



MUSINGS FROM THE OIL PATCH

April 7, 2020

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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 and planning for the future. The newsletter is published every two weeks, but periodically events and travel may alter that schedule. As always, I welcome your comments and observations. Allen Brooks

Summary:

Money Makes The World And The Oil Industry Go Around

The history of the oil industry since the peak in interest rates in 1981 has been tied to the growth in debt. The increase in debt throughout our economy has accelerated as cheap money became available. Fallout from cheap money has contributed to oil price volatility. More cheap money has implications for oil's future.

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Are Today's Oil Market Conditions Like Past Collapses?

Current oil market conditions, and the struggle by the largest oil producers to control pricing, reflect a pattern seen in prior industry downturns. Examining prior downturns may help chart the industry's future.

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Downturn Hurts Industry Workers And Houston's Economy

This oil downturn is having an immediate and severe impact on petroleum workers, as many lose their jobs. We look at the recent trend in petroleum industry employment, and what it means for the Houston economy.

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We trust and hope everyone is safe and healthy, as we deal with defeating the Covid-19 virus while also weathering the current oil price collapse. These are difficult times, but we have confidence we will get through them together and emerge stronger. Our best wishes go out to all our readers and their families.

Money Makes The World And The Oil Industry Go Around

This may be the first of many

The oil market was shocked last week by the announcement of the filing for Chapter 11 bankruptcy protection by Whiting Petroleum Company, a leading oil producer in the Bakken. This may be the first of many of the larger independent oil companies that will not survive the low oil price environment given their debt loads and liquidity challenges. The small oil producer sector will be decimated by a continuation of low oil prices.

The energy world was already beginning to change when 2020 dawned, as producers were looking at lower oil and gas prices and they were facing negotiations with their banks over company borrowing limits based on lowered oil and gas price projections. Given the early March collapse of oil prices following the failure of the OPEC+ discussions, bank price projections have been in flux, further complicating the negotiations with oil and gas companies.

The Whiting Petroleum move highlights how reliant energy companies are on outside capital and bank lending for liquidity

The Whiting Petroleum move highlights how reliant energy companies are on outside capital and bank lending for liquidity. The shunning of energy equities, and increasing concern over the quality of energy debt, has increasingly left energy companies to have to fend for themselves in seeking capital for investment in new oil and gas resources. The inability of companies to access capital markets has forced producers to cut capital spending plans to make them fit within their projected cash flows. With the dramatic drop in oil prices, those cash flow projections are shrinking while also leaving managements with less confidence about those projections.

To demonstrate the challenges faced by producers, we will use some numbers from the Whiting Petroleum 2019 annual report. The company's average oil sales price was \$50.06, which was boosted by \$0.83 per barrel for the effect of hedges it had in place. Whiting Petroleum's average price after the effect of the hedging was \$50.89, which compared with the weighted average NYMEX price per barrel of \$56.97, or roughly a \$6 per barrel discount. These calculations highlight issues complicating the assessment of the health of oil and gas companies from the outside: the volume and price of hedges on production, as well as the location and quality discounts from marker oil prices.

Its price per thousand cubic feet reflected a discount of approximately \$2/Mcf

Whiting Petroleum was in a worse situation with its natural gas production. Its price per thousand cubic feet reflected a discount of approximately \$2/Mcf. The company's gas price is a function of the remoteness of the output from any commercial market of size.

When we look at the company's costs and expenses per barrel of oil equivalent (BOE), we find they totaled \$14.01 for 2019. Based on the company's average oil price (which was not adjusted for its gas output given its low price), this translates into a cash profit margin per BOE of \$36.88. If we include the cost of depreciation, depletion

This means Whiting Petroleum would be unable to invest in new exploration and development, which makes the company a self-liquidating entity

Under today's very depressed oil and gas prices, few producers will be able to fund operations

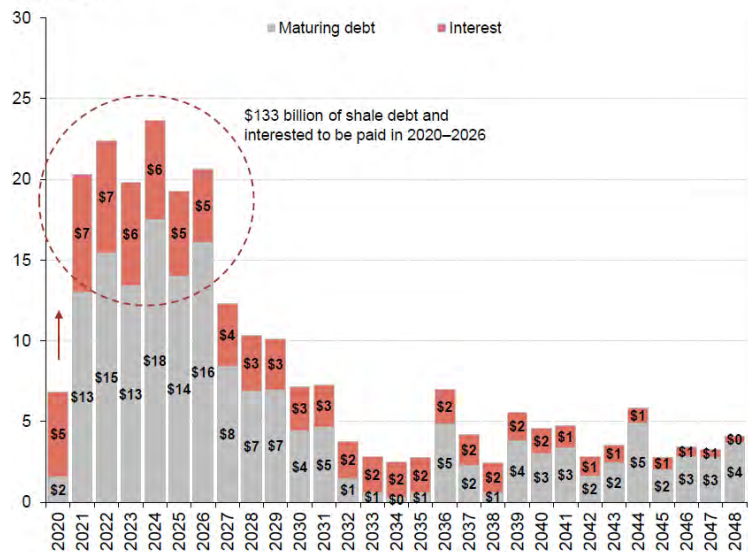
and amortization expense (largely a non-cash expense), but indicative of the amount of investment the company needs to make to insure it replaces produced barrels and remains an ongoing enterprise, the cash profit per BOE falls to \$19.06, or 37.4% of the average selling price after adjusting for hedging. That is a pretty attractive return.

With WTI oil futures prices falling to \$20 per barrel, and assuming the location and quality discount remains at \$6, Whiting Petroleum was looking at generating no positive cash from the oil it produced. It also assumes cash operating expenses remain at 2019 levels. This means Whiting Petroleum would be unable to invest in new exploration and development, which makes the company a self-liquidating entity. In that condition, the company essentially has no value. The bankruptcy filing indicates that reality, as current shareholders will only retain 3% of the shares of the reorganized company, as the debt holders will hold 97% in return for agreeing to cancel their bonds.

Under today's very depressed oil and gas prices, few producers will be able to fund operations. If the companies have a significant amount of debt on their balance sheets, they will face serious challenges to sustain their businesses if they do not address their financial leverage. To understand the precarious health of the producer sector, energy consultant Rystad has prepared a chart showing the debt maturity schedule and annual interest expense for a group of 29 significant producers. While this represents only 29 producers, we believe it is indicative of the financial condition of the balance of the producer sector.

Exhibit 1. Industry Faces Wall Of Debt Starting Next Year

US shale E&P debt and interest by maturity, 29 companies
Billion USD



Source: Rystad

Beginning in 2021, and extending through 2026, this group of companies face debt maturities and interest payments of approximately \$20 billion a year

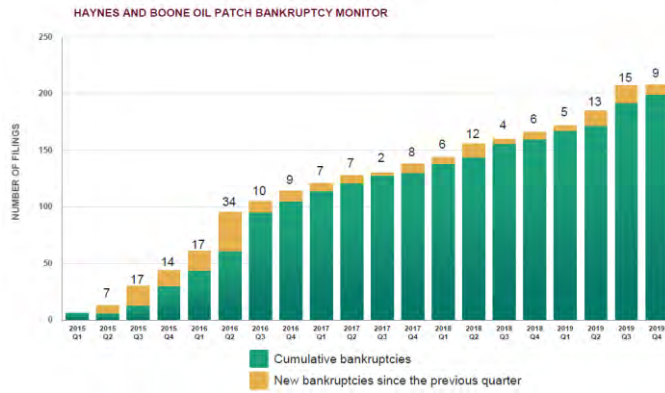
Analysts have suggested that 2020 could see 55-60 additional bankruptcy filings

Rystad's data shows that these companies are facing annual debt repayments of \$2 billion in 2020, but they also owe \$5 billion in interest on their collective borrowings. Given oil and gas prices, these companies will struggle to even meet these financial obligations. Beginning in 2021, and extending through 2026, this group of companies face debt maturities and interest payments of approximately \$20 billion a year. That is a huge wall of debt, which will require balance sheet restructuring if the companies are to survive the downturn.

Law firm Haynes and Boone, LLP has been tracking E&P and oilfield service company bankruptcies for the past several years. Their latest data for the E&P sector, through December 31, 2019, shows over 200 companies have filed for bankruptcy since the first quarter of 2015. In 2019, there were 42 new filings. Analysts have suggested that 2020 could see 55-60 additional bankruptcy filings, but that forecast was before the March oil price collapse. Many of these bankruptcy filings are known as "pre-packaged" plans, which are massive restructurings of company balance sheets negotiated between company managements and their lenders before being presented to a bankruptcy judge.

Exhibit 2. Energy Bankruptcies Poised To Jump

2015-2019 CUMULATIVE NORTH AMERICAN E&P BANKRUPTCY FILINGS



Source: Haynes and Boone

We anticipate a wave of financial restructurings ahead

When a public company hires a restructuring advisor, it must announce it. We are beginning to see a press releases from a number of producer and oilfield service companies announcing the hiring of advisors. We anticipate a wave of financial restructurings ahead. The restructuring negotiations often require months to work out, but it is done in conference rooms rather than court rooms. Therefore, don't expect bankruptcy filings to surge until early summer. These negotiated deals are designed to minimize negotiations that would be directed by bankruptcy judges without such agreements. (In the late 1980s, we worked extensively with financial and oilfield service companies in bankruptcy cases. One Houston bankruptcy judge was famous for sending warring parties

It shifted from -10% to -20% for pre-March 8th responses to -20% to -30%, with a significant number of -40% forecasts, for responses after March 8th

The most important point is to note the significant drop in long-term oil price expectations

into an adjacent conference room to hash out an agreement before he would let them go home. It actually turned out to be an effective way for allocating the court's time.)

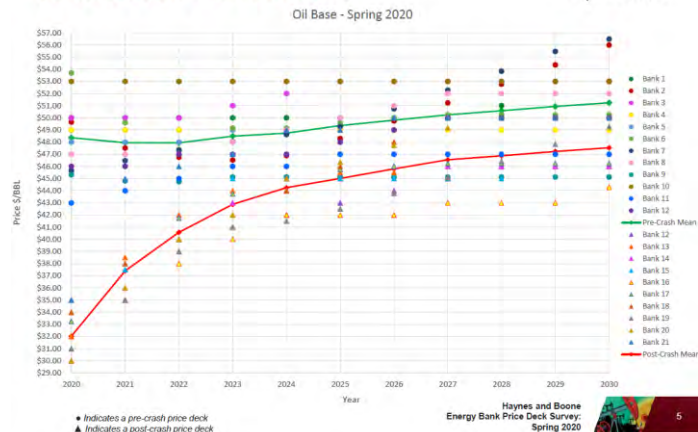
What is complicating the future for energy companies is the revised oil and gas price forecasts of commercial banks, as they deal with company borrowing bases that determine the amount of money a company can borrow on its assets. Haynes and Boone recently released its Spring 2020 survey results. A total of 207 responses were received. Due to the timing of the survey, some responses were received based on oil and gas market conditions prior to the Great Stop due to the virus and the unleashing of the Russia-Saudi Arabia battle. These developments contributed to the oil price collapse and influenced the shift in the central frequency of responses as to the anticipated percentage change in borrowing bases. It shifted from -10% to -20% for pre-March 8th responses to -20% to -30%, with a significant number of -40% forecasts, for responses after March 8th. That shift was not a surprise, but one wonders how much additional pressure this will place on managers who might have been expecting and planning for a lower cutback.

We have presented the price forecasts from leading energy banks that Haynes and Boone also collected. It surveyed 32 energy lending banks, however only 21 responded, or a 65.6% response rate. That response was up from the 17 out of 30 (56.6% rate) banks who completed the fall 2019 survey. Charts from the report show how much oil and gas price expectations have changed. While the lines are reflective of the central tendencies of the forecasts for pre- and post-March 8 responses, the various dots and triangle markers demonstrate how widely bank lender views about future oil and gas prices vary. The most important point is to note the significant drop in long-term oil price expectations. The same cannot be said about natural gas long-term prices.

Exhibit 3. Oil Price Deck Has Radically Changed

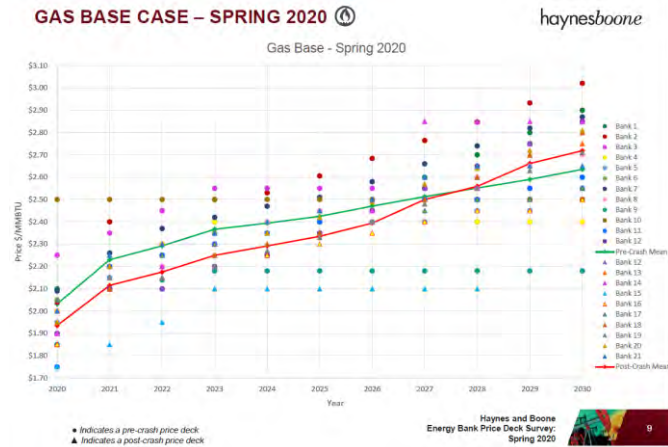
OIL BASE CASE – SPRING 2020

haynesboone



Source: Haynes and Boone

Exhibit 4. How Gas Price Decks Have Changed

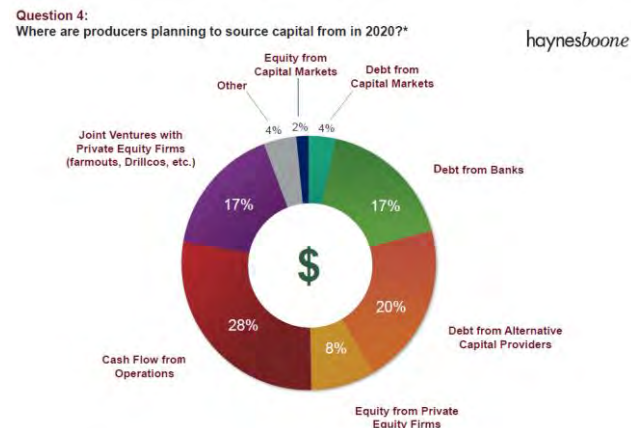


Source: Haynes and Boone

The nation’s largest commercial banks reportedly had a very low (4%) amount of energy loans in their entire commercial lending portfolios heading into 2020

Another interesting chart from Haynes and Boone shows where producers expected to source their capital in 2020. Only 6% is expected to come from public equity and debt markets, while 28% will come from internal sources. We wonder how much that share may change given lower oil and gas prices and demand, coupled with reduced lending from commercial banks who are expected to provide 17%. Bank lending may be widely different depending on the size and location of banks. The nation’s largest commercial banks reportedly had a very low (4%) amount of energy loans in their entire commercial lending portfolios heading into 2020. This means they may be able to lend more money to oil and gas companies. Regional commercial banks in the oil patch have higher portions of their total book of corporate loans committed to oil and gas companies. Whether they will be able, or willing, to boost that exposure is questionable. Thus, there may be a disproportionate financial impact on producers and oilfield service companies depending on their banking relationships.

Exhibit 5. Where Producers’ Capital Will Come From



Source: Haynes and Boone

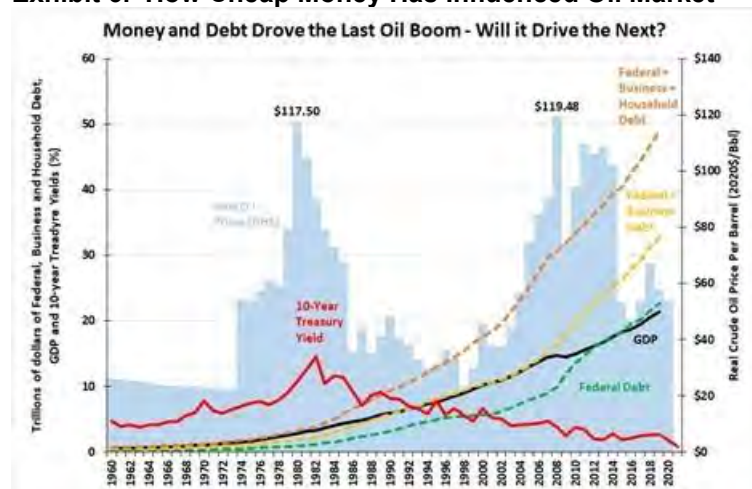
The “easy money” policies that have kept the economy growing

That yield peaked in 1981, when the Federal Reserve helped break the high inflation rates that crippled the U.S. economy

These challenges for E&P and oilfield service companies, in light of the current oil and gas demand and price collapse, highlight a bigger question, which relates to the “easy money” policies that have kept the economy growing. This is an important question when considering how the economy may operate in the future and what that means for energy companies.

In Exhibit 6, we show U.S. financial history compared to real oil prices. Since 1960, with the exception of the 2008 financial crisis, GDP has grown steadily. This growth reflects our expanding population and rising living standards. What has helped fuel the growth has been money. We show the growth in Federal debt, business debt and household debt during this same period. Against the curves of debt growth, we plotted the yield on 10-year Treasury bonds as a measure of inflation expectations. That yield peaked in 1981, when the Federal Reserve helped break the high inflation rates that crippled the U.S. economy. It was caused partially by the 1970s crude oil price explosions. Those were driven initially when OPEC seized control over oil pricing and responded decisively to the closing of the gold window, which made oil exporting countries leery of the depreciating value of the U.S. dollar in which their primary source of income was priced.

Exhibit 6. How Cheap Money Has Influenced Oil Market



Source: WSJ, EIA, St. Louis Fed, PPHB

Note how household debt began climbing immediately after the peak in Treasury yields and accelerated when we entered the 2000s

Since 1981, we have enjoyed a 40-year bull market in bond markets as the yields, such as on the 10-year Treasury bond, declined. Those declines have come as money has flooded our economy (and the rest of the world), and, in turn, encouraged the greater use of debt for all aspects of our economic life. Note how household debt began climbing immediately after the peak in Treasury yields and accelerated when we entered the 2000s. While business debt began growing in concert with peaking Treasury yields, its inflection point came around the same time as the financial crisis, which

The minimal returns from fixed income investments pushed individuals to invest in dividend-paying equities as a replacement for the low interest payments from bonds

commenced in 2007. The greater use of debt by businesses has been a key investment theme of the past 10-15 years, and actively embraced by energy companies. Federal debt accelerated in response to the financial crisis and the need to stimulate the U.S. economy as that crisis crippled economic sectors and industries.

As interest rates have declined and are now in a zone of zero (nominal) rates, investors who have been dependent bonds for their income have been forced to seek alternative investments for their income. This has been especially true for people investing for their retirements, as well as those already retired. The minimal returns from fixed income investments pushed individuals to invest in dividend-paying equities as a replacement for the low interest payments from bonds. This push helped fuel the rising stock market, but also increased the risk profile for individuals. The increased risk was often not appreciated by investors, who were then exposed to stock market volatility.

Low interest rates have upended the investment approaches of pension funds, which traditionally have maintained large fixed income (bond) portfolios underpinning their income requirements for payments to pensioners. Pension funds have aggressively adopted investing in non-traditional financial offerings, including real estate and private equity, helping to fuel the booms in these sectors.

This latest crisis is impacting energy investors who were already suffering from the bursting of the \$100 a barrel oil price bubble in 2014

All investors now are suffering from the Black Swan health crisis caused by the Covid-19 virus. This latest crisis is impacting energy investors who were already suffering from the bursting of the \$100 a barrel oil price bubble in 2014. Not only have energy equities fallen in value, but often the companies have suffered from the low oil and gas prices and oilfield activity, which is now ushering in the next great energy industry restructuring era.

Talk of another \$2 trillion in stimulus suggests further fuel being added to the potential inflation fire

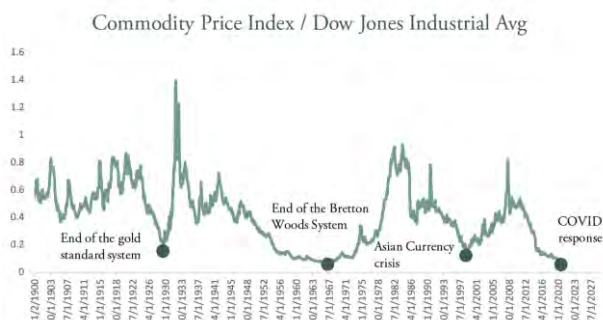
The role of money in the economy will play a role in shaping the future of the energy business. A possible White Swan (Black Swans that are ignored) may be inflation. The unsheathing of the monetary weapon to cushion America's workers forced out of their jobs by government mandates to stay at home and businesses ordered to close while the nation fights the coronavirus seems has just begun. The \$2 trillion economic support legislation recently enacted, which could lead to as much as \$6 trillion of new money flooding the economy, will cause Federal debt and the Federal Reserve's balance sheet to explode. Talk of another \$2 trillion in stimulus suggests further fuel being added to the potential inflation fire.

A question some investors are asking is whether this flooding of economies with money, something being done by virtually every nation's central bank, will produce a wave of inflation. That is a financial phenomenon that has been absent from the economy for years. Is it about to return, and if so, what might it mean for commodity prices (oil and gas) and interest rates?

The firm’s argument is that every time the ratio reaches an extremely low point it has rebounded, as commodity (hard assets) values relative to stock prices (financial assets) have increased

Goehring & Rozencwajg Associates, LLC., an investment firm focusing on commodity-related investments, recently issue a report highlighting the possibility that the Covid-19 government response might signal a change in the relative value of commodity assets. The firm’s two principals are long-time investors in commodity-related stocks. In the report is a chart of the ratio of the Commodity Price Index to the Dow Jones Industrial Average since 1900. The firm’s argument is that every time the ratio reaches an extremely low point it has rebounded, as commodity (hard assets) values relative to stock prices (financial assets) have increased. It should be noted that the ratio’s lows have gone lower than prior lows, such as now. Therefore, the low ratio value doesn’t necessarily mean an immediate upturn. In other words, the ratio could go lower, or if an upturn comes, it could be well in the future.

Exhibit 7. Are Commodity Prices Primed To Recover?



Source: Goehring & Rozencwajg

In their report, Goehring & Rozencwajg wrote the following to explain their rationale for an impending valuation change for commodities:

“We also analyzed the catalyst that started the bull market in resources following all three lows. We concluded that in each case, a bull market in real assets followed a major shift in global monetary policy. For example, in the late 1920’s it was the realization that Britain would have to abandon its attempt to go back on the pre-war gold standard (effectively ending a monetary system that had been in place since 1819). In 1969, it was the first steps in loosening the Bretton Woods exchange standard, ultimately culminating in the “Nixon Shock” two years later. In 1999, it was the move by several Asian economies to intervene in keeping their currencies depressed to spur growth following the Asian currency crisis of 1997. In retrospect, the 2020 rerating of real assets will have been caused by the unprecedented actions being taken today by the global Central Banks.”

“In retrospect, the 2020 rerating of real assets will have been caused by the unprecedented actions being taken today by the global Central Banks”

There is a good chance oil prices will rebound over the next two years. How high they go depends on how much demand is restored, and how quickly. Equally important is how much current

This sets up the potential for another era similar to the 1970s and 2000s

and future oil production is lost. This sets up the potential for another era similar to the 1970s and 2000s. The best caution about the impact of such a volatile future for oil prices came from Robert McNally, the head of Rapidan Energy, a leading energy consulting firm. When he spoke in a webinar, he echoed points he made in a paper published by the Center on Global Energy Policy at Columbia University.

A world without a swing oil producer to stabilize the global oil market, will cause repeated swings between supply-destroying low oil prices and demand-destroying high prices

That paper included a section headed: “The Economic Costs of Boom-Bust Oil Price Cycles.” Mr. McNally suggests that the only winners in boom-bust cycles are “savvy oil traders and storage owners, M&A attorneys and advisory firms, and astute oil market consultants.” He also believes that large, integrated oil and gas companies are better able to withstand the market volatility than smaller ones, which is fairly obvious. At the end of the day, in his view, a world without a swing oil producer to stabilize the global oil market, will cause repeated swings between supply-destroying low oil prices and demand-destroying high prices. This ensures, in his opinion, an earlier end to the petroleum era as consumers and governments abandon fossil fuels subject to wild price swings for the pricing stability of renewables. People will willingly commit to making the necessary investments in costly renewables to ensure price stability, even though their prices will be higher than fossil fuel lows, but below their highs. A key question is whether these massive investments might actually drive renewable energy costs down, a distinct possibility.

Few industry executives have experienced such a business environment

While the energy world deals with short-term, extremely painful turmoil, managers should be alert to the possible impact from the massive injection of money into the global economy and its potential to unleash a wave of commodity inflation. Few industry executives have experienced such a business environment. They also need to watch what happens between Russia, Saudi Arabia and the United States and how they might agree to work to stabilize oil prices. Oil and gas price stability, regardless of the level, will enable the energy industry to adjust operations and plan for the future. It may also extend fossil fuels’ future, critical for the existence of companies and their employees’ careers. These are turbulent times, and they require insightful thinking.

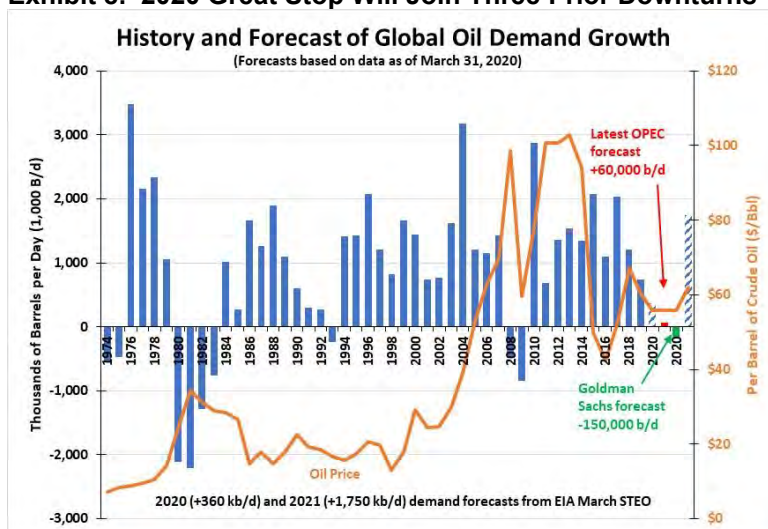
Are Today’s Oil Market Conditions Like Past Collapses?

Conditions in the oil market are a disaster. Global oil demand has collapsed as countries and cities around the world have instituted “stay-at-home” orders, which necessitates closing all non-essential businesses and essentially stopping most economic activity. At the same time, the two leading oil producing countries, who have cooperated for the past three years to manage the world oil supply, decided to not only end that working relationship, but also race to gain market share at the other’s expense.

Crude oil prices have plummeted to depths not seen for decades

Flooding the oil market and battling over market share sounds a lot like previous market collapses. As a result, crude oil prices have plummeted to depths not seen for decades. In fact, for certain qualities of crude oil, the market price reflects a negative value for their owners. In the midst of this disastrous oil landscape, one wonders how similar today's oil market is to past times of chaos?

Exhibit 8. 2020 Great Stop Will Join Three Prior Downturns



Source: EIA, BP, OPEC, Goldman Sachs, PPHB

We will soon be adding the Great Stop of 2020 to that list

When we look at annual global oil demand growth, or contraction, we can find three major contractions and a minor downturn. The three major downturns were associated with the global recessions caused by spikes in oil prices. Those downturns were associated with the Arab oil embargo in 1973, the Iranian Revolution in 1979, and the Great Recession of 2008-2009. We will soon be adding the Great Stop of 2020 to that list. The minor downturn occurred in 1993 and was associated with an earlier short recession and a 1990 oil price spike associated with the seizing of Kuwait's oil fields by Iraq in those nation's war.

The March start of an oil war between Russia and Saudi Arabia was the coup de grâce for oil prices

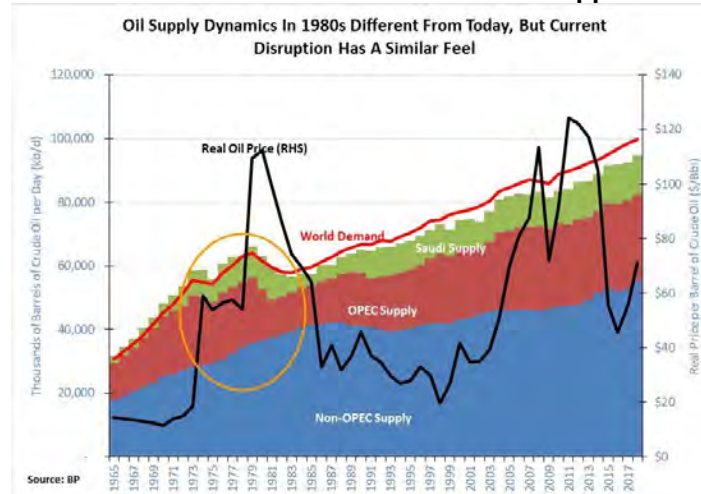
In concert with each demand downturn, crude oil prices either immediately or shortly after headed down, after higher prices contributed to their start. The 2020 downturn has not been caused by an oil price spike, unless one considers WTI rising from the low \$50s to \$63 per barrel between early October 2019 and the first week of 2020 as a modern-day spike. The 2020 demand downturn has been driven primarily by the decision of governments to shut down economic activity as a weapon in fighting the spread of the Covid-19 virus. The March start of an oil war between Russia and Saudi Arabia was the coup de grâce for oil prices. The challenge for the oil market is that its normal self-correcting mechanism is not functioning due to the Great Stop of global economic activity.

While April is expected to be the worst month for oil demand, government extensions of social-distancing and/or stay-at-home mandates will likely mean May's oil demand will improve only marginally from April's level

While every oil industry participant is struggling to understand when the Great Stop might end and then how quickly global economic activity will rebound, expectations for monthly oil demand in the near-term continue to deteriorate. While April is expected to be the worst month for oil demand, government extensions of social-distancing and/or stay-at-home mandates will likely mean May's oil demand will improve only marginally from April's level. What no one knows, and can only speculate about, is how economic and social patterns will change in the post-Covid-19 world from their pre-virus patterns. For example, will people return to flying as they did before to attend to business or to vacation? Has the idea of a cruise vacation been universally damaged? How many people will be willing to cram into commuter trains and buses, or stadiums and rock concerts? Will employees be more desirous of working from home, especially once schools reopen? All of these changes, and a myriad of other possible shifts in how we live and work, will impact on energy consumption. It is difficult to see changes being favorable for oil demand long-term, although cheap oil initially may offset demand depressing forces. Global demand shifts are happening in a world where global oil supplies are increasing.

When we look at the history of global oil supply and demand, we find interesting patterns from the 1970s and 1980s that seem to be reappearing. Much like then, the American shale oil revolution is creating the global oil supply/demand imbalance. That imbalance led to cooperation between Saudi Arabia and Russia to cut their output to balance the global oil market. The Covid-19 response of governments worldwide has upset that cooperation.

Exhibit 9. Earlier Boom-Bust Due To Oversupplied Market

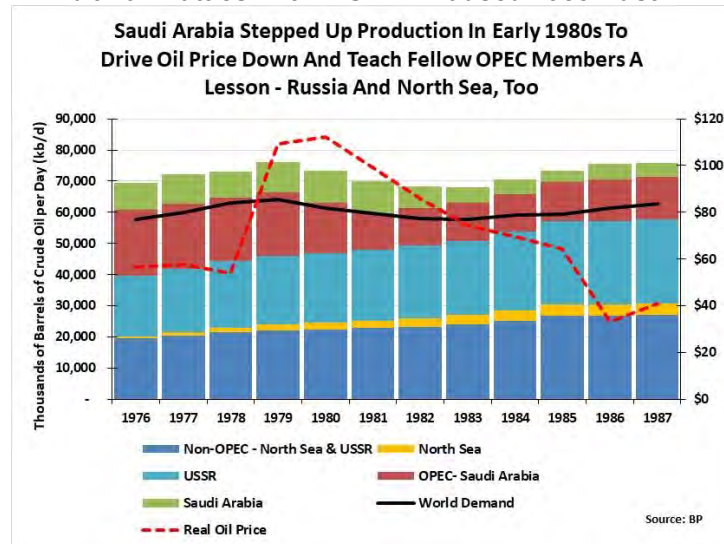


As a result of numerous forces put in play beginning after World War II, and then pushed harder as the United States approached its oil production limits in 1970, international oil supplies began growing

When Saudi Arabia began ramping up its production, the world slipped into a significant oversupplied condition

rapidly. The price shock following the Arab oil embargo in 1973 was the accelerant added to the oil price fire. As Exhibit 10 shows, global oil supply consistently exceeded demand until the early 1980s. The chart shows non-OPEC, OPEC and Saudi Arabia's oil supply. Even though non-OPEC supply was growing at a healthy rate, OPEC supply was growing faster. When Saudi Arabia began ramping up its production, the world slipped into a significant oversupplied condition. The quadrupling of oil prices in 1973 due to the embargo caused many OPEC members to want to overproduce their quotas in order to boost their incomes. These quota-busting actions precipitated the battle within OPEC that eventually led to the war in 1985 when Saudi Arabia flooded the market to teach its fellow members a lesson.

Exhibit 10. Battles Within OPEC Caused 1985 Bust



Source: BP, PPHB

We have also highlighted the emergence of the North Sea as a global supply source

When we look at the dynamics within the oil market during 1976 to 1987, we can see the magnitude of the imbalance between global supply and demand. In the last *Musings*, we highlighted the role USSR oil production played in the formation of OPEC, and we can see from the chart how its production continued to grow on top of the steady growth of non-OPEC production. We have also highlighted the emergence of the North Sea as a global supply source. It took a while for the North Sea's growing oil output to meaningfully impact the market. However, the drilling successes of the early 1970s suggested early arrival of significant output close to the major oil consuming market of Europe. However, the physical challenges of developing North Sea fields slowed the arrival of this incremental oil supply.

During this period, OPEC's output, excluding Saudi Arabia's share, was growing rapidly in the early years. At the same time, oil supply from Saudi Arabia was ramping up, as oil companies were fulfilling

As oil demand was dropping, the rest of OPEC boosted output to 12.5 mmb/d, forcing Saudi Arabia to cut its output to 7.0 mmb/d

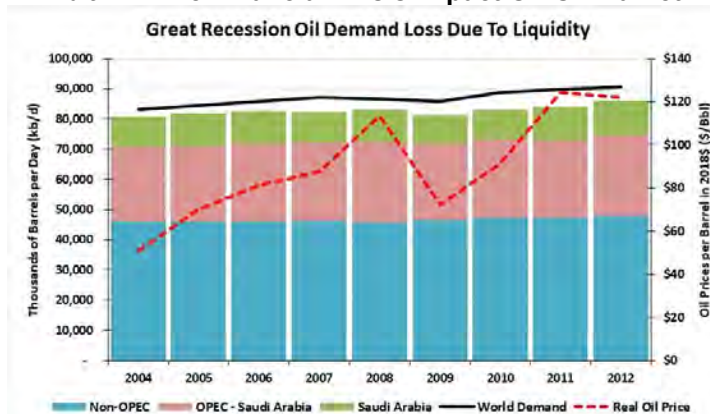
their production commitments. The major oil companies active in Saudi Arabia were working hard to boost production, as they saw few opportunities to increase their U.S. output.

When oil prices spiked in 1980, oil demand began to slide. Demand peaked at 64.1 million barrels a day (mmb/d) in 1979, but then fell 4% in 1980 and an additional 3% in 1981. The demand slide ended in 1983, but not before it had fallen by 10%. Supply dynamics were the real challenge. In 1979, Saudi Arabia's output was 9.8 mmb/d while the balance of OPEC contributed 20.0 mmb/d. The following two years, Saudi output remained stable at 10.2 mmb/d, while output from the rest of OPEC fell to 16.0 and then to 12.0 mmb/d, respectively in 1980 and 1981. During 1981, OPEC struggled to find an official oil price its members could agree upon. As oil demand was dropping, the rest of OPEC boosted output to 12.5 mmb/d, forcing Saudi Arabia to cut its output to 7.0 mmb/d. As OPEC strove to keep its output flat, Saudi Arabia was forced to continue cutting its output to support the organization's target oil price. In 1983, Saudi output had fallen to 5.0 mmb/d. Output then fell to 4.5 mmb/d the following year and hit bottom at 3.6 mmb/d in 1985. In 1986, global oil demand growth offered the opportunity for Saudi Arabia and OPEC to start increasing output.

The last demand downturn associated with the Great Recession contained none of the market dynamics of the 1980s. Demand fell in 2009, but then resumed growing as the world's economic activity rebounded quickly. The growth was driven by developing economies and a resumption of growth in developed economies.

While it appears the current oil oversupply is due to only a few countries, people often forget the amount of capacity in OPEC countries that once were major suppliers

On the supply side, it is clear that OPEC, and Saudi Arabia in particular, absorbed the demand shortfall in 2009 and the growth in non-OPEC production, which was driven largely by U.S. shale oil. However, it is becoming obvious the world is not short of crude oil. While it appears the current oil oversupply is due to only a few countries, people often forget the amount of capacity in OPEC countries that once were major suppliers. Socialist mismanagement and corruption in the state oil company has caused Venezuelan oil production to fall by two-thirds in the past two years. Likewise, Iran, who exported more than 5.5 mmb/d in 1979 prior to its revolution, has seen its exports fall from 2.3 mmb/d prior to 2018 when sanctions were re-imposed, to an estimated 250,000 barrels per day now. With changes in geopolitics, a large portion of this previous oil export capacity could be reintroduced to the market. The questions would be at what cost and how long it would take?

Exhibit 11. The Financial Crisis Impact On Oil Market

Source: BP, PPHB

A tweet from Saudi Aramco indicated that it loaded 15 oil tankers with 18.8 million barrels in one day early last week

Last week, President Donald Trump called Russian President Vladimir Putin to discuss our mutual interest in seeking a resolution of the oil war that would lift global prices and help the U.S. oil industry recover. President Trump also talked with Crown Prince Mohammed bin Salman. He seemed to have made more progress with Mr. Putin, although no agreement. The Saudi Arabian response was more dismissive. In fact, a tweet from Saudi Aramco indicated that it loaded 15 oil tankers with 18.8 million barrels in one day early last week. The issue is that there seem to be few markets available for that oil right now.

Only higher prices will help the U.S. shale industry, and that means the U.S. working with the other leading producers to control supply, not just in 2020 but long-term as oil demand slows and eventually falls

According to media reports, the Crown Prince indicated his country would only agree to action if all producers, including the United States, cut production. A former energy minister from Ecuador, speaking on a webinar about Covid-19 and South America, made an interesting point. In response to a question about the future for “green energy,” he responded that the world’s energy markets have changed significantly. For the first time in decades, the interests of the United States with respect to the global crude oil market are now aligned with those of Russia and Saudi Arabia. The world is and will remain well supplied with oil. Only higher prices will help the U.S. shale industry, and that means the U.S. working with the other leading producers to control supply, not just in 2020 but long-term as oil demand slows and eventually falls. If the U.S. embraces that idea, higher oil prices will help renewables. If it doesn’t, and oil prices remain severely depressed, renewables may struggle without continued subsidies and government mandates.

It is an interesting perspective to realize that since the 1950s, imported oil has been the nemesis of our oil policy. Initially, cheap oil imports were undercutting U.S. oil prices, harming domestic producers. Once U.S. production peaked in 1970, the debate shifted to how vulnerable the country’s economy was to foreign oil powers. As the shale revolution boosted America to become the world’s largest oil producer, and allowed the country to become an

Our energy independence effort not only changed the domestic economy's fortunes, but it also altered the geopolitical power of the United States

oil exporter again, higher oil prices have become more critical for the health of the economy. Our energy independence effort not only changed the domestic economy's fortunes, but it also altered the geopolitical power of the United States. Destruction of our petroleum industry due to the current low oil prices will erode the country's international power once again. How the U.S. responds to the current oil downturn will shape our geopolitical role in the future, and how our economy grows. It is dangerous to speculate on how this issue will unfold, but it is an issue that needs careful watching.

Downturn Hurts Industry Workers And Houston's Economy

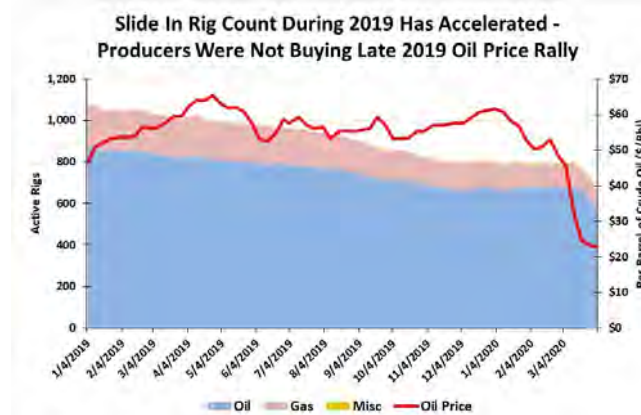
No doubt miles driven are plummeting, and with them gasoline sales

The Houston television stations and media are doing a good job covering the impact of the stay-at-home mandates on life in Houston. The evening news shows have almost always shown the 610 Loop. Now when they show it, you are amazed there could ever be so few cars. Traffic started dropping when the schools closed, which was then followed by mandated shutting of all non-essential businesses. No doubt miles driven are plummeting, and with them gasoline sales. A recent news report cited ExxonMobil cutting back gasoline output from its Baton Rouge refinery because of market conditions. We suspect the company was wondering where it will put any more output as the latest industry concern has become storage capacity.

The slide in the drilling rig count in the face of rising oil prices was an indication that producers were not believing the forecasts of a recovery in 2020

While executives may have been alerted to the potential problems the Covid-19 virus might inflict on the global economic activity and energy demand, they didn't expect a Russia-Saudi Arabia oil war. There has been concern in the oil market about growing oil inventories since late last year. Those concerns, however, had only constrained oil prices from rising. The slide in the drilling rig count in the face of rising oil prices was an indication that producers were not believing the forecasts of a recovery in 2020.

Exhibit 12. Drilling Rig Count Now Entering Freefall



Source: Baker Hughes, EIA, PPHB

The progression in the changes in the Baker Hughes weekly rig count showed: +3, -1, -20, -44 and -64

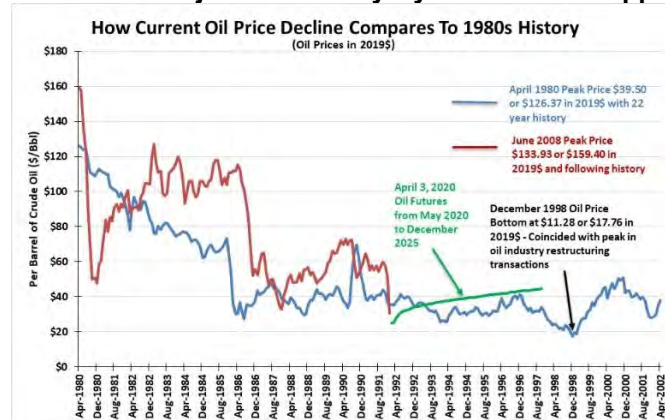
What shocked oil market observers and participants were those producers' decisions to boost output and aggressively target the other's customers

The data in Exhibit 12 (prior page) goes through last Friday and reflects the latest damage to the drilling business. The progression in the changes in the Baker Hughes weekly rig count showed: +3, -1, -20, -44 and -64. The last three weekly declines show the initial reaction of the oil and gas industry to the collapse of the OPEC+ meeting in Vienna on March 6th. It should be remembered that the OPEC meeting was held on a Friday. The way negotiations were conducted within the OPEC community, and between OPEC, Saudi Arabia and Russia, the media was kept in the dark about the possibility of an agreement. All signals about the nature of the negotiations were that they would be contentious. Since optimism is the currency of meetings such as this one, oil ministers were reluctant to announce the output agreement's death until they had communicated with their respective government leaders. That meant confusion reigned about the status of any agreement until Saturday, at which time Saudi Arabia announced its plans to ramp up exports and its production capacity, while also signaling cuts in export prices for Asian buyers and European customers.

The agreement's collapse was not a complete surprise given the rhetoric from the key parties – Saudi Arabia and Russia – since early February when OPEC's market monitoring committee began signaling the need for a large, incremental oil output cut. The Saudis were for a cut; the Russians were not. What shocked oil market observers and participants were those producers' decisions to boost output and aggressively target the other's customers. The Russians went after Asia, as Saudi Arabia targeted Europe, while cutting Asian prices to protect its market share in the region.

The speed with which U.S. oil producers cut drilling rigs from their payrolls was surprising, but it reflected the fear that oil was in a freefall and conceivably could sink into the teens or potentially even lower. Remember that wellhead prices are often at a discount from the WTI price quoted on the NYMEX. That realization forced action.

Exhibit 13. Major Oil Industry Cycles Are Overlapping



Source: EIA, St Louis Fed, NYMEX, PPHB

As every day passes, the estimate of demand destruction grows and is now in the range of 16-25 mmb/d for April and somewhat less in May

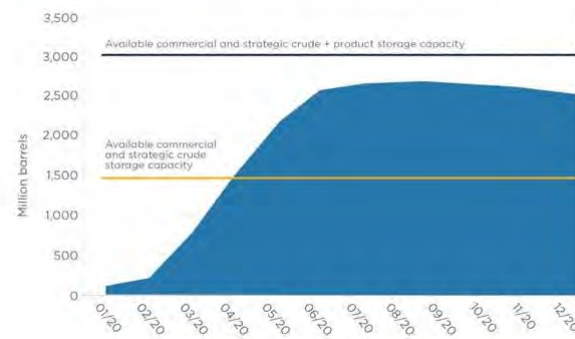
With most European countries and much of the United States in lockdown mode, the world's economy is guaranteed negative growth in the second quarter

While no one knows how the current oil war and demand collapse will play out, prospects are that oil prices are not going to rebound anytime soon. The reason is the tsunami of crude oil that has been unleashed on the market by way of the output boosts by Saudi Arabia, Russia and potentially Libya, assuming its civil war settles down. It was the disagreement over the magnitude of the oil oversupply developing due to the Covid-19 virus impact on global economic activity that derailed the March Vienna negotiations. Saudi Arabia thought an additional 1.5 million barrels a day (mmb/d) cut in OPEC+ output would mitigate the oil price decline. Russia thought the cut needed to be larger, in the range of 4-5 mmb/d. As every day passes, the estimate of demand destruction grows and is now in the range of 16-25 mmb/d for April and somewhat less in May. This is a tsunami of supply heading toward the market.

Global economic growth projections are being ramped down by the World Bank, and they are likely to continue to be revised lower in coming months. Investment bank Goldman Sachs' latest economic forecast suggests US GDP in 2Q2020 falling by 34%, up from its prior -24% projection. Goldman is also predicting a 9% decline in 1Q2020 GDP, but a much greater than earlier forecast rebound of 19% in 3Q2020. With most European countries and much of the United States in lockdown mode, the world's economy is guaranteed negative growth in the second quarter. With most of the South American and Latin American countries also restricting economic activity, as well as Asian and African countries, the negative economic impact is growing. What we don't know is the magnitude of petroleum demand destruction caused by Covid-19 and decisions by governments to shut down economic activity.

Exhibit 14. We Physically Can't Store All The Output

Figure 1: Cumulative 2020 global stocks builds and storage capacity



Source: Rapidan Energy Group

Source: Rapidan Energy

Energy consultant Rapidan Energy is forecasting about an 18 mmb/d demand loss, followed by 14 and 9 mmb/d falls for May and June, respectively. As a result, it sees oil inventories growing rapidly and exceeding available commercial and strategic crude storage

A challenge will be the ability of the industry to physically add such large daily volumes into storage tanks

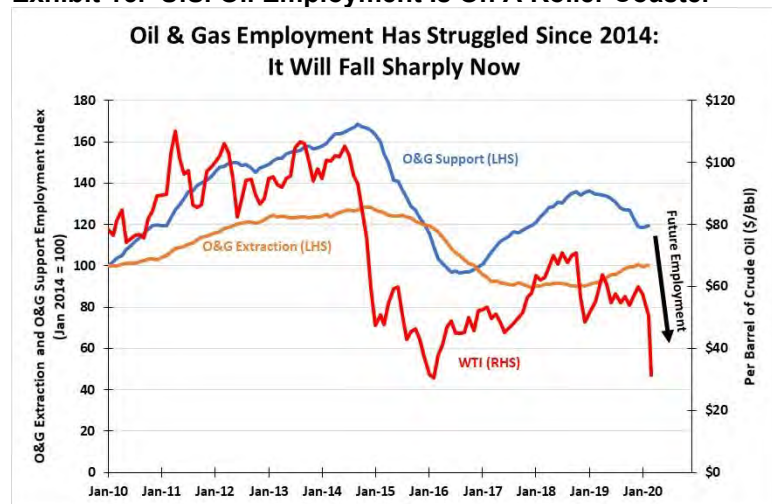
How will people view the “new normal” that follows the ending of stay-at-home and social-distancing orders?

capacity. When refined product storage is taken into account, it is possible the world has sufficient capacity, assuming it can refine appropriate volumes. A challenge will be the ability of the industry to physically add such large daily volumes into storage tanks, once they are identified. Remember, storage tanks are located all over the world and getting volumes delivered will be a logistical nightmare. As a result, the reality is that storage will likely become the bottle-neck that forces production to be shut-in.

Although Goldman Sachs is expecting a healthy economic rebound in the third quarter, the economic recovery in China is turning out to be slower than initially anticipated. How will people view the “new normal” that follows the ending of stay-at-home and social-distancing orders? Will tourism return? Will stadiums be filled to overflowing once sports seasons resume? How much business activity will be conducted at home, as communications connections improve and the value of face-to-face interaction declines? (We will be investigating the potential energy impacts of future activity scenarios in future *Musings*.)

According to data from the Texas Independent Producers & Royalty Owners Association (TIPRO), the U.S. oil and gas industry employed 895,629 professionals, an increase of 8,454 jobs in 2019 compared to 2018. According to TIPRO, Texas accounted for 40% of all U.S. oil and gas jobs, supporting 361,271 direct jobs. That was an increase of 5,550 jobs in 2019. TIPRO also reports that in 2019, Oklahoma added 398 industry jobs for a total of 68,468 employees, while New Mexico’s jobs increased by 758, to 24,720.

Exhibit 15. U.S. Oil Employment Is On A Roller Coaster



Source: BLS, EIA, PPHB

The oil and gas industry struggled in recent times given the drop in oil and gas prices and the lack of industry funding. Eugene Garcia, TIPRO chairman and president of Hurd Enterprises, LLC said, “A

reduction in available capital led to a slowdown in industry activity and a decline in employment during the second half of the year in 2019, with further cuts expected in the first quarter of 2020.” Little did he know, or expect, how industry conditions would have unfolded in the final month of 2020’s first quarter.

The U.S. Bureau of Labor Statistics tracks employment data for industry sectors that include oil and gas employment. There are two categories – oil and gas extraction, as well as support activities for mining. Both subcategories fall under the primary industry sector: mining and logging. Oil and gas extraction positions are associated with exploration and production activities, while support activities for mining include job descriptions associated with drilling activity. In Exhibit 15 (prior page), we show both data series, indexed to January 2010, to demonstrate how oil and gas employment has responded to the recovering oil market following the 2009 recession and then the 2014 oil price drop and now the current collapse. We have also shown the WTI price during this period to put employment changes into perspective.

Support activities fell immediately after the 2014 price drop, as drilling rigs were laid down quickly, although extraction employment declined at a slower pace as exploration scientific work and production maintenance work continued

Both employment categories rose steadily between 2010 and 2014, as oil prices rose and activity increased. Support activities fell immediately after the 2014 price drop, as drilling rigs were laid down quickly, although extraction employment declined at a slower pace as exploration scientific work and production maintenance work continued. Once the WTI oil price bottomed in February 2016, rig activity employment began recovering a few months later, only to peak in late 2019 before starting to slide thereafter. The extraction index showed a different pattern by bottoming in late 2017 and then remaining flat through 2018 before turning up in 2019. The BLS data is preliminary for January and February, and does not reflect the turmoil unfolding in the oil patch now. We think it is safe to say, as the arrow in the chart shows, oil and gas employment will be falling rapidly in the coming months.

The problem for Houston is that most of these positions will be white collar and skilled manufacturing jobs that are high-paying jobs

Bill Gilmore of the University of Houston had projected that Houston would lose 15,000 oil and gas jobs as a result of the deteriorating oil market earlier this year. In a comment on a Houston TV station, he is now predicting a 44,000-job loss due to the virus shutdown and oil price collapse. He did not indicate that these would all be energy jobs, but the number has to be greater than his earlier projection. The problem for Houston is that most of these positions will be white collar and skilled manufacturing jobs that are high-paying jobs. As TIPRO reported, the oil and gas industry paid a national annual average of \$114,745, more than double average private sector wages. That will be a huge blow to the Houston economy. The greater diversity of the Houston economy now compared to the 1980s economy will cushion the pain from the loss of oil and gas jobs. Still, for 2020, and likely 2021, Houston’s employment and its economy will be feeling the impact of the oil downturn.

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