



**QUARTERLY U.S. RURAL ECONOMIC REVIEW**

# Mounting Agricultural Supplies Pressuring Prices

This quarterly update is prepared by the Knowledge Exchange Division and covers the key industries served by CoBank, including the agricultural markets and the rural infrastructure industries.

**Inside this Issue...**

Preview.....2  
 Global Economic Environment.....2  
 U.S. Economic Environment.....3  
 U.S. Agricultural Markets.....3  
 Grains, Oilseeds, and Ethanol.....3  
 Animal Protein Industries.....7  
 Other Commodities .....15  
 Crop Nutrients/Inputs .....18  
 Rural Infrastructure Industries.....19

**Key Points:**

- *Agricultural supplies are on the increase. From field crops to dairy and animal protein, supplies of agricultural goods are building and prices are suffering.*
- *The corn and soybean markets are now caught in limbo between the record-high global harvests in 2014/15 and expectations that the new crops for 2015/16 will be nearly as large.*
- *The EPA's newly proposed Renewable Fuel Standards will not impel blenders to exceed the 10 percent blend wall, but will provide a demand floor if ethanol blending economics turn negative.*
- *Beef will remain in short supply throughout 2015 and much of 2016, with no material increase in beef production expected until 2017.*
- *The poultry industry is greatly concerned about the current outbreak of highly pathogenic avian influenza (HPAI), its trade implications, and its potential for disrupting the domestic market.*
- *Dairy market indicators are mixed. Some are signaling that the worst of the market correction is behind us, but others are suggesting that the correction has not yet run its full course. In our view, the risks to the U.S. dairy industry still lie predominantly on the downside.*
- *As the California drought enters its fourth year, most growers of specialty crops will remain in the black in 2015, albeit with a few outliers posting modest losses. However, their financial stress would worsen if the drought persists into 2016.*
- *The current global glut of crude oil will likely persist into 2016, making it difficult for oil prices to exceed \$70 a barrel through the rest of this year and probably next year as well.*
- *The recent decoupling of forward power prices and forward natural gas prices suggests that wholesale markets are anticipating more volatile prices in the face of capacity constraints as coal plants are retired.*
- *As a result of growing commercial and consumer uses, the developing Internet-of-Things marketplace is likely to open additional opportunities for wireless and wireline telecom providers.*

## Preview

Larger global agricultural commodity supplies and a subdued pace of demand growth have led to a steady increase in expected global inventories of most commodities. These accumulations pose particular challenges for U.S. growers because of the sharp appreciation in the value of the U.S. dollar. The grain, oilseed, and cotton markets are now caught in limbo between the large supplies from the record-high global harvests in 2014/15 and expectations that the new crops for 2015/16 will be nearly as large. Weather conditions, export sales, logistical complexities, and currency realignments are all adding volatility to the marketplace. The animal protein and dairy sectors face a similar array of uncertainties. Strong domestic demand, lower feed costs, animal disease outbreaks, and deteriorating exports have created a diverse combination of market crosswinds that impact each of the protein markets in diverse ways.

In this challenging environment, the net cash income for U.S. agriculture will likely decline significantly in 2015, perhaps by as much as 35 percent. Of course, net cash income over the past five years has averaged nearly 70 percent above the level of the previous decade, and financial balance sheets in the sector are extremely strong in most areas. Plus, price adjustments for a wide array of inputs, including land rents and values, fertilizers, and crop protectants, will likely mitigate the prospective decline in net cash income. Nonetheless, farmers, ranchers, and agribusiness executives are all preparing to tighten their belts this year and next.

## Global Economic Environment

Global growth expectations for 2015 softened considerably early in the year, with surprising weakness in the U.S. economy. The global outlook remains focused on U.S. growth momentum, central bank transitions, and geopolitical gyrations, all of which have created sharply divergent growth paths for a wide range of countries. The U.S. economy will remain the primary growth engine as it regains momentum through the remainder of the year. Central bank actions, continued low oil prices,

and strengthening trade flows should provide improving economic conditions in Europe and Asia. South America will continue to struggle with reduced commodity prices, weak currencies and limited capital inflows. China will likely inject additional domestic stimulus as the year progresses to sustain annual growth rates of 6.5 to 7 percent. Analysts are anticipating that the global economy will grow at about the same subpar pace as it has since 2009.

But significant headwinds remain:

- **The Eurozone continues to struggle with the Greek debt issue.** It is likely to be on-again and off-again throughout 2015 as temporary actions address each crisis deadline and kick the can down the road. Concerns about a Greek exit (“Grexit”) from the Eurozone will keep financial markets and central bank actions uncertain. Growth in Europe has exceeded earlier expectations but remains subdued.
- **China’s growth rate is in question.** Continued low oil prices and strong export markets have aided China’s attempts to transition their domestic market, but additional stimulus will likely be needed to sustain their targeted growth path. Shadow banking exposure to the real estate sector in particular remains an issue.
- **Central bank policies occupy center stage.** Central banks around the world will remain on divergent policy paths in 2015. The U.S. Federal Reserve Bank continues to signal a gradual transition to higher interest rates beginning later in 2015. The Bank of England would likely follow suit if the European economy continues modest growth. The Bank of Japan and the European Central Bank (ECB) will be continuing their quantitative easing and maintaining their near-zero interest rate policies. These divergent policy transitions will leave financial markets unsettled.
- **Geopolitical flare-ups will be ongoing challenges.** The Middle East turmoil appears to be expanding rather than contracting, and Ukraine’s problems will linger for some time and reduce growth potential in both Russia and Europe.

## **U.S. Economic Environment**

Analysts had anticipated that the first half of 2015 would be rocky in the U.S. due to the impacts of severe weather in the Northeast, the West Coast port slowdown, energy sector adjustments to lower global prices, swings in business inventories, and the deteriorating trade deficit. They were right. GDP growth slumped to minus 0.2 percent in the first quarter. However, recent monthly indicators suggest that the U.S. economy, led by consumer spending, is beginning to regain its momentum.

The growth trajectory for the U.S. economy over the balance of 2015 will reflect a perplexing combination of forces in which headline growth will understate the strength of demand for food and agricultural products. U.S. consumers remain the key catalyst to U.S. growth, and their confidence appears to be solid. Job growth remains strong, home prices continue to increase, consumer debt levels have declined sharply, and equity markets are at record highs. While business investment remains subdued relative to corporate profits, the housing sector is showing signs of a sustained recovery, particularly for single family construction. However, the greatly appreciated value of the U.S. dollar and continued widening of the U.S. trade deficit will be significant drags on growth, and government spending at all levels will provide little overall stimulus.

Looking ahead to the second half of the year, a key uncertainty hinges on how the financial markets will react to the Federal Reserve's commencement of a move toward higher interest rates. The Fed is signaling a gradual increase in interest rates beginning in late 2015, with one or two small hikes in the Federal Funds rate by year-end. How the equity and bond markets react to the long-anticipated tightening of U.S. monetary policy will impact economic growth patterns in the second half of 2015 and carryover into international markets. As U.S. interest rates rise in relation to those abroad, so will the value of the U.S. dollar. Some analysts are calling for parity between the U.S. dollar and the euro by year-end.

“*The Fed is signaling a gradual increase in interest rates beginning in late 2015.*”

## **U.S. Agricultural Markets**

Agricultural supplies are on the increase. From field crops to dairy and animal protein, supplies of agricultural goods are building and prices are suffering. All combined, corn, wheat, and soybean stocks will rise in 2015/16 to record-highs both in the U.S. and globally. World supplies of cotton, rice, and sugar remain at all-time highs, and dairy, poultry, and pork supplies are expected to reach record highs domestically and globally in the coming year. These considerations suggest that agricultural producers and many of the agribusiness supply chains will face even more challenging price environments in coming months. Some processors, however, are benefitting from the lower raw commodity prices. Ethanol producers, soybean crushers, and dairy processors have thrived due to lower input costs, despite other challenging market conditions.

## **Grains, Oilseeds, and Ethanol**

Growing global stocks have pushed grain prices lower and reduced volatility. These inventories pose particular challenges for U.S. growers because of the sharp appreciation in the value of the U.S. dollar. However, the greater global supplies will remain the key driver of major price movements over the medium to longer term.

The USDA's latest estimates for the 2015/16 crops put combined global corn, wheat, and soybean ending stocks at a new record, exceeding the current market year's record by 2 percent. While it is still too early to place much confidence on the 2015/16 crop estimates, crop conditions remain above the five year average. Weather will continue to be an important factor moving forward for the three major grain commodities. Recent wet weather has prompted some corn and soybean growers

**Exhibit 1: Prospective vs. Actual Acreage Plantings, 2010-15**

	Prospective Acreage (Reported March 31)*				Actual Acreage (Reported June 30)*			
	Corn	Soybeans	Wheat	Total	Corn	Soybeans	Wheat	Total
2015	89.2	84.6	55.4	229.2	88.9	85.1	56.1	230.1
2014	91.7	81.5	55.8	229.0	90.6	83.7	56.8	231.1
2013	97.3	77.1	56.4	230.8	95.4	76.8	56.2	228.4
2012	95.9	73.9	55.9	225.7	97.3	77.2	55.3	229.8
2011	92.2	76.6	58.0	226.8	92.3	75.2	54.4	221.9
2010	88.8	78.1	53.8	220.7	87.9	78.9	53.6	220.4

\* Millions of acres.  
Source: USDA

to replant or file insurance claims for prevented planting. The weather also plagued wheat harvest progress and reduced the potential for second-crop soybeans.

In a deviation from trend, the grains sector did get a boost from the June 30 USDA reports, which indicated smaller than expected plantings and smaller than expected stocks for both corn and soybeans. The market rallied in response, erasing 2015 losses for corn, wheat, and soybeans. The bullish tone is expected to be relatively short-lived, however, barring summer weather concerns.

### Corn

U.S. and global corn supplies continue to mount amidst near-perfect global weather, resulting in prices below breakeven for most growers. The 2015/16 crop year will likely be the third consecutive year of record corn supplies, both in the U.S. and worldwide. U.S. growers have just finished planting their 2015/16 crop, and they sowed nearly as many acres as last year. (See Exhibit 1.) Rainfall in May reached record levels across the Heartland, so those growers who planted early largely benefited from early moisture, while others (particularly in parts of Kansas, Missouri, and Nebraska) faced several weeks of planting delays. The important growing months are still ahead of us; but if 2015/16 production meets expectations, the impending crop will only add to the current surplus and add further downward pressure on prices.

While the 2015/16 crop is already in the ground, growers are struggling with decisions about how to handle the 2014/15 crop. Many producers have been waiting since

the winter months for a market rally in which to sell large portions of last year's crop. Brazil's larger than expected second crop, and relatively weak U.S. exports, prevented any such rally from developing. Growers did finally get an opportunity to sell at higher prices following the June 30 reports, though. We

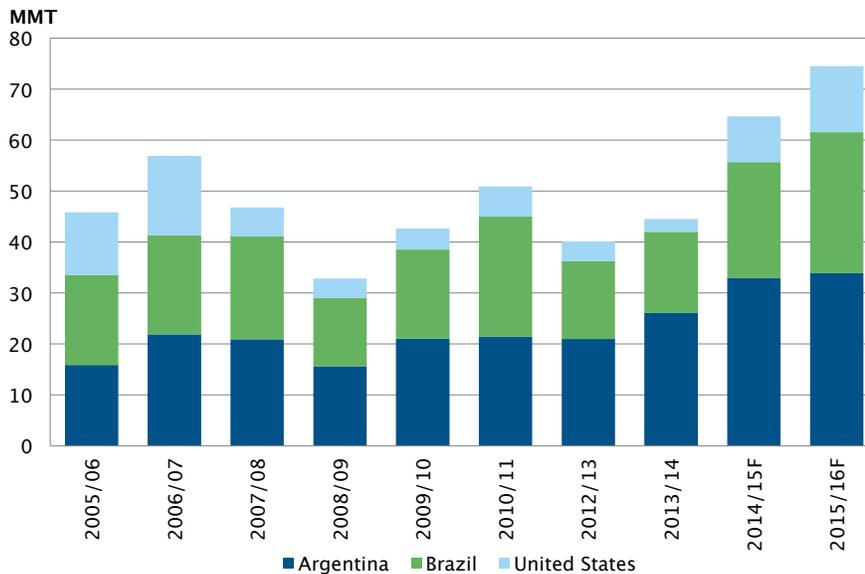
expect that many producers will have seized this opportunity to sell at least a portion of their remaining supplies. If prices retreat from recent highs, growers will again face difficult choices with just a few months before combines start to roll at harvest. Bin space on the farm must be freed up, but selling at current below breakeven price levels is a difficult prospect for any producer. As the summer progresses, the window of opportunity will narrow, and selling could pressure the market lower prior to harvest.

Producers are also behind the curve in forward selling the upcoming crop. Reports indicate that forward selling as of late June was at a 10 year low. But again, the June month-end price rally should increase the amount of new crop that is forward sold.

Grain handlers and coops have experienced some negative impact from the dearth of farmer sales during the first half of 2015. While crop volumes are large, and market carry has been good, throughput of sales at most elevators has been slower than one would expect by midyear. Nevertheless, storage revenue has benefited elevator operators, and margins are considerably improved from recent years when capacity utilization was low and carry was absent from the market.

Looking ahead, July and August weather is likely to determine price levels until at least early 2016 when the market begins to eye Brazil and Argentina production. There is very little if any weather premium priced into the current market, so a weather shift could either produce another price rally, or make selling decisions very difficult once again.

## Exhibit 2: Soybean Ending Stocks



Sources: USDA, CoBank

### Soybeans

Domestic and global soybean supplies surged last year and are on track to do so again in the current 2015/16 crop year, barring major weather disturbances. U.S. growers harvested a record-large soybean crop in 2014/15, and so did South American growers. U.S. growers have planted around 85 million acres of soybeans in the current 2015/16 crop year, up 1 percent from last year; and another outsized crop will only add to the surplus, with domestic supplies expected to grow by 44 percent in 2015/16.

After setting a new record last year, global production in 2015/16 is estimated to be on par with last year's crop, further boosting inventories. Combined, the ending stocks of the three largest soybean producing countries (i.e., Brazil, Argentina and the U.S.) increased 45 percent year-over-year (YoY) in 2014/15 and could rise another 15 percent in 2015/16 if current estimates remain unchanged. (See Exhibit 2.)

Soybean processing margins have been excellent in 2014/15, incentivizing processors to raise crush levels by nearly 5 percent. Looking ahead to 2015/16, the U.S. will export fewer tons of soybean meal as domestic animal

protein sectors expand and Brazil and Argentina jointly increase their exports by 7 percent. Soybean meal prices trailed lower in the second quarter and are anticipated to work lower through the rest of the year as crush continues its robust pace in a high margin environment and stocks increase. The U.S. soybean crush is expected to expand another 1 percent in 2015/16.

U.S. exports of soybean oil are expected to increase 5 percent in 2015/16. While the gain is impressive, 91 percent of soybean oil is still consumed domestically. The recent release of the RFS proposal has the potential to underpin the soybean oil market as demand for biodiesel ratchets higher over the next couple

years. However, larger supplies will keep pressure on prices in the coming year.

### Wheat

U.S. wheat growers will face a challenging market in coming months. The U.S. started the 2014/15 season with its lowest supplies in 7 years, while global supplies set a new record-high. As a result, U.S. wheat was priced above the global market, and U.S. wheat exports are set to fall 27 percent in 2014/15 to the lowest level since 2002/03. Demand was further compressed by ample feed grain supplies, which drastically reduced the domestic use of wheat for feed. The falloff in demand created an environment in which wheat prices realized the largest percentage drop of the three major grain commodities during Q2 2015.

The 2015/16 winter wheat harvest is now in full swing but has been plagued by wet weather raising questions as to the quality and quantity of 2015/16 supplies. However, initial harvest results have been promising. U.S. production is slated to increase 5 percent YoY due to acreage and yield increases. Incremental increases in exports and domestic consumption are not expected to outweigh additional production in 2015/16, and thus U.S.

ending stocks are expected to grow 14 percent. The U.S. will continue to be the high priced supplier in the global market, and basis values are likely to widen as storage needs increase. The U.S. farm gate price for wheat has the potential to fall a dollar per bushel in 2015/16.

Quality may yet be an issue for U.S. growers. Wet weather, like that experienced in May and June in many wheat growing regions, can damage important wheat quality characteristics such as test weight and protein content. Reductions to either of these quality factors would reduce growers' premiums and compound the effects of lower prices.

The global situation will continue to move counter to the U.S. in 2015/16. Russia, Ukraine, the EU and India are anticipating smaller harvests this year, which would lower global production by 1 percent. Global wheat trade is anticipated to fall 3 percent while global ending stocks work slightly lower.

**Ethanol**

The U.S. ethanol industry has been remarkably resilient through the first half of 2015. Although ethanol prices remained well below year-ago levels, ethanol plants have

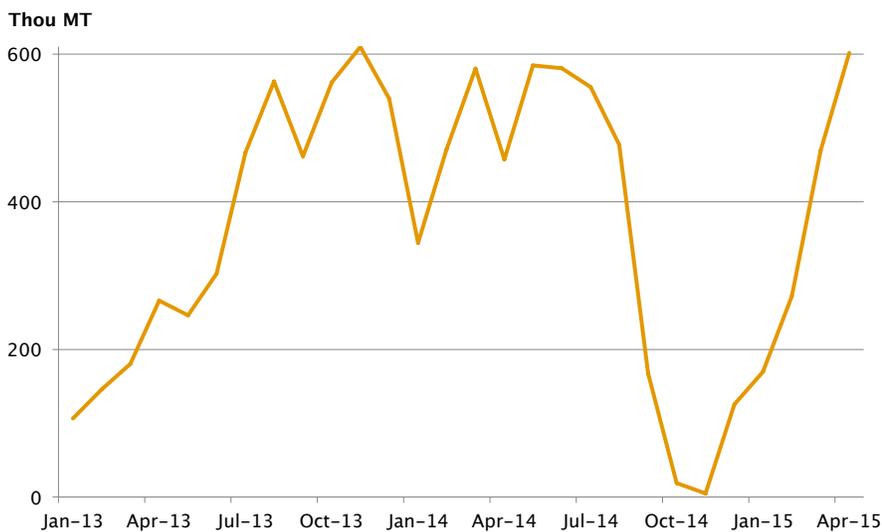
benefitted from other positive shifts in the coproduct markets. Overseas demand for U.S. ethanol has remained strong, and Americans have consumed 4 percent more gasoline (and therefore 4 percent more ethanol) YTD in 2015. An improving domestic economy and cheaper fuel are encouraging drivers to spend more time on the road. So while ethanol output is at record-high levels in 2015, ethanol inventories have remained below the record levels of 2012.

China has also reemerged as a buyer of distillers grains (DDG), in a big way. China had accounted for half of U.S. DDG exports until they all but exited the DDG market in Q4 2014. But they returned in the first half of 2015, importing a record volume of DDGs in April. (See Exhibit 3.) Domestic DDG demand is also improving along with the expansion of the animal protein sectors.

The ethanol industry did not get any help from the Environmental Protection Agency (EPA) when the agency announced its new proposed RFS levels in May. If finalized after the 6-month comment period, the RFS obligations would only require fuel blenders to incorporate ethanol at a roughly 9 percent blend level in 2015 and 2016. Therefore, the RFS will not force blenders to exceed the current 10 percent blend wall, but it will provide a demand floor if ethanol blending economics turn negative.

Plant margins have been well below the superb levels achieved in 2014, but they have remained comfortably above breakeven. Looking ahead, crude oil futures prices show a healthy carry, gaining more than \$1 per barrel by the end of 2015. In contrast, gasoline futures prices show a \$0.30 per gallon decline by year-end, which would act as a drag on ethanol prices and revenue. Domestic corn production is also expected to decline moderately this year, and the futures market indicates that corn prices will drift

**Exhibit 3: U.S. DDG Exports to China**



Source: USDA

higher through year-end. These price moves would be moderately adverse for ethanol producers.

Ethanol margins for the remainder of the year hinge on several key factors: Sustained DDG and ethanol exports, a healthy ethanol/corn price ratio, and a disciplined approach to output. Ethanol production rose by 10 percent during the second quarter, outpacing the typical seasonal gain by a large margin. There are also discussions within the industry about expanding capacity. Both of these factors could contribute to further expansion in output, threatening the current positive margins. However, if production levels off and declines seasonally, positive margins should be maintained through the latter half of the year.

### **Animal Protein Industries**

The animal protein complex, including dairy, is in expansion mode with total production expected to continue increasing in the near-term. Domestic demand for meat and dairy products held up well during the first half of 2015, but as the year progresses, the industries will face several headwinds in both the domestic and global markets. Beef will remain in short supply throughout 2015 and much of 2016, with no material increase in beef production expected until 2017. In contrast, pork output is growing significantly, and prices are adjusting to clear the available supply. Poultry output continues to grow, and prices are slowly eroding. However, the worst ever outbreak in the U.S. of highly pathogenic avian influenza (HPAI) and its trade implications have the industry concerned about an oversupply of product needing to be absorbed by U.S. consumers. Meanwhile, U.S. dairy market conditions appear to have stabilized in recent months, allowing producers and processors alike a chance to catch their breath after last year's stunning "market correction."

#### **Beef**

After bottoming out in 2014 in its most recent inventory cycle, the U.S. beef cow herd is expanding at an aggressive rate. Fueled by economic incentive and dramatic improvements in pasture and range conditions,

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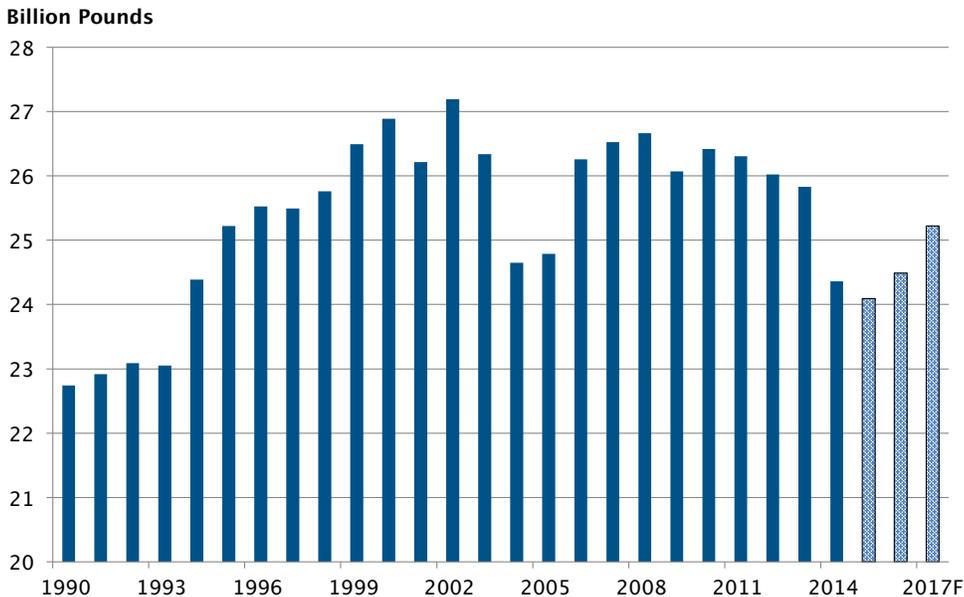
cow/calf producers are continuing to rebuild their herds by slaughtering fewer cows and retaining more heifers.

Herd expansion is expected to continue through 2015 and into 2016. However, the short term impacts of the expansion are limiting the availability of feeder cattle to be placed on feed and compounding the already tight supply situation. Placements of cattle into feedyards declined in 13 of the last 15 months. Given the production timeline, a significant increase in the beef supply won't be realized until 2017.

Total U.S. beef production is expected to ease about 1 percent in 2015, with the decline front-loaded in the first half of the year. Year-to-date beef production is down 5 percent, with a 2 percent increase in live weights more than offset by a 7 percent decline in the number of cattle being slaughtered. Total beef production should begin to rebound in 2016 with a slight 1 percent increase in total output. (See Exhibit 4.) The industry should experience continual YoY increases beginning in 2017.

However, price volatility in the marketplace and lingering uncertainty about the consumer's willingness to continue supporting the current record-high beef prices will be ongoing concerns. If the disparities between the price of beef and those of pork and chicken continue to widen, consumers may become more willing to substitute away from beef and in favor of the lower-priced animal proteins. Proper risk management strategies are paramount to the beef industry's ability to manage margins and take advantage of profit opportunities when they present themselves.

## Exhibit 4: U.S. Beef Production, 1990-2017



Note: data points for 2015-17 are projections from LMIC

Sources: USDA and LMIC

It is the cow/calf sector that will dictate just how fast the herd expansion unfolds. Net returns per cow are expected to be slightly lower than 2014, but average net returns should remain at a very profitable level of nearly \$500/cow. The drastic improvement in pasture and range conditions will support the trends of reduced cow slaughter and increased heifer retention. The major cattle production region of the Southern Plains has seen the greatest improvement of moisture conditions, aiding in herd rebuilding efforts and also building forage stocks. Long term drought conditions are now history, and any future precipitation will boost subsoil moisture.

Cattle feeders are faced with a much more challenging business environment in 2015 versus the healthy profitability that they experienced last year. The fundamental shift downward in feed prices remains intact and will be a positive factor for profitability.

Looking ahead, the number of available cattle for placement on feed will continue to decline over the next couple of years intensifying competition to fill pens. Lower feed costs are not fully compensating for high feeder cattle prices and the correction in fed cattle futures prices. On the revenue side of feedyard operations, fed

cattle prices should remain supported throughout 2015 by tight front-end supplies, but will ultimately be determined by consumer demand for beef.

Owing to the current extremely tight supplies of market-ready cattle, the packing industry continues to experience excess capacity. Packers are faced with the dilemma of procuring enough cattle to efficiently operate their plants, while uncertainty looms regarding the sustained demand pull-through that largely influences packers' profitability. After reaching spring highs leading up to the Memorial Day holiday, a

correction in the beef cutout value has pressured packer margins at a time when this sector normally experiences a seasonally healthy margin environment.

Declining drop credit values (i.e., the value of hides and offal) have negatively impacted packer margins. Running about \$2 per hundredweight below year ago levels; the trend can be attributed to softer export markets. The hide, which commands the biggest proportion of total byproduct value, has slipped significantly. This price decrease is due to softening demand for leather, especially in Asia, coupled with a stronger U.S. dollar making hides more expensive in the global marketplace. Packer margins will remain a challenge throughout 2015, but they could turn out to be better-than-expected insofar as robust consumer demand supports record-high retail beef prices.

Beef demand, in fact, has held up surprisingly well in the face of record-high retail prices in the U.S. Consumer real per capita expenditures on beef were up 14 percent YTD through April 2015. Domestic demand at foodservice establishments remains healthy, with the Restaurant Performance Index posting its 26<sup>th</sup> straight month above 100, indicating ongoing expansion. The

continued strengthening of the U.S. economy and lower gas prices should support the trend of robust beef demand in 2015, despite the widening disparity between the prices of beef and the other animal proteins. However, greater supplies of domestic pork and poultry and thus lower prices could potentially curtail the current strong demand for beef.

U.S. beef exports are experiencing pressure from the strengthening U.S. dollar and increased global competition. The weakened currencies of our major beef exporting competitors (i.e., Australia, EU, Brazil and Canada) have made U.S. product relatively more expensive on a global stage. Despite a 9 percent decline in April in the YTD volume of beef exports, a 4 percent increase in value indicates continued strengthening of demand for U.S. produced beef. A pending decision on Country of Origin Labeling (COOL) legislation has implications with the major trading partners of Canada and Mexico. A failure to repeal/amend COOL may lead to sharp retaliation by Canada and Mexico against U.S. beef and pork exports, resulting in global market imbalances, volatility and uncertainty.

The limited supplies of U.S. beef production in 2015, along with the stronger U.S. dollar, could constrain beef exports during the second half of 2015. At the same time, the higher value of the U.S. dollar and continued strong domestic demand for ground beef have boosted YTD imports over 40 percent YoY, but a tightening of supply in Australia will limit growth of imported lean trimmings into the U.S. in late 2015. Any improvement in moisture conditions in Australia will drop slaughter rates and decrease import volumes into the U.S.

### **Pork**

Since late last year, the pork industry has shifted from a situation of scarcity to one of oversupply. Hog prices fell to their lowest levels in late March, temporarily dropping below the cost of production and putting pressure on margins. Prices rebounded in the second quarter to levels in line with the 5 year average, and profitability returned. With the retail price spread between beef and pork having widened considerably, pork should maintain its competitive advantage to beef in the coming months.

The hog industry has recovered much faster from the Porcine Epidemic Diarrhea Virus (PEDv) than expected, and the number of market-ready hogs available for slaughter has also exceeded analysts' estimates, with supply revisions consistently positive. However, the higher number of market-ready hogs was slightly offset by a reduction in weights, resulting in a 5.9 percent increase in total YTD production. Assuming that the trends of increased slaughter and an offsetting reduction in weights continue, production for all of 2015 should post a 6 percent gain. Hog breeding herd expansion continues; and assuming that the average weight will continue to drift downward, pork production is expected to grow just 1 to 2 percent in 2016, assuming that capacity limitations do not become a binding constraint.

In view of the accelerated pace of production growth in early 2015, the industry has concerns of bumping up against seasonal packing capacity in late 2015 – and even greater concerns for the same period in 2016. Plans for two new packing plants to come online in 2017 should alleviate capacity concerns in the future – but won't help the situation this year or next.

The current oversupply of pork in the domestic market has created merchandising opportunities. Grocery stores and restaurants are featuring pork, emphasizing its competitive price advantage over beef. These specials have boosted demand and, in turn, the cutout value which will push retail prices higher throughout the summer.

Export demand has also helped bolster pork prices. Export shipments in April were larger than expected and amounted to an 11 percent increase YoY. While U.S. pork exports YTD remain 7 percent below 2014, the gap is narrowing, and YoY increases are expected during the second half of 2015. Pork exports are projected to increase 4 percent in 2015 which would help alleviate the pressure of mounting U.S. production. The recent contraction of the Chinese pork supply simultaneously creates the greatest uncertainty and biggest opportunity for U.S. exports. Due to a strong clearance of product off the West Coast, exports to Japan surged 16 percent in April. Headwinds will remain, however, including the strong U.S. dollar and competition from relatively cheaper

EU pork in the global market. Despite the headwinds, Asian demand for pork continues to grow.

With lower feed prices expected to persist during the second half of 2015, the outlook for producer profitability will be determined by hog prices. Buoyed by exports, hog prices are expected to rebound in early summer, lifting commercial farrow to finish operating margins back into the black. The prospects for flat feed costs and strong demand contribute to an upbeat outlook for producer margins throughout 2015 and into 2016.

Pork packer margins slipped in early 2015 but were back in the black by midyear. Margins are expected to remain positive for the remainder of 2015 and throughout 2016, albeit at a lower per head value as pork supplies continue to increase. Aspirations for improved pricing through the summertime hinge on the cutout value, which has the potential to be supported by robust demand. At the same time, however, the concern looms that pork prices will be influenced by excess poultry supplies in the domestic market. The protein markets are dynamic and are expected to heavily influence each other in 2015 as the markets will ration the available supply at the appropriate price level.

*“The U.S. is dealing with the worst outbreak in history of the ultra-contagious highly pathogenic avian influenza (HPAI) virus.”*

### **Poultry**

The U.S. is dealing with the worst outbreak in history of the ultra-contagious highly pathogenic avian influenza (HPAI) virus. The virus is creating an enormous amount of uncertainty in the poultry industry. As of mid-June, 47 million birds had been affected. To date positive cases have been confirmed mainly in commercial turkey and commercial egg layer operations located in the Upper Midwest states. Major broiler producing states in the

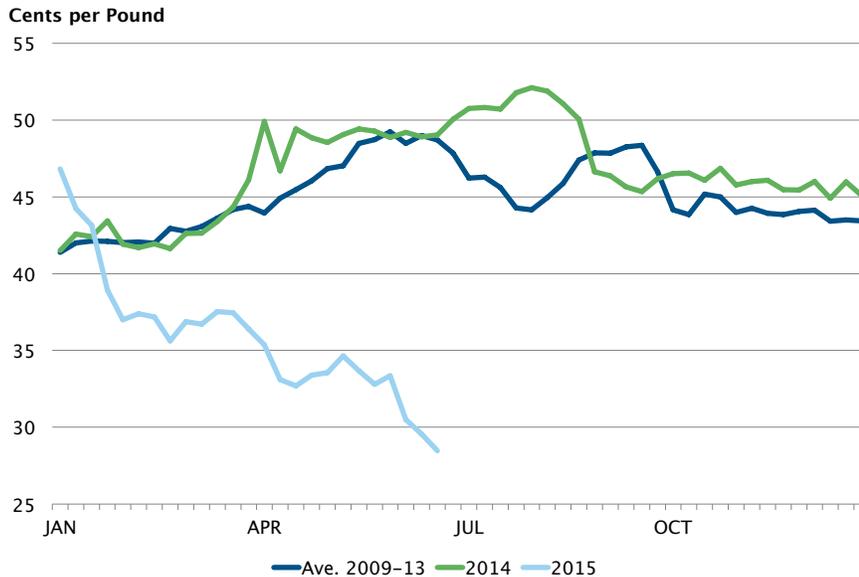
Southeast have not been directly affected by the virus; however trade restrictions have eroded chicken prices. As the industry works toward controlling the current outbreak in the U.S. and protecting against resurgence in the fall when migratory flight paths return south, improved biosecurity protocols and an understanding of trade implications related to a proposed vaccine strategy will be vital.

Some commentators have urged the industry to begin to vaccinate their poultry flocks in response to recent HPAI outbreaks in affected states. However, the broiler industry has been hesitant to do so. Its greatest concern centers on the economic implications for U.S. exports. In particular, implementation of a vaccination program would be used by a significant number of trading partners as a rationale for the imposition of a non-tariff trade barrier to restrict trade. Total trade bans would result, in turn, in abundant domestic poultry supplies. In addition, countries which rely on imports of U.S. genetic stock could face long term supply shortages. The primary breeding companies in the U.S. provide roughly 60 percent of the world's genetic broiler stock.

HPAI has affected 13 percent of the egg layers in the U.S., about 39 million birds. Iowa has been hit hardest by HPAI and provides one of every five eggs consumed in the U.S. The majority of egg layers affected are for breaker egg production which supplies food processors with liquid eggs. With roughly one third of production lost, processors are faced with higher prices and forced to compete with the carton market for available shell egg inventories. Consumers are currently faced with significant cost increases for shell eggs as well as other consumer goods that use eggs as an ingredient.

To date, HPAI has also affected 2 percent of the turkeys in the U.S., about 7.7 million birds. Turkey prices have increased sharply, with turkey breast meat prices surpassing the all-time highs reached last year. Some analysts are anticipating that the turkey industry's current HPAI woes will ultimately lead to further integration within the industry as processing companies will increase their live animal ownership to mitigate the financial impact to individual producers.

### Exhibit 5: Broiler Leg Quarter Prices



Sources: USDA and LMIC

So far, the spread of HPAI has not raised poultry prices as some analysts had anticipated, but rather has lowered them. Leg quarters, a traditional export item, have experienced a significant increase in inventory levels, and prices have adjusted in response to the current bans imposed by major importers of U.S. product. (See Exhibit 5.) The top 10 importers of U.S. poultry have introduced varying trade restrictions at the county, state or national level. However, total nationwide poultry bans have been imposed only by China and Southeast Asia. Further trade restrictions – involving either bans by additional countries or broader scopes by countries with existing but narrower based bans – could create an abundance of broiler supply in the U.S. The resulting lower chicken prices could contract margins and apply negative price pressure onto the beef and pork complexes.

Broiler production continues to experience steady growth, with the hatchery flock stabilizing and increasing in early 2015. Gradual increases are expected throughout 2015 and 2016. Chick placements have increased 3 percent YTD, while average weights have risen over 4 percent, lifting broiler production nearly 7 percent YoY. The forecast for production in 2015 calls for 6 percent growth.

The profitability outlook remains positive in 2015, pending any potential negative pricing impact of trade restrictions. Overall production costs should remain low over the next two years, reflecting the favorable grain price outlook. Improvements in performance metrics such as livability, feed conversion, higher breast meat yield and live weights will also contribute to increased production volume. Along with lower feed costs, these production efficiencies equate to lower overall production costs and should help maintain solid industry returns. Average live weights are expected to increase as more companies are shifting toward a larger proportion of big bird production. Whole bird values

remain well supported inasmuch as the shift to larger birds decreases the available supply of small birds.

As the industry expands per capita supplies in the next two years, we can anticipate a slight erosion of wholesale prices for whole birds, boneless/skinless breast meat, and wings. In contrast, leg quarter export volume and prices will remain pressured until the market processes avian influenza impacts on trade volumes and the resulting domestic supply of dark meat. Industry profitability will be highly dependent on how the trade situation unfolds and the strength of demand.

The shifting landscape for competing meats will heavily influence poultry prices in coming months as well. Record high beef prices have the potential to provide support to the entire meat complex, which could only improve the profitability outlook for broiler production. Alternatively, growing supplies of chicken and pork, and the resultant lower prices, will widen the price gap between beef and other meats, potentially limiting upward price movements for the entire red meat complex.

## Dairy

U.S. dairy market conditions appear to have stabilized in recent months. This hiatus has given dairy producers and processors a chance to catch their breath, following the stunning market “correction” and steep declines in milk and dairy product prices that occurred from August 2014 until early this year. But market indicators are mixed. Some indicators are signaling that the worst of the market correction is behind us, but others are suggesting that the correction has not yet run its full course. In our opinion, the risks to the U.S. dairy industry are still predominantly on the downside.

U.S. dairy producers remain intent on expanding production. Total domestic milk output amounted to 18.35 billion pounds in May 2015, 1.4 percent higher than a year ago; and 1.6 percent higher than a year ago for the first four months of the year. The YoY gain for May reflected a 0.6 percent hike in the dairy herd plus an 0.8 percent increase in milk per cow. The U.S. dairy herd numbered 9.31 million head in May, up 58,000 head from a year ago. Dairy producers are still expanding their herds, albeit at a somewhat slower pace.

Milk prices today are far below what they were a year ago, although they have been edging upward in recent months. For example, the Class III milk price was \$16.19 per hundredweight (cwt) in May 2015, down \$6.46 (off 29 percent) from a year ago. But the Class III milk price bottomed out at \$15.46 per cwt in February 2015 and has been drifting upward since then. Similarly, the Class IV milk price was \$13.91 per cwt in May 2015, down \$8.74 (off 39 percent) from a year ago. The Class IV milk price bottomed out at \$13.23 per cwt in January 2015 and also has edged upward since then. Analysts are looking for the Class III milk price to end up at about \$16.70 in June, the highest level this year; and for the Class IV milk price to be near \$13.85.

While milk prices have fallen dramatically from last year’s all-time highs, so have producers’ feed costs. In April, for example, alfalfa hay was selling for about \$184 per ton nationwide, down 12 percent from a year ago. On balance and based on current futures prices, it turns out that dairy producer margins were still positive during Q2-2015 and

“*Global prices for skim milk powder, cheese, butter, and other dairy products all seem to be heading lower, with U.S. prices not always in synch.*”

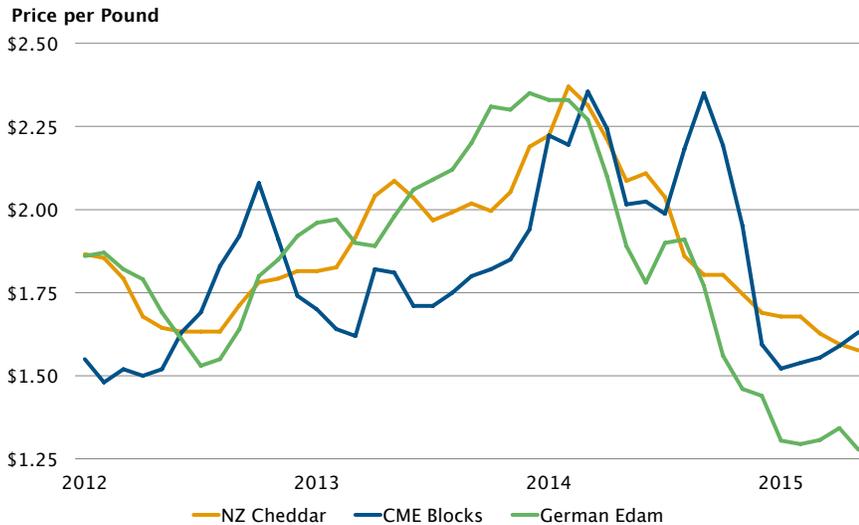
are hovering around \$3.60 per cwt, down about \$5.00 from last year’s cyclical highs. While a 60 percent decline is indeed substantial, the current margin is in line with the five-year average. Margins for California producers are substantially below the national average, inasmuch as milk prices are lower there than elsewhere in the country while feed costs are slightly higher; but even the California producers have stayed in the black, albeit just barely. As long as margins remain positive, milk producers have an incentive to continue boosting milk output.

Judging by the futures prices for milk and animal feed, producers’ margins are expected to widen slightly during the second half of 2015. The Class III futures milk price, for example, rises from \$16.15 per cwt in July 2015 to \$16.75 in November 2015, drifts lower over subsequent months, and then levels off at approximately \$16.50 from March 2016 onward. Similarly, the Class IV futures milk price rises from \$13.90 per cwt in July 2015 to \$14.73 in November 2015, after which it recedes slightly to \$14.48 in January 2016 and then begins to climb again. Meanwhile, producers’ feed costs are expected to drift lower throughout the second half of 2015.

When viewed from this perspective, the production dairy industry’s near-term prospects appear to be upbeat. Indeed, the worst of the correction in the production dairy industry appears to have run its course by early 2015. Going forward, market conditions for dairy producers are expected to show modest improvement.

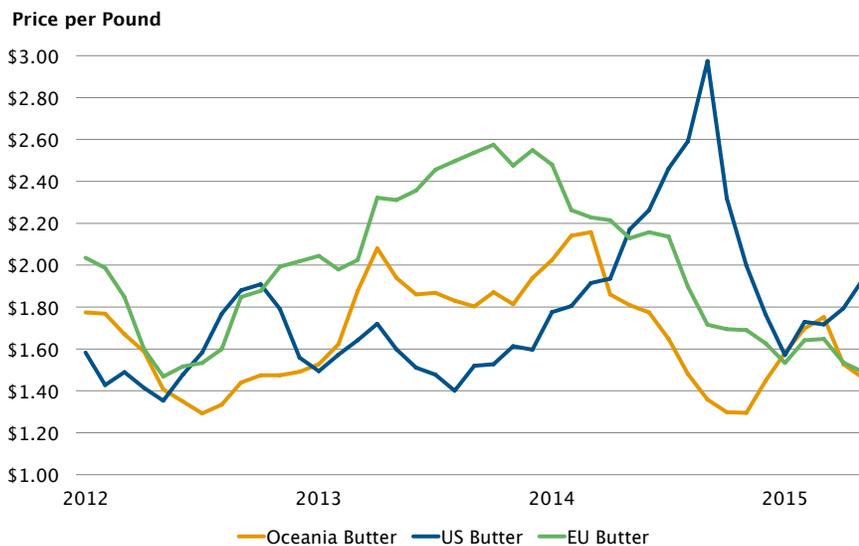
This upbeat near-term assessment is not a foregone conclusion. Other U.S. dairy market statistics suggest that the downward correction to the production dairy industry

### Exhibit 6A: International Cheese Prices



Sources: USDA, Blimling Associates

### Exhibit 6B: International Butter Prices



Sources: USDA, CME Group, and Blimling Associates

could get a second-wind during the second half of the year. There are anecdotal stories, for instance, about a glut of milk in areas of the Northeast and Midwest, with producers there either selling milk at a \$5 to \$7 discount to the Class III and Class IV milk prices or just dumping it.

Even more troubling are the continuing declines in global dairy product prices. The Global Dairy Trade (GDT) auction for June 16 concluded with the index slipping 1.3 percent from the prior week's auction results, the seventh consecutive weekly decline; and the GDT index was then at its lowest level since August 2009.

Global prices for skim milk powder, cheese, butter, and other dairy products all seem to be heading lower, with U.S. prices not always in synch. (See Exhibits 6A and 6B.) However, sooner or later, these disparate movements in dairy product prices are going to have to be ironed out, and we're concerned that it will be U.S. prices that end up making the downward adjustment to align with global prices. And if U.S. dairy product prices do stage another round of declines, milk prices will necessarily follow suit, albeit with a lag (owing to the Federal Milk Marketing Orders pricing system), and those mid-June Class III and Class IV futures milk prices for later months in 2015 and 2016 will turn out to be overly optimistic.

The recent upticks in a number of U.S. dairy product prices are even more puzzling considering how much the value of the U.S. dollar has climbed recently. For the year ended in May 2015, the U.S. dollar rose 12 percent against a broad index of foreign currencies – and it climbed 20 percent against the Euro. As the value of the U.S. dollar rises, so does the cost of

U.S. products to foreign purchasers, thereby eroding the competitiveness of all American exports.

U.S. dairy product exports have in fact faltered in recent months, in sharp contrast to their stellar performance last

year. (See Exhibit 7.) For the first four months of 2015, the aggregate volume of U.S. dairy product exports fell 11 percent from the previous year, while the total value of U.S. dairy product exports plummeted by 26 percent. U.S. exports of NDM/SMP and of lactose did manage to eke out slight YoY gains, but exports of all the other dairy products were running well below year-earlier levels.

There's no shortage of culprits on which to pin the woes currently plaguing U.S. dairy exports. At the top of the list is the recent run-up in the value of the U.S. dollar. Other culprits include:

- Russia's ban on agricultural imports, including dairy, from the EU, Norway, Australia, and the U.S. remains in effect. As a result, the substantial quantities of dairy products normally exported from those countries into Russia are being redirected to other countries or added to mounting inventories. The EU has been especially hard-hit, and its exports have been redirected to Japan, Korea, Saudi Arabia, Egypt, and Mexico – all good customers of the U.S. In late-June, the EU announced that it has extended sanctions against Russia beyond the

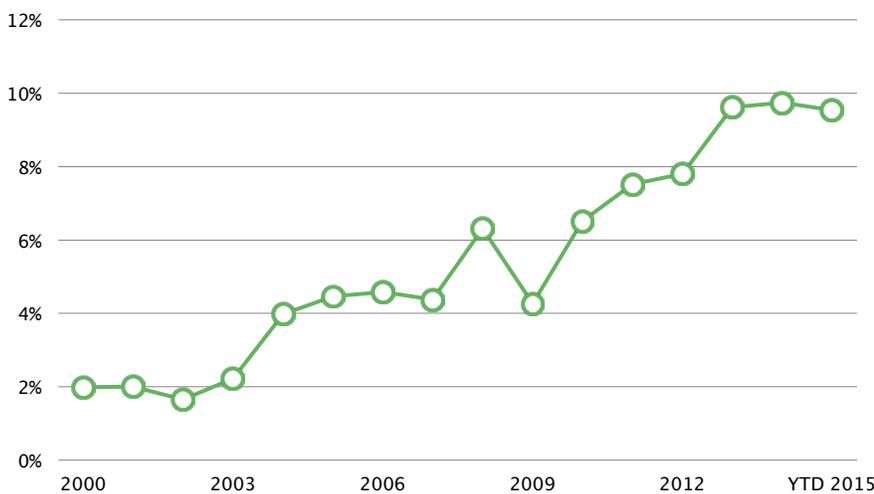
August deadline, and Russia announced that it was extending its sanctions as well.

- The EU's dairy quotas formally ended on March 31, 2015. Dairy producers and processors there had been expanding their production capacities substantially in preparation for the sunset of the quotas. While EU producers appear to have exercised significant restraint in the post-quota period, it would appear to be only a matter of time before they do so.
- Chinese importers of dairy products remain on the sidelines. Their demand for milk powders slackened appreciably during the second half of 2014, following decidedly aggressive purchasing during the first half. Its milk powder imports in January were down 36 percent from a year ago. Analysts are anticipating that China's overstocked inventories will be whittled down later this year to the point where the Chinese step up their purchases from abroad.

Perhaps U.S. dairy product exports will somehow overcome these four restraints and surge ahead during the second half of the year. Even then, it is doubtful that U.S. dairy product exports for all of 2015 would end up not just exceeding those for the previous year, but doing so by a big enough margin to absorb the incremental 1½ percent growth in 2015 milk production, less the growth in domestic U.S. dairy consumption per capita. It's not impossible, but it would be a stretch.

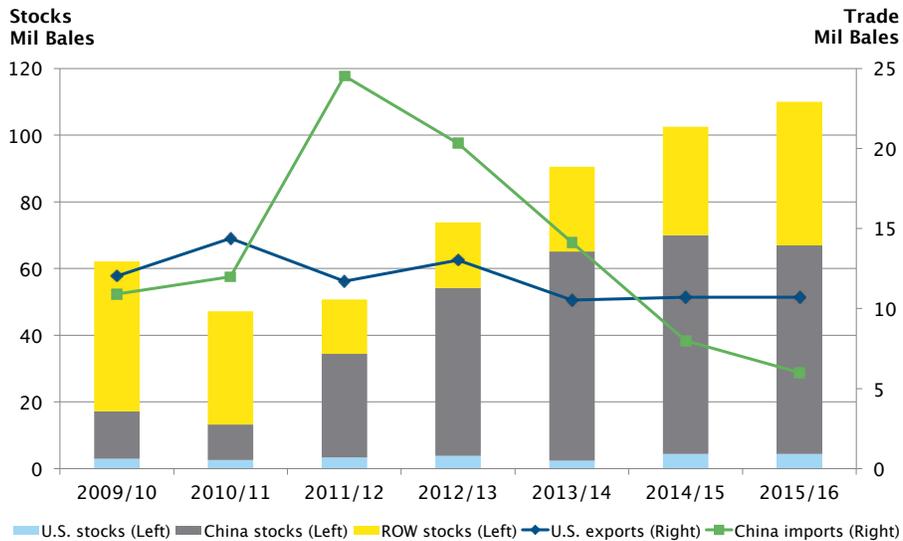
The upward tilt of today's dairy futures prices indicates that these markets have priced in a rebound in U.S. dairy product exports during the second half of 2015. Maybe the participants in those markets know something that we don't. But we lack their conviction. Indeed, as we said at the outset, we believe that the risks lie predominantly on the downside.

**Exhibit 7: U.S. Exports of Cheese and Nonfat Power Milk as a Share of Total U.S. Milk Production**



Sources: USDA, Blimling & Associates

## Exhibit 8: Cotton Stocks and Trade



Source: USDA

The USDA estimates that the ratio for 2014/15 will end up at 15 percent, and assuming trend production and lower overall imports in 2015/16, the market will tighten somewhat in the coming marketing year to 12.6 percent. This swing in market conditions is quite small in comparison to the past two years.

As a result of the U.S. sugar program, the domestic sugar industry is largely immune to the ongoing glut in sugar supplies globally. World sugar prices recently hit a six year low as supplies remain high despite production and consumption coming into alignment.

## Other Commodities

### Sugar

After two years of extreme volatility, the U.S. sugar markets are finally stabilizing. The antidumping agreement reached with Mexico is holding, and imports from Mexico in 2015 have been fewer than expected, keeping the domestic market relatively balanced.

This year's U.S. growing season is off to a fast start, aided by favorable early planting conditions in the key sugar beet regions of North Dakota and Minnesota. In fact, the season got out of the gates so early that a sizable portion of this year's sugar beet harvest could be completed in August and September and therefore be counted in the prior season's production. (The U.S. sugar marketing year extends from October to September.) Historical trends favor strong production in early harvest years, so odds are on the side of a larger than average beet harvest. Imports from Mexico are also expected to rise modestly in the latter half of 2015. Therefore, the market tone is likely to shift during Q3 from slightly bullish to slightly bearish.

The U.S. sugar market is typically viewed as being in balance when the stocks-to-use ratio is at 14 percent.

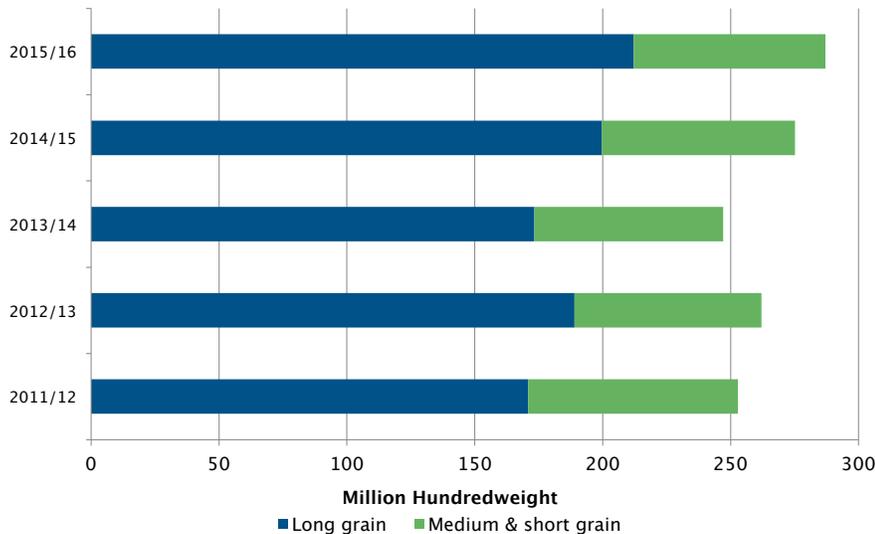
### Cotton

Four years after China's cotton stockpiling program transformed the global market, its effects are still being felt. China is now slowly selling off its stocks, but world supplies remain at record levels. (See Exhibit 8.) Looking ahead to 2015/16, global supplies are expected to decline, albeit modestly, for the first time since 2010. World production declines for the fourth consecutive year will usher in the supply cut.

As the world's leading cotton exporter, the U.S. continues to be greatly hemmed in by the burdensome global supplies. World cotton trade is expected to slump further in 2015/16 to a 7-year low. Synthetic fibers remain far more competitively priced than cotton, and nearly a year's worth of cotton is still stockpiled around the world.

In the U.S., the 2015/16 production picture is still blurry, largely due to the excess rain received during the spring months in Texas. The USDA currently assumes a national abandonment rate for 2015/16 of 10 percent, well below the 10-year average of 17 percent. Key to this assumption is that the early season precipitation across Texas will help most growers there produce a full crop. Even with the low abandonment assumption, U.S. production is expected to decline by 11 percent in the upcoming season.

### Exhibit 9: U.S. Rice Supply



Source: USDA

Despite the projected cutback in domestic production, prices are expected to remain largely flat over the coming year. Large global supplies will overshadow the production declines, keeping the price range bounded between \$0.50 and \$0.70 per pound.

There is reason for some optimism in the U.S. cotton sector, though. The U.S. and global economies are expected to improve, which should aid cotton consumption. And U.S. cotton mills are making a comeback, with domestic mill use expected to reach a 5-year high in 2015/16.

#### Rice

The rebound in U.S. rice supply in 2014/15 has been a mixed blessing for the industry. (See Exhibit 9.) An 11 percent boost in supplies delivered greater volumes for grain handlers and merchants and improved utilization of storage capacity. Exports also increased substantially as U.S. rice regained competitiveness in the global market. But abundant supplies have resulted in lower prices and reduced returns for growers. The nearby futures rice price is 35 percent lower than it was last year at this time, and has challenged Mid-South growers with difficult planting decisions in 2015.

Much of the supply rebuilding has been in the long grain rice class. Carryover inventories from 2014/15 into the new marketing year are expected to be nearly double that of last year. Hence, even as production is expected to remain relatively steady, and use is projected to rise, the modest growth in demand won't be enough to prevent a significant building of ending stocks in 2015/16.

Conversely, short and medium grain rice, much of which is grown in California, will be supported by a marginal decline in supply in 2015/16. It is estimated that California growers planted 11 percent less rice YoY as a result of the ongoing drought, the least acreage planted in the state since 1991. Nonetheless, short

and medium grain exports are slated to pick up pace in 2015/16, which could bring ending stocks down by 24 percent. This will likely keep prices steady over the coming year.

Globally, both production and consumption are expected to set records in 2015/16. Output increases will come largely from expanded acreage in Asia and most of the increase in demand will come from China. World use will outstrip production for the third consecutive year, though, sending ending stocks down by 7 percent YoY and 15 percent below 2013/14 levels.

The world's two largest exporters, India and Thailand, will account for most of the reduction in inventories. India's decline will come as a result of a smaller crop, and Thailand will continue to reduce its stockpiles that it began building as part of its Paddy Pledging Program in 2011. The U.S., the world's fifth largest rice exporter, is expected to benefit most from the tighter world market by gaining share of global trade.

#### Specialty Crops

California is now heading into its fourth year of severe drought. All Californians face significant water restrictions during 2015. For urbanites, the restrictions

will represent an inconvenience, including brown lawns and empty swimming pools. For growers, ranchers, and agribusinesses, the restrictions pose a threat to their economic livelihoods. Specialty crops would appear to be particularly vulnerable, considering that California's growers account for 80 percent or more of the nation's fruits, vegetables, and nuts. But in fact, many specialty crops growers are able to mitigate these risks to a large degree by diverting water from other uses or sourcing it from underground aquifers.

California's water restrictions are becoming increasingly onerous for the state's growers and ranchers. During the first few months of the year, it was the state's junior water rights holders who were hardest hit by the restrictions. But from mid-May onward, the state's water regulators have imposed limitations on senior water rights holders, for the first time since the drought of 1977. While some of these senior water rights holders reportedly have vowed to contest these state-imposed limitations in court, most of them appear to regard tightening limitations as inevitable.

California growers' first line of defense against the 2015 water restrictions will be to draw more heavily on their underground water reserves. Not everyone has equal access to these underground basins, however. Where groundwater is available, growers will pump more of it to offset the reductions in their supply of surface water; and they'll also drill more and deeper wells.

Californians currently face no state-mandated regulatory restrictions on groundwater extraction or newly drilled wells. Today, landowners are allowed to exercise an "overriding right" to drill as many wells and pump as much groundwater as they wish. A few local government entities have imposed restrictions on new drilling (e.g., Paso Robles on the Central Coast), but they remain the rare exceptions rather than the rule. This largely unencumbered "overriding right" is in the process of being dialed back, but not in time to impact the current situation.

The vast majority of California growers with access to underground water basins thus will pump more groundwater to offset their restricted allocations of surface water. Depending on their access to these

underground basins, some growers will be able to offset all of the reductions while others will be able to offset only part of the restricted allocations. This year, economists at UC-Davis project that the reduced allocations of surface water to California farmers would amount to about 8.7 million acre-feet less than normal, but that increased groundwater pumping would make up about 70 percent of that loss, leaving a net water shortage of about 2½ million acre-feet. (California's irrigated acreage consumes roughly 34 to 35 million acre-feet of water in a normal-precipitation year, and less than that during a drought.) But this is just a guess, and there will be no way to verify its accuracy after the fact. California's water regulators currently do not monitor or measure groundwater extractions.

Against that backdrop, our assessment of the drought's potential impact on California's agriculture sector yields four key takeaways:

1. The damages wrought by the drought in 2015 will be worse than those in the previous year, but far from catastrophic. With each successive year of drought, the underground water tables decline further, boosting the cost of pumping groundwater to the surface and increasing the likelihood of well failure.
2. Not all commodities will be impacted equally. Those yielding the highest returns on investment will be affected least by the drought because growers will redirect the limited water supply to these plants and away from those yielding the lowest returns. California's highest yielding crops are its permanent plantings, including nuts, citrus and other tree fruits, and vine-grown fruits and vegetables.
3. Growers will again fallow some of their land and redirect the water that would have been used to irrigate those acres toward more profitable crops grown in other fields. They are expected to fallow 550,000 to 600,000 acres this year, or about 30 percent more than they fallowed in 2014. The resulting losses in revenue will fall most heavily on field crops such as corn, wheat, cotton, rice, hay, pasture, and beans.

4. Agricultural lenders will experience some deterioration in the credit quality of their California-based borrowers, but it will be modest in scope. The borrowers connected with the permanent-plantings should escape largely unscathed, whereas those connected with field crops and dairy production will bear the brunt of the continuing drought. Crop insurance will offset some of these lost revenues, although not all of California's field crops are eligible for coverage. (For example, apricots, peaches, plums, nectarines, and lettuce are not covered under the crop insurance program.)

Our bottom line conclusion is that most California-based growers of specialty crops will remain in the black in 2015, albeit with a few outliers posting modest losses and slight deteriorations in credit quality; but their financial stress would worsen if the drought persists into 2016.

### **Crop Nutrients/Inputs**

Net farm income is forecast to fall 32 percent in 2015. If realized, net farm income would be the lowest since 2009. Livestock receipts are likely to outpace crop receipts for the second consecutive year. The decline in corn receipts (\$6.7 billion) will account for the largest share of the nearly 8 percent drop in crop receipts. Farm input expenses are expected to increase 5 percent YoY in 2015. However, manufactured inputs including fertilizer, fuel, electricity and pesticides are expected to fall 9 percent YoY. Fertilizer and fuel prices are projected to lead the decline, falling 4 percent and 27 percent respectively.

Tightening grower margins in 2015 will continue to apply downward pressure on crop input prices, with growers looking for ways to grow more with less. Fewer input-intensive corn acres and lower commodity prices will keep a bearish tone on crop input prices and quantities in 2015. Recent news of anticipated consolidation in the seed and chemical industries underscores the need for manufacturers to look for sources of additional non-organic growth as the growers' purse strings tighten.

Domestic crop nutrient capacity is expected to increase substantially over the next few years, which will elevate

supplies and move prices lower. The expansion will likely displace imports and create new challenges and opportunities for retailers as infrastructure networks develop. Those crop nutrient producers that have the ability to utilize low cost captive inputs and take advantage of logistical efficiencies are likely to reap the most benefit. These expansions are likely to be large in scale but will take time to come online, so producers will not benefit until at least 2017.

For now, fertilizer prices are generally drifting lower following spring application and in response to persistently lower commodity prices.

Ammonia prices drifted lower during the second quarter and are likely to continue that trend as growers complete their sidedress applications. Domestic prices are likely to trail slightly lower as crop nutrient producers attempt to entice retailers to take delivery for the fall. Since the start of the second quarter, Corn Belt prices have fallen around 2 percent. In Q3, fall fill activity will pick up, which should underpin prices.

World urea prices have held steady due to lack of interest from two large international players. Brazilian and Indian growers continue to look for lower prices, but suppliers are holding prices steady. As the delivery window closes and prices are finalized, price direction will become more certain. Domestic urea prices have been relatively firm through the first half of the year as transportation delays kept product from being placed in certain locations. With spring application complete, prices are likely to move lower into the fall fill season.

UAN sidedress activity has been locally heavy depending on the amount of precipitation and ability to get tons applied. Prices have remained relatively steady through the second quarter, but may move lower following competing forms of nitrogen. Discounted tons may entice further application and relieve the retailer of any inventory overhang. UAN prices will likely work lower as the fall approaches.

Similar to urea, the global phosphate market looks for direction in the form of deal flow to Brazil and India. Deflated soybean prices and the inflated Brazilian

currency are contributing factors to the lack of business. A slow-to-develop monsoon season in India may be playing a role in lack of additional interest. In the domestic U.S. market, recent phosphate demand for soybean pre-plant and dealer storage has been relatively light. Similar to other nutrients, prices will face pressure in the lead up to fall fill.

Demand appears to be the limiting factor for potash price increases through the first half of the year. One potash producer indicated catch up applications may have been made in 2014, which lowers their expectations for 2015 demand. Prices have drifted lower through the second quarter with buyers reporting little interest in accepting more inventory. International markets remain stable without much movement. Domestic prices are likely to move lower in an attempt to spur demand moving forward.

### **Rural Infrastructure Industries**

Advances in technology, new government policies, and shifting consumer behavior continue to challenge the decision-making frameworks across all rural infrastructure industries. Broadband providers, for instance, must conform to the new net neutrality rules while keeping pace with soaring broadband demand growth – and fighting to remain relevant among a growing pool of competitors. In response largely to new initiatives of the EPA, the power sector will witness the largest wave of coal-fired retirements this year, driving demand for natural gas-fired generation and renewables. Water utilities must begin developing long-term water shortage management plans in order to operate successfully in providing clean and affordable water to a growing population, with less supply.

### **Communications Industry**

The Federal Communications Commission's (FCC) net neutrality order remains contentious. Its Open Internet Order rules, which reclassify broadband as a Title II telecom service subject to a host of regulations, took effect on June 12. Several industry groups have filed suit against the FCC's Open Internet Order rules, arguing that the move to reclassify broadband as a Title II service violates various laws, regulations and rulemaking

“*High-speed broadband and Internet connections remain far from ubiquitous across the nation.*”

procedures. The FCC insists that the new rules are on firmer legal ground than the 2010 rules, which were denied by the courts. Meanwhile, those carriers subject to the new rules are working to ensure that appropriate processes and procedures are in place. Legacy telephone carriers have long operated under the auspices of Title II regulation and are arguably uniquely well prepared to meet the new requirements.

Consumers' video viewing habits continue to evolve rapidly and are spurring major structural changes within the telecom industry. Video viewing is today the primary driver of Internet traffic growth, with consumer video accounting for 73 percent of U.S. network traffic in 2014. Internet traffic in the U.S. quadrupled from 2009 until 2014, and is expected to continue to grow at double-digit rates during the next five years. In effect, the data equivalent of 50 billion DVDs traveled across U.S. networks last year and is expected to soar to 125 billion DVDs in 2019. Netflix alone accounts for 37 percent of peak evening traffic in North America, and Nielsen reports that so-called long-form content (i.e., videos over 10 minutes in length) viewing among adults aged 18 to 64 years on their PCs and mobile devices grew more than 50 percent in 2014.

Consumers' and businesses' voracious appetite for broadband continues to drive network usage and necessitate network upgrades. (See *Exhibit 10.*) In 2014, the average U.S. network speed increased by 25 percent to 22.2 megabits per second (Mbps). The industry's increasing use of content distribution networks, which store content on multiple servers closer to consumers and deliver video content more quickly, is transitioning more traffic to metro-area networks. Analysts estimate that metro-only traffic will triple by 2019 while long-haul traffic will rise by 12 percent a year through 2018.

Local providers and fiber transport companies will soon need to upgrade their last-mile, metro-area networks and long-haul routes to handle peak traffic flow. Although the majority of video traffic on wireless devices is accessed through a wired connection via Wi-Fi, wireless data traffic surged 54 percent in 2014, with no slowdown expected any time soon. In an effort to gain more network capacity, wireless carriers are jockeying for additional spectrum in the upcoming Federal Communications Commission (FCC) Broadcaster Incentive Auction (600 MHz). Along with these network investments, additional data center capacity will be necessary to house and process the mounting volume of data.

Consumer viewership is shifting away from the pay TV model in favor of other video devices. In fact, TV viewership shrank 11 percent in 2014, and the number of pay-TV subscribers edged down 0.5 percent over the past 12 months. While the rate of decline is still just nominal, many analysts are wondering whether this dip signals the beginning of a growing dissatisfaction with pay TV. In the face of an increase of 1.3 million newly formed households in Q4-2014, pay TV not only failed to add any

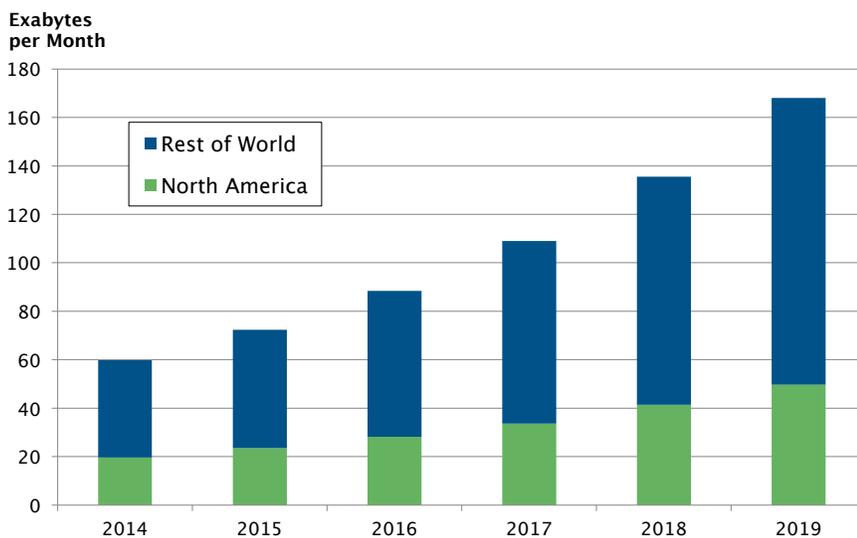
new subscribers during Q1-2015, but actually posted a loss of 31,000 subscribers during those first three months. In a recent survey, respondents indicated convenience was the top reason for watching content online, including the ability to watch TV on their own schedule and to skip commercials. The average American household watches only 17 of the 189 channels typically offered through its pay TV subscription.

As more Over-the-Top (OTT) providers enter the marketplace and top contenders such as Netflix and Amazon continue to produce and deliver blockbuster content such as House of Cards for a fraction of the cost of traditional pay TV, many consumers are reconsidering their monthly subscriptions. Pay TV companies have relied on TV Everywhere applications, premium and sports content, and local broadcasts to retain subscribers. However, HBO's recent venture to deliver content directly to consumers, Yahoo's pilot deal to livestream an NFL game, and Apple TV's goal to offer local broadcast content all indicate that pay TV's long-standing competitive edges are dulling. Although the cost of a broadband connection along with several OTT

subscriptions may not result in any overall savings, the perceived value of paying for only what you consume calls for serious consideration when providers are promoting their benefits and service pricing, including bundled offerings. Broadband competition will intensify as legacy cable providers continue to shift focus to increasing and retaining broadband market share.

High-speed broadband and Internet connections remain far from ubiquitous across the nation. According to a recent American Customer Satisfaction poll, 61 percent of American households reported having only one or no provider offering high-speed Internet connections in their area. Meanwhile, rural telecom providers struggle to make a business case to deploy high-speed access to the most

### Exhibit 10: Projected Global Internet Protocol Traffic, 2014-19



Source: Cisco VNI Global IP Traffic Forecast, 2014-19.

remote areas of the country, while the FCC continues to work on one-time deployment funding and ongoing support models for rate-of-return providers. Several rural providers are augmenting broadband revenues with complementary services such as online security, home monitoring, storage and other IT services. The FCC's updated E-Rate program is expected to offer more than \$100 million in funding in 2016, and recent buzz in Congress and at the FCC has many rural providers looking forward to a revamped Lifeline program that will provide support to low-income Americans to defray the cost of broadband service.

Telecom merger and acquisition (M&A) activity picked up during the first half of the year. The booming Internet traffic volume has companies looking to strengthen their competitive positions in the marketplace, particularly while low interest rates prevail. Although the regulatory landscape is still unclear, the industry is charting a course with an eye on diversifying broadband assets and gaining scale. Shortly after the collapse of the proposed Time Warner Cable and Comcast merger, reportedly due to regulatory opposition, Time Warner announced a new buyer, Charter Communications. The parties believe that the newly minted agreement will gain regulatory approval, as the new combined company will own less of the broadband market share than Comcast currently does. At the same time, AT&T and DirecTV recently met with the FCC and presumably discussed conditions of their proposed merger that has been pending for more than a year. Verizon announced its intention to acquire AOL, and a number of smaller deals were announced, some including smaller communications providers, data centers and fiber transport companies.

The Internet of Things (IoT) is beginning to gain traction as more consumer products are introduced, including connected thermostats, light bulbs, household appliances, door locks and other home security equipment. Announcements from Google and Apple touting new home automation platforms that operate home-based connected devices from anywhere have heightened awareness of the IoT market. Research firm IDC predicts that the global IoT market will grow by 19 percent this year. U.S. sales of connected cars are

“*Going forward, the low natural gas prices and environmental regulations will continue to wreak havoc on coal generation.*”

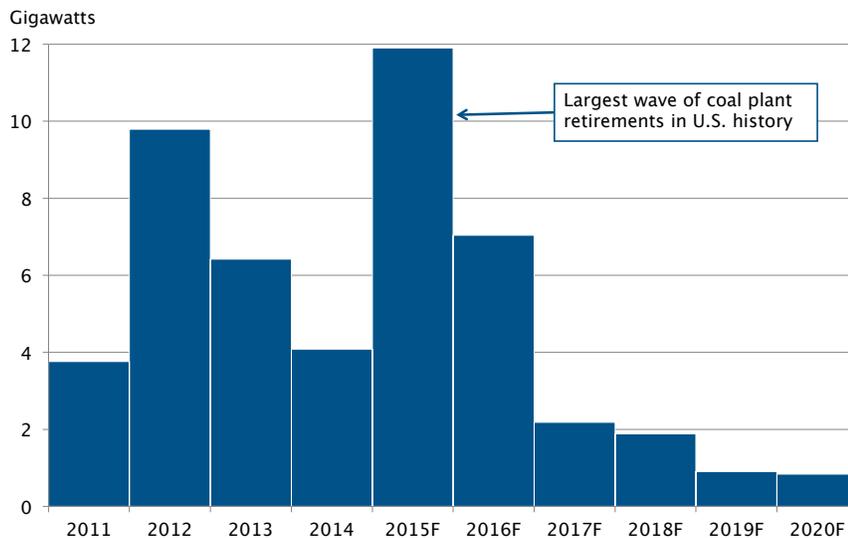
expected to rise by 35 percent in 2015. As a result of growing commercial and consumer uses, the developing IoT market is likely to open additional opportunities for wireless and wireline providers.

Cyber security, for good reason, is top of mind for many consumers, government agencies and enterprises. Cisco estimates that hackers collectively take in somewhere between \$450 billion and \$1 trillion annually for cybercrimes each year. Over the next five years, the annual cost of data breaches is predicted to reach \$2.1 trillion, nearly four times the already staggering cost of data breaches today. The stakes are climbing even higher for communications providers that are supposed to protect customer data. The FCC levied a \$25 million dollar fine on AT&T Services, Inc. during the quarter for failure to properly secure customer proprietary network information (CPNI). The newly signed Freedom Act imposes additional burdens on communications carriers inasmuch as they now must transparently collect and securely house telecommunications records and provide those data to government agencies upon demand. (Under the previous version of the Patriot Act, those carriers were tasked with collecting and directly providing those records to the government.) Despite the heavy burden to safeguard private data, there is also opportunity to provide services to help consumers and small enterprises safely store data.

### **Power and Energy**

The global supply of crude oil has exceeded demand for the past 15 months, resulting in the worst glut since the 1997 Asian economic crisis. U.S. oil production from shale resources has begun to taper off after peaking in April 2015. However, when compared to oil production

## Exhibit 11: U.S. Coal Plant Retirements, 2011-20



Note: Values for years 2015-20 are forecasts and subject to change.  
Source: SNL Energy and CoBank

last July (when crude oil prices began slipping), the YoY growth in U.S. oil production from shale will be up approximately 13 percent. Furthermore, based on comments from the Organization of the Petroleum Exporting Countries' (OPEC) latest meeting on June 5, 2015, the 12-nation cartel has signaled that its production levels will remain above 30 million barrels a day. This production level, coupled with slower than expected demand growth, suggests that the global oversupply of crude oil will likely persist into 2016, making it difficult for oil prices to exceed \$70 a barrel through the rest of this year.

Natural gas prices in the U.S. will also remain under downward pressure. Growing gas inventories could climb to 4 trillion cubic feet for the first time ever by the end of storage season in October, and these record-high inventories should help keep natural gas prices capped at \$3 per million British thermal units (MMBtu). In turn, a price ceiling of \$3 will continue to spur electricity generators to switch fuels to gas from coal. The combination of higher demand from the power sector, which is approximately 3 billion cubic feet per day (Bcf/d) higher today than it was a year ago, and slower production growth from shale producers will limit the downside for gas prices through the rest of 2015.

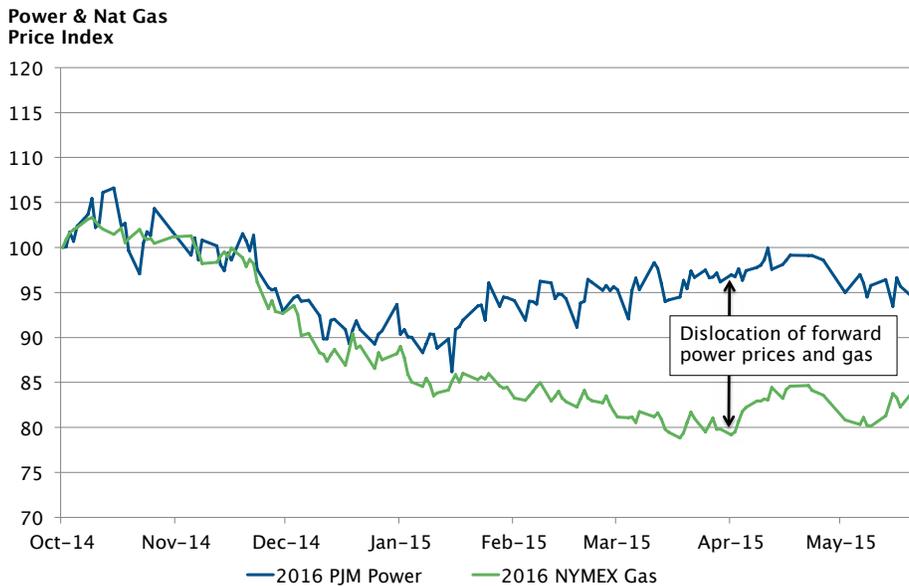
Going forward, the low natural gas prices and environmental regulations will continue to wreak havoc on coal generation. Coal unit operators cite the EPA's Mercury Air Toxic Standards (MATS) and low gas prices as the main drivers for retiring 19-23 gigawatts (GW) of coal-fired generation capacity this year. (See Exhibit 11.) Given the large number of recent retirements driven by MATS, the industry was surprised by the Supreme Court's June 29, 2015 ruling that rejected the EPA's MATS regulations. However, power producers have already responded to MATS by implementing significant coal unit retirements. For this reason, the ruling against MATS will probably not materially change the nation's power generation mix. The next

industry-wide battle will commence when the EPA issues its final rules governing CO<sub>2</sub> emissions from fossil fuel generating units. Final CO<sub>2</sub> emission rules are expected in August, at which point each state will have one year to develop implementation plans to ensure a 30 percent reduction in greenhouse gas emissions by 2030.

In light of the prospective increase in coal retirements, many analysts are concerned that power prices will soon experience greater spikes during surges in demand. Forward electricity power prices already have increased for many regions thus far in 2015, despite low gas forward prices at or below \$3/MMBtu. In the past, forward power prices have tended to closely track gas prices. The recent decoupling of forward power prices and forward natural gas prices suggests that wholesale markets are anticipating more volatile prices in the face of capacity constraints as coal plants are retired. (See Exhibit 12).

Coal retirements, though widespread, are more concentrated in certain regions. The PJM Independent System Operator, which services much of Appalachia, represents approximately 45 percent of the projected coal retirements in 2015 and 2016. Outside of PJM, the Midwest and Southeast regions will account for almost the

## Exhibit 12: Coal Plant Retirements Decouple Power Prices from Gas Prices



Note: Prices were normalized at October 27, 2014

Sources: Bloomberg, CoBank

entire remaining balance of 2015-16 coal retirements. As a result, forward power prices in these regions will also reflect a higher risk premium associated with capacity constraints during peak demand times. California is retiring very few coal units, but faces reduced hydro generation due to current drought conditions. Regional power prices in California could become elevated, but this upside risk will be mitigated by low demand growth and the significant solar capacity that has come online recently. Texas will also experience very few coal retirements through 2016. Drought conditions have eased in Texas, and the state is aggressively adding wind and natural gas-fired capacity. Forward power prices in Texas are currently stable.

In an effort to offset the negative effects of the prospective large-scale coal retirements, including elevated power prices and reliability concerns, developers and utilities are currently constructing over 14 GW of new generating capacity across the country. Wind accounts for 47 percent of this new capacity; natural gas, for 39 percent; and solar, for 10 percent.

Texas, Oklahoma and California hold the top three spots in terms of new generating capacity currently under construction. Texas is the clear winner with 4.6 GW of

new capacity scheduled to come online this year. Texas is building more wind and natural gas capacity than any other state, with 2.7 GW and 1.7 GW, respectively, under construction. Oklahoma follows Texas in total new builds by a large margin with 1.8 GW scheduled for completion this year. California is putting the final touches on more solar projects than any other state, building 1 GW of new capacity. These new solar projects represent more than 60 percent of all generating capacity currently under construction in the state; the remainder consists mostly of natural gas.

Going forward, the two dominant themes across the U.S. energy

sector will likely continue to be the resilience of U.S. shale producers and the retirement of coal-fired generation. These market shifts will result in greater volatility for energy prices and higher risk premiums due to potential capacity constraints and reliability issues resulting from the significant coal unit retirements.

### Water Utilities

Drought conditions pose many challenges to water utilities which are tasked with providing an ever-growing population with affordable and potable water. Droughts vary in severity and duration; and this variability makes it difficult for water agencies, particularly the smaller ones with limited resources, to take the necessary actions to limit the downside risks associated with water shortages.

Droughts today are lasting longer and impact water supplies more severely than they used to. For example, the Colorado River has been dogged by a 15-year drought, which has reduced the river's average water flow to about 70 percent of its historical normal. Lake Mead, located in Nevada and the nation's largest manmade reservoir and water storage facility for the Lower Colorado River Basin, currently contains just 41 percent of its 26

million acre-foot capacity. Despite the trend towards long-lasting water shortages, many water utilities respond with short-term, emergency solutions.

According to the 2014 Water Shortage Preparedness Survey published by the American Water Works Association (AWWA), the most common supply-side strategy used by water utilities during a water shortage is to rely on their neighbors for help. Water utilities do this either by executing mutual aid agreements or by establishing transfers and/or interconnections with other nearby water agencies. Often, however, the majority of a state's land-area will be experiencing elevated drought conditions, and neighboring water agencies will then be limited in their ability to divert flows to other water suppliers.

“*The small rural water systems with limited resources are likely to bear a disproportionate share of the risks associated with water shortages.*”

Another short-term solution involves so-called demand-side management (DSM) programs, which are designed to reduce customers' demand for water. According to the AWWA survey, the most popular DSM program consists of voluntary water use restrictions. In the past, however, voluntary restrictions have had highly mixed results. For example, California imposed voluntary restrictions in early 2014 to reduce consumption from residential and commercial customers by 20 percent. One year later in January 2015, water consumption had decreased only 9 percent, even though 94 percent of Californians believed that “the state is undergoing a serious water shortage,” according to a recent public opinion poll. Consequently, the Governor had to impose mandatory restrictions in March 2015 to reduce water consumption by 25 percent for residential and commercial customers by March 2016.

According to the AWWA survey, as many as one-third of all U.S. water utilities do not actively monitor the effectiveness of water use restrictions. This is particularly alarming considering that a large portion of water utility revenue is tied directly to the volume of water consumed. Furthermore, when utilities fail to track the effectiveness of water use restrictions, it limits their ability to develop long-term water shortage management plans, reinforcing the common strategy of managing long-term water shortages with short-term solutions.

The one-third of U.S. water utilities that do not track the effectiveness of their water use restrictions includes a disproportionate number of small utilities with no more than 5,000 connections. Their small scale may well be the reason why they don't monitor the effectiveness of their water use restrictions – they simply lack the resources to do so. Indeed, their lack of resources also hinders small utilities in preparing for or responding to water shortages. Often, the only solutions available to small water systems for handling water shortages are short-term in nature given the significant resources required for the permitting and engineering associated with long-term water supply solutions.

Drought conditions do not discriminate among water utilities based on their ability to manage water shortages. However, some are simply better prepared to deal with less supply and an associated reduction in demand. Therefore, the small rural water systems with limited resources are likely to bear a disproportionate share of the risks associated with water shortages. This is especially true given that water shortages and droughts are becoming longer in duration and more severe. Water managers in many regions of the U.S. have entered a new era – one that requires supplying a growing population with less supply – also referred to as the new normal. ■

This quarterly update is prepared by the Knowledge Exchange Division and covers the key industries served by CoBank, including the agricultural markets and the rural infrastructure industries. Analysts at Plus One Strategic Communications LLC prepared the overview of the communications industry.

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