

Who's Driving Gasoline Prices?

At a late-March meeting of oil refiners, the U.S. Energy Information Administration forecast record U.S. gasoline demand in mid 2004. Moreover, meeting the demand may prove challenging, the EIA said, because of several technical issues, such as phasing in low-sulfur fuels, and replacing one environmentally mandated additive found to be a public hazard with another, less-poisonous one in the several states and urban areas requiring reformulated gasoline. Such refining uncertainties coupled with increased world demand also have reduced imported amounts of finished gasolines. These and other factors discussed below may drive gasoline prices to a 2004 average of \$1.67 per gallon, up 10 cents from the EIA's February projection, with a peak monthly average of \$1.83 projected for late spring once the heavy driving season begins.

Dire gasoline price predictions belie the relative abundance of world petroleum reserves. For example, despite cumulative production of some 650 billion barrels of oil since the late 19th century, a trillion more are at hand. An additional 10 trillion barrels of oil resources in the form of bitumen, shale oil, oil sands, and existing oil requiring enhanced recovery methods await the demand of an expanding world economy. Amidst such energy abundance, why over the past three decades do gasoline prices fluctuate so much?

In these *Reports* of May 7, 1973 we commented that amid a 1960 oil glut small, independent oil companies reduced prices and were soon followed down by the major oil companies extracting oil in the Middle East, thereby reducing the royalties paid to countries now known as the Organization of Petroleum Exporting Countries. OPEC, other countries in the Persian Gulf, as well as Libya, Venezuela, and others objected, and in 1970 successfully demanded both price and tax rate increases for their oil. In late 1972, five Persian Gulf states effectively nationalized their reserves, breaking long-term contracts with international oil companies and placing oil center stage in the world's political theater

Acknowledging increasing energy imports amid OPEC militancy, we then asked "[h]ow will U.S. imports be paid for? We do not pretend to know the answer, but

offer this observation: foreign producers presumably will not continue indefinitely to exchange their energy supplies for paper currency that is not redeemable in gold."

Since the United States a) cancelled international dollar convertibility into gold in August 1971, b) became a large importer of foreign oil, and c) became the focus of Middle Eastern religious and territorial strife, gasoline and petroleum prices from time to time have spiked, providing doomsayers, the media, and some politicians opportunities to wax apocalyptic and to demand yet another government inquiry into international oil company, refiner, and retail gasoline station profits. Paying sharply increased pump prices, automotive commuters especially feel a commensurate increased anxiety and general helplessness that fosters the growing hope that some authority might do something to remove such unpleasant surprises from daily life. However, hope for stabilizing energy prices lies less among those who would find fault and more with understanding diverse energy market factors, including prolonged and willful destruction of the dollar, once as good as gold, and for long the world's oil currency.

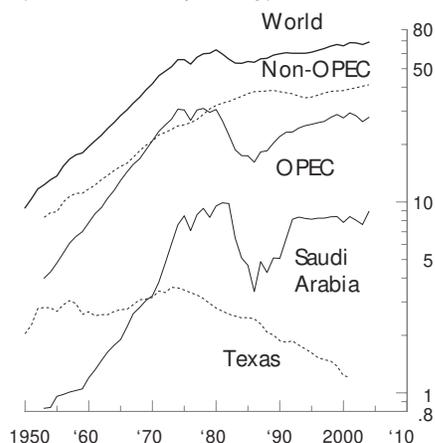
For example, in our *Reports* for June 18, 1973, we noted that "oil sheiks are said to be buying gold with unwanted dollars [of which] they hold too many of the

nearly \$100 billion floating about the world..." That concern for the dollar's sagging purchasing power within OPEC was later demonstrated during an OPEC meeting in Vienna during March 1974, when its president offered to delay yet another price increase only if "the industrialized nations curtail their galloping inflation," which had further reduced the value of their petroleum dollar hoard. Miscalculating the power of their cartel and world market response, at the time OPEC produced an average of 30.4 million barrels of oil a day, or some 54 percent of world oil consumption. As shown in Chart 1, 30 years later in 2003, OPEC produced an average of 28.0 million barrels a day, or about 36 percent of world oil consumption, a considerable loss of market share attributable to the industrial world's successful development of especially nuclear and natural gas energy sources and its scramble to find and develop diversified, non-OPEC petroleum supplies.

Indeed, not only do non-OPEC countries now out-produce OPEC, but also world oil production must match consumption, which grows increasingly efficient and can select from alternative energy supplies. For example, as Chart 2 shows for the world's largest oil consumer, over the past 30 years the amount of energy the U.S. consumes to produce a dollar of GDP has decreased by about 45 percent.

Gathered in ancient times as found on

Chart 1: World Crude Oil Production
(Million Barrels per Day)

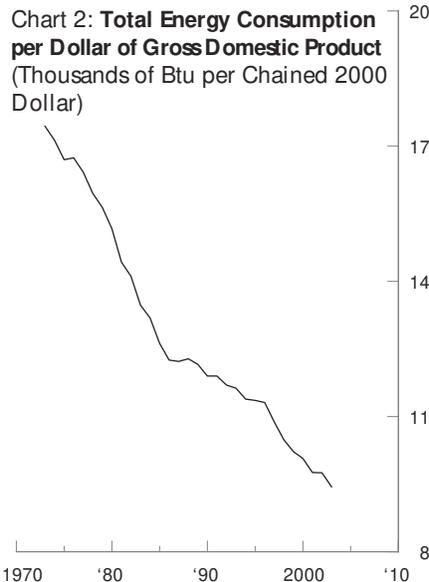


the surface as tar, crude oil¹ now is found around the globe, trapped in ancient rocks both sufficiently porous to absorb the oil and sufficiently impervious to hold the oil in place over eons. The search in the 1800s for more lamp kerosene, first made from coal (coal oil) and then from petroleum, encouraged the first oil wells in Pennsylvania, where Col. Edwin Drake sold his “black gold” for \$20 a barrel, the price then of an ounce of gold, which today is a bit more than \$400 an ounce. Relatively cheap petroleum today is essential to modern living, and diverse enterprises spend trillions of dollars on this energy resource and its discovery, transportation, refining, and distribution so that three principal gasoline octanes readily may be purchased from numerous retail outlets in most communities. Indeed, the least expensive of gasolines² in 2003 powered the average U.S. passenger car and its occupants on daily commutes and errands for a bit less than seven cents a mile, the favorable result of the trend in passenger car fuel rates shown in Chart 3.

As found, crude oil contains hundreds of hydrocarbon types that are separated, cleaned, and concentrated by refining, a common but complex process that uses high-temperature distillation, catalysts, and additional chemical conversion to produce myriad useful products. For example, fractional distillation typically yields about 40 gallons of raw gasoline from 100 gal-

¹ Found in ancient marine sediments generally between 10 million and 270 million years old and now below the earth’s crust both on land and beneath seas, crude oil (petroleum) is a dark, sticky liquid or tar known as a hydrocarbon, or a compound consisting mostly of hydrogen and carbon, two elements that readily burn or combine with oxygen to make mostly water and carbon dioxide. Crude oil on average contains 84 percent carbon, 14 percent hydrogen, one to three percent sulfur compounds, and less than one percent of nitrogen, oxygen, metals, and salt compounds. Burning petroleum products yields large amounts of heat energy that we use in diverse processes from internal combustion engines to heating our homes to commercial flying at near the speed of sound. Other chemical and thermal processes transform hydrocarbons also into more than 4,000 diverse and immensely valuable products including such common items as fertilizer, antiseptics, polishes, detergents, gums and rubbers, cosmetics, crayons, heart valves, other lighting and heating fuels such as paraffin and propane, lubricants, paints and other coatings, plastics, explosives, insect repellants, and even perfumes, insecticides, and volleyballs.

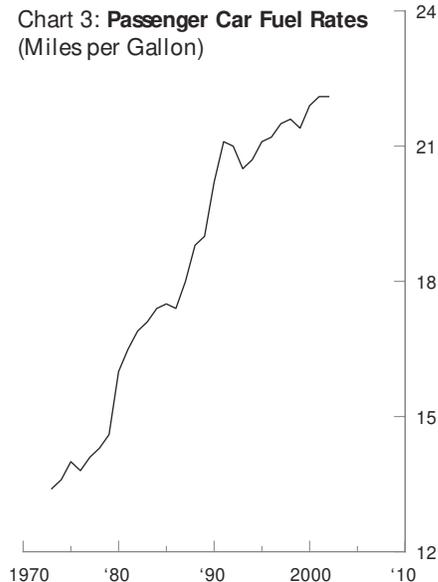
² Crude oil refiners produce conventional (plus low-sulfur), oxygenated, and reformulated gasolines in three anti-knock grades commonly known as the octane ratings regular (85-87), midgrade (88-90), and premium (90+). Generally, internal combustion engines need increasing octane with increasing horsepower density to prevent premature ignition of the fuel, or knocking, which damages engines.



lons of crude oil. The long carbon chains of heavier distilled fluids such as gas oil (heating oil) and heavy and residual oils can be further broken into gasoline and lighter products by secondary cracking and coking, processes that improve the yield of gasoline at the expense of heavier distillates such as gas oil to over 50 gallons per hundred of crude oil, as price and seasonal transportation and heating conditions may demand.

Refinery gasoline must be further finished by adding lighter hydrocarbons to yield the common three anti-knock octanes burned in automobile engines, before such blends are sold to consumers in most areas of the U.S. Large urban areas ranging from southern New Hampshire to southeastern Virginia, Chicago to southeastern Texas, Phoenix, and all of California also require reformulated gasolines blended with oxygen-containing compounds such as methyl tertiary butyl ether (MTBE—made from methanol made from natural gas) and ethanol (fermented and distilled from agricultural carbohydrates or grain) to meet stringent air pollution requirements. Ironically, because MTBE, a known carcinogen, has found its way into some public water supplies, regulators have mandated its removal from most gasoline, including present stocks, and the substitution of up to 15 percent ethanol in a blend commonly called gasohol. However, recent digitally controlled automobile engines with double catalytic-converter exhaust systems meet emissions standards without oxygenates such as ethanol, which unfortunately costs significantly more to produce than does conventional finished gasoline.

The upshot of engine octane requirements and emissions regulations (including new, low-sulfur requirements) means



that some refiners must limit their product to reformulated gasolines destined for some large urban areas, all of California, and several environmentally proactive states. It also means that nationwide perhaps 16 different gasolines must be refined, transported, and carefully stored without possibility of mix-ups. All these requirements have put considerable cost and time burdens on a limited number of scrambling gasoline refiners, pipeline operators, storage tank farms, and retail gasoline stations. Indeed, the EIA recently reported that as of March 15, 2004, regional refining and blending differences for gasoline contributed to prices that ranged from an average of \$1.61 per gallon (octane 87) on the Gulf Coast to a high of \$2.10 in California, a 49-cent per gallon difference due in part to stringent environmental requirements as well as unusual and hopefully short-lived production factors. And removing MTBE from existing stocks of reformulated gasolines adds further costs in Massachusetts, Connecticut, and especially California, where refining³ already is strained. Moreover, should a major refinery producing reformulated gasoline have a problem, and the affected urban areas not be permitted to temporarily substitute other blends, price moves would be dramatic, as happened in California last year.

Refiners buy crude oil from a variety of oil fields spread around the globe from the North Slope of Alaska to the deserts

³ The EIA reports that domestic refineries produce some 90 percent of gasoline consumed in the Nation’s 175,000 stations. About 40 percent of the crude oil used comes from U.S. oil fields. Some 45 percent of domestic gasoline comes from just Gulf Coast refineries.

Announcing the Spring 2004 E.C. Harwood Memorial Conference

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May 13-14, 2004

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“The way to resume is to resume” — Horace Greely, *New York Herald Tribune*, 1870

This conference reviews a subject that should be addressed at least once every 20 years or so: Does society gain from adopting a gold monetary standard, and if so, how does it go about resumption from a practical standpoint?

The operations and benefits of the classical gold standard have been studied extensively. Government-managed resumption also has been examined. But the practical problems of resumption have received little consideration. For example, what should be the gold contents of currencies? A solution might begin with the realization that the original gold standard was privately produced and that its successful reestablishment depends on the desires and capabilities of modern financial players. What monetary standard would emerge if private banks and money markets were allowed to function freely? Recent deregulations and bank consolidations give hope that that we are moving in the direction of free financial markets. The conference will consider the results of studies of these and related issues.

Conference Program

Thursday, May 13, 2004 (All events at AIER)

9:00 a.m. – 12:00 p.m. E.C. Harwood Library

Lawrence H. White, University of Missouri-St. Louis,
Is There Enough Gold in Fort Knox?

Anna Schwartz, National Bureau of Economic Research,
The 1981-82 Gold Commission

Gerald O’Driscoll, Cato Institute, *Discussant*

W. Lee Hoskins, Pacific Research Institute, *Discussant*

12:00 – 2:00 p.m. Helen F. Harwood Ballroom
Lunch

2:00 – 5:00 p.m. E.C. Harwood Library

H. David Willey, Federal Reserve Bank-New York (retired),
Central Banks and the Restoration of the Gold Standard

Hugo Salinas Price, Grupo Elektra, *On the Experience of Silver Coin in Mexico*

Walker F. Todd, American Institute for Economic Research, *Discussant*

Thomas Ferguson, University of Massachusetts-Boston, *Discussant*

Friday, May 14, 2004 (All events at AIER)

9:00 a.m. – 12:00 p.m. E.C. Harwood Library

John Hathaway, Tocqueville Asset Management, *Gold Portfolios*

Michael Darda, MKM Partners, *Nuts and Bolts*

Richard Sylla, New York University, *Is There an Alternative to Gold?*

Michael Crook, New York University, *Discussant*

Robert Wright, New York University, *Discussant*

12:00 – 2:00 p.m. Helen F. Harwood Ballroom
Lunch

Additional Programs

Estate Planning and Tax Saving Gifts presented by American Institute for Economic Research, Wednesday, May 12, 3 p.m. in the E.C. Harwood Library. Contact Shaun Buckler at (413) 528-1216 ext. 3146 for information.

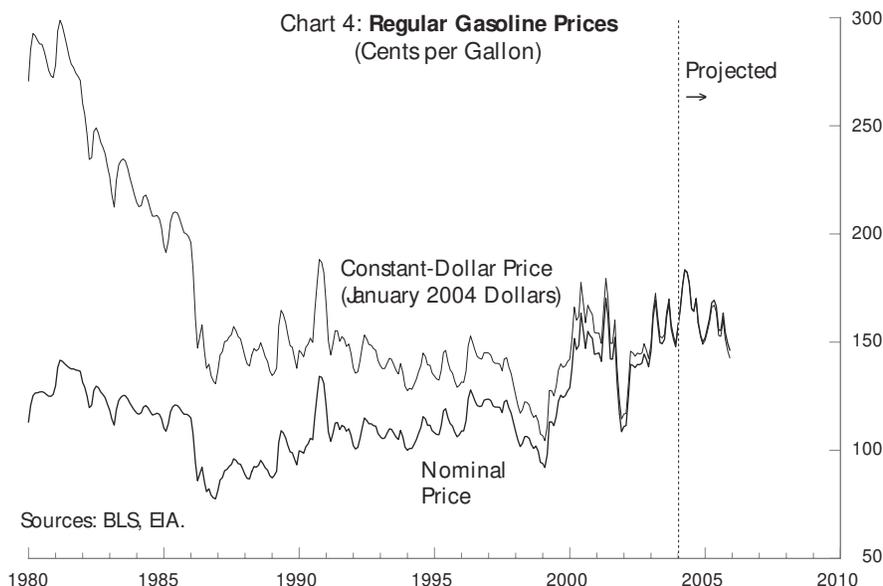
Gold as an Asset Class presented by American Investment Services, Wednesday, May 12, 4 p.m. in the E.C. Harwood Library. Contact John Barry at (413) 528-1216 ext. 3119 for information.

A reception and dinner will follow for those attending either program.

Registration • Transportation • Accommodations

There is no charge for the conference, but seating is limited. To reserve a seat, please contact Susan Gillette at AIER, (413) 528-1216, fax (413) 528-0103, gillette@aier.org. Information on traveling to and staying in the Berkshires is available from The Berkshires Visitors Bureau at 800-237-5747 or at www.berkshires.org.

Chart 4: Regular Gasoline Prices
(Cents per Gallon)



Sources: BLS, EIA.

of Saudi Arabia.⁴ According to the EIA, the mix of crudes entering the Nation's refineries during February 2004 cost 46 percent of the average retail price of \$1.65 per gallon of regular. Refining cost 19 percent, distribution and marketing nine percent, and Federal, state, and local taxes cost another 26 percent. For comparison, a year earlier the average retail price was \$1.61 per gallon, with costs of crude, refining, distribution and marketing, and taxes of 49.5, 15.0, 9.5, and 26 percent. While clearly of short-term concern, no long-term trend of continuously increasing gasoline prices can be seen. Indeed, as Chart 4 shows, gasoline prices, adjusted for dollar depreciation, are relatively low despite transitory refining, storage and distribution, and retail concerns.

Coupled with reduced oil and gas development and investor reluctance in the absence of long-term petroleum production contracts, increased consumption in the improving economies of the OECD countries and in India, Japan, and China (now the second-largest oil consumer) has drawn down existing world stocks. In the U.S., according to the EIA crude oil stocks (refinery feed stocks), while up from recent lows, remain near the low side of the five-year average range. Gasoline stocks also had been well below the average range and, despite a

⁴ West Texas Intermediate crude oil traded in 1,000-barrel futures contracts on the New York Mercantile Exchange sets the benchmark price for world oil trade. Other grades and locations trade in reference to NYMEX prices, and traders' daily activities reflect supply and demand pricing factors. In effect, producing countries sell into a giant pool of oil and refiners and importing countries buy from that pool. For example, en route from producing country to buyer, whole tankers are bought and sold, at times more than once, before unloading at some final buyer's terminal.

recent 1.4 million barrel buildup, remain near the bottom of their five-year average as the summer driving season nears.

Finally, at least one more factor pushing up the price of world petroleum, as demonstrated by the recent and sustained rise in the dollar price of gold and deterioration of the dollar versus the euro, is the renewed perception among foreign oil producers that the dollars they get for oil

Since the mid-1990s, California has had frequent and severe gasoline price spikes. In response to public outcry, the EIA in its "2003 California Price Study – Final Report" concluded last November that California's supply then was restrained by refineries, ports, pipeline, and distribution terminal constraints. It especially noted refinery outages that imbalanced the system and fostered large price increases. Other California factors included: a) little to no excess refinery capacity; b) replacement supply sources distant from markets (e.g. 14 days by tanker from the Gulf Coast); and c) because the region uses a unique gasoline that is difficult and expensive to make, other suppliers cannot make up any shortfall.

once again buy significantly less of the things they want from the world's markets. Déjà vu – all over again.

On St. Patrick's Day this year, the EIA published a flow chart⁵ that presents a simplified picture of why gasoline prices are high. The two most important reasons were tight gasoline supplies due to strong demand and high crude prices. Tight supplies were in turn a result of refinery capacity limits within the many types of gasoline required coupled with decreased importation of finished gasolines. The document further showed that high crude prices were imputed to OPEC, which (in anticipation of a glut of crude inventory in the second quarter of 2004) soon may cut production and curtail so-called leakage from member countries, and to increasing demand for crude from countries such as the U.S., Japan, and China. Finally, the chart shows that gasoline supply reductions and constraints and strong U.S. gasoline demand have fostered an inventory draw down of one million barrels rather than the usual seasonal building of 12 million barrels. The EIA concludes: "...one thing is sure: luck will have nothing to do with the path of gasoline prices over the next several weeks, as supply and demand factors will drive prices."

Despite present supply uncertainties amid rising world demand, even modest price increases if sustained will have the salutary effect of stimulating capital-intensive exploration and new oil-field development, which have been slow to respond to increasing world demand. Already oil-rich countries such as Libya, Iraq, and Iran want to expand production to new highs, and large investments in petroleum and low-carbon natural gas pipelines and liquefied natural gas terminals await government approvals to distribute millions of gallons a day in new production to both industrialized and developing countries. The implementation of such plans and the re-emergence of long-term energy supply contracts among diverse, international producers and oil companies will be important signs of returning stability to energy markets, and a precursor to putting the brakes on gasoline price spikes. □

⁵ <http://tonto.eia.doe.gov/oog/ino/twip/twipprint.html>

PRICE OF GOLD

	2002 Apr. 11	2003 Apr. 10	— 2004 —	
			Apr. 1	Apr. 8
Final fixing in London	\$301.30	\$324.60	\$427.25	\$419.50

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