend relationship between spot prices and OSP's is not fixed or inevitable. OPEC price experts certainly understand that the spot price increase since September applies only to a very small percentage of world crude oil sales and is essentially of a temporary, ephemeral nature since it reflects the effect of a temporary, ephermeral supply interruption. Thus, if OPEC policy makers should choose to let their OSP's follow spot market price increases they would do so because they want to raise the price of oil, not because of some immutable economic link, operative only in an upward direction, between spot prices and OSP's.

There are some indications that the OSP of OPEC's marker crude (Saudi Light) will be raised only moderately, if at all, at the beginning of 1981 and that most OPEC countries will initially support such a policy. However, if the market tightness prevails into spring 1981, the position of Saudi Arabia and the other OPEC price moderates w

once again be weakened and the price hawks will be able to raise OSP's at their own discretion.

U.S. Government Policies

Since one of the key issues in the current situation is the degree to which inventories will be utilized to offset the foreign production losses, government officials are informally considering the possibility of temporary governmental "inventory management," that is, direct or indirect government control over the oil stocks of private companies. Such action would be justifiable only if there is evidence that a) under shortage conditions private company inventory management runs counter to the public interest; and b) the government is a more efficient inventory manager under these conditions than private companies. The historic evidence of the 1973/74 and the 1979 oil shortage suggests exactly the opposite. During the 1979 shortage the industry drew down stocks at a substantially faster rate than normal to meet demand. The gasoline shortage in the early summer of that year was due primarily to the rigidities of the government gasoline allocation system. In the 1973/74 situation the government did adopt an inventory management policy with the result that oil stocks rose while the public suffered shortages. These experiences hardly make a convincing case for government inventory management.

What, then, should the government do? If there is no early further improvement in the availability of foreign oil or if the supply

situation deteriorates the Administration may consider short-term measures to increase supplies and reduce demand.

Removing all remaining price controls on domestic crude oil at the beginning of 1981 instead of phasing them out through the first nine months of the year may be desirable under these conditions. The higher price would have some short-term downward effect on consumption and some short-term upward effect on production (the latter because it is unlikely that the production of price controlled domestic oil is currently maximized in view of the assured early decontrol).

In another area, the Administration could consider temporary suspension of the recent reduction in the lead content of leaded gasoline. The low lead content requires an offsetting high "clear" octane rating of the gasoline which, in turn, requires a higher volume of crude oil to produce the same quantity of gasoline.

The Administration could also ease existing restrictions on the consumption of natural gas for industrial use and electric power generation in order to back out some oil from these markets. Furthermore, it could encourage or mandate increased "wheeling" of electricity from systems where it is generated from coal or nuclear power into systems where it would back out oil or gas generated power.

If these and other measures result in a temporary 500,000 B/d reduction in U.S. oil imports, which may be achievable, the current world oil shortage would be reduced by about 30%.