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PIRINC has prepared the enclosed report, *Oil and the Other Commodities*.

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Within the US, gasoline, is in the spotlight. While crude oil costs are a significant component of gasoline prices, this product has its own specific, commodity-like problems that have helped push prices up beyond increases in crude costs. In particular, high demands have run up against short-term supply constraints at a time when stocks, industry's cushion against supply/demand surprises, are exceptionally low.

This report focuses on the common elements of movements in oil and other commodity prices and then considers the special aspects of oil. The report then turns to gasoline and especially the impact of newly implemented Federal and state regulations on supply availability. With minimal growth in refining capacity at home, the US looks to product imports to meet a growing share of its gasoline requirements. There is evidence that early in the year, regulatory requirements for gasoline inhibited the ability of foreign sources to meet them. On the other hand, it appears that strong price incentives to date, plus resolution of "teething" problems, is leading to improved supply availability and, assuming no new surprises, the potential for less extreme prices.

If you have any questions or comments, please call John Lichtblau, Larry Goldstein or Ron Gold.

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Oil and the Other Commodities

Summary

As has happened before, global economic growth led by industrial output pushes up demand for commodities, narrows available spare capacity and leads to escalating prices, particularly for industrial raw materials. A falling dollar adds another upward price influence. Over the past year commodities in general, and metals in particular, have registered strong double-digit increases in dollar prices. And then there is oil, the world's most prominent commodity.

Oil has shared in the overall upward price movement. As with other commodities, world demand has been outpacing expectations and available spare capacity has been declining sharply. In the case of crude oil, the spare that exists is concentrated in a few Persian Gulf countries. In common with other commodities, oil has become a favorite of investors looking for higher returns in the face of already high equity values and low interest rates. Yet oil is different, at least some of the time. A highly visible producers organization, OPEC, has demonstrated a long term, if uneven, ability to influence prices through its quota agreements. Moreover, supply of this essential commodity is subject to significant risks of disruption, as developments over the past few years in Iraq and Venezuela have highlighted. With limited spare capacity and tight inventories the mere threat of disruptions adds further upward pressure on prices.

Within the US, a very particular oil product, gasoline, is in the spotlight. While crude oil costs are a significant component of gasoline prices, this product has its own specific, commodity-like problems that have helped push prices up beyond increases in crude costs. In particular, high demands have run up against short-term supply constraints at a time when stocks, industry's cushion against supply/demand surprises, are also exceptionally low.

This report focuses on the common elements of movements in oil and other commodity prices and then considers the special circumstances surrounding oil. The report then turns to gasoline and especially the impact of newly implemented Federal and state regulations on supply availability. With minimal growth in refining capacity at home, the US looks to product imports to meet a growing share of its gasoline requirements. There is evidence that early in the year, regulatory requirements for gasoline inhibited the ability of foreign sources to meet them. On the other hand, it appears that strong price incentives to date, plus resolution of "teething" problems, is leading to improved supply availability and, assuming no new surprises, the potential for less extreme prices.

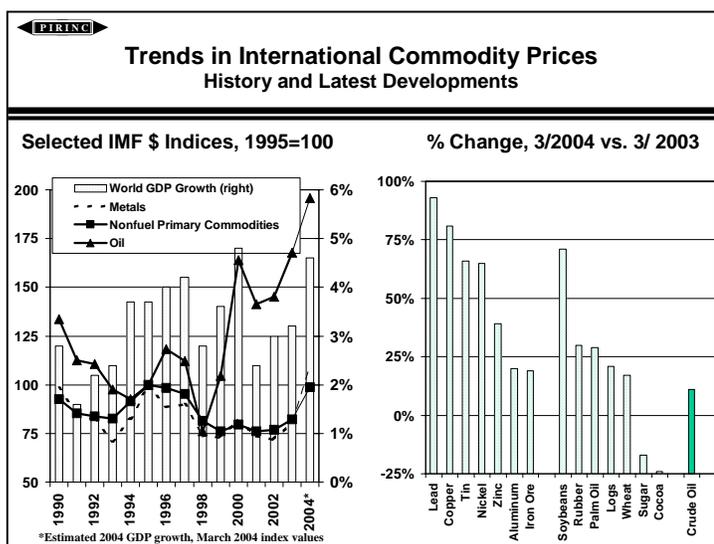
Commodity Price Developments

The chart below shows, in the left panel, broad trends in commodity price movements, including oil, since 1990 and, on the right, changes over the 12 months through March of this year for a selection of commodities, again including oil. As indicators of broad trends, the left panel shows

the IMF dollar price index for non-fuel primary commodities and, within that category, the IMF dollar price for metals. Also shown is the IMF index for oil prices, derived from the average of the spot prices for WTI, Brent, and Dubai crude. The indices all have a base value of 100 for year 1995. Average annual values are shown for 1990 through 2003 and values as they stood in March 2004. The panel also shows as bars average annual world GDP growth. The bars of the panel show year-on-year world GDP growth as calculated on a purchasing power parity basis by the IMF, including estimated growth in 2004.¹ The just published estimate of 4.6%, is significantly above the IMF's estimate of 4.1% published in September of last year.

Three broad GDP growth cycles stand out: the 1990-95 growth slowdown and recovery following the first Iraq crisis, the growth setback from the 1998 international debt crisis and subsequent 1999-2000 recovery, and, most recently, the 2001 growth slowdown exacerbated by 9/11 followed by an initially slow, but still accelerating recovery led by the two growth poles, the US and China. Through the mid-90s, the broad commodity indices and oil prices showed a roughly similar pattern, falling in the early 90s followed by strengthening in the mid-90s as world economic growth accelerated. Oil's movements were somewhat stronger, primarily because prices had been pushed up in 1990 by the Iraqi invasion of Kuwait. In 1995, the oil price corresponding to the base index value of 100 was just over \$17/barrel. At its 1996 peak for that cycle, the index value reached 118, or a price of about \$20.40. All three indices fell sharply in 1998, the debt crisis year, but thereafter, oil moved off on a path of its own.

Between 1998 and 2000, the oil price index more than doubled, (with the average composite price rising from about \$13 to about \$28/barrel). The other indices behaved very differently. The overall index for non-fuel primary commodities declined by about 3% between the two years, weighed down by price declines food and especially beverages.² The more cyclically attuned metals index rose between the two years by 11%, a significant gain on its own terms but



¹ In general, world GDP growth on a market exchange rate basis tends to be about a percentage point less, due primarily to the much lower GDP weight assigned to China when market exchange rates are used.

² The IMF index of prices for food (Cereals, vegetable oils, protein meals, meats, seafood, sugar, bananas and oranges) fell by about 10%. The price index for beverages (Coffee, Cocoa, and Tea) showed a drastic decline of 33%.

minimal compared to what happened with oil. Recently, the three indices are again showing similarities. The March 2004 values shown are up versus their 2003 averages by 21% for all non-fuel commodities, 36% for metals, and 17% for oil.

The right panel shows for selected commodities included in the IMF indices, the price changes from March 2003 to March of this year. Among the metals group, lead, copper, tin and nickel, show increases of more than 50% while the other three show gains in about the 20% - 40% range. Among the agricultural commodities, soybeans show a spectacular increase while rubber, palm oil, logs, and wheat show respectable double-digit gains. But not all agricultural prices have strengthened. Sugar and cocoa show double-digit declines. Compared to these other commodities, the price increase for oil, up 11%, does not stand out.³ Commodity prices in general, although with some exceptions among the agricultural commodities, appear to have been influenced by accelerating economic growth, narrowing of spare capacity, and to a certain extent, since these are all dollar-based indices, the declining dollar. They may also have caught the fancy, at least temporarily, of investors looking to diversify from stocks and interest-bearing investments.

Commonalities and Uniqueness of Oil

While oil is of course a commodity and at times shows price movements similar to those of other cyclically sensitive prices, there is no denying that oil is different, both in its international and domestic political aspects, as well as, at times, its very different price paths. Of course a big obvious difference is the existence of OPEC, the international organization whose member countries, “---coordinate their oil production policies in order to help stabilize the oil market and to help oil producers achieve a reasonable rate of return on their investments.”⁴ But just how, when, and to what extent OPEC and its member countries actually impact oil prices is far less obvious.

The next chart looks at trends in OPEC crude production, annually in the left panel since 1990, and monthly on the right since January 2003. The chart shows production for OPEC as a whole, OPEC ex Iraq, and OPEC ex Venezuela. OPEC decisions involve the setting of country “quotas,” or agreed production levels. These are shown for selected effective dates over the course of the 1990s through 2002, and then levels in effect by month since the beginning of 2003.

³ Oil prices were rising in the approach to the Iraq war, so the March vs. March comparison may look exceptionally low. Nonetheless, eliminating this factor does not change the conclusion that oil lately has been behaving more or less in line with other commodities. Comparing March 2004 with September 2003, well after any war risk premium had dissipated, shows a price gain for oil of 25% versus a gain in the IMF metals index of 36% and a gain in the non-fuels index of 20%.

⁴ From the functions of OPEC as described on that organization’s website, www.opec.org.

From 1990 to 1998, total OPEC production rose from 22.5 MMB/D to nearly 28, a gain of nearly 25%, or 5.5 MMB/D. Virtually all the gains went to countries other than Iraq.⁵

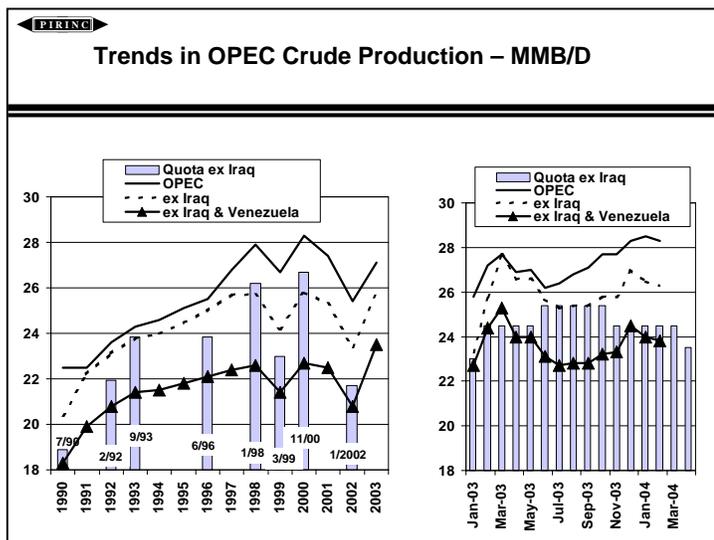
Production among the OPEC

members ex Iraq first expanded disproportionately to compensate from the withdrawal of nearly all of Iraqi production from the world market with growth slowing after 1995 as Iraq began a return to market under UN supervision. In July 1990,

on the eve of the Iraqi invasion of Kuwait, the quota agreement came into effect calling for a total production level of about 22 MMB/D of which 19 were assigned to members other than Iraq. The quota for OPEC ex Iraq was raised over the next few years, reaching nearly 24 MMB/D in February 1993, where it remained through 1997. Until the February increase, OPEC ex Iraq production generally exceeded the quota for the group, a condition that reappeared after 1993. The years immediately following the first Iraq war through 1998 was the period when oil prices overall moved more-or-less in line with the other broad commodity price indices, suggesting that OPEC was basically following the market, exercising little active control over prices (or adherence to official quotas) over this time-frame.

In 1998, still higher OPEC production confronted the international debt crisis and economic slowdown that resulted in a price collapse that, in relative terms, exceeded what happened to other commodities.⁶ In March 1999, the OPEC countries agreed on a quota reduction (ex Iraq) of about 3 MMB/D. Although the actual reduction was somewhat less, and from a higher level, the reduction, combined with a pick-up in economic activity, was sufficient to push prices up beyond pre-1998 levels. In effect, in the face of a near-disastrous erosion of revenues, the organization did coalesce sufficiently to take significant volume of oil off a glutted market and raise prices.

The year 1998 marks a break in what had been an upward trend in OPEC production. Since that year, production has fluctuated but rarely gone beyond the 1998 level. At first glance, this might suggest a sea change in OPEC behavior, in particular, greater cohesion and aggressiveness in



⁵ Saudi Arabia, the country with the largest immediate spare production capability showed the largest individual country gains with production rising from an average of 6.4 MMB/D in 1990 to just over 8 in 1991, a level it more or less maintained over the 1991-98 period.

⁶ In October 1997, the average price of oil as calculated by the IMF stood at just above \$20/barrel. At the end of 1998, the price had fallen to \$10.41. Successful OPEC action to cut production pushed up prices by the end of the following year to \$25.

limiting production and propping up prices. But, although not obvious from the overall production profile, this has been a period of great stress and challenges within OPEC. Since 1997, OPEC has had to cope with the return of significant, and volatile, volumes of Iraqi production, growth in production elsewhere, especially the sharp recovery of oil supplies from Russia, and the falloff in demand growth in the aftermath of 9/11, all negative elements for prices, especially in 2001 through most of 2002. Toward the end of 2002, the oil market environment changed radically. Instead of attempting to manage production in the face of minimal growth in demand for its oil, its capability to produce was suddenly reduced by political turmoil in Venezuela while the build-up to the Iraq conflict meant a potential, and soon actual, loss of supply from that country.

As shown in the panel on the left of the chart above, in the first three months of 2003, production by OPEC members apart from Iraq and Venezuela moved up sharply to levels well above annual average levels for 1990-2003. Since that time, although they have fallen back from their March peak, they remain at historically high levels. Total OPEC production, including Iraq, has been averaging above 28 MMB/D into early 2004, well above year-earlier levels thanks in part to the (still incomplete) recovery of Venezuelan production and continued high production by the other members.

While 8 of the 11 OPEC countries were producing at capacity, estimates of world oil demand have been creeping up. The table on the right summarizes the evolving estimates of world demand as published by the International Energy Agency. The IEA estimate of last year's demand has itself moved up. In January of 2003, the IEA estimated demand for

| IEA Estimates of World Demand | | |
|--------------------------------------|--------------------|--------------------|
| | MMB/D | |
| | <u>2003</u> | <u>2004</u> |
| As of: | | |
| January 2003 | 77.9 | |
| September 2003 | 78.4 | 79.4 |
| December 2003 | 78.4 | 79.6 |
| February 2004 | 78.5 | 79.9 |
| April 2004 | <u>78.6</u> | <u>80.3</u> |
| Change | 0.7 | 0.9 |

that year at 77.9 MMB/D. By its most recent April outlook, the estimate for last year had grown by 0.7 MMB/D. Estimates for this year's demand have also moved up from earlier estimates. In its September outlook, the IEA estimated 2004 demand at 79.4 MMB/D. By April of this year, estimated demand was up by 0.9 MMB/D to 80.3. While demand estimates have moved up, IEA estimates of non-OPEC supply have not, meaning that the unexpected demand growth is to be met through drawdowns/smaller builds in already low stocks and or higher OPEC production.

Capacity Issues

The higher than anticipated demand for oil is pressing against limited OPEC capacity, especially in the first few months of the year, putting upward pressure on prices apart from any official OPEC agreements regarding quotas. The table below shows OPEC capacity details for the years 1990, 2001, and the latest March 2004 estimate just released by the Department of Energy. The

bottom of the table shows production for the same periods and the comparison between production and capacity.

In 2001, estimated OPEC capacity stood at 32.6 MMB/D, nearly 5.5 MMB/D above the 1990 figure. Among the countries showing higher levels were Iraq, Venezuela, and Saudi Arabia, which together accounted for just over half the total increase. The latest estimate, for March 2004, shows total capacity down by 2 – 2.5 MMB/D from the 2001 level. Reductions in estimated capacity for Iraq and Venezuela account for over half of the total decline. While estimated Saudi capacity was unchanged, the other members of OPEC showed a collective decline of 0.9 MMB/D.⁷ Part of the overall decline in capacity is clearly related to geopolitical developments, as in the case of Iraq, and internal political problems, as in the case of Venezuela

which have discouraged new investment and hampered ongoing maintenance. Another consideration is that with OPEC production more or less stagnant in recent years, the rationale for investment in new capacity was less compelling.

In 1990 and 2001, OPEC production as a percent of capacity was about the same, 83% and 84% respectively. In March 2004, the percentage was much higher, 93%, thanks to the combination of higher demand and lower capacity available to meet it. In this respect, the physical supply/demand conditions for oil resembled what was happening to commodities in general and produced a similar result, namely higher prices.

In one respect, the current market is even tighter than indicated by the overall capacity figures. The world is looking for light, low-sulfur crudes, the most suitable for producing gasoline, especially gasoline that meets the new more stringent sulfur specifications discussed below. But existing spare capacity is concentrated in the heavier, higher-sulfur crudes and in countries further away from the Atlantic basin markets, further stretching out the supply chain. This has put added upward pressure on short haul high quality crudes such as WTI.

| Estimated OPEC Capacity | | | |
|------------------------------------|-------------|-------------|--------------------|
| MMB/D | | | |
| | 1990 | 2001 | March 2004 |
| OPEC Total | 27.2 | 32.6 | 30.2 – 30.7 |
| of Which: | | | |
| Iraq | 2.2 | 2.8 | 2.2 |
| Venezuela | 2.4 | 3.2 | 2.5 |
| Saudi Arabia | 8.6 | 10.2 | 10.0 – 10.5 |
| Other OPEC | 14.0 | 16.4 | 15.5 |
| OPEC Production | 22.5 | 27.4 | 28.1 |
| Production as % of Capacity | 83% | 84% | 92% - 93% |

1990 and 2001 capacity figures from the EIA 2003 International Energy Outlook. The March 2004 capacity and production are from the EIA April 2004 Short-Term Energy Outlook. The upper bands of the March ranges include additional Saudi production that could be brought on after a short delay. See table 3a of the **April Outlook** for details.

⁷ Among the other OPEC members, Indonesia shows a significant markdown in estimated capacity, from 1.5 MMB/D in 2001 to 1 in March 2004. Algerian capacity was down by 0.4 MMB/D.

What about Gasoline?

Higher prices for crude oil mean increased costs of producing gasoline. But gasoline prices are influenced not simply by fluctuations in crude costs but also by specific supply/demand conditions associated with the product. Early last year, and even more so this year, gasoline has experienced supply constraints that have pushed up prices significantly beyond the cost of crude. In the first quarter of this year, spot gasoline prices, as measured by the New York Harbor price for 87 octane unleaded averaged about 20 cents/gallon above the crude (WTI) price. The differential was significantly above the 13¢ differential in the first quarter of 2003 and far above the 8¢ differential for the same period in 2002.

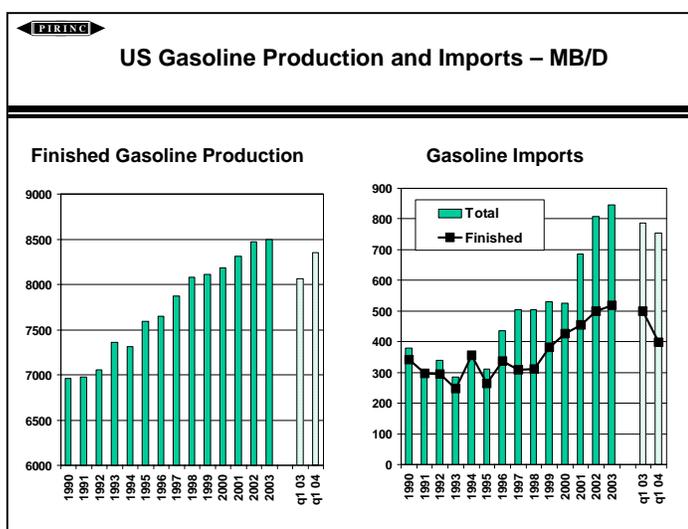
As in the case of crude, surprisingly strong demand has been pressing against capacity, although for gasoline this year, the capacity limitations have been aggravated by regulatory actions.

The chart on the right shows trends in US finished gasoline production and gasoline imports from 1990 through 1993, and the first quarters of 2003 and 2004.

Between 1990 and 2003, US finished gasoline production rose by about 1.5 MMB/D but with a slowdown in growth in the later years. In 2003, gasoline production was about flat versus 2002. At first glance, higher production in the first quarter of this year versus last suggests a significant improvement, but as will be discussed momentarily, part of the gain is statistical.

Total gasoline imports, shown by the bars in the right panel, were relatively flat in the early 1990s but have since surged, growing from just over 300 MB/D in 1995 to 800 in 2002 and nearly 850 in 2003. From 2000 to 2003, the growth in imports was about the same as the increase in domestic production, with both up just over 300 MB/D, suggesting that at the margin foreign suppliers are playing just as important a role as domestic sources.

The total gasoline figures include both finished gasoline and blending components. The line in the right panel shows finished gasoline imports, which through the first half of the 1990s, accounted for nearly all of the total. Since then, blending components have become increasingly important, especially since 2000. These go into the production of finished gasoline, in this case through blending with other additives as opposed to running crude. From 2000 to 2003, the



increase in imports of blending components amounted to nearly three-quarters of the increase in production of finished gasoline.

The growing reliance on product imports is linked to the slowdown in growth of domestic refining capacity. As shown in the table on the right, refining capacity grew by about 1 MMB/D between 1995 and 2000 but has been virtually flat ever since. Indeed, figures for late 2003 indicate no growth at all since the beginning of 2002.

In the first quarter of 2004, total gasoline imports were down by about 4% versus the first quarter of 2003.

There was a large shift in composition between this year and last. In the first quarter of this year, imports of finished gasoline are running about 100 MB/D below year earlier levels, while blending component imports are up by nearly 70. Newly implemented regulations played the key role in these changes. The bans on MTBE that came into effect in California, New York and Connecticut at the beginning of this

year restricted the market for MTBE-based finished gasoline imports while creating a market for imports of RBOB (reformulated gasoline blendstock for oxygenate blending) that could be blended locally with ethanol. However, the decline in finished gasoline imports was significantly greater than the rise in blending components — and at a time when prices were signaling that more was wanted. Here, another regulatory program, the tightening of sulfur specifications that took effect this year played a small but important role, at least in the early part of the year.

As of January 1st of this year, refiners and importers (apart from “small” refiners subject to transition provisions) are subject to a corporate pool average maximum standard of 120 ppm of sulfur, a substantial reduction from prior year average sulfur levels of about 300 ppm. This need to reduce overall sulfur levels means less acceptability of foreign-source, high-sulfur gasoline. Data for early this year show a sharp fall-off in imports from certain countries, particularly in Latin America where sulfur levels are far above the new standard.

Given time, and the incentives created by high margins, these supply limitations can be overcome, and indeed there is strong evidence the process is already underway as other sources of supply are tapped to take advantage of the opportunities. However, the process involves looking further afield and bringing supplies from more distant sources — and therefore takes time and involves somewhat higher costs, particularly in light of sharp increases in tanker rates.

Conditions with respect to inventories and spare capacity are exceptionally tight but it should be kept in mind that for oil, as for other commodities, there is an ongoing tendency to hold lower inventories and avoid excess capacity, thereby reducing industry costs. For consumers, these

**US Operable Distillation Capacity
MMB/D**

| | |
|----------------|--------------|
| 1/1995 | 15.43 |
| 1/2000 | 16.51 |
| 1/2001 | 16.57 |
| 1/2002 | 16.76 |
| 1/2003 | 16.76 |
| 11/2003 | 16.76 |

Source: US EIA

cost-savings have for the most part been passed through in lower prices. However, there is a trade-off. Inventories and spare capacity are two cushions against supply/demand “surprises” and their decline means greater reliance on price movements to correct imbalances. In effect, price volatility — both up and down — has become the norm rather than the aberration.

As for gasoline, with refining capacity flat, rising imports are required to meet growth in demand. It thus becomes increasingly important that regulatory actions to change product quality be sensitive to the ability of foreign markets to meet these changes in a timely fashion. Given strong enough incentives and time to respond, foreign markets can meet almost any US product specifications. But even temporarily getting ahead of the international market’s ability to supply the more stringent product can put upward pressure on prices to US consumers apart from any developments in the crude oil market.