



VOL. 1, NO. 4
APRIL 2006

EconomicLetter

A stylized world map in shades of teal and blue, showing the continents. It is positioned behind the title and the article title.

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Running on Empty?

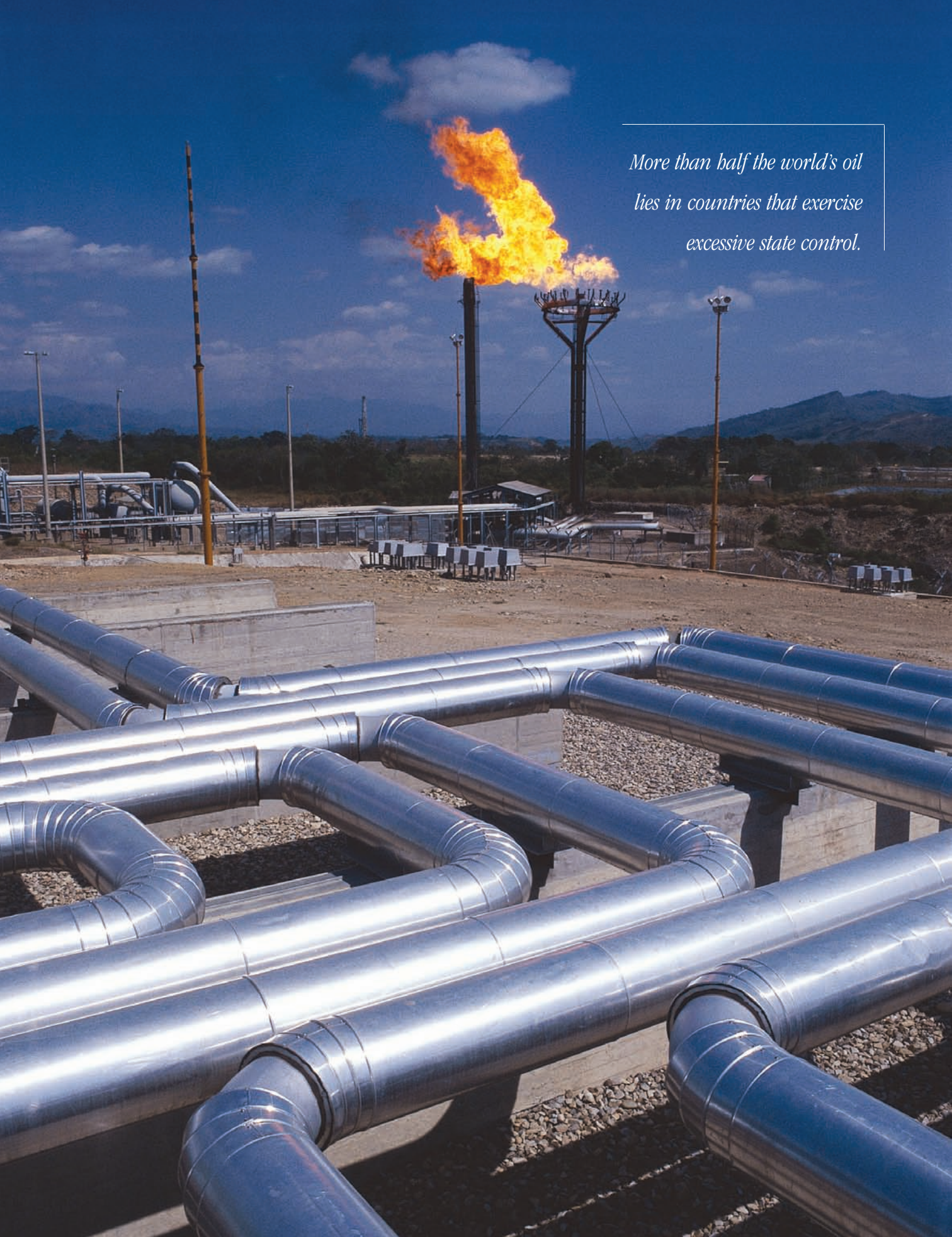
How Economic Freedom Affects Oil Supplies

by Stephen P. A. Brown and Richard Alm

The extent of economic freedom in the countries with the world's oil supplies will greatly affect how well that oil is delivered to consumers.

Oil prices have marched upward in recent years, ending nearly two decades of relatively cheap energy. The weekly benchmark price for a barrel of West Texas Intermediate rose from \$32.20 at the end of 2003 to \$42.56 at the end of 2004 and to \$59.49 at the end of 2005 (*Chart 1*). In April 2006, oil reached an all-time high of more than \$75 a barrel, measured in current dollars.¹

In explaining today's high oil prices, many analysts point to surging demand from China, India and other rapidly industrializing countries and cyclical growth in U.S. consumption. When added to existing demand from Europe, Asia and elsewhere, these increases have outstripped any gains in global production and reduced excess capacity to near zero. The



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analysts expect economic development to continue apace in China and India, with their appetites for oil growing as fast as or faster than their economies.²

Are we running out of oil? The question always arises when oil prices spike. Some experts—including Matthew Simmons, author of *Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy*—argue that world oil production is at or near its peak and prices will just continue to rise, perhaps toward \$200 a barrel or more. Industry veteran T. Boone Pickens also sees oil prices going nowhere but up.

The center of gravity among energy-industry experts isn't as alarmist. The U.S. Energy Information Administration, the International Energy Agency and Daniel Yergin's Cambridge Energy Research Associates all see sufficient oil resources to supply generations to come. Price pressures will moderate as new production reaches the market.

Today's proven reserves total 1.3 trillion barrels, but the U.S. Geological Survey estimates the world's remaining conventional resources at 2.6 trillion barrels.³ Canadian tar sands boost the estimate to 2.8 trillion barrels.

Keeping the global economy chugging—including the Chinas and Indias—requires about 85 million barrels a day. At current rates of use, 2.8 trillion barrels should last 90 years. Most likely, oil use will continue to rise, but conventional resources and tar sands should still be sufficient for 60 to 70 years. Other unconventional oil resources, such as shale oil, will greatly extend the time horizon at which we run out of oil.

Having oil is one thing. Delivering it to a growing market is another. World economies differ greatly in their capacity to organize enterprises, adopt new technologies, raise capital and supply what consumers want. When it comes to increasing oil production, economic systems matter quite a bit. More oil would flow onto world markets and prices would be lower if

major oil resources were in countries where producers responded freely to market incentives. The extent of economic freedom in the countries with the world's oil supplies will greatly affect how well that oil is delivered to consumers.

Where the Oil Is

The world's oil wealth is concentrated in a relatively few countries. Four of the five nations with the largest oil reserves are in the Middle East: Saudi Arabia at 267 billion barrels, Iran at 133 billion barrels, Iraq at 115 billion barrels and Kuwait at 104 billion barrels. Canada joins the top ranks on the strength of Alberta's tar sands, which have expanded Canada's oil-producing potential by a factor of 15. Taken together, the top five nations account for three-fifths of the world's oil reserves.

Oil reserves are also large in the United Arab Emirates, Venezuela, Russia, Libya and Nigeria. Adding these countries to the big five producers raises the total to 86 percent of world reserves. Significant oil deposits can be found in a dozen or so other countries, including the United States,

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Chart 1
Oil Prices Keep Rising



SOURCE: *The Wall Street Journal*.



Table 1
Proven World Oil Reserves, 2006

		Billions of barrels	Percent of world reserves	Cumulative percentage
1	Saudi Arabia	266.8	20.6	20.6
2	Canada	178.8	13.8	34.4
3	Iran	132.5	10.2	44.7
4	Iraq	115.0	8.9	53.6
5	Kuwait	104.0	8.0	61.6
6	United Arab Emirates	97.8	7.6	69.2
7	Venezuela	79.7	6.2	75.4
8	Russia	60.0	4.6	80.0
9	Libya	39.1	3.0	83.0
10	Nigeria	35.9	2.8	85.8
11	United States	21.4	1.7	87.5
12	China	18.3	1.4	88.9
13	Qatar	15.2	1.2	90.0
14	Mexico	12.9	1.0	91.0
15	Algeria	11.4	0.9	91.9
16	Brazil	11.2	0.9	92.8
17	Kazakhstan	9.0	0.7	93.5
18	Norway	7.7	0.6	94.1
19	Azerbaijan	7.0	0.5	94.6
20	India	5.8	0.5	95.1
21	Oman	5.5	0.4	95.5
22	Angola	5.4	0.4	95.9
23	Ecuador	4.6	0.4	96.3
24	Indonesia	4.3	0.3	96.6
25	United Kingdom	4.0	0.3	96.9
26	Yemen	4.0	0.3	97.2
27	Egypt	3.7	0.3	97.5
28	Malaysia	3.0	0.2	97.8
29	Syria	2.5	0.2	97.9
30	Gabon	2.5	0.2	98.1
World total		1,292.5	100.0	

SOURCES: *Oil and Gas Journal*; authors' calculations.

Mexico, Qatar, Algeria and Norway. The top 20 countries control more than 95 percent of the world's oil wealth; the top 30, 98 percent (*Table 1*).

The economic policies in these countries will determine whether future supplies of oil will keep up with growing demand.

Oil and Economic Freedom

Relieving the current upward pressure on world oil prices requires getting more oil resources out of the ground and into the supply chains that feed corner gasoline stations, airlines and electric power plants. Economic logic and history tell us that free enterprise systems, with their reliance on private capital formation and incentives, better direct resources to efficiently meet consumer needs. In a market economy, oil producers, just like the makers of soft drinks and computers, respond to higher prices and expand capacity and output.

Oil exploration and production require huge investments over long periods. In the United States, Canada and countries with a history of stability and relatively free markets, these commitments involve a strictly economic calculus. Much of the oil that could slake global demand, however, lies under nations that don't embrace markets as fully. Some subject their economies, including oil resources, to extensive state control. Others are politically unstable or corrupt. Where markets are underdeveloped, decisions on oil exploration and production are skewed by garbled economic signals, bureaucratic red tape and an uncertainty that leads to greater risks, higher costs, widespread inefficiency and distorted incentives.

The Heritage Foundation compiles an annual ranking of nations' willingness to allow markets and private enterprises to guide production. On a scale of 1 to 5—best to worst—Heritage's economic freedom index rates countries on policies that govern trade, investment, finance, government spending, money supplies, labor mar-

ket flexibility, state intervention and property rights. Heritage assigns grades, classifying economies as free, mostly free, mostly unfree or repressed.⁴

Just three of the 30 countries that control nearly all of the world's oil wealth score highly enough to be among the nations that Heritage categorizes as free—the United Kingdom, the United States and Canada (*Table 2*). These countries rely on private companies to run their energy industries, but they have only 16 percent of world reserves, almost 90 percent of it in Canada. The United States passed its production peak in the 1970s, and the United Kingdom may have done so recently. Neither is likely to add much to conventional world oil supplies.

Another six of the top producers earn Heritage's mostly free rating. Because Saudi Arabia, Kuwait and the United Arab Emirates are in this group, it possesses a lot of oil—38 percent of the world's reserves. The reasonably good Heritage rating indicates these countries' economies are stable and functional, but in each of these countries, the oil industry is controlled by the state rather than private enterprises.

The remaining countries with significant oil reserves—a total of 21, with 44 percent of the verified oil in the ground—are laggards in the Heritage rankings, either mostly unfree or repressed. They aren't good candidates for increasing oil production because their economies are suspect and their oil industries are state-controlled.

Iran maintains one of the world's most closed economies. Venezuelan oil production has flagged since President Hugo Chavez sacked many key people in the government-run oil company. Civil unrest has troubled investment in Nigeria, a country that operates its oil industry through concessions to foreign companies. Iraq, which Heritage doesn't currently rate, doesn't seem to be the place to boost investment and oil production as long

Table 2
Oil Economies' Freedom

		Heritage freedom index	Percent of world reserves
Free			
25	United Kingdom	1.74	0.3
11	United States	1.84	1.7
2	Canada	1.85	13.8
	Total		15.8
Mostly free			
18	Norway	2.29	0.6
5	Kuwait	2.74	8.0
14	Mexico	2.83	1.0
1	Saudi Arabia	2.84	20.6
6	United Arab Emirates	2.93	7.6
28	Malaysia	2.98	0.2
	Total		38.1
Mostly unfree			
21	Oman	3.01	0.4
13	Qatar	3.04	1.2
16	Brazil	3.08	0.9
30	Gabon	3.28	0.2
23	Ecuador	3.30	0.4
12	China	3.34	1.4
17	Kazakhstan	3.35	0.7
15	Algeria	3.46	0.9
20	India	3.49	0.5
8	Russia	3.50	4.6
19	Azerbaijan	3.51	0.5
27	Egypt	3.59	0.3
24	Indonesia	3.71	0.3
22	Angola	3.84	0.4
26	Yemen	3.84	0.3
29	Syria	3.93	0.2
	Total		13.2
Repressed			
10	Nigeria	4.00	2.8
7	Venezuela	4.16	6.2
9	Libya	4.16	3.0
3	Iran	4.51	10.2
4	Iraq	—	8.9
	Total		31.1

NOTE: 1 = most free, 5 = least free. Heritage does not currently rate Iraq.

SOURCES: The Heritage Foundation; authors' calculations.

Table 3

Big Oil, Big Government

		Percent of world reserves	Cumulative percentage	Government intervention index
1	Iran	10.2	10.2	5.0
2	Syria	0.2	10.4	5.0
3	Saudi Arabia	20.6	31.0	4.5
4	Kuwait	8.0	39.1	4.5
5	Nigeria	2.8	41.9	4.5
6	Oman	0.4	42.3	4.5
7	Angola	0.4	42.7	4.5
8	United Arab Emirates	7.6	50.3	4.0
9	Libya	3.0	53.3	4.0
10	Qatar	1.2	54.5	4.0
11	Algeria	0.9	55.4	4.0
12	Brazil	0.9	56.2	4.0
13	Yemen	0.3	56.5	4.0
14	Venezuela	6.2	62.7	3.5
15	Mexico	1.0	63.7	3.5
16	Norway	0.6	64.3	3.5
17	Indonesia	0.3	64.6	3.5
18	Egypt	0.3	64.9	3.5
19	China	1.4	66.3	3.0
20	Azerbaijan	0.5	66.9	3.0
21	India	0.5	67.3	3.0
22	Malaysia	0.2	67.5	3.0
23	Gabon	0.2	67.7	3.0
24	Kazakhstan	0.7	68.4	2.5
25	United Kingdom	0.3	68.7	2.5
26	Canada	13.8	82.6	2.0
27	Russia	4.6	87.2	2.0
28	United States	1.7	88.9	2.0
29	Ecuador	0.4	89.2	1.5

NOTE: 1 = most free, 5 = least free. Iraq is not included because Heritage does not currently rate it.

SOURCES: The Heritage Foundation; authors' calculations.

as its future remains clouded by insurgencies and political uncertainty.

Taking into account state control of petroleum resources provides a somewhat different view of oil and market forces. The Heritage Foundation's freedom index includes a measure of government intervention, based in part on the share of revenues derived from state-owned enterprises. In petroleum-rich countries, this almost always means oil.

On this scale, more than half the world's oil lies in countries that exercise excessive state control (*Table 3*). Governments dominate Middle East oil production, with countries fully owning the industry or allowing only minority partners from the private sector.

Two-thirds of the oil reserves are in nations Heritage rates as mostly unfree or worse on government intervention. Adding Iraq, a nation with a history of state control, the proportion climbs above three-quarters.

Although today's prices give private companies incentives to drill for oil, government ministries don't always take full advantage of market opportunities. They may be mired in red tape. They may treat the oil industry as a cash cow, choosing to rake in revenue without incurring the costs of investing in new capacity. They may prefer to reap the gains of monopoly prices.⁵ Saudi Arabia, for instance, maintained a relatively constant capacity to produce oil from 1994 to 2001. It has increased its capacity only a little over the past five years. Mexico has considered inviting foreign investment into its energy sector, but government-owned Pemex retains control and has done little to expand capacity.

Heritage's government intervention score applies to the entire economy, not just the oil sector. Russia's relatively good ranking on this measure doesn't reflect the fact that Moscow ministries remain a dominant player in the energy industry. Despite recent overtures to attract foreign investment to the oil industry, the 2004 takeover of Yukos, a previously private and



richly endowed producer, still casts a cloud over Russia's energy sector.

Implications for Oil Prices

A large part of the world's oil reserves are outside the easy reach of free markets, with their incentives and disciplines. Oil prices are rising—not because the world is running out of oil but because the bulk of reserves are in countries where market incentives cannot work fully or in the hands of monopolists who may be exercising their power by restraining investment.

Because of the mismatch between reserves and economic systems, today's oil prices are higher than they would be in a world of free markets. Tomorrow's oil prices are likely to be higher, too, because producers, divorced from market incentives or with an incentive to restrain production, are likely to underinvest in new capacity.

High oil prices have flooded the oil producers with cash. At the same time, they've strained household budgets in the consuming countries. So far, though, the economies of the United States, other major industrial nations and the newly industrializing countries have continued to grow. They've withstood the price shock because greater energy efficiency has made them less dependent on oil and supplies have risen to meet increasing demand.

Even so, many consuming nations are concerned about the prospects of continued upward pressure on oil prices as markets tighten. They wonder how much more their economies can endure. A future of ever-escalating oil prices doesn't bode well for economies in many parts of the world.

To a great extent, rising oil prices are self-limiting. Higher oil prices encourage conservation and development of unconventional oil resources and alternative fuels. Higher oil prices should also help overcome at least some of the difficulties in developing

the vast conventional reserves not fully connected to the market. In the long history of natural resources, the prospect of scarcity and higher prices has provided ample incentive for innovation.

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Notes

The authors thank Julia Carter and Raghav Virmani for research assistance.

¹ Using inflation-adjusted dollars, oil would have to reach \$96 a barrel to match the record set in April 1980.

² For China and India, the income elasticities of oil demand are about 1.4, which means oil consumption rises 14 percent for every 10 percent increase in gross domestic product. Year-to-year changes in energy efficiency slightly dull the income effect on oil consumption.

³ Conventional oil resources are those produced by drilling wells. Unconventional oil resources, such as tar sands and shale oil, are produced through other technologies.

⁴ Data for this discussion are from The Heritage Foundation, *2006 Index of Economic Freedom*. The Fraser Institute produces an index with country rankings similar to those shown here but provides less extensive coverage of oil-producing nations.

⁵ See "OPEC's Incentives for Faster Output Growth," by Dermot Gately, *The Energy Journal*, vol. 25, no. 2, 2004, pp. 75–96.

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SouthwestEconomy

FEDERAL RESERVE BANK OF DALLAS



ISSUE 2
MARCH/APRIL 2006

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