

Natural Resource Market Commentary

2nd Quarter 2017

Introduction

Chart 1: 100 Years of Commodity Valuation



(1) Goldman Sachs Commodity Index to 1970. Goehring & Rozencwajg Commodity Index pre-1970.
Source: Bloomberg, Goehring & Rozencwajg Models.

We are at the bottom in global commodity prices. As you can see from Chart 1 (which plots the price of commodities as measured against the US stock market going back 100 years), commodities are as cheap today as they have ever been. Only in the depths of the Great Depression and at the end of the dying Bretton Woods Gold Exchange Standard did commodities reach this level of undervaluation relative to equities. For those investors willing to ignore the noise and extreme negative commentary (regarding surging shale production, OPEC disunity, electric cars, and China's impending collapse), there is a proverbial fortune to be made if they invest today. When commodities are this cheap relative to stocks, the returns accruing to commodity investors have been spectacular. For example, had an investor bought the Goldman Sachs Commodity Index (or something equivalent) in 1970, by 1974 he would have compounded his money at 50% per year. From 1970 to 1980 commodities compounded annually in price by 20%. If that same investor had bought commodities

in 2000, he would have also compounded his money at 20% for the next 10 years (especially attractive considering the broad stock market indices return nothing over the same period).

But investors, both retail and institutional, have absolutely no interest in this radically undervalued asset class. Commodities are as cheap as they ever get relative to financial assets, and outsized returns await those willing to invest today, but nevertheless most investors still are not paying attention. In an age where everyone is obsessed with underperforming their benchmark, no one can take the risk of buying a declining or stagnant asset class—the safest bet is to stick with popular investment classes such as bonds and technology stocks.

Investors want comfort and proof that the turn is imminent and assured before they decide to invest. In the following commentary, we would like to make the case that the turn is likely here today and that, even if it is not, the future returns are so great that they are very much worth the wait. Last year, we believe commodities made their cycle-lows back in February in a spasm of panic selling before rallying strongly throughout 2016. Since January, oil prices have fallen back 20% from their highs while investors have become incredibly bearish—a situation not dissimilar to what happened back in 2001 at the beginning of the last great commodity bull market. After making its panic low of \$11 per barrel back in the first quarter of 1999, oil prices rallied strongly (up 230%) over the next 18 months. After peaking at \$37 per barrel in September of 2000, oil prices proceeded to pull back by over 50% in the next 12 months, in a wave of bearishness not unlike today. In retrospect, we know the selling spasm in oil (and all commodities) presented investors with an incredible buying opportunity. We believe the same opportunity is here for investors today.

Let's go back and look at the two most recent periods when commodities were comparably “cheap” relative to stocks and discuss the backdrops that were in place, as well as the forces that ultimately broke the bearish psychology and caused commodity prices to enter into huge bull markets.

In the world of natural resources, we believe our crystal ball is better than average, but sometimes it is equally important (if not more so) to look back instead of forward in order to understand the forces at play today. So let's turn the clocks back to 1970 to see what the financial landscape looked like as commodities made their bear market lows.

By 1970, the era of the gold (and gold-exchange) standard in the US was rapidly drawing to a close. For nearly 180 years, the US dollar had been defined by the weight and price of gold. For most of its existence, the US dollar was fixed such that one ounce of gold cost \$20.67 before 1934 and \$35 thereafter. The 1960s saw a huge economic boom that was vigorously stimulated by both the Vietnam War as well as the introduction of the Johnson administration's War on Poverty and Great Society programs. The US decided that it wanted “guns and butter,” and robust credit creation was necessary to attain both. Money supply and bank credit grew strongly throughout the

1960s, and the US ran large chronic trade deficits. These deficits resulted in a huge quantity of US dollars accumulating on the foreign government's central bank balance sheets. With the dollar pegged at \$35 per ounce (a price that was perceived as undervalued) foreign governments (led by France) began to aggressively exchange their US dollars for ounces of gold beginning in the mid-1960s. Inflationary pressures had been strongly building throughout the US economy beginning in the early 1960s, but since everyone believed the US would continue to honor its \$35 per ounce exchange privilege to foreign governments, inflationary pressures were extremely slow to spill over into commodity markets. Although it's impossible to know precisely what international bankers and investors were thinking in 1971, by judging from the weakness in commodity prices, it is safe to assume they thought the US government would at some point severely contract money supply growth, raise taxes to run budget surpluses, and force the US economy into a severe, deflationary recession. In fact, William McChesney Martin, Federal Reserve Bank Chairman until 1970, threatened repeatedly throughout the 1960s to make good on his quote from a speech in 1955 to be "the chaperone who has ordered the punch bowl removed just when the party was really warming up."

Except for the extraordinary 14-year period following the Civil War, the US dollar had always been defined in terms of gold, and the global financial community was extremely slow in believing that the US government would ever sever the link.

A great example of the "anchoring" influence of gold can be seen in the price action of copper during the 1960s. Even though the US experienced numerous copper shortages during the 1960s (brought about by the Vietnam War), by 1968, copper prices were still below their 1956 high of 42 cents. Oil prices exhibited similar behavior. Even in the face of incredibly strong global oil demand, oil prices in 1970 were only slightly higher than they were in 1957 (approximate \$3.10 per barrel). In fact demand was so strong during that period, that global oil consumption actually grew by 8% per year between 1965 and 1970. In 1969 and 1970 oil consumption grew by almost 3.5 mm b/d year over year achieving all-time demand records that still stand today. Grain prices followed a similar path. For example a bushel of corn was priced at \$1.50 per bushel in 1950 and by 1970 it averaged only \$1.40. Wheat in 1950 averaged \$1.90 per bushel and by the end of 1970 (after a big rally), it only hit \$1.80 per bushel. The deflationary effect on commodities, brought about by the mistaken assumption that US governments would eventually be forced to significantly tighten both monetary and fiscal conditions to slow the run of gold from the US Treasury, caused commodities to become completely dislocated from their incredibly bullish underlying fundamentals. Although commodities languished in an undervalued state through much of the 1960s, by the end of the decade they had set themselves up for a massive bull move. This explains the first radical undervaluation of commodities since the end of the Great Depression (1970 on the chart above).

But for students of market history (and for those interested in the similarities with today), it is imperative to understand another very important development that took place in financial markets in the late 1960s. While the huge growth in money supply and bank credit in the 1960s bypassed

commodity markets for the most part, it did find a very comfortable home in the stock market. By the late 1960s, a craze in growth-stock investing was about to grip financial markets. A group of approximately 50 high-quality growth stocks (the “Nifty Fifty”) were about to become institutional darlings and form the nexus of a stock market mania.

While the broad market reached a price-to-earnings ratio of 20 times in the early 1970s, the “Nifty Fifty” were gripped in a classic market bubble with their price-to-earnings ratio approaching 50.

For those investors prescient enough to recognize how radically undervalued commodities had become relative to stocks in 1970, it didn’t take long for their insights to be rewarded. In August 1971, President Nixon “closed the gold window” and in so doing ended the US pledge to exchange dollars for gold. The US was now free to print as much money as it pleased and to debase the US dollar to whatever level it felt appropriate. Overnight, commodity investors no longer needed to worry about a massive tightening of monetary and fiscal policy to protect the dollar’s value relative to gold and to foreign currencies. The closing of the “Gold Window” had an immediate impact on nearly every commodity. Gold prices surged by over four and half fold in just three years, while oil prices quadrupled, grain prices tripled, and copper prices doubled. For those interested in the plight of equities, the stock market peaked in the first week of 1973 and then proceeded to enter into a devastating two-year bear market. The stock market decline was led (not surprisingly) by the Nifty Fifty stocks, some of which fell by almost 90%.

For those investors willing to make commodity-related investments back in 1970, the returns were spectacular. From 1970 until 1980, the Goldman Sachs Commodity Index surged seven-fold versus a stock market that experienced a devastating bear market and which ultimately returned little. By the end of the decade, a true mania had developed in commodity markets, with many commodities becoming radically overvalued (1980 in the chart above) as investors started to believe (erroneously) that natural resources had reached a perpetual state of shortage.

As is the norm with huge bull and bear markets alike, investment opinions often conform and align with the price action of the asset class, while important underlying trend changes are often missed. For example, as oil prices raced higher and higher, common wisdom believed that the world was “running out” and that demand would continue to exceed supply. However, at exactly the same time, the huge oil deposits in Alaska’s North Slope, the North Sea, and Western Siberia (all discovered in the late 1960s), were all about to start production. In an ironic twist that few foresaw at the time the world was about to be flooded with crude oil by 1980.

By 1979, the mania that had developed around commodities prevented investors from seeing the huge underlying supply and demand changes that had taken place. It was time to get out of

commodities and back into stocks, which had gone through a devastating bear market, and had returned little for over a decade.

The great commodity bear market that stretched from 1980 to 2000 shattered the Club of Rome's belief (developed in the 1970s) that natural resource markets had entered into a period of perpetual shortage. In fact, as the great 20-year commodity bear market unfolded, a new dogma was accepted that commodities would be in perpetual surplus. Huge investments in global mining and oil and gas projects in the 1970s combined with the introduction of new technologies (cyanide heap leaching in the gold industry, solvent extraction-electro winnowing [SX-EW] in the global copper industry and 3-D seismic imaging and sub-sea completion in the oil and gas industry) all contributed to the huge surge in commodity supply throughout the 1980s and 1990s. The break-up of the Former Soviet Union also contributed to the collapse of commodity prices during that period. (For a great essay on my research and opinion on the impact of the FSU implosion on global commodities market, please consult the book *Mr. Market Miscalculates: The Bubble Years and Beyond* by James Grant and look up the chapter titled "Thank Mother Russia"). The FSU was a huge commodity producer, much of which went into their industrial-military complex. As the economies of the FSU imploded post-1990, the FSU became a huge exporter of unneeded raw materials. This excess supply continued to depress commodity markets throughout the 1990s, and contributed to the widely-held belief by 1999 that commodity prices would never again recover.

The intense level of bearish commodity psychology caused by years of excess supply growth, severely exacerbated by dismantling of the FSU, had by 1999 produced another great investment opportunity (1999 on the chart above).

As opposed to the late 1960s (when the investment backdrop of the gold standard anchored commodity prices far below their equilibrium price levels), the buying opportunity of the late 1990s was caused by a combination of excess supply and rampant bearish investor psychology. With oil collapsing to \$11 per barrel, and with copper at real price levels not seen since the Great Depression, it was hard to get bullish in the late 1990s. But for those who were willing to do serious research that tried to peer into the future, it was clear that new supply-and-demand trends were quietly emerging. These trends would ultimately force the great commodity bear market to end only a few years later. This time, it was the emergence of a huge new commodity buyer (China), combined with more than a decade of chronic underinvestment, that would cause the next massive commodity bull market to unfold.

At the same time, critical developments in the stock market were taking place. After the Savings and Loan crisis of the early 1990s, the 1997 Asian currency crisis, and the 1998 collapse of Long-Term Capital Management, the US Federal Reserve throughout the 1990s had allowed for rapid growth in all of its monetary aggregates. In a repeat of the 1960s, the majority of this newly created

money avoided commodities altogether and instead again found a comfortable home in the stock market.

As we mentioned, the commodity bear market in the 1960s and early 1970s had occurred alongside an overvalued stock market embodied by a new “craze” that revolved around the “Nifty Fifty.” In an interesting similarity, the great commodity bear market of the 1990s occurred alongside one of the most over-valued markets in US history that revolved around a full-blown market bubble in technology and internet stocks.

We believe it’s important to highlight that both periods of extremely depressed commodities prices (1970 and 2000), were accompanied by overvalued equity markets and related investment bubbles—a situation that exists once again today.

By the end of 1998, oil plunged to its \$11 per barrel lows (a price last seen in 1986) while the internet stock market bubble had begun to form. By 1999, oil had quietly slipped into a bull market (although it would take another four years before anyone acknowledged it as such) and by the summer of 2000, the tech/internet bubble had begun to break. The great commodity bull market of the last decade had quietly taken off. Just like in 1970, if an investor had chosen to invest in commodities in 1999, the payoff would have been huge. From 1999 to 2010, commodities (as measured by the Goldman Sachs Commodity Index) returned almost six-fold while the stock market returned almost nothing.

And so here we are today. After six years of declining commodity prices (brought about by shale related surges in oil and gas production, rapidly rising grain yields, and the massive expansion in certain parts of the mining industry— primarily iron ore), and nearly eight years of a rising equity market, commodities today are now priced as cheap relative to stocks as they’ve ever been, as the chart above clearly shows.

While it is obvious that commodities are cheap today, the most pressing question facing a commodity investor is what will ultimately make them expensive. If removing the anchoring effect of the Gold-Exchange Standard allowed commodity prices to explode in the early 1970s and supply disappointments and strong Chinese demand forced commodity prices higher in the 2000 to 2010 cycle, what forces will drive commodity prices up from their depressed levels in this next cycle?

We are research driven and, as we have often written, we believe that our research uncovers inflection points and trend changes sooner than the consensus opinion. As we mentioned earlier,

while our crystal ball sometimes becomes cloudy, we believe that our research more often than not gives us insight into trend changes that most investors usually miss.

What does this research tell us today? First, as we have mentioned over and over again, we believe that global commodity demand will continue to surprise strongly to the upside. Over the last 17 years, commodity-demand surprises have come primarily from China. Our modelling tells us that these upside surprises are far from over, especially with regards to oil, natural gas, copper, and agricultural commodities.

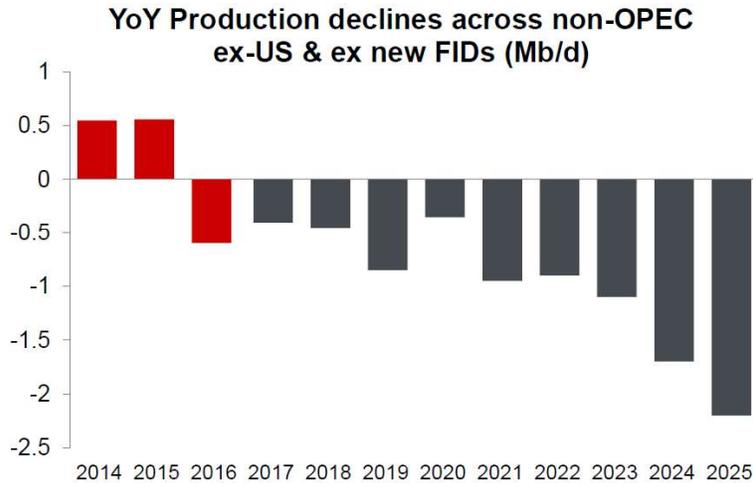
However, a new source of demand is about to emerge that few (if any) analysts mention: India. The same research and modelling that correctly predicted the rise of China early last decade now tells us India today is rapidly approaching its “tipping point” of rapidly accelerating commodity consumption. In fact, our research leads us to believe that India today is precisely where China was back in the early part of last decade. (For a further discussion of the China-India parallel, please read the “Global Oil Market” section of this letter.) And remember, the world has never before had two major countries (each with populations exceeding 1.3 billion) that are simultaneously in the middle (China) and just entering (India) their periods of intense commodity consumption growth. From the late 1960s until the early part of last decade, we calculate the world had approximately 500- 750 million people residing in emerging market economies that are in their period of high intensity commodity consumption at any given time. However, with India now joining China and the rest of the South-East Asian countries, we calculate that over four billion people have now entered into what we call the middle of their “S-Curves” – that is, the period where commodity consumption intensity rapidly increases. All of today’s headlines discuss potential weakness in future commodity consumption. However, we believe just the opposite is now unfolding. We are now entering into a period of pronounced, prolonged acceleration in global commodity demand.

Second, our models tell us that supply disappointments loom in many commodities while the conventional consensus opinion believes that supply will continue to surge. The global oil market presents a great example of the discrepancy between consensus belief and reality. For the second year in a row, new conventional oil discoveries have contracted to almost nothing. As we have written extensively in the past, for the first time ever (even including all of the reserve revisions), we are now shrinking our reserve base of conventional oil. Although the International Energy Agency (IEA) predicts large increases in non-OPEC oil outside of the US next year and beyond, our modelling tells us that non-OPEC oil supply outside of the US will severely disappoint -- an opinion that oil service companies such as Halliburton strongly agree with.

Chart 2: Halliburton Global Market Fundamentals

Global Market Fundamentals

- North America demonstrating role as swing producer
- Non-OPEC non-US production declines accelerating
- Demand growth supports long-term international recovery



Source: Wall Street research, IEA, Wood Mackenzie

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Source: Halliburton Presentation.

Furthermore, as we have discussed at length in these letters, we believe the US shale revolution will not be exportable to the rest of the world, with the exception of three plays (please see our 3rd Q 2016 letter for a detailed analysis). We have reached a bizarre point in global oil supply. For the next several years, the only source of incremental oil supply growth could very well come from just six counties in West Texas. Given our belief that global oil demand will continue to vastly exceed expectations, we ultimately believe these six counties will simply not be able to meet the growth needs of the entire world.

Finally, in a strange parallel with both 1970 and 2000, a very richly-valued equity market and a related investment mania are once again taking place at the same time as a great commodity bear market. Back in the 1960s and the 1990s, the Federal Reserve ran very loose monetary policies and very little (if any) of that newly created credit wound up in commodity markets. Both prior periods experienced extreme stock market overvaluation and both periods had distinct market bubbles. Over the last seven years, the Federal Reserve, through its three rounds of “quantitative easing” has run the loosest monetary policy ever experienced and, just like what happened back in the 1960s and 1990s, very little (if any) of that money wound up invested in commodity markets. With the general stock

market priced at 20-times earnings and with the intense speculation now taking place in the “FANG” stocks, we have yet another data point suggesting we have replicated the set up to both the 1970 and 2000 experiences. Back in 1970, the investment mania surrounded the “Nifty Fifty” while the 2000 mania surrounded the internet. Today’s mania surrounds social media and big data. Although there is no explicit reason why a commodity bear market bottom should coincide with a speculative stock market top, the fact remains that it happened twice before, and history suggests it’s about to happen again—another data point suggesting that today’s commodity bear market is rapidly drawing to a close.

Please study the chart at the top of this essay. At current levels, an investor has an opportunity to profit in commodities that comes only once in an investment lifetime. Everything has been set up, and yet few (if any) have made the investment. Spectacular returns await the few who do.

Market Commentary

Intense pessimism regarding oil prices dominated global resource markets in the 2nd Quarter. Continued talk from the Fed about both future interest rate hikes and balance sheet reductions rattled resource investors. The S&P North American Natural Resource Sector Index, which has a high weighting to the North American oil and gas stocks, declined by 7.2% during the second quarter. For the year the Index is down 11.2%.

Reflecting the relative outperformance of mining versus energy this year, the S&P Global Natural Resource Index, with its much higher mining and agricultural weightings, continued to outperform its North American peer. For the 2nd Quarter, the S&P Global Natural Resource Index declined only 1.0%. For the full year, the Index is actually up 2.5%. In comparison, the overall market as measured by the S&P 500 stock index rose by 2.6% during the quarter. For the year, the S&P 500 is up a robust 7.5%.

Oil was the worst performing commodity during the 2nd Quarter, falling over 9.5%. Exploration and production and oil service stocks were particularly hard hit. For example, the S&P E&P index fell over 14% during the quarter. For the year, E&P stocks are down over 22%. Oil service stocks (as measured by the Philadelphia Oil Service Sector Index) fell 22% during the quarter and are now down 28% for the year. As we will discuss extensively in the oil section of this letter, we believe investors are not properly appreciating the dynamics in global oil markets today. For reasons that we do not agree with, investors believe that global oil balances have loosened considerably since the beginning of 2017. We believe instead that oil markets have tightened almost exactly as we outlined back in our 4th Q 2016 and 1st Q 2017 letters.

Although investing in energy over the last six months has been painful, we believe that global oil market balances have rapidly tightened. The present weakness in energy and energy-related equities represents a huge buying opportunity for those investors with small energy exposure. Investors are now registering maximum pessimism and the underlying fundamentals have improved just as we outlined six months ago. The last time we saw such a wide divergence between reality and perception was back in the 4th Q of 2001, when oil hit \$17 (on its way to \$145, we might add). We will discuss all of the fundamental oil data in the oil section of this letter.

Outside of energy, base metals were mixed. Aluminum, zinc, and nickel were all down between 2% and 6% during the quarter. The standout was copper which rose by almost 2% during the same period. As we have outlined in these letters, we believe investor perception regarding global copper markets are rapidly changing. Last year, almost every metals analysts thought the global copper market would be in structural surplus for years and years to come. Recent data has now forced many of these copper analysts to change their stances. Please read the copper section of this letter where we outline our belief that copper and copper-related equities will continue to be great investments in the next several years. Copper equities, responding to all of the Fed talk regarding tightening, were weak during the 2nd Q (copper stocks as measured by the Global X Copper Miners ETF fell by 7.0% during the quarter) and we used that weakness as an opportunity to add to our copper equities.

Precious metals were weak overall during the quarter. Gold fell less than 1%. Silver however, showed pronounced weakness, falling by almost 10% during the quarter. Responding to the increased pressure to reduce the production of diesel-powered cars in Europe (platinum dependent) and the continued strong gasoline car sales in China (palladium dependent), platinum prices were weak (down over 2%) while palladium prices were strong (up almost 6%). Gold stocks followed the gold and silver prices and were down 3.2% during the quarter. For the year however, gold stocks are still up over 5%.

After showing pronounced strength in the 1st Quarter, physical accumulation of gold by western investors, as measured by the physical gold ETF's, turned negative in the 2nd Quarter. However, physical gold accumulation by both China and India soared in the 2nd Quarter and absorbed most, if not all of the western physical liquidation. As we have written in previous letters, we believe that history is now repeating itself and that if the Fed continues to raise interest rates and ultimately shrinks its balance sheet, the US dollar will continue to weaken (counterintuitively). Fitting this pattern, the Fed has raised rates twice so far this year and the dollar has now declined by over 7%. The Fed has indicated that it will raise rates again later this year and that it is preparing to shrink its balance sheet. We strongly believe that both of these events will put significant additional downward pressure on the US dollar. As the dollar continues to weaken, we believe western investors will aggressively return to the physical gold markets. We recommend investors maintain present positions in the gold and silver stocks.

And finally, after four years of a grinding bear market, global grain markets appear to be showing signs of life. Huge speculative short positions ran into adverse weather conditions which has finally stirred investor interest. Wheat prices were particularly strong. Record low wheat plantings in the US combined with extremely dry European weather has produced a surge in wheat prices of 20% during the 2nd Quarter and 25% for the year.

As we have written about in previous letters, global grain demand remains incredibly strong (the same “S-curve” effect that has impacted the global oil markets also significantly impacts global protein markets -- a subject we have researched and discussed at length). If we have any pullback in global grain yields (especially in soybeans), we could see global inventories swing from huge excesses to record lows very quickly. Given the above normal temperatures in the US Midwest over the last several weeks, the risk of lower-than-expected yields has increased. We are monitoring global weather conditions very closely. We ultimately believe that depressed grain prices combined with low valuations in many agricultural stocks has created the potential for an explosive move in grain prices that has made investments in the agricultural industry attractive. Accordingly, we have increased our exposure to the agriculture-related stocks.

Global Oil Markets

The disconnect between fundamentals and market perceptions in today’s global oil markets is the greatest we have ever seen. As our readers know, we first outlined our very bullish case for crude oil at the beginning of this year. Since then, we have received countless phone calls asking where our analysis has gone wrong and what would explain the weakness in crude oil prices. Quite remarkably, just the opposite has occurred. Since we first wrote, the global oil market has undergone one of the largest improvements in the fundamentals (if not the largest) ever recorded. However, the market sentiment has remained unanimously bearish. In this essay, we will explain exactly what has happened since we first wrote six months ago, where that leaves the oil market for the remainder of 2017, and what we expect to happen for 2018. In summary, with recent data all coming in positive, we are more bullish now than when we first wrote back in January. We have written over the years that we like to be involved in markets where the commodity is depressed, investor sentiment is bearish, and our analysis tells us the fundamentals have improved. Quite simply, no market better embodies these characteristics than the global crude oil markets today. A sell-side research analyst highlighted the offshore drilling stocks as having the potential “to be a career making trade,” but we believe the same can be said for the energy trade broadly.

Oil prices were weak during the 2nd Quarter, with West Texas Intermediate Crude Oil (WTI) declining by 8.5% from \$50.24 to \$46.04 per barrel. Year to date through June 30th, WTI has declined by 12%. Following the oil price, energy-related securities were down anywhere between 7% and 14% for the quarter, leaving their year-to-date performance down approximately 20-25%.

We believe oil prices completely disconnected from fundamentals in the 2nd Quarter which saw huge improvement. When we first wrote back in January, our models told us that the oil markets had been in deficit for 2016, even though the IEA's Oil Market Report at the time suggested the market had been in surplus by 700,000 b/d. A mere 90 days later, the IEA had revised 2016 demand upward by 300,000 b/d and confirmed what we had predicted last year: the market was in deficit in 2016, and OECD inventories actually drew from January 1st to December 31st. We wrote about these developments in April and further stated that as 2017 progressed, we expected the oil market to slip much further into deficit. As a result, we predicted that inventories would continue to normalize relative to long-term averages throughout 2017 and would work off most of their excess by the end of the year.

Since we last wrote, there have been numerous articles published suggesting that the OPEC cuts have not had their intended effect. These articles claim that inventories remain at high levels and that the global oil markets are still in oversupply. When we last wrote, we explained how January global oil balances did indeed suggest that the market was still oversupplied; however, since then inventories had begun to draw down rapidly (we will outline in a minute our explanation for January's anomalous reading). Global oil inventories still stand at high levels relative to long-term averages, but it is the direction of this overhang that is the most important factor to oil fundamentals. Since February global oil inventories have repaired themselves at the fastest pace since we started keeping records in 1983. Based on all the data we look at, we believe the oil market is in a substantial and persistent deficit, and we expect oil inventories to rapidly draw and normalize relative to long-term averages by early next year. The last time inventories stood at these "normalized" levels, crude oil prices were over \$100 per barrel and we continue to believe there is a strong likelihood we can reach similar price levels again sometime in 2018.

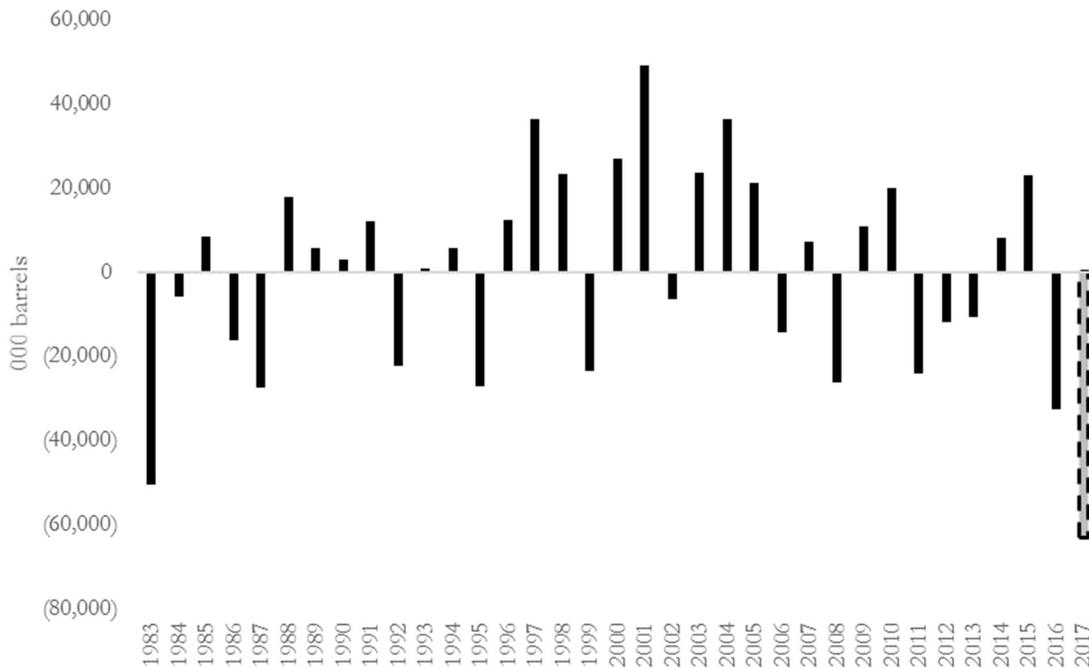
Since we last wrote in April, OECD oil inventories (a proxy for global inventories since few non-OPEC countries maintain any inventories) have drawn counter-seasonally by 22 million barrels during a period that normally sees them build by 47 million barrels. This implies that the global oil markets were in deficit by 750,000 barrels per day between March 1st and May 31st (the most recent month of global data). This is the largest three-month decline in inventories relative to long-term averages since late 2013. This inventory draw is consistent with (if not slightly ahead of) our initial estimates put forth back in January. We stated we should see the oil market in deficit by as much as one million barrels per day as 2017 progressed. Based upon our models (which accurately predicted the recent unanticipated decline in OECD oil inventories), we still believe inventories should fall to normalized levels by early next year. The implications to the oil price cannot be overstated.

The most recent IEA report (released July 12th) includes global data through May. However, the Energy Information Agency (EIA, the statistical arm of the US Department of Energy), releases real-time weekly data for the US. Since the US makes up over 50% of total OECD inventories, the

direction of US inventories is of critical importance, and the most recent data continues to paint a very bullish picture. Since the end of February, U.S. core petroleum inventories (that is, commercial crude oil, gasoline, distillate, jet fuel and residual fuel) have declined by an incredible 63 million barrels. This occurred during a period that normally sees core inventories draw by only 1.5 million barrels, implying the oil market in the US alone was undersupplied by nearly 500,000 barrels per day. Most importantly, the draws relative to historical levels have persisted in June and into the first week of July, suggesting that the strong draws we saw in OECD inventories through May (from the IEA report) will likely continue.

To help put these figures in their proper perspective, since the beginning of the year, US core petroleum inventories have declined by 20 million barrels (versus a normal build of 16 million barrels), which is a very sharp pace. Furthermore, these figures include January’s anomalous builds (which we’ll explain in great detail in a moment). Since the end of February, US core petroleum inventories have drawn by an unprecedented 63 million barrels (versus a normal draw of 4 million barrels). This is the sharpest decline for this period since the EIA data begins in 1983 and shatters the old record (set in 1983) by 25%. As you can see in the chart below, the inventory behavior has become irrefutable – the oil market is clearly undersupplied.

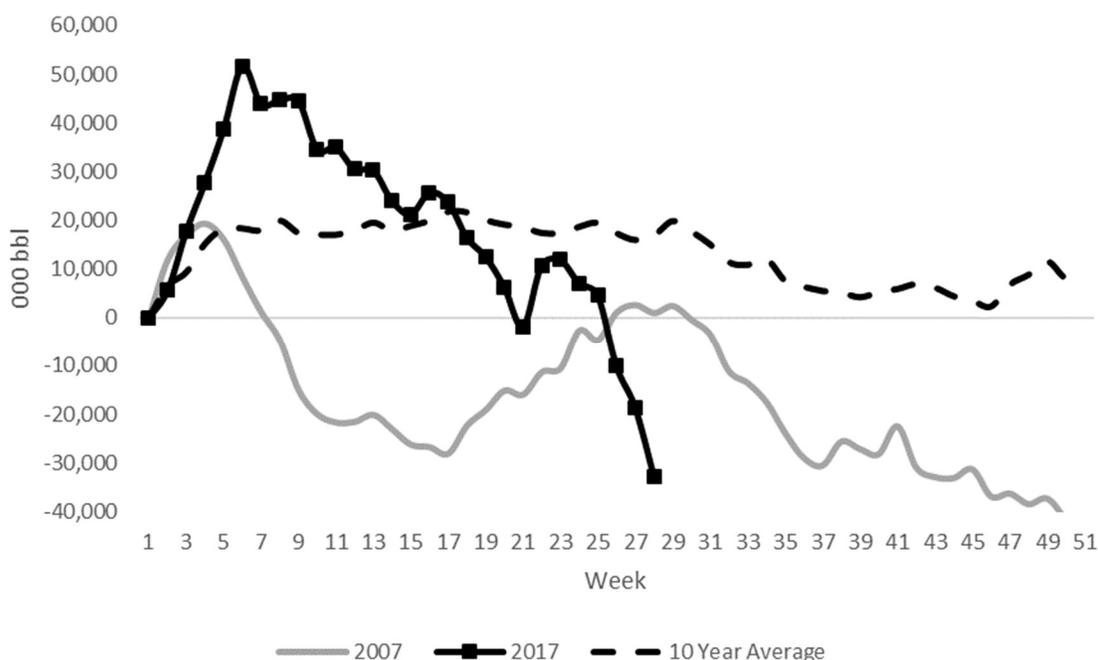
Chart 3: Cumulative US Core Petroleum Inventory Change (March-June)



Source: Energy Information Agency as of 7/20/17.

Readers of our letters will remember that we have compared the dynamics in the oil markets today with 2006-2007. At the end of 2006, OPEC (working off of flawed IEA data) believed that global oil markets were oversupplied despite the fact that inventory behavior at the time suggested otherwise--a subject we discussed back in our 2006 quarterly letters-- but few market participants took notice. As a result, OPEC cut production into an already-tight market in November 2006, inventories drew down sharply over the next 12 months, and prices advanced relentlessly throughout 2007 and 2008. We argued earlier this year that OPEC was again repeating its same mistake. Again working off of faulty IEA data, OPEC cut production in a market that had already fallen into deficit. We argued the 2016 OPEC production cut would produce inventory draws even more severe than 2007-2008, given that we expected the magnitude of the undersupply to be much greater this time around. Since we wrote, inventories have indeed followed an even more severe draw down than the same period in 2007. As you can see in the chart below, the 10-year average change in US core petroleum inventories over the first 27 weeks of the year is a build of 16 million barrels. Back in 2007, US core petroleum inventories were largely flat by the 27th week, implying a market that was ~100,000 b/d undersupplied. By comparison, this year US core petroleum inventories have drawn by nearly 20 mm b/d through the 27th week. This is a full 20 million barrels more than the comparable period in 2007 and the pace of recent draws suggests the oil market is substantially tighter today than it was in the period preceding oil's rally to \$145 per barrel by the summer of 2008.

Chart 4: US Core Petroleum Inventory Progression Throughout Year



Source: Energy Information Agency as of 7/20/17.

It has been very frustrating to see the market shrug off the recent inventory announcements, however as we mentioned earlier in this essay, these are precisely the markets we look to get involved with: markets where the sentiment is unanimously bearish and the fundamentals have dramatically improved. These have been the most important markets for us to be involved with since we began managing natural resources investments in 1991 and we are convinced that this time will be no different.

Amazingly, this has all happened in the first half of the year – a period of historically weaker oil demand compared with the second half. Looking forward through the remainder of 2017, we expect the market will get substantially tighter. The IEA is currently projecting 2H2017 global demand to average 98.9 million barrels per day, while non-OPEC oil supply is expected to average 58.6 million barrels per day and OPEC NGLs are expected to average 6.9 million barrels per day. These figures imply the call on OPEC crude oil will average 33.4 million barrels per day during the second half of the year. Much attention has been given to OPEC's recent increase in production (mainly from Libya and Nigeria), however even after accounting for these increases the most recent estimates have OPEC producing less than 32.6 million barrels per day implying the market will be undersupplied by a very large 800,000 barrels per day during the second half. Given the preliminary estimates for June OECD inventories, we should have worked off all of the overhang relative to 10-year averages by early 2018. Furthermore, as we discussed in our last letter, we believe the IEA will be forced to revise its demand estimates higher, just as they have done in eight of the last nine years. Over the last nine years, the IEA has chronically underestimated global demand and has been forced to revise its initial estimates higher by 1.0 million barrels per day on average every year. Since their first estimates for 2017 demand (released last summer), the IEA has already revised its estimates higher by 400,000 barrels per day, and we think additional revisions are forthcoming. In their latest report, they once again revised 2017 demand higher after admitting that second quarter demand looked to be more robust than initially expected. As we have written countless times, we believe the chronic underestimation is the result of not properly understanding the so-called S-Curve phenomenon and all of our analysis tells us that this phenomenon will accelerate from here. (Please read ahead to see our discussion on global demand projections.) As a result, the inventory overhang could be completely worked off even sooner than our models suggest. As we mentioned earlier, the last time inventories were below the 10-year average levels, the price of crude was above \$100 per barrel.

Looking into 2018, we expect further significant tightening in global crude oil markets. The IEA is currently projecting global demand to average 99.3 mm b/d while non-OPEC supply is expected to grow by a very strong 1.4 m b/d to average 59.7 mm b/d. OPEC NGLs are expected to average 6.9 m b/d, leaving the call on OPEC crude at 32.7 mm b/d for the full year. While it remains to be seen how OPEC proceeds at its March 2018 meeting in Vienna, if we assume, as our base case, that OPEC production will remain at today's elevated rate of 32.5 mm b/d, the oil market will be in deficit next year by 200,000 b/d for the full year. This would reduce OECD inventories by another 70 million barrels next year. However, our models tell us inventory draws could be much larger. In particular, our models suggest that the IEA's estimate for demand is likely once again understated. Furthermore, the estimates for non-OPEC production growth outside of the US are at risk of being

revised lower. We will go into both factors in a moment, however after adjusting for both demand and non-OPEC supply, our models tell us that it is very likely the global oil markets could be undersupplied by upwards of 600,000 barrels per day next year for the second consecutive year. This would be an unprecedented level of cumulative undersupply in the global oil markets and, if OPEC maintained present production levels, inventories would be drawn down to record lows. Given that global demand is expected to average 99.3 mm b/d next year that would put OECD inventory cover at 43 days, or the lowest level since the IEA data began in 1990.

We mentioned that OECD inventories grew more than we would have anticipated in January of this year. Understanding the reasons for this unanticipated inventory build is important, as we believe this build is the driving force behind the surging bearish sentiments that took place this spring. For the US, core inventories built in January by 56 million barrels during a month that normally sees them build by only 28 million barrels (suggesting the market was oversupplied by 800,000 b/d). Furthermore, January's inventory builds were not isolated to the US, as total OECD inventories built by 68 million barrels during a period that normally sees them build by 44 million barrels (confirming the 800,000 b/d oversupply). After careful analysis, we believe that January's builds were the result of several anomalous factors and are unlikely to be repeated again. First, January was incredibly mild both in the US and abroad. On a global basis, it was the third warmest January since recording began in 1880. While much of the world's oil-based heating needs have been replaced by other sources, demand was nevertheless impacted to a certain extent by the extremely mild temperatures. Second, while it is difficult to pin down precisely, our models suggest that part of January's anomalous build was caused by the last gasp of OPEC crude production making its way through the system ahead of the production cuts taking hold. For example, in the two months leading up to the OPEC announcement last November, the cartel boosted production by as much as 600,000 b/d above the level it produced throughout the summer months. This was done for several reasons, most notably so that OPEC member countries could cut production executed off of a higher base. Also, it is conceivable that OPEC member countries looked to reduce their inventories ahead of the self-imposed restrictions imposed by their cuts. Whatever the case may be, it often takes upwards of three months for a barrel of crude oil to fully work its way through the system. As a result, it is very likely that the majority of January's anomalous builds were the result of such a final surge in OPEC production that had occurred in October and November of last year. Further adding to this explanation, the IEA reported a large balancing item for November and December, suggesting that based upon their figures, the reported surge in OPEC crude had not yet made its way into storage. We believe this is what happened in January and explains the large builds across the US and OECD broadly. This is a critical observation because it means that, absent a large-scale ramping up of OPEC production (which we believe is unlikely), January's inventory builds are unlikely to be repeated.

There have been several headlines recently calling for the death of crude oil as electric cars will all but replace the internal combustion engine. We wrote in the 2nd Q of last year how the world will run out of copper long before we are able to replace even a fraction of the world's automotive fleet with electric vehicles, and we would recommend anyone interested in the topic to please read that section of our 2nd Q letter. However, in the remaining part of today's letter, we would like to

explain why we believe not only are we not approaching the end of the age of oil, but rather we are on the verge of a massive increase in global crude demand. We should point out that at present, global oil demand is incredibly robust. In the U.S., we set an all-time record in both gasoline and jet fuel demand during the 2nd Q. Globally, demand jumped by 1.5 mm b/d year-on-year during the 2nd Q and this growth is expected to persist into the second half and through most of next year. In their recent report, the IEA once again revised 2017 demand estimates higher (this time by 100,000 b/d) and called the growth in demand “dramatic.”

We have written many times in these letters about the so-called “S-Curve Tipping Point” and its impact on non-OECD oil demand. To summarize, once a country hits a certain per-capita level of GDP, its oil consumption begins to accelerate much faster, as the population moves steadily into a more energy-intensive phase in its development. Many analysts (including the IEA), have projected linear oil demand growth from the non-OECD world, whereas our research over the past decade has told us to expect exponential growth. We firmly believe this difference explains why the IEA has chronically underestimated global demand by on average 1.0 m b/d in eight of the last nine years. The IEA first put forward long-range non-OECD Asian oil demand forecasts for 2017 back in 2012, and since then they have revised up their forecast by nearly two million barrels per day in aggregate. Clearly, properly understanding this issue is of critical importance for any serious oil investor.

While this observation is not new (we started writing about the S-Curve phenomenon back in 2010), we wanted to present a few examples that help to shed light on this research at work. Back in 2001, China had not yet reached its S-Curve tipping point. In that year, its real GDP (measured in real 2010 U.S. dollars) reached \$1,900 per person. The average Chinese citizen in 2001 consumed 1.4 barrels of oil over the course of the full year. Total vehicle sales in 2001 averaged 2.2 vehicles per thousand Chinese citizens, while the airlines carried approximately 57 out of every thousand Chinese citizens. In many respects, 2001 was a typical year for Chinese per capita oil demand growth: it grew by 0.02 barrels per person that year, very much in line with the average rate it had grown over the prior 25 years of 0.03 barrels per person per year. This steady-state equilibrium was on the verge of a sudden change however. By 2008, Chinese real GDP reached \$3,800 per capita (the beginning of the S-Curve). At that point, the average Chinese citizen consumed 2.2 barrels of oil over the course of the year. Instead of two vehicles being sold per thousand citizens, by 2008 this figure reached nearly nine vehicles. Similarly, total passengers carried by airlines increased from 57 per 1,000 Chinese citizens to nearly 100. Before most analysts realized what had happened, Chinese oil demand growth had quadrupled from 0.03 barrels per person per year to 0.12 barrels per person per year in only seven years. Nevertheless, most analysts still did not appreciate the seismic shift that had taken place, and as a result the IEA has chronically underestimated demand ever since.

By 2017, Chinese real GDP is expected to reach \$7,377 per person. Oil demand meanwhile has continued its relentless growth, and is expected to reach 3.2 barrels per person this year. Vehicle

sales have nearly tripled since 2008 and now surpass the US on an absolute basis by nearly 60% (a truly incredible statistic given that as recently as 2005 Chinese total vehicle sales were 67% below the US). This year, 24 vehicles will be sold for every 1,000 Chinese citizens, while total airline passengers carried is expected to reach 414 out of every 1,000 Chinese citizens. And please remember, our research tell us that China, at its present per capita GDP levels, is only 40% through its “S-Curve” trajectory. Such is the power of the S-Curve at work.

Despite the fact that this phenomenon has been going on for over a decade, its impact continues to confound most energy analysts. Another factor that has gone unnoticed by many is that the S-Curve is not simply confined to China. Indonesia, Vietnam, the Philippines and Thailand are all experiencing the same phenomenon. However, the wild card going forward will be a country that few (if any) analysts are writing about today: India. Long time readers will recall that we have often said that India is expected to join the S-Curve club sometime in the beginning of the next decade, based upon all of our modeling work. However, we now believe our models were too conservative and that India now looks to be entering its S-Curve tipping point five years sooner than we previously estimated. From 1970 to 2000, the average number of people going through the S-Curve tipping point globally was relatively stable at approximately 700 million. If we are correct, then we are on the verge of having four billion people globally all going through the S-Curve tipping point together. Simply put, we are potentially entering the largest period of commodity demand growth the global economy has ever experienced.

Where is India today and how do we expect it will ultimately develop going forward? India per capita GDP today stands at \$1,973 per person – exactly the same level as China in 2001. The average Indian consumes 1.2 barrels per oil per year, once again very much in line with China in 2001. Over the last decade, India has grown its oil consumption by 0.03 barrels per person per year just as China did in the decade leading up to 2001. However, there is some evidence to suggest that India is further along its growth trajectory than we had believed. For example, Indian vehicle sales are expected to reach 2.8 vehicles per thousand Indian citizens, which is higher than China was in 2001. Similarly, total airline passengers carried is expected to hit 90 out of every 1,000 Indian citizens this year. These figures are 35% and 55% ahead of where China was in 2001. It should come as no surprise then that Indian oil demand is growing at a very robust rate. Next year, Indian oil demand is expected to grow by 300,000 b/d just as it has since 2016, making it the second largest source of global demand after China. Since 2016, Indian per capita oil demand has grown at nearly 0.7 barrels per person per year, suggesting to us that India has already entered its S-Curve tipping point phase.

If we were to use China as a guide, then we should expect to see Indian oil consumption growth reach approximately 0.12 barrels per person per year over the next several years which, given India’s population of nearly 1.4 billion people, would equate to annual demand growth approaching 500,000 b/d every year. However, the IEA in its latest Medium Term report projects that Indian demand will grow by only slightly more than half that rate until 2022. Our models once again tell us that the analytic community is missing the mark in regards to global oil demand, just like they did with

China at the start of last decade. Instead of entering a period of subdued oil demand growth, we are on the verge of entering the next stage of rapidly accelerating growth. The implications to the global economy and oil markets are tremendous.

One element we have not touched on is non-OPEC supply. Back in 2013, we undertook a huge project to estimate the future growth potential in non-OPEC / no-US oil supply. We are in the process of updating a large-scale research project regarding the looming disappointments in non-OPEC oil supply outside of the US and will write about our conclusions in the next letter. In short, the IEA is projecting non-OPEC oil supply growth outside of the US to grow by 700,000 b/d next year and we think these figures are far too optimistic. A large energy-service company in a recent presentation stated that given the curtailment of capital spending by oil companies globally, there is actually risk that non-OPEC oil supply outside of the US contracts by several hundred thousand barrels per day each year for the next several years (Chart 2). Our initial results support this conclusion and we will write about it in depth next time. Also, there has been much attention paid to the US shales. As we have repeatedly outlined in these letters, we believe the shales will continue to grow robustly, but that they will not be enough to meet global demand going forward. And now recent data indicates the US shales have slowed their growth dramatically, which confirms our models. Between January and May, total US production grew by 572,000 b/d according to the EIA weekly data. However, since then, US production growth has slowed dramatically to only 55,000 b/d. Please note that this has been adjusted for hurricane-related disruptions in the Gulf of Mexico during June. We are working on figuring out the reason for this dramatic slowdown. Our preliminary research suggests that the accelerated completion of drilled-but-uncompleted wells in the shale plays at the end of last year and the beginning of this year may explain the slowing. Please read our next quarter's letter when we will discuss all of these supply trends in great detail.

Copper Market

At this point last year, most investors took an extremely negative view towards global copper markets. Weakening Chinese demand, surging global mine supply, and massive “hidden” copper stockpiles in Chinese warehouses supposedly posted as bank financing collateral were all commonly accepted bearish data points that would ultimately drove copper prices lower.

We strongly disagreed with all these arguments. We believed that Chinese copper demand would remain strong, that surging 2015 and 2016 mine supply would come to a halt, and that little if any copper actually existed in Chinese metal warehouses. If our analysis was correct, we believed copper bears would have to eventually drop their negative stance and come to accept the vastly improved underlying fundamentals in global copper markets. In last quarter's letter, we quoted one of the prominent firms that had taken a strong bearish stance towards copper in 2016 and who ultimately was forced to reverse its bearish stance last quarter. The firm wrote: “The improvement in demand growth was stronger than we had anticipated and appears likely to absorb much of the

‘wall of supply’ that we had expected would drive prices lower during the 2H16 and early 2017.” And as we continue into the second half of 2017, additional firms are now reversing their previously bearish stances toward copper prices. For example, another firm which had been very bearish toward global copper markets, wrote just last week that: “After overhauling our global copper supply-demand and Chinese demand frameworks, we now forecast the copper market to be in deficit over the medium-term (from near-term surpluses previously). With market tightness reducing inventory levels over 2018, we expect prices to rebound by 2019.”

As we have written about many times, the copper analytic community has been incorrect in their projections of Chinese copper demand. If China wants to grow out of the “middle-income” trap that has stranded many an emerging economy, then the amount of copper invested in its economy will have to almost double from its present levels. It now seems that many analysts are recognizing this fact, and as a result are raising their long-term Chinese copper growth assumptions.

However, even with these revisions, we believe that most analysts are still significantly underestimating global copper demand. For example, few analysts have made any comments regarding what’s presently occurring in India. As you have read in the oil section of this letter, more and more evidence is emerging that India is now entering their period of accelerating oil consumption. If this is true, then India is also approaching its period of rapid acceleration in copper consumption. Although our copper and oil models are based on somewhat different frameworks, both predict an acceleration in consumption when per capital GDP passes ~\$2,000 in per capita real GDP.

Emerging evidence is now confirming that India is indeed approaching its period of rapid growth in electric consumption which is the largest driver of copper consumption. In last quarter’s letter, we quoted from a front page *New York Times* article that discussed how Indians are beginning to develop a strong desire to buy air conditioners. On May 1st, Forbes’ online magazine ran the following story: “The World’s Hottest Market: Air Conditioners For India and Hundreds of New Electric Plants to Power Them.” The article goes on to state that “India is poised for an explosion in room air conditioning that may require as many as 300 new electric power plants in the next 10 to 15 years. ACs are the first appliance people want to buy when they cross a certain income threshold. Millions of Indians are expected to cross that threshold in the next 10 to 15 years, so analysts expect demand for room air conditioners akin to the surge in China around the turn of the millennium.”

Similarly, an article appeared in Zee Business (an on-line India news service) on April 25th with the headline: “Air conditioner sales sizzle in India’s scorching summer.” The article goes on to state that “meanwhile, Indians are buying air conditions at a faster pace than ever. Partly due to the higher disposable income and also due to the scorching summers year after year. Currently only 4 to 5% of households in India currently have ACs, and this is expected to grow by 15% per year until 2020.” In tropic climates (such as India’s), air conditioning is one of the largest sources of electricity consumption and our models tell us that as a result, India’s electricity consumption is set to soar.

The copper needed for the build-out of India's electricity generating infrastructure will be huge. India has an incredibly low level of copper installed in its economic infrastructure at present. Our models calculate that today India has only 15 pounds of copper per person invested in its economic infrastructure versus China which has approximately 175 pounds per person invested in its infrastructure. Given this low level of copper in the economy combined with India's 1.3 billion person population, our models tells us that Indian demand alone will add nearly 400,000 tonnes of incremental world copper demand in the next several years. This would add an additional 50% to annual copper consumption growth. And this is before we get around to the huge amount of copper demand that will be associated with building out the global renewable electric generating base—a subject we have discussed at length.

Meanwhile, global mine supply has now stopped growing. Because of the start-up and expansion of four large mines in Peru and two huge mine expansions in Kazakhstan , global copper mine supply grew by almost 5% in 2015 and by almost 7% in 2016. Most of this new supply has now come on line and our models tell us that global copper mine production growth will experience a rapid slowdown beginning in 2017 and lasting until the beginning of the next decade. Copper mine supply data from the World Bureau of Metal Statistics confirms that global copper mine supply has been flat now for over 18 months, confirming that the bulk of this copper supply surge has ended.

Chinese copper demand remains strong while India has now entered its period of rapid copper consumption, and mine supply has stopped growing. As a result, we expect to see significant inventory drawdowns over the second half of this year, leading to significant upward copper price pressure. Copper remains our preferred metal investment and we recommend significant investment in the global copper industry. We used the weakness in copper equities to increase our holdings in selective copper stocks.

Precious Metals

As we mentioned earlier, gold was down slightly during the second quarter, while silver (more rattled by the Fed's talk of rising rates and shrinking balance sheets) actually declined by over 9%. Despite the recent price action, we remain bullish toward precious metal markets.

Western investors have recently reversed their first-quarter physical gold accumulation. As you'll recall, the twelve physical gold ETFs that we track liquidated 225 tonnes of gold in the final months of 2016. These same ETFs reversed course starting in January and lasting until the first week in June. Over that period they added close to 120 tonnes to their physical holdings. Since the

beginning of June however, we have seen a return to liquidation as these same 12 ETFs have again liquidated approximately 30 tonnes in the last month and a half.

However, offsetting this weakness in western demand, we have seen an explosion in both Indian and Chinese physical demand. Lingering Indian distrust surrounding paper currency after last year's forced note exchange program combined with a financial system that has re-liquified and an excellent start to the Indian monsoon season has re-stimulated Indian gold demand. It now appears that India imported over 500 tonnes of gold in the first six months of 2017. Although some of this demand was pulled forward to avoid the increased GST that was imposed in the second half of the year, very recent Indian premium trends indicate that the initial imposition of the GST has had little impact on gold demand through July. Even if gold demand weakens slightly, a 900 tonne import figure would represent the strongest Indian gold demand reading since 2012. In China, premiums for physical gold continue to move higher, indicating that demand remains extremely robust.

With the US dollar now beginning to show considerable weakness, we believe that western investors will soon resume accumulating physical gold. Recent behavior by western physical silver buyers suggests that we could be on the verge of a significant period of western physical gold accumulation as well. Because of its inflation and economic sensitivities, changes in the behavior of precious metal investors are often expressed first in the silver market. We track nine physical silver ETFs, and a significant trend change is now clearly taking place even though few precious metal analysts have commented upon it. As opposed to the gold ETFs, which have shown little in the way of net accumulations since mid-April, the silver ETFs have begun what looks to be an aggressive accumulation cycle. Starting in November of last year through mid-April, the nine silver ETFs liquidated nearly 110 tonnes of silver (or approximately 45% of the silver they accumulated in all of 2016 -- very similar to what the gold ETFs did during the same period). However, this liquidation abruptly stopped at the end of April and since then the silver ETFs have been aggressively accumulating. Since April 20, these nine silver EFTs have added nearly 125 tonnes of silver (more than what they liquidated between November and April). The silver holdings of these ETF's have now reached 2,117 tonnes, surpassing their prior peak holdings set in November of last year. By comparison, the holdings of the twelve gold ETFs we follow now stand 140 tonnes (or 7%) below their November levels. Given that trend changes often occur in silver markets ahead of gold, we believe that we are on the cusp of a large return of physical gold accumulations by western investors.

We are bearish on the US dollar and we believe gold is cheap on our models. Chinese and Indian demand both remain extremely strong, while the behavior of physical silver investors indicates to us that western investors are about to return to the physical gold markets. We continue to believe precious metals equities remain excellent investments.

North American Natural Gas

Henry Hub natural gas prices were weak during the 2nd Q, as milder than normal weather decreased demand while US production grew for the first time in two years. Prices declined by 4.9% over the course of the quarter to end at \$3.19 per thousand cubic feet.

In our last quarterly letter, we explained how we were constructive on US natural gas in the short term, as continued strong demand (from coal-to-gas switching and the ramping up of LNG exports) and declining production (at that point in time) had left the market in deficit. Inventories grew over the winter due to the near-record mild weather in the US, but we expected this to change as winter gave way to spring and summer. However, we were less optimistic on the longer-term fundamentals, given the ability of US gas supply to grow materially, driven primarily by the tremendously productive Marcellus and associated gas volumes from increased activity in the gas-rich Delaware sub-basin in the Permian.

Our views remain largely unchanged. Gas demand remains strong, but our concerns about growing gas supply have already appeared. The 2nd Q (or “shoulder season”) is traditionally a period of inventory builds, as both winter heating demand and summer cooling demand are typically at subdued levels. Total inventories built by 837 billion cubic feet during the quarter which was slightly less than the average historical build of 908 billion cubic feet over the same period. The Sabine Pass LNG export facility continued to increase its throughput and reached 1.7 bcf/d in April (the most recent monthly data available), a five-fold increase compared with last year as its ramping up continued. This was the major driver of the lower-than-average inventory builds experienced during the quarter. We expect that this new source of demand is now permanently embedded in the system and will persist going forward.

While the increased LNG exports are clearly a positive for the US market, our concerns regarding production growth now appear to be justified. Between January and April, US gas production grew by nearly 1 bcf/d – the largest three-month growth rate since 2015. Incredibly, this occurred with a US rig count that stands 43% lower than it did over the same period in 2015. Just as we had predicted, growth was driven by increased production in both the Marcellus and the Permian (most likely from the Delaware side although EIA didn’t give a breakout). However, we did not anticipate production growth from another source – the Haynesville. After peaking at an incredible 10.5 bcf/d in 2011, the Haynesville spent the next six years declining by over 40%. However, beginning in March of this year, the basin actually started to grow once again. Between January and April, the Haynesville added nearly 200 mmcf/d of production and initial predictions from the EIA suggest that this growth has actually accelerated.

With the hottest days of summer still in front of us, and hot temperatures in many parts of the country, there is a likelihood that inventories will draw relative to normal as we progress through the season. Furthermore, additional LNG volumes loom in the distance as new trains are brought online

at Sabine Pass. However, we maintain our neutral view toward natural gas markets due to the potential for a large supply response.

Agricultural Markets

Wheat prices were very strong during the 2nd Q, advancing by nearly 20% on concerns over the condition of the crop resulting from excessive heat in the midwestern US and lack of rain in Europe. Soy and corn prices were more subdued, declining by 0.40% and rallying by 1.72% respectively. Since the end of the quarter, soy and corn prices have fared better, increasing by 6% and 3% respectively.

As we wrote last quarter, global agricultural markets remain in a very interesting state. Global grain demand remains extremely strong, as developing countries continue to increase their protein consumption. We wrote at length in our past letters regarding the effects of rising incomes in the non-OECD world on the global grain markets. The same phenomenon we describe in our oil section very clearly impacts global protein demand – another example of the S-Curve at work. As a country hits a certain level of per capita GDP, they switch from a starch-based diet to a meat-based diet. Since raising livestock is up to seven times as grain-intensive as subsisting on a plant-based diet alone, the impact on the grain markets is immense.

However, the robust demand trends were masked last year by record crop yields in nearly every growing region globally. Yields in the US shattered prior records as growing conditions were nothing short of perfect. We argued earlier this year that it would be almost impossible to recreate last year's perfect global conditions and there is a high likelihood that global grain inventories would be drawn down more sharply than anticipated this year.

Since then, conditions have been very hot in much of the US and excessively dry in parts of Europe. In their most recent report, the USDA reduced US wheat production by 64 million bushels to 1.7 bn. Corn and soybean production has not been revised materially, but there is a risk that it may need to be if conditions do not improve.

Friday, July 21st 2017

As recently as April, speculators were incredibly bearish regarding the grain markets. The net exposure of speculative wheat traders reported by the CFTC hit an all-time net short level at the end of April. Soy and corn speculators did not hit all-time net speculative length, but both were at multi-year net short extremes. The price action since then is likely the result of speculators covering their short positions in the face of less-than-perfect growing conditions. We have become slightly more bullish regarding the global agricultural markets, as it now seems likely that 2017/2018 yields will fall below the records set last year. As a result, global demand trends should now come to the fore as the year progresses. Because of these strong demand trends, our models tell us that global stocks could end the year materially substantially lower than consensus estimates. As a result, we added to certain of our agricultural investments over the quarter.