MORNING BRIEFING
August 30, 2018

Full Pipelines & Killer Robots

See the collection of the individual charts linked below.

(1) Too much of a good thing in the oil patch. (2) Frackers still fracking. (3) Rigs in search of pipelines. (4) Shipping costs rising along with costs to build pipelines as a result of steel tariffs. (5) Railroads better equipped to bring sand to frackers than to take their oil. (6) Terminators are coming. Can they be stopped? (7) Beautiful swarms can be deadly.

Energy: Gushers Seeking Pipelines. There can be too much of a good thing. Too much sun causes sunburn. Too many hot dogs result in a stomach ache. And too much oil production in the Permian Basin in Texas and New Mexico is overwhelming the capacity of pipelines that transport oil. The supply crush means shipping costs are rising, and that's depressing the spot price of Permian Basin oil. It's also leading oil companies to question the wisdom of expanding their production capacity any further until pipeline capacity catches up with supply, which could take roughly a year.

The abundance of oil does have an upside: Pipeline companies can charge higher prices to oil companies that don't have long-term contracts. Pipelines are also scrambling to expand capacity, and that's giving the local economy a boost beyond the region's already robust activity. Let's drill down into this "good" problem:

(1) *Pumping all out*. US oil production has soared for over a year to 10.9 million barrels/day (mbd) in June and July from 8.5 mbd in September 2016 (*Fig. 1*). Much of the added supply has come from oil fields in Texas and New Mexico where the technological miracle of hydraulic fracking has been extracting oil that was once trapped in the earth (*Fig. 2*).

Over the past two years, as companies lowered costs and figured out how to operate in a $40- to $60-a-barrel oil environment, they've aggressively increased the number of rigs in use. The number of US oil rigs jumped to 860 units during the week ended August 24, up from a low of 316 units in 2016 when oil prices cratered (*Fig. 3* and *Fig. 4*).

Given this positive environment, the stalling of the rig count in recent weeks was notable. The number of US oil rigs has bounced between 858 and 869 for the last 13 weeks, according to Baker Hughes data. While that's not catastrophic, it's unusual given the recent strength in oil prices.

The number of oil rigs being used in the Permian Basin followed a similar pattern. The Permian, which contains the nation's largest concentration of oil rigs, saw its rig count hit 485 last week, unchanged from earlier in the month and up only slightly from 480 in early June.

(2) *Maxed out.* The number of rigs may be plateauing because the pipelines that carry crude oil away from the Permian Basin are near capacity. "Nearly all crude pipes leaving the Permian were operating at full capacity last quarter, up from an average 94% capacity during the previous three months, according to East Daley Capital Advisors. The congestion is expected to worsen over the next year and

a half, further depressing local crude prices," a 7/30 *WSJ* article reported.

Producers selling oil in Midland, TX fetch about $16 less per barrel for their oil than West Texas Intermediate gets, according to CME Group data. Those selling in Midland receive less because of the higher oil transportation costs to ports and refiners.

As you might expect, pipeline companies are pouncing on the opportunity that bountiful oil presents, and have many projects in various stages of development. The problem: Getting the approvals to build a pipeline and then building it all takes time. In addition, President Trump's tariffs on steel could drive up the cost of these projects.

'"We can drill a well anywhere in the Permian in less than 30 days. … We can bring that well online within a couple of months. It takes 18 months to bring on a new pipeline. ... It's not a quick fix," Bernadette Johnson, vice president of market intelligence at Drillinginfo, told *The Dallas Morning News,* according to a 6/1 article.

Late next year, upward of 1.8 million barrels of capacity on oil pipelines running from the Permian to Corpus Christi, TX is expected to hit the market as pipelines built by Epic Midstream Holdings, Plains All American Pipeline, and a Phillips 66 and Andeavor joint venture come online, the above-mentioned *WSJ* article added.

"Permian oil production, according to EIA data, hit 3.2 million bbl/d in early May. Current projections call for output to continue to rise to 3.6 million bbl/d by the end of 2018, and to reach as high as 5.3 million bbl/d in 2020. On the takeaway side, current pipeline capacity available for Permian producers to transport oil out of the basin equaled 2.8 million bbl/d in 1Q 2018. Several major projects are planned and being put in service … If all of these are successfully funded and accomplished, total transportation capacity should rise to as high as 5.8 million bbl/d by the end of 2020. That will balance the supply/takeaway equation," explained a 6/7 article on Drillinginfo.com.

Indeed, those betting on the future price of oil sold in Midland do expect capacity to come online because the discount slowly shrinks over the next year to only $4.62 by next August. Expect this good problem to crop up again, as pipeline capacity increases may be met with production increases, which will then create new capacity issues on pipelines. This cycle will undoubtedly make for a rich trading environment.

(3) *A Band-Aid*. In the meantime, producers have been shipping a small, but increasing, portion of oil by truck and train. The amount of chemical and petroleum products shipped by rail has jumped to 43,300 units during the final week of August from its recent low of 39,800 units during the week of November 25, 2017 (*Fig. 5*). (We are using a 26-week moving average of the data, which are very volatile on a weekly basis.)

However, shipping capacity via rail and truck are also strained and more costly. Increasing the amount of oil shipped by rail further would be tough because the rails are needed to bring fracking materials to the oil well sites.

"Many of the rail terminals in the Permian have in recent years been converted to supplier terminals, mostly for production materials like frac sand, and using them to transport crude would involve retrofitting and readjustments, which have yet to happen. In response to current constraints, Murex, a distribution company operating one of the few rail terminals in the Permian, has announced its plans to double its' crude takeaway capacity to 75 thousand barrels per day starting in Q3 2018," according to a July report by McKinsey.

The constraints in the trucking industry—primarily a lack of drivers—are being felt by many industries, not just those in the oil patch, so pipelines remain the most effective mode of transport for oil.

(4) *Industry stats*. The S&P 500 Oil & Gas Exploration & Production industry contains companies with operations far beyond the fields of Texas, but we thought we'd take a look nonetheless. The industry's stock price index is up 36.3% y/y (*Fig. 6*). Its revenue is expected to grow 16.0% this year and 6.6% in 2019, while earnings are forecast to climb tremendously this year, as they're coming off a small base, and 29.2% in 2019 (*Fig. 7* and *Fig. 8*). As earnings have improved, the industry's forward P/E has fallen to 17.5 (*Fig. 9*).

Meanwhile, the S&P 500 Oil & Gas Storage & Transportation stock price index has risen only 4.7% y/y (*Fig. 10*). The industry's revenues are targeted to grow 5.5% this year and 8.3% in 2019, while its earnings are expected to increase 22.8% this year and 13.2% in 2019 (*Fig. 11* and *Fig. 12*). Its forward P/E has also improved with earnings, to a recent 23.3 (*Fig. 13*).

Defense: Debating Killer AI Robots. A UN committee is meeting this week to discuss how to deal with autonomous weapons. Whether or not they should be allowed is a topic with strong opinions on both sides. If you want a good scare, watch this video dubbed "Slaughterbots" by Stop Autonomous Weapons, a group that—as you might have guessed—wants to ban autonomous weapons. The video portrays a world where small autonomous, flying drones easily evade capture, have cameras for facial recognition, and deploy explosives. In other words, the drones can fly, identify targeted humans, and kill their targets.

Even more disconcerting is how small armies of those drones could be harnessed. In the video, a swarm of drones is unleashed to target people in a city based on age, sex, uniform, or ethnicity. Another set of drones is unleased to attack congressmen, but on only one side of the aisle (which side, it doesn't say). Drones attack students at a college, presumably based upon their social media posts.

A number of prominent scientists are warning about the threat of AI weapons, including Tesla CEO Elon Musk and now-deceased Stephen Hawking. "Unless we learn how to prepare for, and avoid, the potential risks, AI could be the worst event in the history of our civilization. It brings dangers, like powerful autonomous weapons, or new ways for the few to oppress the many," said Hawking in 2017 at the Web Summit technology conference in Lisbon, CNBC reported on 11/8/17.

However, the decision to ban autonomous weapons may not be as cut and dried as the video implies. A 7/10 *WSJ* essay by Erik Schechter, a writer on defense and security issues, laid out the other side of the argument:

"[L]et's assume for the moment that warbots, unhampered by feelings of fear, anger or revenge, can outperform human soldiers in keeping the rate of civilian casualties low. (We'll know for sure only if such a system is developed and tested.) If the goal of international humanitarian law is to reduce noncombatant suffering in wartime, then using sharpshooting robots would be more than appropriate, it would be a moral imperative."

Along those lines, Jeremy Rabkin and John Yoo, scholars at the American Enterprise Institute, argue in a 9/1/17 *WSJ* essay: "Robots won't bring perfection to the use of force, but they can reduce mistakes, increase precision and lower overall destruction compared with their human counterparts."

Beyond the dilemma of whether AI weapons are moral, there's the practical problem of enforcing such a ban. Enforcement would be next to impossible because there's no way to discern whether a shot was

fired by a traditional weapon or an AI-enhanced weapon. Determining whether the shooter was a human-controlled drone or an AI-controlled drone would require capturing the drone and looking at its internal software.

“Countries already hide their nuclear-weapons programs behind claims of scientific research or energy production. The technology involved in autonomous weapons is a classic instance of ‘dual use,’ with obvious peaceful applications. The same technology that can produce a self-driving car can also drive an autonomous tank. A drone can just as easily deliver a bomb as a box from Amazon,” argue Rabkin and Yoo.

Likewise, the jump to AI weapons isn’t that much of a stretch from the capabilities that already exist in today’s weapons. Schechter notes that combat pilots currently rely on machines when they have to hit a target beyond visual range, the Captor sea mine hunts submarines on its own, and the Phalanx gun automatically shoots water-skimming missiles.

So perhaps instead of debating whether or not to ban AI weapons, we should be acknowledging that the cat already has one paw out of the bag.

By the way, do you recall the wonderful drone-based light show staged by Intel at the February 2018 Winter Olympics Opening Ceremony in PyeongChang, South Korea? Here is a video of the beautiful event. Intel set a Guinness World Record for most simultaneous airborne drones: 1,218 in total. Now imagine if the remarkable swarm were weaponized and programmed to execute a malevolent deed.

CALENDARS

US. Thurs: Personal Income & Spending 0.3%/0.4%, Headline & Core PCED 2.3%/2.0% Y/Y, Jobless Claims 214k, EIA Natural Gas Report. **Fri:** Consumer Sentiment Index 95.5, Chicago PMI 63.8, Baker-Hughes Rig Count. (Econoday estimates)

Global. Thurs: Eurozone Economic Confidence 111.9, Germany Unemployment Change & Unemployment Rate -8k/5.2%, Germany CPI 0.1%m/m/2.0%y/y, Canada GDP (annualized) 3.1% q/q, Japan Jobless Rate 2.4%, Japan Industrial Production 0.2%m/m/2.6%y/y, Japan CPI Total, Core, and Core-Core 1.0%/0.8%/0.5% y/y. **Fri:** Eurozone Unemployment Rate 8.2%, Eurozone CPI, Germany Retail Sales -0.2%m/m/1.3%y/y, Italy GDP, China M-PMI 51.0. (DailyFX estimates)

STRATEGY INDICATORS

Stock Market Sentiment Indicators (*link*): Our Bull/Bear Ratio (BBR) climbed for the fourth week this week to 3.26—its highest reading since late March; it rose above 3.00 two weeks ago for the first time in nine weeks. Both bullish sentiment and the correction count moved up for the fourth week, after showing little movement the previous three weeks. Bullish sentiment climbed 5.1ppts (to 59.6% from 54.5%) over the four-week period, while the correction count fell -4.6ppts (22.1 from 26.7); it was the highest reading for the former and the lowest reading for the latter since the final week of January. Eight weeks ago, bullish sentiment was at 47.1%, while the correction count was at 34.3%. Meanwhile, bearish sentiment was unchanged at 18.3% this week; it has fluctuated in a narrow band between 17.6% and 18.8% the past 13 weeks. The AAII Ratio advanced for the third week last week to 58.7%, after falling the prior three weeks from 59.6% to 47.6%. Bearish sentiment fell from 32.1% to 27.1% over the three-week period, while bullish sentiment climbed from 29.1% to 38.5%.

US ECONOMIC INDICATORS

GDP (*link*): Real GDP accelerated 4.2% (saar) last quarter, the fastest growth since Q3-2014 and double Q1's 2.2% gain. That barely budged from the initial estimate of 4.1%, though there were some changes within the components. The main revisions were to real nonresidential fixed investment, consumer spending, and trade. Real capital spending expanded 8.5% (saar)—faster than the preliminary estimate of 7.3%—following Q2's double-digit gain of 11.5%. Last quarter's revision was led by investment in intellectual property products (to 11.0% from 8.2%, saar), followed by equipment (4.4 from 3.9), while spending on structures (13.2 from 13.3) was little changed from its robust pace. Real consumer spending (3.8 from 4.0) was slightly slower than first reported, as spending on goods (5.4 from 5.9) eased a bit while spending on services was unchanged at 3.1% (saar). Within goods consumption, both durable (8.6 from 9.3) and nondurable (3.7 from 4.2) goods consumption were slower than initial estimates. Trade remained a major contributor to Q2 real GDP, as import (-0.4 from 0.5) growth moved to a slight negative from a slight positive, while export (9.1 from 9.3) growth was only a couple of ticks below its initial advance—posting its strongest growth since Q4-2013. Meanwhile, residential (-1.6 from -1.1) investment contracted at a slightly faster pace, while government spending (2.3 from 2.1) expanded at a slightly faster rate—with upward revisions to both federal (3.7 from 3.5) and state & local (1.6 from 1.4) government spending. Real final sales (5.3 from 5.1) growth was 1.1ppt higher than real GDP—posting its best performance since Q1-2006.

Contributions to GDP Growth (*link*): Real consumer spending once again was the number-one contributor to real GDP growth last quarter, with trade at the number-two spot. Some highlights: (1) Real consumer spending accounted for 2.55ppts of real GDP growth, with both services-related (1.43ppt) and goods (1.12) consumption adding significantly to Q2 growth—the latter by impressive contributions from both durable (0.60) and nondurable (0.52) goods. (2) Trade (1.17) once again is contributing to economic growth, led by strong exports (1.10); the latest revision showed imports (to 0.07 from -0.06) added rather than subtracted from growth, but only slightly. (3) Nonresidential fixed investment accounted for 1.13ppt of Q2's increase, with revisions moving investment in intellectual property products (0.47) to the biggest positive contributor of the group, followed by structures (0.39ppt) and equipment (0.27). (4) Real government spending added 0.41ppt to growth last quarter, with both federal (0.24) and state & local (0.17) government spending contributing. (5) Residential investment (-0.06) was a slight negative contributor during Q2; it has contributed positively only once in the past five quarters. (6) Inventory investment (-0.97) subtracted nearly a full percentage point from GDP growth during Q2—all nonfarm (-1.00).

Pending Home Sales (*link*): The Pending Home Sales Index (PHSI)—measuring sales contracts for existing-home purchases—took a step back in July, falling 0.7%, after advancing in June for the first time in three months. July's PHSI result fell short of year-ago levels for the seventh straight month, contracting -2.3% y/y. Regionally, sales were mixed last month, but all four regions were below year-ago levels; here's the tally: Northeast (1.0%m/m & -2.3%y/y), Midwest (0.3 & -1.5), South (-1.7 & -0.9), and West (-0.9 & -5.8). NAR's Chief Economist Lawrence Yun noted: "It's evident in recent months that many of the most overheated real estate markets—especially those out West—are starting to see a slight decline in home sales and slower price growth. The reason sales are falling off last year's pace is that multiple years of inadequate supply in markets with strong job growth have finally driven up home prices to a point where an increasing number of prospective buyers are unable to afford it." Yun forecasts that existing-home sales will decrease by -1.0% this year to 5.46mu and that the national median existing-home price will increase by around 5.0%. Looking ahead to next year, he forecasts that existing sales will increase by 2.0% and home prices by around 3.5%.

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