

MUSINGS FROM THE OIL PATCH

June 10, 2008

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Note: Musings from the Oil Patch reflects an eclectic collection of stories and analyses dealing with issues and developments within the energy industry that I feel have potentially significant implications for executives operating oilfield service companies. The newsletter currently anticipates a semi-monthly publishing schedule, but periodically the event and news flow may dictate a more frequent schedule. As always, I welcome your comments and observations. Allen Brooks

Are We Destined For High Energy Prices For Ever?

Friday's explosive oil price move exceeded the price of a barrel of Brent crude at the end of 1998 and beginning of 1999

Last Friday, the price of a barrel of crude oil on the NYMEX soared \$10.75 to close at \$138.14, a new all-time record high. The action in the trading pits followed Thursday's action when oil prices jumped by more than \$5 per barrel, bringing the two-day advance to more than \$16, or better than a 13% increase. The most amazing realization about Friday's explosive price move is that the one-day jump exceeded the price of a barrel of Brent crude at the end of 1998 and beginning of 1999 in the midst of the industry recession following the Asian currency crisis.

At the same time crude oil prices were jumping, we were reading two analyses of the fundamentals for the global energy and oil markets and the implications for oil prices. One paper was written by a team of economists and researchers from the Federal Reserve Bank of Dallas while the other was issued by the economic research firm GaveKal.

Either "the days of relatively cheap oil are over," or "the world should begin preparing for a reduction in oil demand"

According to the Dallas Fed economists, the days of relatively cheap oil are over and the global economy faces a future of high energy prices. Interestingly though, the final conclusion of the paper is that absent supply disruptions, an oil price in excess of \$100 (in 2008 dollars) cannot be sustained for the next 10 years. In contrast, the GaveKal people believe the world should begin preparing for a reduction in oil demand that will significantly alter the world's use of energy and petroleum. So which scenario will prevail? Our guess is the world's energy future will reflect a blend of these two analyses.

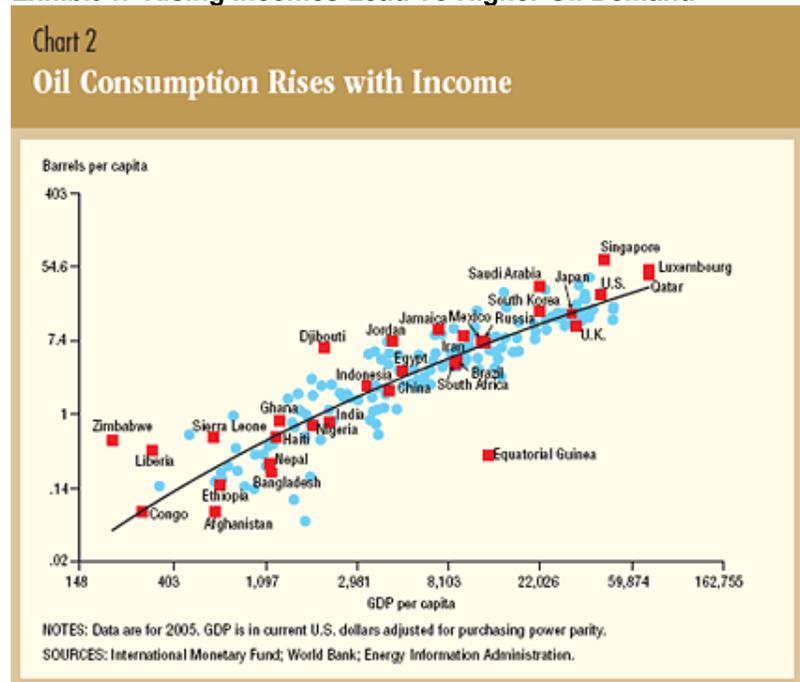
The Dallas Fed paper began its analysis of the world's energy situation from a conventional viewpoint. The authors examined the

Doubling per capita income more than doubles per capita oil consumption

four principle factors that have driven oil prices over recent years: strong global demand; oil supply growth failing to match demand so expectations of future tight oil markets dominate traders' thinking; fear of supply disruptions; and continued weakness in the U.S. dollar. All of these forces have played a role in boosting global oil prices and in influencing views about the future course of oil prices.

The authors point out that as incomes rise, economies use more energy. They pointed to the fact that a broad cross section of nearly 180 countries shows that doubling per capita income more than doubles per capita oil consumption. This track record is demonstrated in the chart in Exhibit 1. With China's gross domestic product (GDP) per capital rising from \$1,103 in 1990 to \$4,088 in 2005, we have a partial explanation for that country's rapid growth in energy consumption. Likewise, India's per capita GDP rose from \$1,202 to \$2,222 over the same period and highlights why its energy consumption has been advancing rapidly.

Exhibit 1. Rising Incomes Lead To Higher Oil Demand



Source: Dallas Federal Reserve Bank

They believe, players in the global energy market view demand increases as a fact of life that won't be slowed much by a weakening U.S. economy

The Dallas Fed economists suggest that since the oil era began, the course of global oil prices has been influenced by the ups and downs of the U.S. economy. Now, they believe, players in the global energy market view demand increases as a fact of life that won't be slowed much by a weakening U.S. economy.

On the oil supply side, they see the world's energy industry responding to higher prices as drilling activity is hitting new highs in response to companies expanding their E&P budgets. Oilfield

The anticipated price for crude oil in 2011 has moved upward steadily from around \$60 per barrel in January 2007 to more than \$120 in the first week of May 2008

equipment and staffs are fully employed and additional capacity is being added rapidly in response to escalating prices and higher wages. However, despite this increased activity, oil supply growth continues to lag the growth in demand. As expected supply growth has failed to keep pace, tight oil markets have further boosted oil prices and are likely to continue to do so.

The tight supply and demand fundamentals that are lifting oil prices are reinforced by the fact that oil demand is inelastic in the short-term, meaning it does not respond quickly to changing prices. This dynamic is also influencing price expectations that are manifest in the futures market. The anticipated price for crude oil in 2011 has moved upward steadily from around \$60 per barrel in January 2007 to more than \$120 in the first week of May 2008.

Exhibit 2. Events And Trends Have Boosted Price Expectations



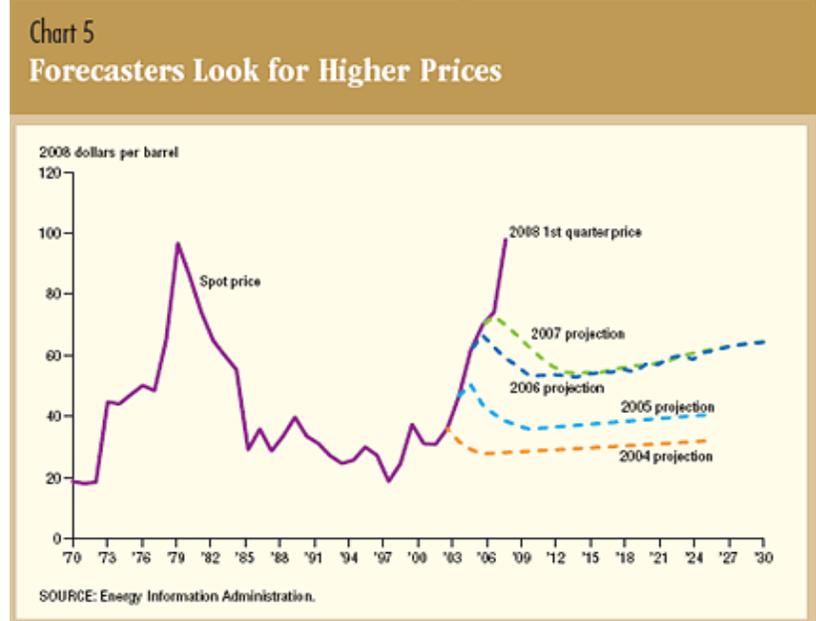
Source: Dallas Federal Reserve Bank

The EIA's best estimate for long-term prices has doubled in just the last four years

The reaction to this rise in oil prices has manifested in the long-term price forecasts issued by the U.S. Energy Information Administration (EIA). The EIA's best estimate for long-term prices has doubled in just the last four years, as shown in Exhibit 3. At the time of the 2007 forecast, the EIA anticipated a price decline in upcoming years with oil settling above \$60 per barrel for the long haul out to 2030. But a very recent forecast update from the EIA, it now believes that oil prices will settle out at close to \$65 per barrel by 2025 and subsequently rise to over \$70 by 2030. This most recent forecast, still to be updated later this year, reflects a pattern of progressively higher oil price forecasts each year.

What the latest forecast shows is that the EIA has decided its earlier demand forecasts were too low and its supply projections were too

Exhibit 3. Forecasters Have Steadily Raised Forecast Oil Price

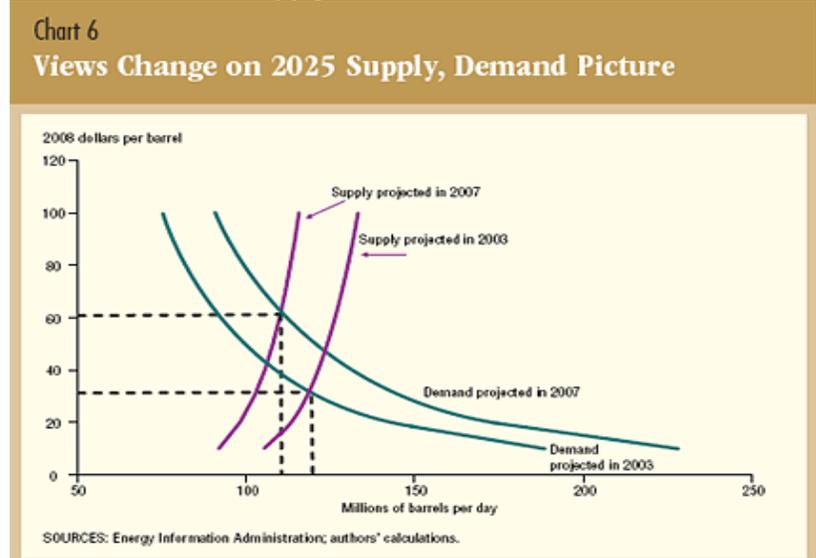


Source: Dallas Federal Reserve Bank

The EIA has projected a supply curve that has shifted significantly to the left implying less oil will be available at all prices than previously anticipated

high. The result is that between 2003 and 2007, the projected demand curve has moved up and to the right signaling consumers want more oil at all prices. Additionally, the EIA has projected a supply curve that has shifted significantly to the left implying less oil will be available at all prices than previously anticipated. The intersection of these new supply and demand curves has moved the market clearing price up considerably from the low \$30 per barrel level to slightly over \$60, now.

Exhibit 4. Shifted Supply/Demand Lines Lift Oil Price Forecast

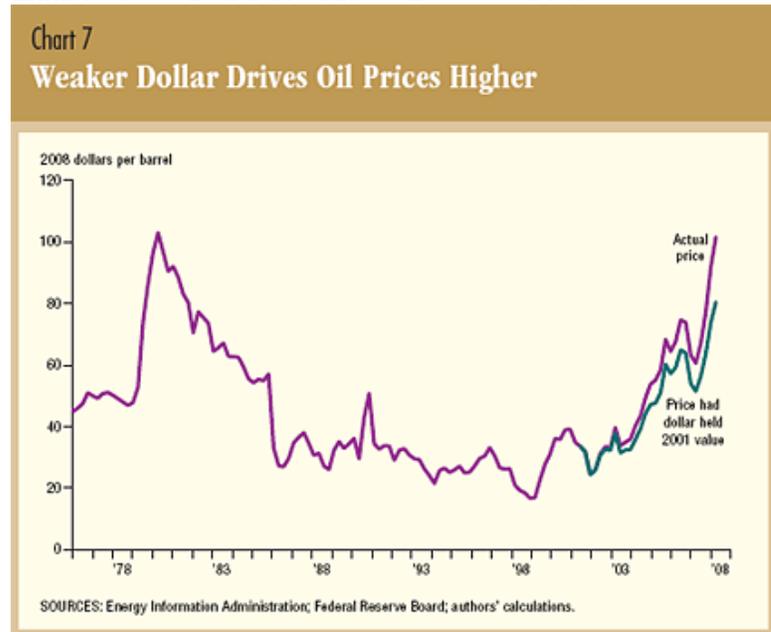


Source: Dallas Federal Reserve Bank

If the U.S. dollar had merely held its 2001 value against the Euro, oil would have traded at about \$80 per barrel in early 2008

Another factor the Dallas Fed researchers focused on was the impact of the weakening of the U.S. dollar. According to their research, the value of the dollar has fallen by 46% from its mid-2001 peak against the Euro and is down 21% just since 2004. As they have determined, if the U.S. dollar had merely held its 2001 value against the Euro, oil would have traded at about \$80 per barrel in early 2008. That would have been more than \$20 per barrel below the actual spot price. As they point out, the impact of currency movements accounted for roughly one-third of the \$60 increase in oil prices between 2003 and 2007.

Exhibit 5. US Dollar Weakness Boosts Oil Price



Source: Dallas Federal Reserve Bank

One of the more disquieting variables in the oil price mix is the fear of supply disruptions due to geopolitical events. This fear is reflected mostly in short-term price movements rather than long-term prices. The primary way it is reflected is through the shape of the forward futures price curve. The traditional shape of the curve is upward from the spot price, a pattern referred to as “contango.” However, sometimes future delivery prices are below the spot price, referred to as “backwardation” that can occur because of sudden supply shortages or a dose of uncertainty. This pattern is created by refiners bidding aggressively for short-term oil supplies because they want to avoid the risk, i.e., cost, of shutting down their operations. At the present time, backwardation is dominating the futures market.

The quadrupling of oil prices since 2003 might reduce demand by 10% to 20% over the next decade

The impact of high prices will drive some conservation, but in the opinion of the Dallas Fed authors, the amount of savings will be minimal. They believe, based on past responses of U.S. oil consumption to rising prices that the quadrupling of oil prices since 2003 might reduce demand by 10% to 20% over the next decade.

Exhibit 6. Futures Curve Reflects Fear of Supply Disruptions

Chart 8

Backwardation Suggests Fear of Supply Disruptions

Source: Dallas Federal Reserve Bank

They believe that any savings will be insufficient to relieve pricing pressure

They believe that Europe might see similar declines. However, they also believe that any savings will be insufficient to relieve pricing pressure due to the demand growth from China, India, the Middle East and other developing economies. Without a dramatic, worldwide move toward energy conservation or a greater U.S. and European consumption response to higher oil prices, global demand will not fall sufficiently to significantly impact oil prices.

The authors also examined the impact of oil prices on the development of greater unconventional oil supplies. Industry estimates suggest that these unconventional oil resources are plentiful around the world and can be developed and produced at costs well below current oil prices. If sufficient volumes can be developed, these resources would put downward pressure on current oil prices. The challenge is that the high cost to develop these resources would act as a brake on their future development if industry participants thought that future oil prices might decline to, or fall below, those cost estimates.

Absent supply disruptions, it will be difficult to sustain oil prices above \$100 (in 2008 dollars) over the next 10 years

At the end of the Dallas Fed paper, their final paragraph sums up their conclusions. We found this paragraph somewhat confusing given the tone of the paper and the data presented in it. The paragraph reads as follows: "What's the bottom line? Absent supply disruptions, it will be difficult to sustain oil prices above \$100 (in 2008 dollars) over the next 10 years." This would suggest that the authors believe that a price between \$70 and \$100 is the range within which global oil prices will trade over the coming decade – high in historical terms, but below the market clearing price estimated by many Peak Oil analysts.

After the last oil price spike in 1980 there was an 18% decline in the share of petroleum consumption in total primary energy consumption

The GaveKal research organization is known for its global economic insights and unique analytical approaches to complex financial issues. While their paper was triggered by discussions about Peak Oil, they believe energy analysts should be focusing more on the demand side of the equation rather than supply. To support their thesis, they harkened back to the late 1970s when oil demand was undercut by high oil prices. The issue was summarized by Sheik Zaki Yamani, the then Saudi Arabian Oil Minister, who lectured his fellow OPEC oil ministers about the challenges they faced in aggressively trying to push oil prices higher. As he put it, "Remember, the Stone Age didn't end because the cavemen ran out of stones."

GaveKal believes the oil analytical community has become fixated on supply issues – the slow growth in both OPEC and non-OPEC oil supplies and the debate over the pace of global oil field production depletion rates. They think people should shift their attention to the issue of demand and its possible destruction. As they point out, when oil prices get too high, consumers start seeking alternatives or alter their consumption habits. After the last oil price spike in 1980 to \$90 a barrel (in 2006 dollars) in response to the Iranian crisis and its cessation of oil exports, there was an 18% decline in the share of petroleum consumption in total primary energy consumption. Absolute petroleum demand did not return to its pre-spike level for ten years while total primary energy consumption grew by 25% in that same period. As they point out, the oil price rose by a factor of nine during the 1970s, about the same as it has risen this decade.

GaveKal suggests at the end of this discussion that they could immediately jump to the conclusion that we are facing a decade of flat to negative petroleum demand growth. As they point out, demand growth in the OECD countries is flat or falling, China's demand growth rate has been cut in half over the past three and half years and figures from other emerging markets are pointing to energy demand growth slowing as oil prices rise.

As GaveKal begins its analysis, they focus on some of the "givens" in the analytical world. The first is that China and other developing economies will become wasteful consumers of energy just as is the United States. They highlighted a story about global oil markets in the *Financial Times* that began its analysis by asking what would happen if China's oil consumption per capita increased to the level in the U.S. today. GaveKal states categorically that China will never consume as much oil per capita, or even half or a quarter as much, as Americans do today.

There is a good correlation between GDP growth and energy use, but not all rich consumers are equally as energy profligate as Americans

There is a good correlation between GDP growth and energy use, but not all rich consumers are equally as energy profligate as Americans. By studying the consumption patterns by types of oil, one comes to different conclusions about how much energy Americans and Europeans consume. As the data shows, America's consumption habits cannot be explained simply by GDP growth or with GDP per capita size. In the former case, Asian GDP growth

Cities consume about 65% of world energy demand

has been much greater than that of the United States. Likewise, Europe's GDP per capita is roughly similar to that of the United States, but the region's total energy demand has been in a structural decline since 1986. Thus, GaveKal believes there are other factors at work in the energy market and these factors can be altered significantly impacting global oil demand growth.

Their analysis shows that about 75% of oil consumption is related to human interaction as opposed to only 25% for manufacturing. They further find that cities consume about 65% of world energy demand. The breakdown in how that energy is consumed is: 34% for transport; 44% for buildings; and 22% for industries. Of the 47 million barrels per day of oil (mm b/d) the International Energy Agency (IEA) estimates is used for transportation, cities consume nearly 29 mm b/d of gasoline and diesel fuel merely to move people around town. In many cities it is clear that a vast amount of that energy use is for idling vehicles stuck in bumper-to-bumper traffic. The IEA estimates the balance of the energy for transportation is split roughly 55% for shipping and 45% for trucks, buses and planes.

Architects are designing buildings that reduce energy consumption by 65% at an incremental 2% cost

The volume of oil used for space heating, cooling, lighting and other building services represents about 12 mm b/d for cities and 6 mm b/d for suburban and rural areas. They point out that today, architects are designing buildings that reduce energy consumption by 65% at an incremental 2% cost. Technology in this area is improving rapidly and offers the potential for even greater energy savings in buildings in the future. According to UN statistics, by 2025 it is estimated that 65% of the world population will live in cities. This means that how future cities are designed and built will be crucial to energy consumption. This migration to urban areas is particularly striking in China, suggesting that its energy consumption patterns might not follow the historical pattern of other developed economies.

Manhattan ranks with Hong Kong and Monaco as among the most energy efficient cities in the world

Additional data on city energy consumption shows that Manhattan ranks with Hong Kong and Monaco as among the most energy efficient cities in the world. Manhattan energy consumption per capita is about 3 tons of oil equivalent (Toe) compared to 8.9 Toe for U.S. non-urban areas, 8.3 Toe for Canada and 4 Toe for Japan. The higher density of European cities is a partial reason why its energy consumption has been in a structural decline since the 1980s. It is quite likely that China, India and other rapidly developing economies will evolve with their populations living more like Europeans.

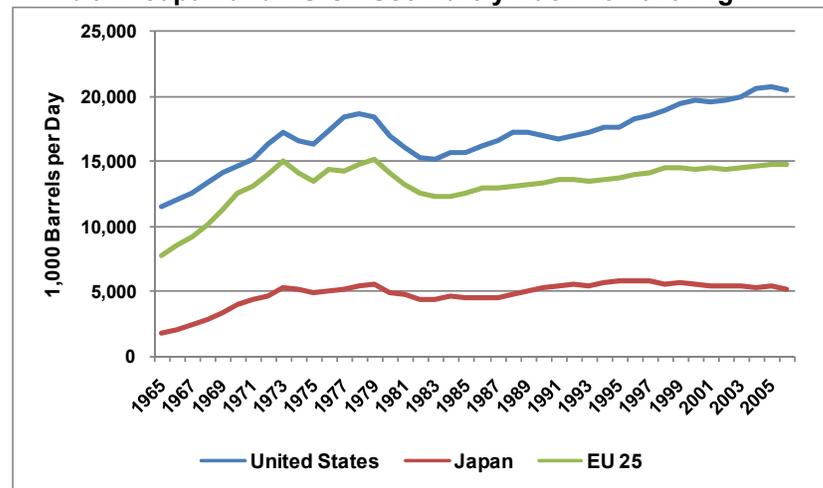
Another issue for global energy demand is the subsidies that governments offer their citizens. We have written about this topic in several recent issues of Musings since the escalating price of oil has been putting significant financial pressure on the various governments. In recent weeks there have been a number of governments that have reduced or eliminated their subsidies. But as GaveKal points out, the IEA did a study in 2001 where they sampled the eight biggest emerging markets in terms of energy consumption

It took 20 years for U.S. petroleum demand to recover to its 1979 high and 14 years for Japan

and worked out how much energy would be saved if their subsidies were removed. The study's answer was 12.8% for the sample and 3.5% for the world, or approximately 8 mm b/d. For China the reduction would be 9.4% and 18% for Russia.

In the last half of the paper, GaveKal asked the question: Can demand change significantly? They believe it can. They cite the fact that it took 20 years for U.S. petroleum demand to recover to its 1979 high and 14 years for Japan. Today, Japan's demand is still below that 1979 peak. In the European Union 25 (the expanded EU), petroleum demand has barely returned to its historical peak, but that is due to the inclusion of the former eastern European countries. In the old Europe, energy use is only at the level of demand experienced in 1974.

Exhibit 7. Japan and EU Oil Use Barely Back To 1979 High



Source: BP, EIA, PPHB

While China remains the primary focus for energy consumption, the reality is it is the Asia-Pacific region that is the largest consumer and China is only 30% of that total

They point out that after the initial oil shock in the 1970s, world GDP growth slumped from 4.17% to 0.22% over the next two years, but subsequently recovered. Japan experienced flat or negative oil demand growth year-over-year from 1980 until 1988. However, Japan's GDP growth outperformed the world's rate. Europe turned over its automobile fleet relatively quickly and cut the size of its car engines in half. Europe also went on a huge investment program to build nuclear power plants to produce energy cheaper than from fossil fuels. Japan also went nuclear. Its use of oil for power generation fell from 73% in 1973 to 26% in 1986 and today stands at 9.5%. While China remains the primary focus for energy consumption, the reality is it is the Asia-Pacific region that is the largest consumer and China is only 30% of that total.

In the transportation arena, the U.S. remains the world leader consuming about 30% of the total of all transportation fuels. The U.S. consumes about twice that of Europe, suggesting that with changed attitudes and infrastructure investment, U.S. transportation fuel consumption growth not only could be slowed, but reversed.

Hong Kong is 2.5 times more efficient in its energy use than the U.S., 1.8 times better than Europe and 4 times more efficient than the Asia-Pacific region

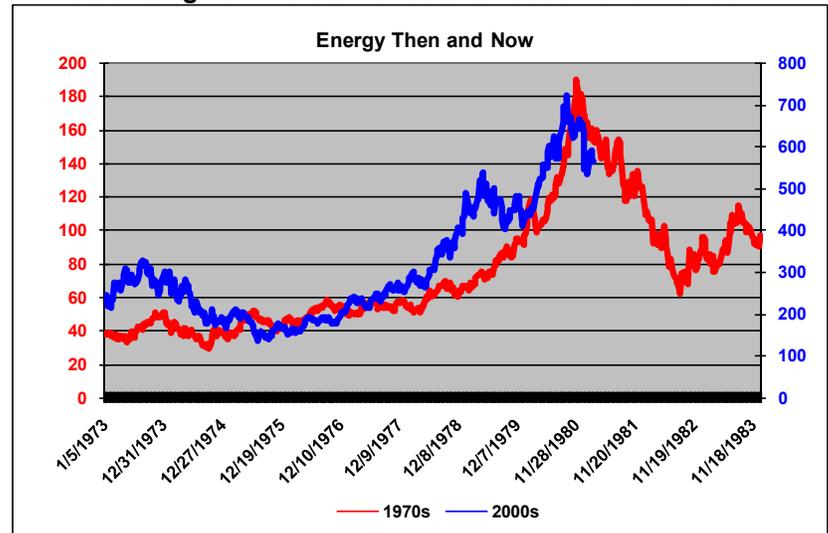
In the area of mass transportation, there is room for significant future savings. The GaveKal people point to Hong Kong as the shining star. It has a highly developed and efficient mass transit system, high population density and large proportion of mixed-use buildings, which can be used 24 hours a day. Hong Kong is 2.5 times more efficient in its energy use than the U.S., 1.8 times better than Europe and 4 times more efficient than the Asia-Pacific region. By getting people in the U.S. to shift from driving alone to using mass transit, there is substantial room for energy savings here. But the good news is that Asia has the fastest rate of urbanization with the lowest ratio of passenger cars at 14 per 1,000. Hong Kong has a ratio of 53 passenger cars per 1,000 people and even Europe has more passenger cars per capita than the U.S., but consumes much less fuel as mass transit use is well established. It is also interesting to note that Europe stands out as the only region that still consumes less petroleum than it did 34 years ago, while its standard of living has increased significantly over that period.

Our head tells us that the Dallas Fed analysis may have greater value in modeling and near-term forecasting, but our gut says that GaveKal has its finger on the true pulse of potential change

In considering these two papers, we are left with the opinion that the world will unfold differently than both assume. The Dallas Fed paper seems to be more conventional in its analysis and possibly more pessimistic in its outlook, although they do not foresee current world oil prices being sustained for this decade. On the other hand, the GaveKal paper is more optimistic about the future because they believe there are sufficient precedents to guide the world in how to change the energy demand culture. Their analysis offers more insight into what might change rather than what will change. However, we have learned over the years to not underestimate the ability of humans to adapt and change. For some observers of today's energy markets, that belief translates into consumers making only modest consumption habit shifts and adjusting to high energy prices. On the other hand, the GaveKal analysis shows how significantly demand could be reduced with only a few adjustments to consumer energy consumption patterns. Our head tells us that the Dallas Fed analysis may have greater value in modeling and near-term forecasting, but our gut says that GaveKal has its finger on the true pulse of potential change. The GaveKal analysis has more issues that could become the equivalent of 'Brown Swans' – not totally unknown events, but ones that could surprise if they come to pass.

Oilfield Service Stocks: Then and Now – An Update

On April Fool's Day this year we published an issue of the Musings devoted totally to the possible future course of energy and oilfield service stocks. At that time, we commented that one chart we had prepared as part of our research we found to be very scary. That chart was an overlay of the performance so far this decade of the oilfield service stocks within the Standard & Poor's 500 Index on the stocks' performance during the 1970s and early 1980s. The chart we published is shown in Exhibit 8.

Exhibit 8. Original Chart of 1970s and 2000s Performance

Source: Standard & Poor's, PPHB

Energy stocks have been quite volatile during the past 60 days as crude oil prices have vaulted to a new record high of \$135 per barrel before dropping \$10-12 and then soaring by over \$16 per barrel

We are now just over two months beyond that point and we thought it would be interesting to update the chart. Our purpose, which we plan to continue to do, is to see whether history more or less repeats itself, or whether we truly are in a different world. Energy stocks have been quite volatile during the past 60 days as crude oil prices have vaulted to a new record high of \$135 per barrel before dropping \$10-12 and then soaring by over \$16 per barrel. During this period, the media has seized upon the jump in oil prices, combined with Congressional queries of oil company executives, to focus on the impact of energy prices on consumer spending, shifts in automobile driving and buying habits and significant increases in mass transit ridership.

Another major thrust of the media, investment and congressional communities has been to try to understand what really is behind the rise in oil prices. That debate has created a lot of interesting conjecture, but some of the best analysis was discussed in our first story in this Musings. The point is that the health and future direction of the U.S. and global economies has become a major discussion topic. That has been combined with heightened speculation about what may happen to Asian economies, and their demand for energy, as a result of the economic slowdown currently enveloping the world's developed economies. This discussion and analysis has resulted in considerable stock market volatility, both for the overall market but for energy stocks in addition.

The downturn in the stock prices evident in our original chart continued for a very brief time period before the stocks rallied and climbed to new all-time highs

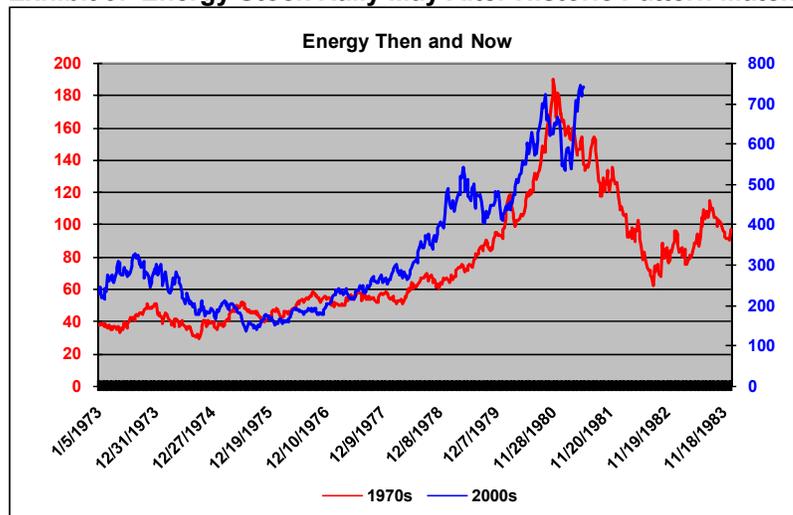
Exhibit 9 shows an update of our chart showing energy stocks – then and now. The downturn in the stock prices evident in our original chart continued for a very brief time period before the stocks rallied and climbed to new all-time highs. At this point in time it looks like the current stock performance is going to be slightly different from the earlier decade. However, when looked at many years in

Widely reported statements by oil refiners that they are having little trouble in buying crude oil supplies suggests that the tight oil market is easing

the future, the double top in the oilfield service stocks may not look terribly different from the pattern of the earlier period. While we recognize that history does not exactly repeat, the pattern still remains alarming enough to keep us on the edge of our seat.

Lower crude oil prices due to investors starting to focus more on weakening demand factors, coupled with widely reported statements by oil refiners that they are having little trouble in buying crude oil supplies, suggests that the tight oil market is easing. If supply is becoming more abundant, and the reports of increased storage of lower quality crude oil in tankers prove correct, it is not hard to see crude oil prices going through a correction phase in the near future.

Exhibit 9. Energy Stock Rally May Alter Historic Pattern Match



Source: Standard & Poor's, PPHB

If we have been shocked by crude oil prices soaring 35% in the span of five months, we equally should not be amazed if the price collapses by an equal or greater amount as the summer unfolds

That correction phase may be further stimulated by the recent settling of the Democratic search for its presidential nominee. With the Democrats picking Senator Barack Obama for the fall campaign, the party's ultra-liberal agenda on economic and taxation issues may also become a factor in driving crude oil prices lower. Only time will tell whether crude oil is entering a new environment influenced less by speculation and focus on weakness of the U.S. dollar and more from shifts in consumer buying habits and weak economic demand for energy in general. If we have been shocked by crude oil prices soaring 35% in the span of five months, we equally should not be amazed if the price collapses by an equal or greater amount as the summer unfolds. Again, we reiterate our view that the short-term movements in crude oil prices and energy and oilfield service stock prices may be both violent and extreme, but that violence does not have to signal the destruction of the underlying long-term industry and stock fundamentals.

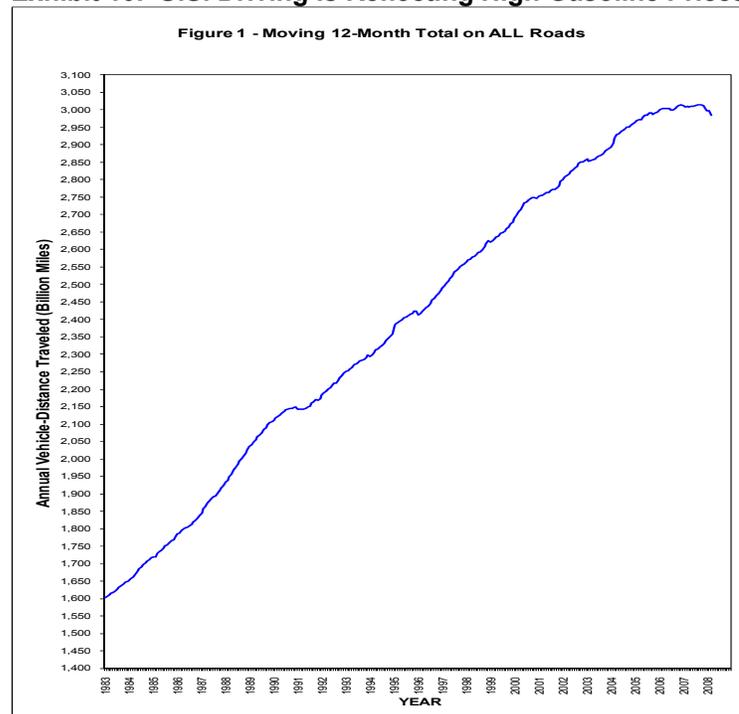
Less Miles Showing Consumers Being Hit By Gas Prices

The media is full of stories about the impact of high and rising gasoline prices on automobile manufacturers and consumers. As we discussed in our last issue, the U.S. Department of Transportation has reported that miles driven by Americans fell by 11 billion in March, marking a 7.6% drop from the previous month. More importantly, this drop was the largest monthly decline ever experienced since record-keeping was started in 1942 and only the first monthly drop since 1991.

Since last November the 12-month total of miles driven has been flat and is now declining

After reading the details of that report, we started looking at the history of this data series. The results were more significant than the March report in documenting the impact of high and rising gasoline prices on American driving habits. We found a chart the department had done in its analysis of the history of miles driven that we thought was quite telling, yet it does not appear to have been discovered by the popular media. The chart plotted the history of a rolling 12-month total of miles driven. As you would expect, the chart reflected a steady upward trend until late last year. In fact, since last November the 12-month total of miles driven has been flat and is now declining. What was interesting, however, was when we plotted that chart's data against the average monthly price for all gasoline grades. This data is in Exhibit 11. What we found was a series of points in time at which either miles driven dropped or the trend line of growth in miles driven changed consistent with increases or decreases in gasoline prices.

Exhibit 10. U.S. Driving Is Reflecting High Gasoline Prices

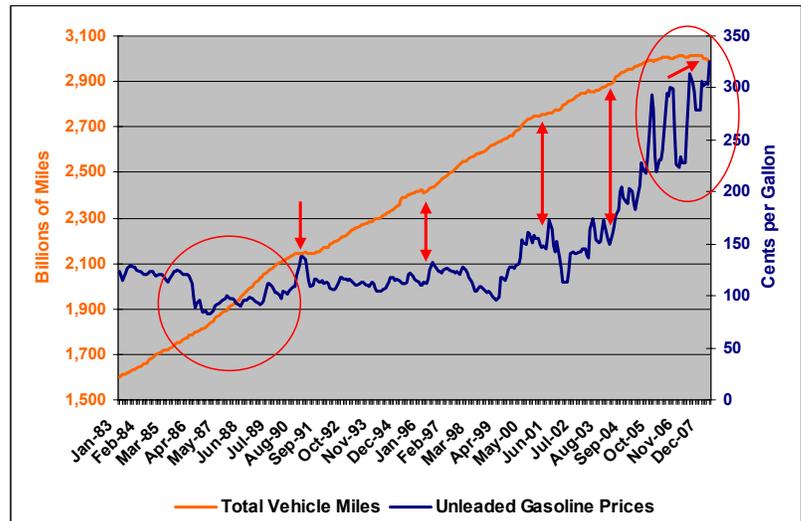


Source: Federal Highway Authority

It appears that when gasoline pump prices crossed the \$2.20 per gallon level, the growth in miles driven began to slow

We have highlighted a series of those data points with red arrows. What was also important was to look at the change in trend line growth in the second half of the 1980s following the collapse in world oil prices and the subsequent decline in gasoline prices. That period is in a red circle in the lower left-hand corner of the chart. In the upper right-hand corner you can see the flattening in miles driven growth trend and its subsequent decline and the high and volatile period for gasoline prices. It appears that when gasoline pump prices crossed the \$2.20 per gallon level, the growth in miles driven began to slow. With gasoline prices above \$3.00 per gallon, the trend not only stopped increasing but it has now declined.

Exhibit 11. Gasoline Prices Have Impacted Miles Driven



Source: Federal Highway Authority, EIA, PPHB

The change in driving is also reflected in data about the gasoline market that shows a decline in the annual volume of gasoline retail deliveries starting in 2004 when average annual gasoline pump prices neared \$2.00 per gallon. Through May, the average pump price has gone up by \$1.43 per gallon, or nearly 75% higher than the average price reported in 2003. Without even looking at the weekly retail delivery data, we have to believe that gasoline consumption is falling even with more vehicles on the roads.

The Philadelphia AAA organization reported last week that it is experiencing twice the number of service calls for vehicles that have run out of fuel than last year

The Philadelphia AAA organization reported last week that it is experiencing twice the number of service calls for vehicles that have run out of fuel than last year. Some have speculated that this reflects the impact of higher gasoline prices on tight consumer budgets. What is interesting is that we have not seen, nor heard, reports of people hoarding gasoline as they did in the 1970s – the last period when gasoline prices soared in a very short time period. At that time, there were numerous media studies and other reports about a shift in consumer gasoline consumption habits. Whereby consumers had previously not stopped to fill up their gas tanks until the gas gauge reflected one quarter full, they now were not letting

This allocation system failed to capture the dramatic demographic trends underway that found cities experiencing rapid growth were short of gasoline and areas losing population were swimming in it.

their tanks drop by more than one-quarter. The result of the studies was that the nation's vehicle stock had become a secondary gasoline storage system. That meant that while the government was reporting a decline in primary gasoline storage volumes, the national total of gasoline supplies was not down anywhere near as much as implied by the government report because the vehicle fleet had an additional 7-10 gallons per vehicle in storage. What this change in consumer habits did do was to exacerbate the problem of regional gasoline demand and supplies at a time when the federal government was regulating the volumes of gasoline being distributed around the country.

As a result of the oil embargo in 1973 and the Iranian oil crisis in 1979, consumers found that physical supplies of gasoline were reduced. As a result, the federal government moved in and created a system for allocating gasoline volumes based on historical information and trends. Unfortunately, this allocation system failed to capture the dramatic demographic trends underway that found cities experiencing rapid growth were short of gasoline and areas losing population were swimming in it. The major regional impact was that the Midwest (where the designation of Rust Belt was born) was well supplied with gasoline while cities such as Houston and Dallas where people were moving for jobs in the energy business were short gasoline. As a result, the government invented odd and even gasoline buying days (depending on the last number on the vehicle's license plate) and gasless Sundays. One of the adjustments citizens in the Southwest had to make was planning time to wait in line at gas stations in order to buy fuel before going on about one's business.

At last week's General Motors (GM-NYSE) annual meeting, Chairman and CEO Rick Wagoner announced that the company, which has been reporting a string of financial losses, would be halting production at four pickup truck and SUV assembly plants in favor of building more fuel efficient automobiles. The company also said it may sell its Hummer line of vehicles – the poster-child for American gas-guzzling vehicles. In almost the same breath, Ford Motor Company (F-NYSE) that had previously announced it had given up any hope of being profitable in either 2008 or 2009, is signaling it is not sure when the company may return to profitability.

Aptera Motors 'Everywhere' car is a three-wheeled hybrid that can achieve 300 mpg when it has a fully charged battery and a top speed of 90 mph

As the automakers were admitting their need for new business strategies, NBC News did a segment on consumers abandoning SUVs and opting for fuel-efficient vehicles. They also did a segment on the Aptera Motors 'Everywhere' car, a three-wheeled hybrid that can achieve 300 miles per gallon (mpg) when it has a fully charged battery and with a top speed of 90 miles per hour (mph). The futuristic-looking vehicle was also reported capable of accelerating to 60 mph within 10 seconds. The super efficiency goal can be reached on trips of no more than 130 miles, which represents the maximum battery charge using the small gasoline engine. While the vehicle is still under development, Aptera has begun to accept orders for delivery in 2009 for residents of California. The estimated

Exhibit 12. New Style Fuel-Efficient Vehicles Are In Our Future

Source: Aptera Motors

price tag is \$29,000. Whether anyone wants to be seen driving in this vehicle may be another story. But clearly the American automobile industry's future will be characterized by many newly-designed and powered vehicles.

Oil Prices And Broken Business Models

We think we were caught in the vanguard of the airline industry retrenchment due to high fuel prices

We think we were caught in the vanguard of the airline industry retrenchment due to high fuel prices. A little over a week ago, we were returning to Rhode Island from Houston only to experience one of those traveler nightmare scenarios. Booked on an early morning flight, we got to the airport very early and settled down in the President's Club for a cup of coffee and to read a newspaper. After chatting with some business friends we encountered there, we headed for our gate with plenty of time to spare. The gate agents were very efficient and boarded the plane early and had everyone settled in when the pilot came on and announced that there had been a maintenance issue earlier but it was corrected and they were just waiting on the paperwork. He said as a result of the delay, we would not be leaving for an additional 15-20 minutes. That was not a concern since we had almost a two-hour layover in Cleveland before our flight to Providence.

Shortly after the first announcement, the pilot came back on the speaker to tell us that our plane was being taken out of service and we needed to disembark and wait for instructions from the gate agent. As we did, thoughts about missing our connection in Cleveland become foremost in our mind, especially given the full planes and scaled back flights. Fortunately for us, Continental commandeered another plane and got us to Cleveland where they had held our connection (there were six people on our flight making that connection). Our thanks goes out to the gate agents, crew and scheduling people who made everything work in the end.

The middle of last week, Continental Airlines (CAL-NYSE) announced it was mothballing 67 additional planes in order to reduce capacity and as a result would be laying off 3,000 of its

“The airline industry is in a crisis. Its business model doesn't work with the current price of fuel...”

45,000+ staff. As management explained in the release and letter to employees, “The airline industry is in a crisis. Its business model doesn't work with the current price of fuel and the existing level of capacity in the marketplace. We need to make changes in response.”

The company went on to highlight that it was planning to reduce capacity after the summer travel season when tourist/vacation travel traditionally falls off. The cutbacks are scheduled to be implemented over the winter and through the course of 2009. The plane retirements would focus on the company's least fuel efficient planes – the Boeing 737-300 and 737-500 models. According to CAL, it will continue to take delivery of new fuel efficient 737-800 and 737-900 models, but the company's total fleet size will shrink from 375 at the end of June (reflecting six planes already taken out of service) to 354 by the end of this year and further shrink to 344 planes by the end of 2009. The projected retirements by type of plane, as presented in CAL's press release is shown in Exhibit 13.

Exhibit 13. Continental Airlines Retrenchment Plan

TABLE B: Continental Airlines Mainline Fleet Plan as of June 5, 2008

	Net		Net		
	Total@	Changes	Total@	Changes	Total@
	6/30/08E	2H08E	YE2008E	2009E	YE2009E
Mainline Jets					
777-200ER	20	-	20	2	22
767-400ER	16	-	16	-	16
767-200ER	10	-	10	-	1
757-300	17	-	17	-	17
757-200	41	-	41	-	41
737-900ER *	10	10	20	18	38
737-900	12	-	12	-	12
737-800*	111	6	117	-	117
737-700	36	-	36	-	36
737-300**	47	(24)	23	(23)	-
737-500**	55	(13)	42	(7)	35
Total Mainline	375	(21)	354	(10)	344

* Final mix of new 737-800/-900ERs are subject to change

** Final mix and quantity of 737-300 / 737-500 exits subject to change

Source: Continental Airlines Press Release, June 4, 2008

CAL's actions will result in a reduction in domestic capacity of 11% by the fourth quarter

The press release pointed out the challenge the company was facing. “These record fuel costs have fundamentally shifted the economics of our business. At these fuel prices, a large number of our flights are losing money, and Continental needs to react to this changed marketplace.” CAL's actions will result in a reduction in domestic capacity of 11% by the fourth quarter. Most of the capacity cuts will come in September when the company plans to remove 27 of the 67 planes targeted to be mothballed. Besides laying off staff

The net result is a reduction in United Airlines' domestic capacity of 18% by the end of 2009 and a cut in international capacity of 5%

The airline capacity reductions mean the travel and leisure industry will be hurt by fewer travelers

For every one dollar per barrel increase in crude oil, the airline industry's costs increase by \$1.6 billion

and parking planes, CAL's two most senior executives reduced their salaries for the balance of 2008, an employee motivational move not demonstrated by other airline CEOs.

But CAL is not the only airline to announce capacity reductions and staff layoffs. United Airlines (UAL-NYSE) is parking an additional 70 planes above the 30 it had previously announced were being taken out of service. The company is retiring its entire fleet of 737s and its oldest 747s. It will also lay off 1,100 people. The net result is a reduction in domestic capacity of 18% by the end of 2009 and a cut in international capacity of 5%. UAL's capacity reductions will target markets such as Hawaii where available seats will shrink by 45% and Orlando where the cut will be 30%. While consumers do have options for getting to Disney World and Universal City, it's hard to drive to Hawaii. It is interesting that Continental delayed announcing their target city and route cuts for at least a week – we suspect to sort out what other airlines are doing in order to possibly gain a competitive advantage.

As we read the airline capacity reduction announcements last week, we reflected on our last trip and wondered if we had been a victim of an "early plane retirement." We were on an old 737. The pilot's choice of the words "being taken out of service" sounds awfully close to "mothballed" or "retired" or "parked." But what struck us from a bigger picture point of view was that the airline capacity reductions mean the travel and leisure industry will be hurt by fewer travelers. The tourism industry is the largest employer in this country and now is about to become an innocent victim of high fuel costs.

The action of the various airlines is consistent with the latest airline association forecast projecting a devastating outlook for industry profits. The International Air Transport Association (IATA) issued a new industry forecast at the time of its recent annual meeting in Istanbul, Turkey. IATA's latest forecast calls for the airline industry to lose \$2.3 billion this year, down from its prior projection of a \$4.5 billion profit made in March. This latest forecast is the second reduction so far this year, and is attributable to higher fuel bills and reduced traveling due to a weakening global economy.

Giovanni Bisignani, IATA director general and CEO, speaking at the IATA AGM and World Air Transport Summit, highlighted the impact of rising fuel costs on the industry's profitability. For every one dollar per barrel increase in crude oil, the airline industry's costs increase by \$1.6 billion. The new IATA forecast is based on a crude oil price of \$107 per barrel, up from \$86 used in the March forecast. At the \$107 per barrel price, the airline industry loses \$2.3 billion, but at around today's price - \$135 per barrel – the industry losses escalate to \$6.1 billion. The new forecast puts the industry's fuel bill at \$176 billion this year, or 34% of total operating cost.

In commenting on the health of the industry, Mr. Bisignani, said, "Twenty-four airlines have gone bust in the last six months and \$130 per barrel oil is reshaping the industry even as we speak. In the

In the past few days, in virtually every media we encounter, the obituary for the SUV is being written or spoken

next 12 months we could face \$99 billion in extra costs from oil." This explosion in fuel costs and its ramifications on airline company viability was also highlighted in the CAL press release. As the company pointed out, "The price of Gulf Coast jet fuel closed yesterday (June 2) at \$151.26 -- about 75 percent higher than what it was a year ago. At that price and at our current capacity, our fuel expense this year would be \$2.3 billion more than it was last year. That increase alone amounts to about \$50,000 per employee." These economics suggest further belt-tightening by the industry to the detriment of its cliental – passengers

Another American industry that appears to have a broken business model is the domestic automobile business. In the past few days, in virtually every media we encounter, the obituary for the SUV is being written or spoken. Jack Nerad, executive market analyst for Kelley Blue Book, said recently, "Up until now, we've said it's [the gas guzzler] not dead. But right now, it's probably on life support." This is supported by sales figures and customer traffic on dealer lots. As Brent Robinson, sales manager of a GM dealership in Minnesota, told the *Toronto Star* newspaper, "We haven't had anyone crack the door on a Yukon or a Denali in 30 days."

However, we still think it is a bit premature for editorialists and columnists to be suggesting which SUV models should be purchased for enshrinement in museums for future generations to see. Yes, there are certain models that do resemble 'barns on wheels,' but their appeal has been waning for some time. Clearly there are people who need these abnormally large vehicles, but they are not the majority of consumers as suggested by many newspaper stories. If you have a family of 5 or more, you have few choices that provide comfortable travel for all. And if you are hauling groups of kids or people around, these larger SUVs may be the best alternative, and often the only choice available. However, the leaders running the automobile companies should be focusing on how best (and quickly) to reduce vehicle weight and improve the fuel efficiency while still providing a versatile vehicle for those needing the flexibility and size.

What is particularly interesting is that the new 40-mpg vehicle had not been hinted at or leaked to automobile writers previously

The announcements by domestic automobile manufacturers about financial losses well into the future, the closure of pickup and SUV assembly plants and the acceleration of small car and hybrid car designs suggest a massive shift in industry dynamics. As a Ford Vice President for marketing said, "May was a watershed month. We are, as an industry, catching up with the breathtaking choices the consumers are now making." In fact, while announcing its large vehicle plant shutdowns, GM also announced it was rushing out a 40-mpg vehicle by the end of 2009 and hopes to introduce its Chevy Volt plug-in hybrid for the 2010 model year. What is particularly interesting is that the new 40-mpg vehicle had not been hinted at or leaked to automobile writers previously. The normal process for introducing a new vehicle extends over two to four years with early hints followed up by prototype models. There has been none of this traditional pattern for this new vehicle introduction beyond the press

Why did these executives not anticipate the possibility of an explosion in fuel costs that would severely alter the economics of their businesses?

release. Does this smack of a management panicking under pressure?

What we find amazing about both the airline and automobile industries is that the executives running the companies appear to be in a panic mode. These industries traditionally have been known for their extensive consumer research and long-term strategic planning efforts. Yet both industries are suggesting their basic business models are broken, yet the managements have no alternative models to suggest. Why did these executives not anticipate the possibility of an explosion in fuel costs that would severely alter the economics of their businesses? We expect these industries will become case studies for future business school students, maybe as soon as this fall. We wonder if the final chapters will have been written by then. Better yet, will the case studies be presented by out-of-work airline and auto executives?

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