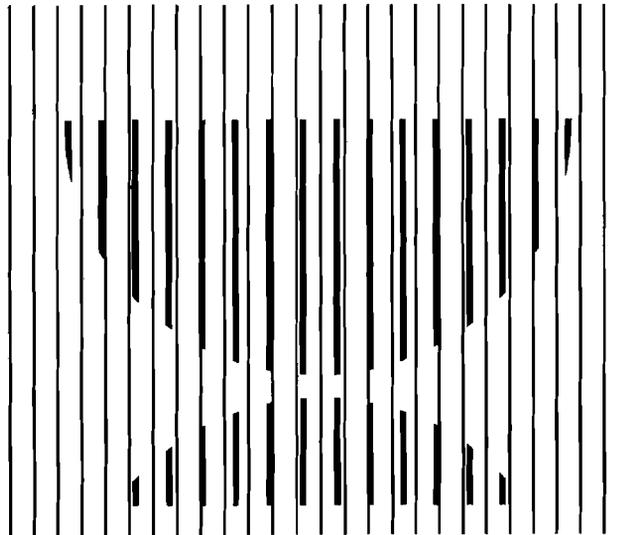


# **CBO STAFF MEMORANDUM**

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UNDERSTANDING THE VOLATILITY  
OF OIL PRICES DURING  
THE IRAQ-KUWAIT CRISIS

January 1991



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## OVERVIEW

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Iraq's invasion of Kuwait last August had a dramatic effect on the price of crude oil. Between August and October 1990, oil prices doubled. Moreover, in each month through November, daily prices moved up and down sharply, in a range exceeding 50 percent of the pre-invasion price. At the outset of the crisis, high oil prices resulted directly from the supply loss that came with the world boycott of 4.3 million barrels per day (bbl/day) of Iraqi and Kuwaiti production. Immediate increases in oil production from other sources and a release of commercial oil stocks helped to hold down price increases. Yet, even as other oil sources made up the immediate loss, prices remained high because of the possibility of open hostilities and the loss of further supplies from the Persian Gulf. With continued additions to world oil supply and a slowdown in economic growth, prices are expected to decline. However, crude oil prices are expected to remain highly volatile even as they trend downward.

The immediate cause of high oil price volatility has been the rapid pace of developments relevant to both current and future supply and demand conditions. Information flowed quickly during the early course of the Iraq-Kuwait crisis, with the nearly daily announcements relevant to the prospects for peace or war in the Gulf, the intense efforts by the world's oil producers to increase their capacity, and the uncertain outlook for the U.S. economy.

The underlying factor that has allowed these developments to be translated into such large price movements is the limited ability of supply and demand to respond, which became even more restricted as the crisis developed. This occurred for two closely related reasons: the loss of the OPEC supply buffer, and the slow release of supplies from inventories.

First, in the weeks and months immediately following the Iraqi invasion, members of the Organization of Petroleum Exporting Countries (OPEC) greatly increased production from their available excess capacity. (The biggest increase was from Saudi Arabia, but Venezuela, Libya, Iran, and Nigeria also contributed.) This increased production has further restricted the future ability of world supply to respond to even moderate supply losses. It removes an important buffer from the market, which the industry has been able to call upon in the past when faced with accidental supply disruptions and unexpected surges in demand. Further supply increases must now come from higher-cost sources.

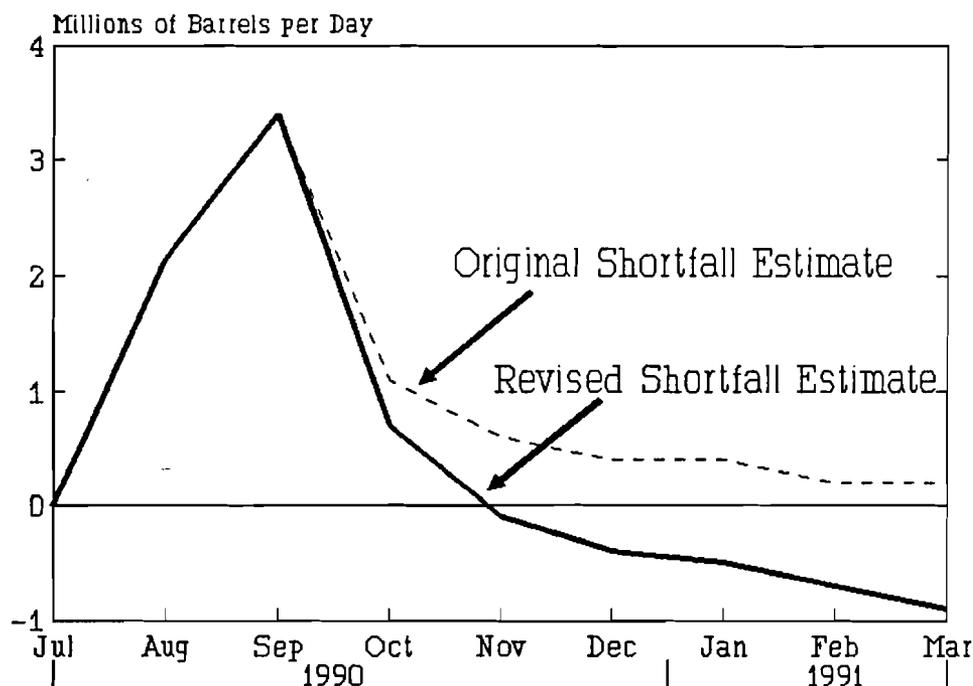
The second reason, the slow release of available supplies from inventories, resulted from the great uncertainty that surrounded the military situation in the Middle East. Worldwide production increases are offsetting the loss of oil from Iraq and Kuwait, and oil prices appear to be heading downward (as evidenced by prices in the futures markets). But the oil industry is not selling off its crude oil inventories at a rate commensurate with the market's view of declining oil prices. A greater level of sales from inventories would help bring current prices in line with market expectations. Moreover, a greater release of stocks would take pressure off other sources of supply and help restore the market's supply buffer.

## CHANGES IN U.S. OIL MARKETS DURING THE CRISIS

When Iraq invaded Kuwait on August 2, the United States and other countries began enforcing a boycott on oil from those two countries. A total of 4.3 million bbl/day of high-quality (light) oil were taken out of the world market. In the succeeding months, Saudi Arabia and other countries increased their sales significantly. Original month-by-month estimates of the supply shortfall showed that increased production would make up all but 0.6 million bbl/day by November 1990 (see Figure 1). But the worldwide response was greater than expected, and by November, other countries had completely made up the production lost because of the boycott.

The loss of 4.3 million bbl/day is not very significant in a world market that supplies over 60 million bbl/day. Many energy analysts in government and industry concluded that the amount of oil actually lost from world markets justified a price increase of \$5 per barrel or less. Yet prices for oil traded in the futures market, which were around \$20 just before the crisis, were as high as \$40 in late September and early October 1990 (see Figure 2). The average cost of imported oil to U.S. refiners went from \$16.50 per barrel in July to nearly \$33 in October.

FIGURE 1. Initial and Revised Estimates of World Oil Supply Shortfall, July 1990 to March 1991



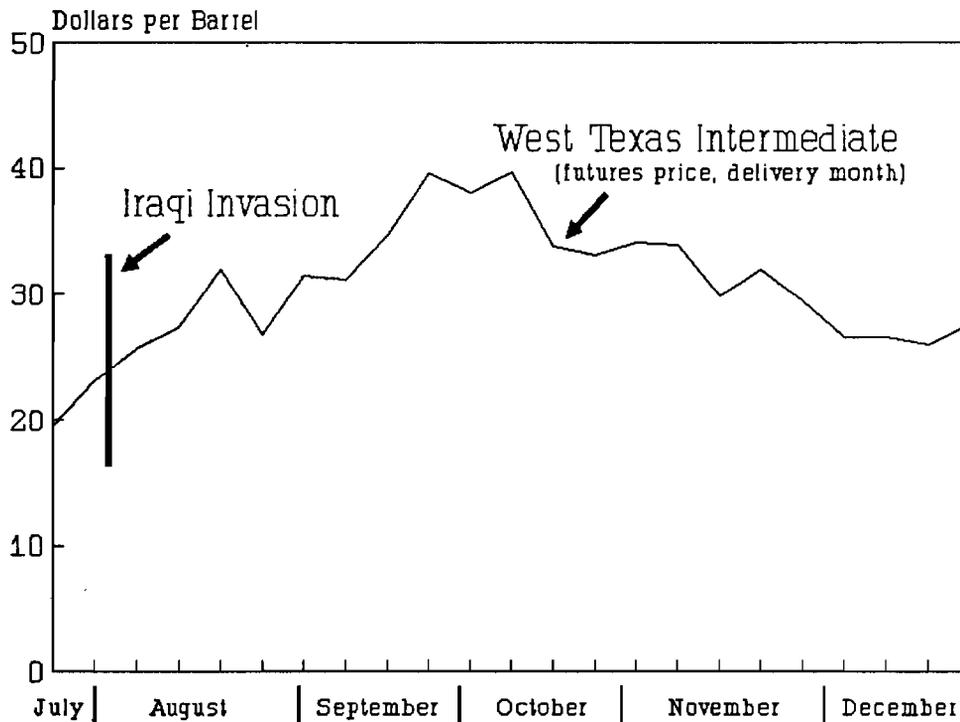
SOURCE: CBO using data from the Energy Information Administration.  
NOTE: Negative values indicate a surplus.

The withholding of oil stocks for speculative reasons does not seem to explain this price rise--apparent demand and petroleum product stocks were remarkably stable. Also, there was no evidence that crude oil stocks were being withheld while prices were rising. In fact, crude oil stocks fell sharply.

Is something missing from the standard explanations of price rise and stock change? Is there a speculative bubble in the oil markets, waiting to burst? Or could prices remain at or above current levels for an indefinite period? Before answering these questions, it may be useful to start with some background on current U.S. market conditions. Specifically, the following sections look at data on the supply and demand both of crude oil and of the petroleum products that are refined from that crude oil. Important petroleum products are motor gasoline, jet fuel, distillates (including diesel fuel and home heating oil), residual fuel oil, and propane.

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FIGURE 2. Crude Oil Prices During the Iraq-Kuwait Crisis, End of July Through December 1990



SOURCE: CBO using data from the New York Mercantile Exchange.  
NOTE: Prices shown are end-of-week prices.

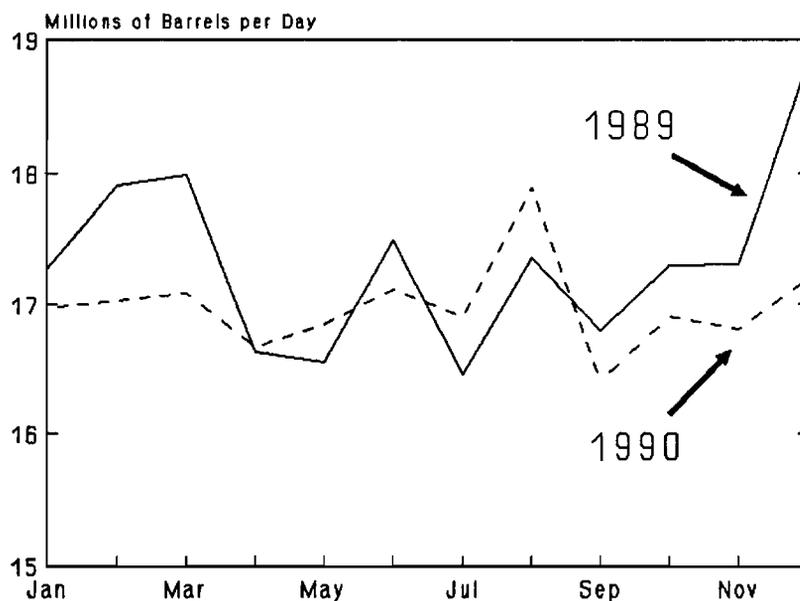
### How Have Markets for Petroleum Products and Crude Oil Reacted?

As crude oil prices rose in the early months of the crisis, petroleum product demand, stocks, and imports in the United States showed little change.

- o Demand for petroleum products increased from 16.9 million bbl/day in July to 17.9 million bbl/day in August, but by September 1990 had fallen back to the July level and continued to drop to 16.5 million bbl/day by November (see Figure 3). Increased gasoline consumption largely accounted for the August spike in total demand for petroleum products. That increase is comparable with the increase in past summers. In November, lower fuel oil demand, a result of warmer weather and the economic slowdown, led to total demand that was lower than usual.
- o Stocks of petroleum products were stable, rising modestly from 745 million barrels at the end of July to 760 million by the end of September 1990 and then drifting downward to 740 million at the end of November (see Figure 4). The September rise is attributable to increased stocks of heating oil and is comparable with past stock building in early fall, while later seasonal stock declines for gasoline pulled down total stocks of petroleum products.
- o Imports of petroleum products remained steady after July.

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**FIGURE 3. Demand for Petroleum Products, 1989 and 1990**

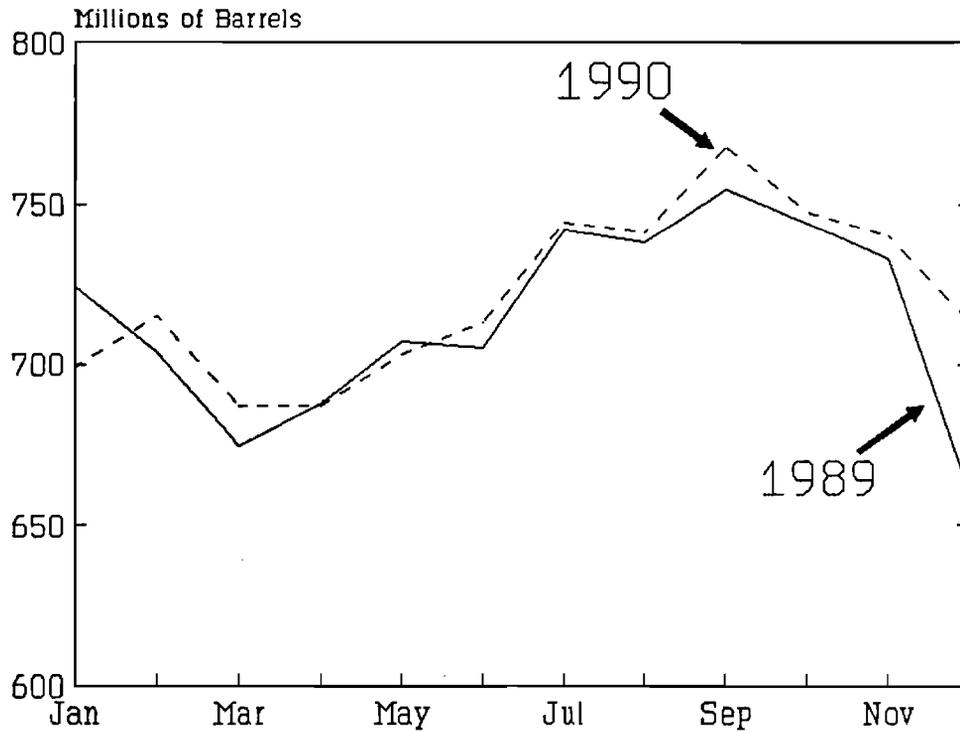


SOURCE: CBO using data from the Energy Information Administration.

On the surface, the domestic markets for petroleum products provide no indication of any underlying imbalance that would be pushing prices so high. However, there is more activity when one considers inventories and imports of crude oil.

- o Commercial inventories of crude oil (excluding the Strategic Petroleum Reserve), which had been at a near record high of 380 million barrels at the end of July, fell steadily through the next four months, reaching 345 million barrels by the end of November 1990 (see Figure 5).
- o Gross imports of crude oil fell from 6.8 million bbl/day in July to 5.1 million bbl/day in November. U.S. requirements for oil imports were offset, barrel for barrel, by oil taken from inventories in August and September. In October and November, falling refinery demand for crude oil lowered import requirements by a further 1.0 million to 1.5 million bbl/day.

FIGURE 4. Stocks of Petroleum Products, 1989 and 1990

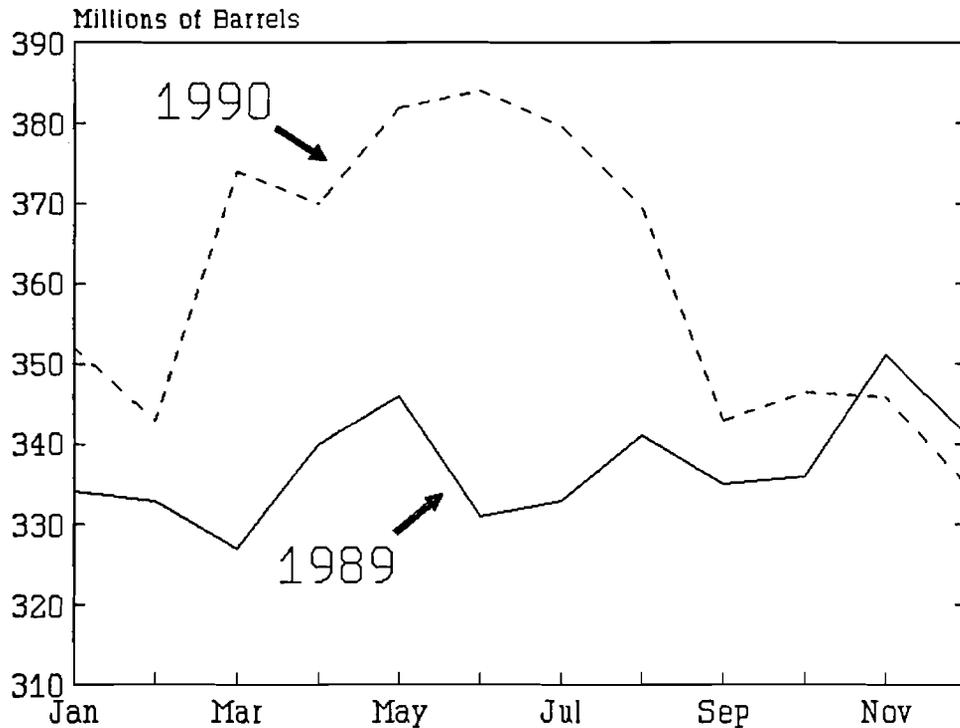


SOURCE: CBO using data from the Energy Information Administration.  
NOTE: Data show stock levels at end of month.

### Comparing Current Oil Markets with Markets During Past Crises

The drop in crude oil imports and stocks and the lack of response in petroleum product markets contrast sharply with the market's reaction to rising prices in past supply disruptions. The clearest example of this difference is presented in Figures 6 and 7, which compare the current market's response with that during the oil embargo of 1973 and 1974. Oil prices are plotted next to an index of the number of days that current imports may be replaced by current stocks (calculated as stocks divided by current imports per day).

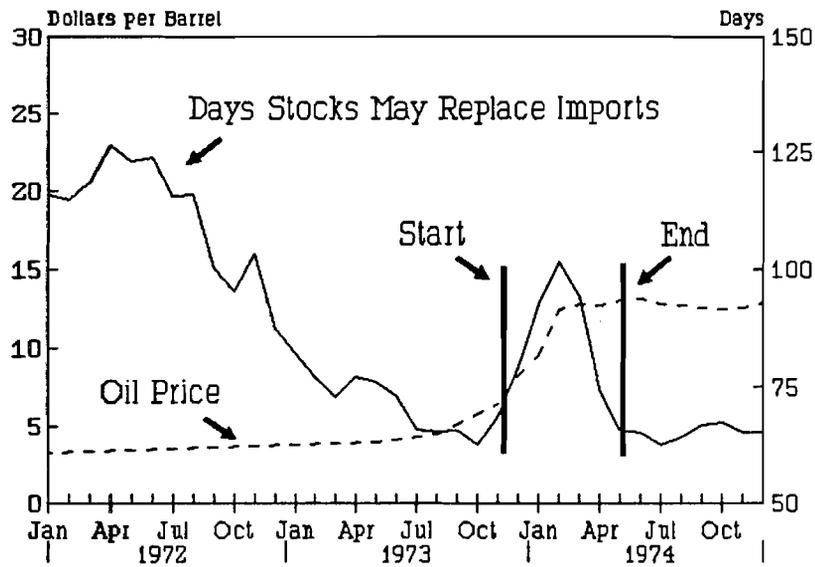
**FIGURE 5. Stocks of Crude Oil, 1989 and 1990**



SOURCE: CBO using data from the Energy Information Administration.

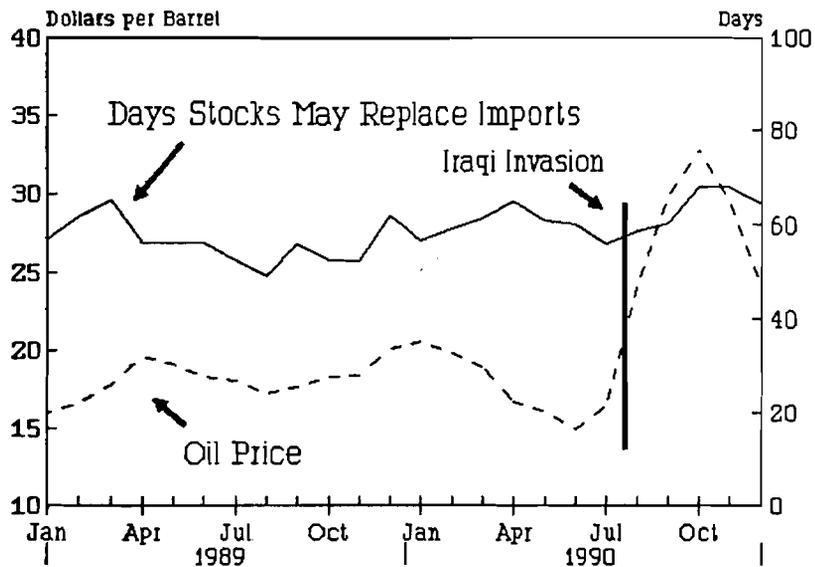
NOTE: Data show stock levels at end of month.

**FIGURE 6. Oil Markets Before and During the Oil Embargo of 1973 and 1974**



SOURCE: CBO using data from the Energy Information Administration.  
 NOTE: Prices are monthly averages.

**FIGURE 7. Oil Markets Before and During the Iraq-Kuwait Crisis**



SOURCE: CBO using data from the Energy Information Administration.  
 NOTE: Prices are monthly averages.

In past disruptions, as exemplified by the 1973 embargo, refiners held on to crude oil stocks as prices rose, not knowing how much higher prices might go. Incentives for suppliers to hold on to or even add to primary stock levels constrained supply further and added to price pressures. At the same time, additional demand from retailers and small distributors (to add to their own storage) and more frequent purchases by gasoline consumers in the face of rising prices also pushed apparent demand and prices up.

In the current crisis, crude oil inventory demand (again, measured by how many days imports may be replaced by stocks) changed little despite the dramatic price rise. And virtually all of the change that took place in the product markets can be explained in terms of normal seasonal movements in the markets for gasoline, heating oil, and residual fuel oil. What has changed?

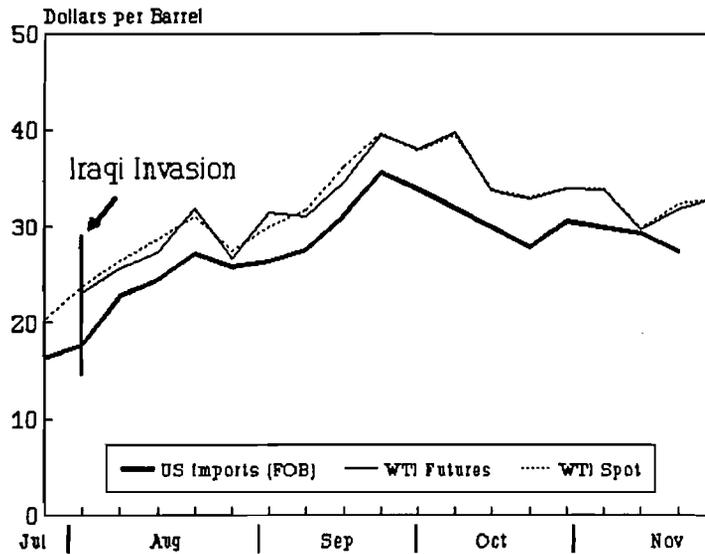
### Why Petroleum Product Demand and Stocks Have Not Risen Since August

Today's market and markets in the past exhibit two big differences that account, at least in part, for the fact that rising prices have not led to increased demand and stock building since the Iraqi invasion. The first is the absence of price controls. The second is the existence of widely used spot and forward trading mechanisms--including the futures markets--for crude oil and petroleum products. ("Spot" refers loosely to sales for delivery within the next month. "Futures markets" allow traders to buy and sell fixed-price contracts for products to be delivered one to twelve months hence. Trading in a futures contract for the current, or delivery, month is equivalent to a spot sale if the contract is held to maturity.)

Prices Adjust Rapidly to New Market Conditions. Together, unrestricted pricing and the new market institutions allow wholesale and retail prices to adjust rapidly to levels that reflect all information on current supply and demand conditions. As a result, all prices for related commodities (crude oil and petroleum products, wholesale delivery and retail) move together (see Figures 8 and 9). Looking at this another way, the price levels reported for spot sales and futures trading are now the best indicators of the immediacy, duration, and location of shifts in supply or demand.

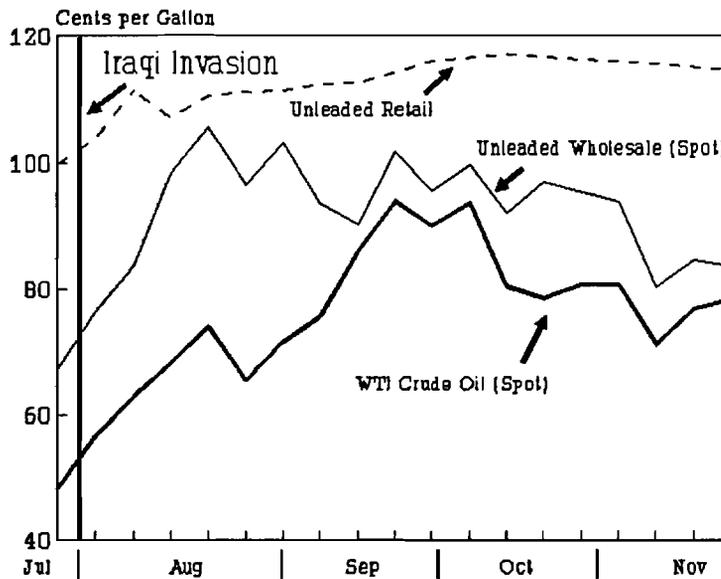
Efficient Pricing Dampens Speculative Incentives to Hold Stocks. The new spot and forward markets promote efficiency by keeping relative prices (for crude oil and petroleum products, for products in different regions, and for products delivered at different times) in line with relative costs (for refining, transportation, and storage, respectively). The markets do this by arbitrage--the simultaneous buying and selling of the same or related commodities for delivery in different places or times. (Traded commodities include petroleum products and different grades of crude oil.) As a result of these trades, information on the future supply and demand for any one product (including place and time) is conveyed quickly to the prices for all commodities.

**FIGURE 8. Comparison of Spot, Futures, and FOB Oil Prices, End of July Through November 1990**



SOURCE: CBO using data from the Energy Information Administration.  
 NOTE: WTI = West Texas Intermediate. FOB = free on board. Futures prices are for delivery-month contracts.

**FIGURE 9. Comparison of Crude Oil and Gasoline Prices, End of July Through November 1990**



SOURCE: CBO using data from the Energy Information Administration.  
 NOTE: WTI = West Texas Intermediate.

Speculation in the futures markets cannot push futures prices out of line with expected supply costs without creating strong incentives to bring prices back in line with costs. For futures contracts maturing within the next month, the futures price is very closely related to the cost of the commodity to be delivered within the next month.

A major consequence of full and rapid price adjustments is that suppliers and consumers all along the distribution chain have less incentive than otherwise to build or draw stocks in anticipation of further price movements: prices have already adjusted to fully reflect expectations. In other words, futures markets provide an alternative outlet for speculative incentives to hoard (or unload) oil and, as a consequence, can help dampen volatility in oil demand and prices.

### Why Crude Oil Stocks and Imports Have Not Risen Since August

The performance of the futures market can help explain why inventories and demand did not rise in the aftermath of the Iraqi invasion of Kuwait. In particular, rapid price adjustment explains why speculative demand did not lead to growth in product inventories. The question remains, however, why crude oil stock levels declined in the face of rising prices.

The simple answer is that, even while prices continued to rise, the market apparently had an expectation that prices would ultimately fall, so that purchases were postponed. The full answer relies on the relationship between futures prices and storage costs.

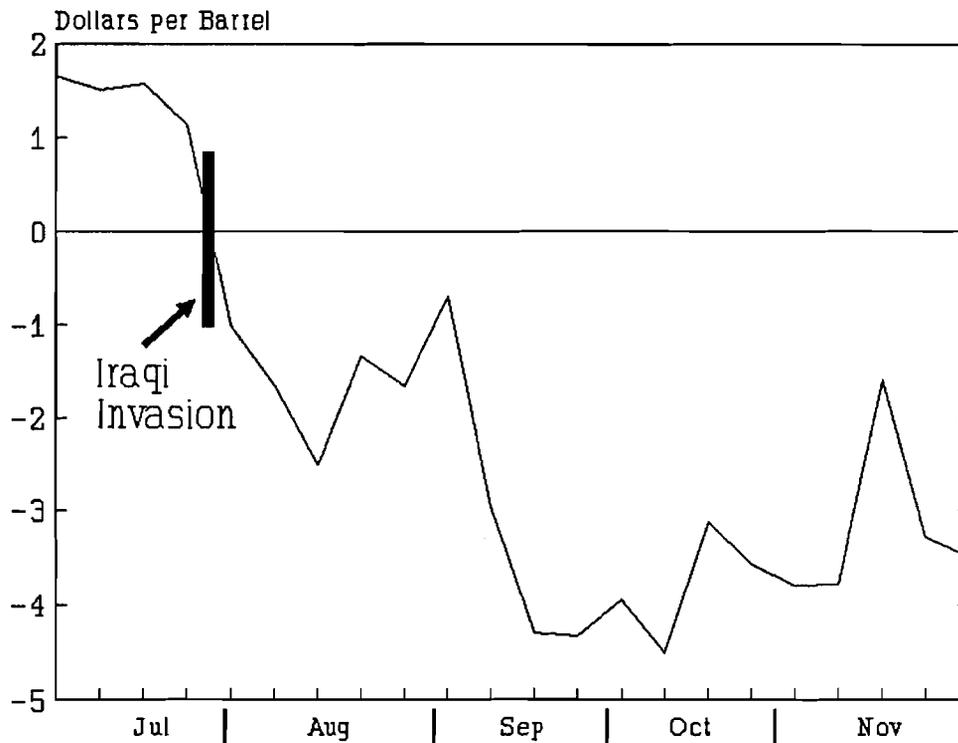
Futures prices reflect a market consensus of the future course of cash prices, adjusted for uncertainty and limited by the cost of storing the product. The difference between current market prices and futures prices for later delivery generally bears a very close relation to storage costs. If prices were otherwise expected to remain constant, contract prices for later delivery should exceed current prices, with the difference approximating the cost of storing the product for that period (unless there are limits on storage capacity or on capabilities to draw stocks). Higher prices in the future lead to stock building, lower prices to stock drawing.

In the fall of 1990, futures prices for later delivery months were much lower than prices for the current delivery month (see Figure 10). That is, even as prices continued to rise in the aftermath of the Iraqi invasion, the market apparently held on to an expectation that they would fall in the near future. This situation usually indicates the profitability of selling from inventories now and replenishing those inventories later, and that appears to have been the case: the futures price pattern seen in the fall of 1990 conforms strongly with the sell-off of crude oil inventories during those months.

## WHAT HAS CAUSED PRICE VOLATILITY?

The change in oil prices that results from a given loss of supply or an increase in demand for oil tends to be disproportionately large when compared with price changes for other goods. The reason is that the short-term capability of oil producers to increase output and the willingness of consumers to reduce purchases is generally very limited when compared with other markets. Thus, when supply is disrupted, for example, only a very large price increase will stimulate the greater production and lower consumption needed to bring the market back into balance.

FIGURE 10. Maturity Spread for Futures Prices of Crude Oil, July-November 1990



SOURCE: CBO using data from the New York Mercantile Exchange.

NOTE: Maturity spread is the contract price for delivery in the current month minus the contract price for delivery four months later.

The Iraqi invasion of Kuwait caused price changes to appear to be even larger than the news that elicited them should have warranted. And such changes came much more frequently than before the invasion. Iraq initially announced it would withdraw from Kuwait immediately. However, Iraq's intention to remain in Kuwait and the resolve of other nations that Iraq should leave both stiffened over a number of months. These developments raised the likelihood of military action to remove Iraq forcibly as well as the possibility of further supply disruptions in the Persian Gulf. Other news from the Gulf made it clear that the capability of oil-exporting nations to increase their output was much greater than those countries initially reported. Meanwhile, on the domestic front, continuing bad news about the economy and unseasonably mild weather in some parts of the country contributed to lower-than-expected petroleum demand.

All of these developments could lead to large price movements because both the supply and demand for oil are not very sensitive to changes in oil prices. As the Iraq-Kuwait crisis developed, the ability of the oil supply to respond became even more restricted and oil prices became increasingly volatile. This happened for two closely related reasons: the loss of the OPEC supply buffer, and limitations on the sale of inventories.

#### The Loss of the OPEC Supply Buffer

This analysis links recent high and volatile oil prices to a basic shift in market structure that occurred in response to the loss of supplies from Iraq and Kuwait. As OPEC producers used up their excess production capacity, the marginal source of oil in today's market shifted from the low-cost, developed fields in the Middle East to higher-cost sources of oil. Higher-cost oil includes not only production from old, intensively developed regions like the United States, but also oil that comes from new, rapidly installed capacity in the Middle East. This means that additional production can be brought quickly into the market today only at a very high cost. Moreover, because the world demand for oil is not very sensitive in the short term to price, only a very large price increase would significantly reduce demand. In other words, the volatility of current oil prices in response to changing market conditions depends greatly on how much excess OPEC capacity remains to be tapped.

The success of past OPEC efforts to constrain supply has effectively distorted relationships between the world supply and price of oil. As long as OPEC has excess supply capacity, the marginal source of supply will be the world's low-cost producers. In most markets, the marginal source of a product is the highest-cost source. However, whenever OPEC's excess capacity is exhausted, a traditional supply curve reemerges: the high-cost producers again become the marginal source of added oil supply, and market prices then reflect their higher production costs. That was the situation during the early months of the Iraq-Kuwait crisis.

In the first three months of the crisis, OPEC's biggest producers increased their output and fully committed their excess capacity of low-cost oil to the world market. No low-cost buffer of oil remained to cushion a market continuously threatened by chance events, such as refinery shutdowns, oil spills, and extreme weather. With even a small supply disruption (or threat of disruption), bringing supply back into balance with demand would require much larger price changes than was the case before the crisis; hence the increase in price volatility.

Gradually, the supply buffer was restored by OPEC (particularly Saudi Arabian) efforts to develop new production capacity beyond what is needed to satisfy current demand (see Figure 1). During the first months of the crisis, however, available excess production capacity was insufficient to immediately offset the full loss of oil from Iraq and Kuwait. The buffer might have been adequate if sufficient additional supplies of oil had been forthcoming from commercial (privately owned) and strategic (government-owned) inventories. In that case, the immediate price increase would have been lower and the subsequent volatility of prices lessened.

#### Limits on Supply from Inventories

In the absence of an OPEC supply buffer, increased supply from crude oil and petroleum product inventories can help ease market pressures and reduce price volatility. Yet, despite an apparent expectation that oil prices would ultimately fall, the oil industry did not sell off its crude oil inventories at the highest rate possible, and virtually no destocking of petroleum products took place.

The Role of Uncertainty. Incentives for the oil industry to release more of its available crude oil inventories have been restricted by the uncertainty surrounding the military situation in the Middle East. There appears to be a market consensus that oil prices will fall (as evidenced by futures prices), but the oil industry did not release stocks at a rate that would help bring current prices in line with their expectations.

The difference between futures prices for different delivery dates is affected by uncertainty about the future as well as the cost of storage. Even though a decline in futures prices for later delivery dates generally indicates that inventories can be profitably sold off, the incentive for destocking is apparently lessened because the expected price on which the futures contract price is based is very uncertain.

In portfolio parlance, investment in physical stocks (or, in this case, the selling of stocks) can be too risky relative to investment in futures contracts (or, in this case, selling futures). Not selling stocks helps keep current prices high; selling futures contracts helps depress futures prices for later delivery--hence, the large spread between futures prices for current- and later-month delivery.

Analytical assessments of uncertainty are hard to come by, but the data show that daily movements in crude oil futures prices averaged more than \$1.00 per barrel for August and September 1990, compared with a normal \$0.25 per barrel. Separate evidence from prices on options for crude oil futures underscores this uncertainty. (In an options market, traders buy and sell contracts giving them the option to either buy or sell futures contracts at a given price. The price of an option reflects the intrinsic value of the futures contract plus a risk premium. The risk premium on options to buy reflects the market's assessment of the upper limit on oil prices. The risk premium on options to sell reflects the lower limit on prices.)

The crude oil options market in the early months of the crisis appeared to be more worried about rising prices than about falling prices, as evidenced by the asymmetry in risk premiums on options to buy and to sell. Even though the market consensus appeared to be that prices would fall (as evidenced by futures prices), there was more uncertainty surrounding the upper limit for future prices than there was for the lower limit. Even though the likelihood of a broadened Middle East war, which could significantly disrupt world oil supplies, was remote, that eventuality would cause a severe increase in prices. In the case of the lower limit, OPEC would probably intervene to restrict any drop in prices by limiting its production.

Institutional Constraints on Petroleum Product Inventories. Petroleum product inventories demonstrate great seasonal variation, but they are generally more stable in the face of changing oil prices than are crude oil stocks. The main reason for this is the precautionary need to maintain industry flexibility.

Crude oil stocks maintained at refineries enhance the industry's flexibility in meeting changing demand conditions in the markets for individual products. Once crude oil is refined into products and moved into pipelines and regional distribution terminals, the industry's ability to raise or lower the supply of individual products becomes more limited.

Several related constraints on changes in total inventories of petroleum products include the level of uncertainty in specific markets and the operating requirements of the distribution system, specifically:

- o The level of uncertainty about the future demand for some petroleum products is high. In early fall, winter requirements for heating oil are particularly hard to predict.
- o Some petroleum product prices (particularly heating oil) are expected to rise relative to crude oil costs in the near future.
- o Refineries produce more than one product in the same process; thus, inventories of any one petroleum product are not completely flexible. For example, it is difficult to reduce gasoline inventories when refiners are trying to increase the production of heating oil.

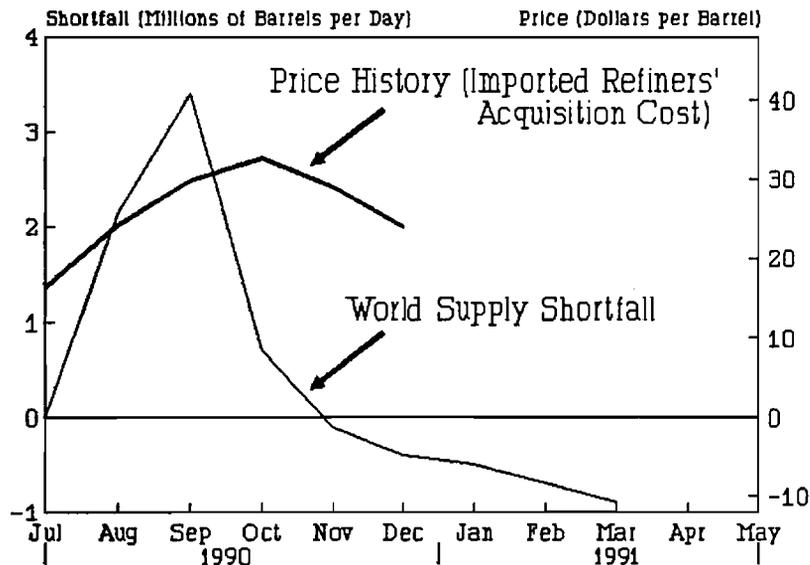
- o Petroleum products needed to keep processing units and distribution lines full are counted as inventory. Although product inventories at the outset of the Iraq-Kuwait disruption were not low compared with recent years, they were lean, and refiners' ability to sell off any significant volume of petroleum product stocks without disrupting supplies was limited. In other words, the amount of petroleum product on hand at refineries, pipelines, and bulk terminals at the outset of the Iraqi disruption was very close to minimum operating inventories.

## THE OUTLOOK FOR OIL PRICES

Even without a resolution of the Iraq-Kuwait crisis, the world could see a steady progression toward lower oil prices through the spring of 1991, as additional oil production reaches the market. This outlook assumes no further major shifts in oil supply or demand and no changes in the level of uncertainty. In the event of such shifts, oil prices will continue to move up and down sharply. But the range of price movement will narrow as OPEC works to restore its excess supply capacity.

When analyzing the price effects of future supply disruptions, it is important to compare the magnitude of the supply loss with the level of low-cost production capacity available at that time (see Figure 11). Price increases and subsequent volatility will be much lower if excess capacity available from OPEC exceeds the loss.

**FIGURE 11.** Estimated Oil Supply Shortfall Compared with Crude Oil Prices



SOURCE: CBO using data from the Energy Information Administration.  
 NOTE: Negative values indicate a surplus.

Until the OPEC buffer is restored to pre-crisis levels (not before the spring of 1991), any sudden supply loss of 1 million bbl/day could raise prices up to the level of \$35 or \$40 per barrel.

In the event of mild winter weather or a severe economic recession, a drop in oil demand of 1 million bbl/day would lower prices as much as \$10. However, if demand drops significantly, some restrictions on supplies by OPEC should be anticipated, so oil prices would not fall too far. A reasonable bottom range for oil prices might be around \$15 to \$20 per barrel.

### A Method for Predicting Short-Term Price Changes

The change in the price of oil needed to remove a given shortfall from the market (by raising production and lowering consumption) is related in economic theory to the sum of the elasticities of supply and demand. "Elasticities" are values that measure the percentage change in the quantity supplied or demanded from base levels that would result from a 1 percent change in price. A small sum indicates that quantities supplied and demanded are not very responsive to price changes and that, conversely, a large price increase would be needed to remove a supply shortfall.<sup>1</sup>

The Energy Information Administration's (EIA) international models present this sum of elasticities as an "excess demand elasticity," measuring the responsiveness to price of the excess of demand over supply during a shortfall. However, this value still implicitly represents the sum of supply and demand elasticities.

EIA estimates the world's excess demand elasticity as 0.1. Based on this value, a \$5-per-barrel price increase (from a \$20 base) would have been needed to erase the remaining October 1990 shortfall of 1.1 million barrels per day (see Figure 1). That is, the October price should have been only \$25 per barrel, not the \$33 seen on average for that month (based on the refiners' acquisition cost of imported oil). Since prices in October were so high, there must be something wrong with that approach.

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1. The increase in supply and decrease in demand needed to remove a given shortfall (or supply shift) would be:

$$\text{Shortfall} = dQ_s + dQ_d$$

From the definition of supply and demand elasticity ( $E_s$  and  $E_d$ , respectively, where  $E_d$  is positive), the price change needed to clear this shortfall from the market would be

$$dP = \text{Shortfall} * \frac{P}{Q * (E_s + E_d)}$$

where P and Q were the market price and quantity before the shortfall arose.

Today, with the loss of the OPEC supply buffer and the limits placed on the withdrawals of crude oil stocks by market uncertainty, the responsiveness in the market is dictated more by the short-term supply limitations of high-cost producers like the United States. This situation suggests that the excess demand elasticity that describes the current market may be much smaller. If the excess demand elasticity were only a third of EIA's assumed level (that is, 0.033), a price increase of \$10 to \$15 per barrel (from a \$20 base) would have been needed to remove the shortfall of 1.1 million bbl/day that remained in October 1990. The resulting price would be much closer to the \$33-per-barrel average actually observed for October, and the price volatility observed in the fall of 1990 would be easier to explain.

### Major Uncertainties Behind the Price Outlook

The short-term elasticities of oil supply and demand are helpful for understanding the range of oil prices in the very near term. But elasticities over the longer term will become larger. In particular, efforts to increase oil production capacity in the aftermath of significantly higher prices will lead to a more elastic supply. A lower price will emerge over time if nothing further happens to change the shortfall that the short-term elasticities worked to erase, and if OPEC adds to and produces from new capacity as expected.

In other words, cheaper oil will come to the market as time passes. If estimates of world production capacity for November are correct (indicating the initial supply shortage has disappeared), oil prices could have come down at any time in December or January to around \$20 to \$25 per barrel. Uncertainty would have been the key factor holding prices above that level, by causing OPEC not to sell all the oil it is capable of producing, and by persuading consuming countries to hold on to their own stocks.

Prices will remain volatile, however, even as the midrange price adjusts downward. Changes in volatility will depend most importantly on how much excess supply capacity develops. Government decisions to release (or a clear demonstration of willingness to release) strategic inventories would help reduce volatility by adding to the supply buffer OPEC is working to restore.

Any reduction in uncertainty about the political and military outcome of the Iraq-Kuwait crisis would also help reduce volatility by spurring a temporary increase in supply in the form of released commercial oil stocks.

### Summary of Factors Affecting Oil Prices

During the remaining course of the Iraq-Kuwait crisis (or any other major supply disruption), oil prices will be influenced in the following ways:

- o Unpredictable events, such as cold (or mild) weather, the release of supplies from the Strategic Petroleum Reserve, refinery accidents, and local oil spills, will all have a magnified effect on prices, as long as there is no OPEC supply buffer.
- o In the first few months of 1991, efforts by Saudi Arabia to significantly increase its production capacity will affect the range of price volatility. These efforts may ultimately restore OPEC's supply buffer and moderate oil price volatility even without a resumption of production from Iraq and Kuwait.
- o Changes in the level of uncertainty about future events will continue to affect prices. Reduced uncertainty about future prices could lead to greater stock withdrawal and much lower prices--assuming the market's consensus outlook is still for falling prices.
- o Increased uncertainty, a shift in market expectations toward constant or rising future prices, or a reduction in stocks to minimum operating levels could all bring current destocking to a halt and raise prices. (Private crude oil stocks could go as low as 300 million barrels.)