



QUARTERLY U.S. RURAL ECONOMIC REVIEW

Larger Supplies Continue to Challenge U.S. Agriculture

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.

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Key Points:

- *Ample supplies of grains and oilseeds in 2015/16 will keep grain prices insulated from major escalations through the rest of this year and potentially far into the future.*
- *Grain market participants are anticipating a sharp reduction in China’s corn price support in 2016, which would impair U.S. exports of corn and corn-alternatives. Lower DDG prices would in turn impair the ethanol industry’s profit margins.*
- *Following 18 months of record earnings, the ethanol industry has rebalanced in 2015. If the industry can maintain production discipline in 2016, it should be able to sustain positive margins.*
- *The animal protein complex is now growing per capita meat supplies at the fastest rate in nearly forty years, and the larger supplies will likely cause meat prices to erode over the next two years.*
- *We anticipate that a cyclical recovery of the U.S. dairy industry will be delayed until early to mid-2017, because a U.S. recovery is unlikely to gain traction without support from exports and the medium-term outlook for U.S. dairy product exports is unfavorable.*
- *Many Californians are convinced that El Niño will be their deliverance, unleashing torrential rains that will end the drought. However, even if an El Niño event does end California’s drought, the state’s water woes will probably still persist. Water availability will remain a key issue in many parts of the U.S.*
- *Within the power and energy industries, the combination of stricter environmental regulations and low natural gas prices has resulted in historic coal-fired retirements.*
- *Internet traffic quadrupled between 2009 and 2014, with consumer video viewing accounting for 73 percent of U.S. network traffic in 2014.*
- *All segments of the communications industry are benefiting from streaming video trends, with the exception of the traditional pay-TV providers, who have begun to experiment with new business models and offerings.*

The Changing Agricultural Landscape

After two years of sharply falling income, U.S. agriculture confronts a much different global marketplace today than it did in 2010-14. The economic slowdown in China is rippling through other emerging economies with significant linkages to China's economy, particularly in terms of raw materials and commodities. Global demand for agricultural products will continue to grow but at a subdued pace. At the same time, the expected surge in supplies is not so large that it will preclude a major role for severe weather conditions. Climatic events such as the developing El Niño will continue to disrupt the agricultural markets.

Global Economic Environment

Going forward, the global economy will need to adjust to slower growth in China while the advanced economies will need to address major structural issues that are limiting their growth potential. China's economic slowdown to 6 to 7 percent a year will trigger slower growth rates in those emerging countries with significant linkages to China, particularly with respect to raw materials and commodities. Countries such as Australia and Brazil (the world's #1 and #2 iron ore exporters) and Chile (the #1 copper exporter) will be directly impacted.

The advanced economies have their own challenges. They each face unique structural challenges that are complicated by the lack of political consensus about how to address them. High levels of government debt and the demographic realities of aging populations will limit many aggressive pro-growth strategies. The legislative dysfunction and procrastination that were prevalent in the U.S. and other advanced economies during and after the global financial crisis will cease to be an acceptable approach.

In this setting, global growth will be uneven, subdued, and vulnerable to geopolitical shocks, while divergent central bank policies and geopolitical surprises will continue to roil the exchange rate and financial markets. Nonetheless, cautious optimism is warranted based upon the following considerations:

- **The U.S. will be the major driver of global growth but will need to transition through Presidential and Congressional elections before beginning to address significant structured challenges.** Consumer spending, housing and equipment purchases will likely be the main engines of growth. However, continuing uncertainty over key policies such as taxes, regulation, and immigration will continue to curb business fixed investment and to limit growth rates to the 2.5 to 3 percent range in 2016.
- **China will remain committed to realigning its economy toward greater consumer dependence but the transition will likely be uneven.** In the short run, China will continue to stimulate its economy to maintain growth and promote political stability, though with its high debt levels, the degree of stimulus will be limited. During 2016, its transition away from an investment and export driven economy to consumer leadership will remain difficult and potentially volatile.
- **Central banks in the U.S., Europe and Japan will chart divergent paths for the foreseeable future.** The number one challenge facing the central banks during 2016-18 will be to unwind their extraordinarily stimulative monetary policies without undermining the global economic recovery or triggering a renewed inflationary cycle.
- **The value of the U.S. dollar will either stabilize or move higher.** Having already risen dramatically in recent years, the value of the U.S. dollar isn't likely to change much in the near-term; but if it does move, it's more likely to strengthen than to weaken, given that U.S. interest rates will be rising and the U.S. economy continues to outperform the other advanced economies.
- **Eurozone sovereign debt issues will continue to limit economic potential.** Global capital markets will constantly re-assess the Eurozone's progress toward establishing a unified banking system, the risks of default, and members' commitments to fiscal discipline. Overall economic growth in Europe will

likely remain subdued around 0.5 to 1.5 percent during 2016-18 unless major economic reforms within the peripheral countries are achieved.

- **Emerging markets will continue to have difficulty in attracting capital as interest rates in some advanced economies rise and demand growth in commodity markets remains subdued.** Slower growth in China and many advanced economies will limit the potential growth in many emerging economies, particularly those that have relied on raw material and commodity export growth to drive their economies.
- **With tenuous growth prospects in many parts of the world, geopolitical flare-ups will continue to add volatility to the global landscape.** The Middle East turmoil shows no sign of abating and Ukraine's problems are likely to worsen. Subpar economic growth in many other regions will likely create further geopolitical turmoil.
- **World energy markets will remain volatile as the paradigm shift matures and production is adjusted to the new economic realities.** Going forward, the combination of a more self-sufficient North American energy market, reduced European dependence on Russian energy supplies, China's realignment of its energy supply chains and the response from Saudi Arabia will have significant economic and geopolitical consequences.

U.S. Economic Environment

After growing at an impressive 3.9 percent annual rate in Q2-2015, U.S. economic growth is likely to remain in the 2.5 to 3 percent range through 2016. While the underlying growth trajectory seems solidly based, U.S. election year rhetoric and geopolitical developments will likely make 2016 a rollercoaster year in terms of quarter-to-quarter growth rates.

Other indicators also suggest that the U.S. economy is gaining momentum, with strong consumer demand serving as the cornerstone for what is now the 4th longest U.S. economic expansion. Bolstered by higher incomes,

“*In the face of low inflation and low unemployment, the Federal Reserve will soon end its near-zero interest rate policy, but probably not until next year, and then pursue a gradual normalization of short term rates.*”

reduced debt levels, improved housing prices, and a growing job market, consumers should provide a strong engine of growth for the overall economy. Businesses continue to add about 250,000 jobs a month to their payrolls; joblessness has declined to around 5 percent, on par with what it was prior to the Financial Crisis of 2007-09; and wage gains are poised to accelerate in 2016.

Other sectors of the economy, however, are less robust. Business fixed investment will remain subdued until the Presidential and Congressional elections are completed and clear policy directions begin to emerge. Net exports will also be a drag on growth as the strong U.S. dollar boosts imports and limits export potential. On balance, inflationary pressures should remain benign until global growth recovers and shrinks the excess capacity still plaguing so many U.S. industries.

In the face of low inflation and low unemployment, the Federal Reserve will soon end its near-zero interest rate policy, but probably not until next year, and then pursue a gradual normalization of short term rates. But in doing so, the Fed will continue its data dependent approach to the timing and pace of interest rate increases to avoid undermining the economic growth path or triggering inflationary pressures. There will be ongoing concern about the pace of Federal Reserve interest rate hikes, but the financial markets will begin to take them in stride as we get further from the liftoff announcement.

U.S. Agricultural Markets

U.S. agriculture confronts a much different global marketplace today than it did in 2010-14. Absent dramatic weather disruptions, global commodity supplies will continue to grow while the economic slowdown in China and other emerging markets will dampen global demand growth. The transitions that are unfolding in the commodity markets will percolate through all of the related supply chains as the new pricing paradigm works its way through the global marketplace.

In turn, the full range of agricultural inputs including land, fertilizer, crop protectants and farm machinery will need to be realigned in terms of both volume and price. Agricultural producers will continue to emphasize cost management and economies of scale in their quest for “speed, space and risk management options,” and farmer cooperatives are making accommodative changes in their business plans, strategies, and capital plans. This new pricing paradigm will accelerate the pace and scope of the supply chain realignments. The need to

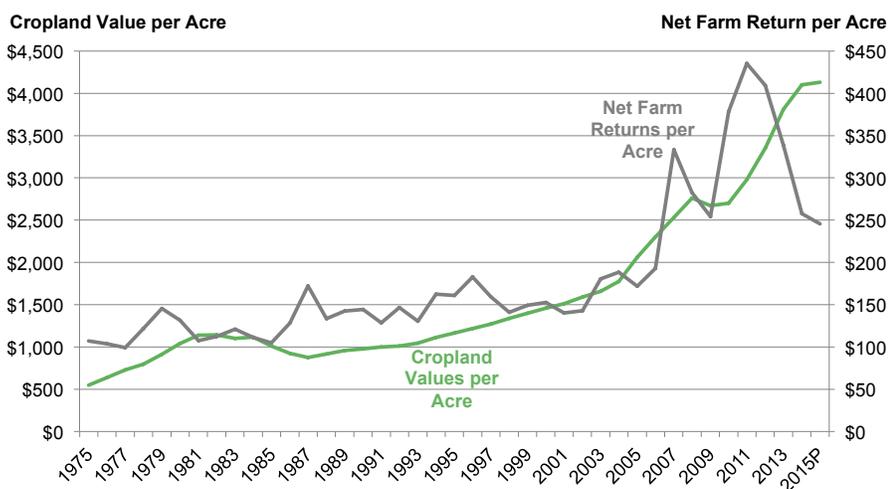
access debt capital is likely to increase all across the agribusiness supply chains as margins narrow and accumulated liquidity balances are drawn down.

Net cash farm income is projected to tumble 25 to 30 percent during 2014-15 but should level off as production expenses align to the new market realities. During 2010-14, net cash farm income exceeded the average for the previous decade by over 70 percent and provided producers with strong liquidity and solid balance sheets. Going forward, farm incomes are likely to remain above those of the previous decade, but by smaller margins. Government revenue and crop insurance will provide some buffer, but the farm programs may fall under greater scrutiny if outlays far exceed Congress’s expectations when they passed the legislation in early 2014.

Farmland Values

Among the new realities confronting U.S. agriculture will be a re-valuation of farmland values. Cropland prices nationwide doubled during the decade that ended in 2015, climbing to \$4,130 per acre from \$2,060 in 2005 – with the biggest increase occurring during 2010-13. (See Exhibit 1.) Unlike the surge in farmland prices that occurred in the late 1970s, the recent run-up was not a market bubble. To the contrary, the doubling of cropland values was a reflection of underlying fundamentals – i.e., a steep rise in net cash farm income plus an unprecedented fall in interest rates. Moreover, this time around, farmers kept a tight rein on their indebtedness, even as farmland values soared. As a result, the farm sector’s leverage ratio (i.e., debt to total assets) was essentially the same in 2015 as it was ten years earlier. In contrast, during the earlier 1970s episode, the farm sector’s leverage ratio rose dramatically as farmland values climbed, thus contributing to the inflating bubble.

Exhibit 1: U.S. Net Farm Returns versus Cropland Values, 1975-2015P



P: USDA projections

Farm returns (including government payments) over variable costs for wheat, soybeans, and cotton, weighted by acreages harvested.

Sources: USDA, Informa Economics, and CoBank

Cropland prices will trend lower, however, over the next year or two. First of all, net cash farm income will probably continue to decline during this period, though to a lesser extent than the 25 to 30 percent drop posted in 2014-15. Second, U.S. interest rates will be rising during the next year or two, as the Fed moves to normalize short-term rates. As a result, farmland values will recede, but it should be an orderly, measured decline, with cropland values bottoming out 10 to 15 percent on average below the cyclical high.

Grains, Oilseeds, and Ethanol

Ample supplies of grain in 2015/16 will keep grain prices insulated from major escalations through the rest of this year and potentially far into the future. Grain and oilseed inventories have swelled over the past three years. Domestic demand is likely to remain relatively flat across grain commodities, highlighting the importance of exports. Absent weather-driven crop shortages, the stage is now set for lower grain prices for the foreseeable future. Moreover, regional disparities in basis may also widen insofar as larger supplies strain not only grain storage capacity but also the nation's already overextended rail, barge and truck systems.

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While wet weather conditions plagued much of the Eastern Corn Belt last spring, the grain and oilseed crops are flourishing today and the latest USDA estimates point toward a relatively well supplied market in 2015/16. In the near term, as the domestic fall crop harvest progresses, yield revisions and volatile macroeconomic conditions, here and abroad, will exert the largest influences on crop prices and sales.

Corn

This year, U.S. supplies of corn are expected to fall for the first time in three years. This decline is a result of fewer planted acres, yields that have retreated from the record set last year, and somewhat resilient old-crop demand amidst large global supplies. While recent yield projections have moved lower, only a select few states are expected to see a reduction from trend yield in 2015.

As the harvest season progresses, the USDA's current estimates of corn acreage and yields could turn out to be too high, because they understate the impact of the heavy rainfall in the Eastern Corn Belt during the planting season. Though the latest USDA estimates do incorporate a yield reduction that has taken some of this impact into account, many private-sector analysts think that it's too little. While August yield and acreage estimates may have been the seasonal high for corn, ample U.S. and global supplies will likely curtail large price escalations heading into next year. Price volatility will persist as the corn harvest works its way north and more accurate yield estimates are obtained.

The recent rollercoaster of changing macroeconomic conditions continues to roil the commodity markets and temper U.S. export expectations. In particular, China's economic slowdown to 6 to 7 percent has fostered concern over its longer-term growth prospects. The market also anticipates a sharp reduction in China's corn price support in 2016, which would impair U.S. exports of corn and corn-alternatives. China currently holds nearly half of the world's corn stocks, and will likely attempt to reduce its inventory in 2016. If the Chinese authorities impose controls on the importation of unregulated corn-alternatives such as distillers grains and sorghum, the brunt of those regulated reductions would fall on U.S. exporters, and the prices for those corn-alternatives would fall. The lower prices would represent gains for the livestock industries but losses for the ethanol industry. While the timing of changes to China's corn price support is unknown, it appears to be a question of when and not if the changes will take place.

Near-term uncertainty about the size of the 2015/16 crop will likely keep grower sales choppy and sales will

be done based on cash flow needs. Current estimates call for only a 1 percent decline in U.S. corn supplies this year, so elevators will have their hands full finding enough space during the harvest. But they will also benefit through the coming crop year from good storage utilization and a strong, positive market carry.

Soybeans

This year’s U.S. soybean crop is expected to be on par with last year’s record. The increase in planted acreage should largely offset modest yield reductions. A second consecutive bumper crop will cause U.S. stocks to be twice as large in 2015/16 as they were last year, likely resulting in further downward pressure on prices. The back-to-back large crops will keep domestic crush humming at last year’s record setting pace. Growing supplies and healthy overseas competition will lower prices for the soybean complex in 2015/16.

Large global supplies, the strong U.S. dollar, and slackening global demand will create headwinds for U.S. soybean exports. This year will be the third consecutive year of growth in the global soybean supply, and South America is expected to raise another record

crop of soybeans in 2016. (See Exhibit 2.) The sharp decline in the value of the Brazilian real adds to U.S. export challenges, and South American growers may plant additional beans in the coming seasons as they receive very different price and demand signals than their U.S. counterparts. Tight supplies of credit in South America may shift production from input-intensive crops to soybeans. And larger South American supplies may shorten the export window for U.S. soybeans as competitors’ supplies swell.

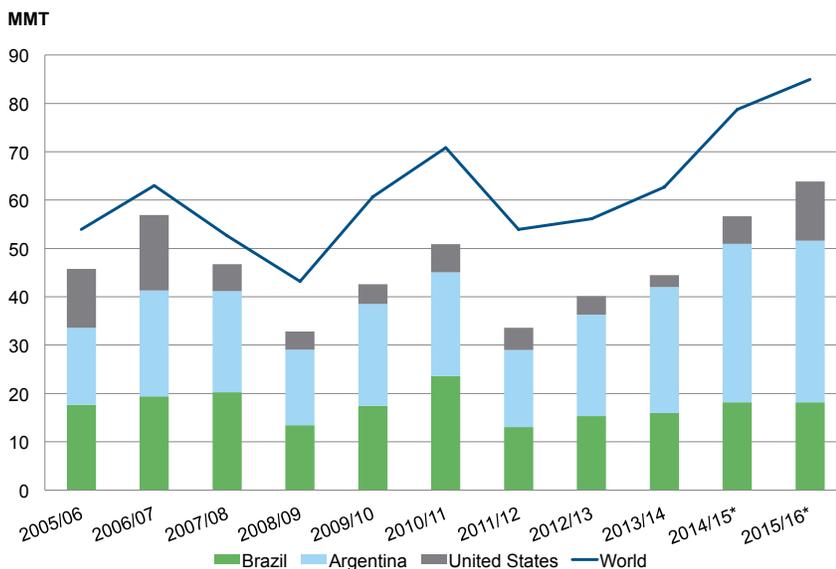
The headwinds faced by U.S. exports have been highlighted recently by the slow pace of new-crop U.S. soybean exports. At the end of August, U.S. new-crop soybean overseas sales were 38 percent below what they were a year ago. China will continue to be the largest destination for U.S. soybeans; however, China’s economic slowdown, changes to Chinese monetary policy and record large, less expensive, South American supplies will lead to a reduction in U.S. exports through the marketing year. But at the same time, increased demand from the expanding U.S. animal protein and biodiesel industries will partially offset the effect of reduced exports.

Slower new crop export sales could complicate elevator storage decisions, especially in the Upper Midwest, where corn, wheat, and soybeans are all grown and compete for storage. Slower unit train orders to the West Coast will keep soybeans in storage longer this year, making merchandising decisions all the more critical.

Wheat

With the spring wheat harvest wrapping up, winter wheat is being planted and the planting pace is in line with the five year average. As the 2015/16 wheat harvest comes to a close, production is expected to increase 1 percent year-over-year (YoY) reflecting the absence of last year’s dry conditions. Much of this increase

Exhibit 2: Soybean Ending Stocks



Source: USDA-FAS

is due to fewer abandoned acres. In addition to higher production in 2015/16, more old-crop wheat supplies are still available. Domestic wheat stocks are set to expand 16 percent YoY, setting the stage for supplies to exceed demand in 2015/16.

Wheat exports are anticipated to increase YoY as domestic production recovers from last year's drought stricken level. However, exports will be the second lowest since 2009/10. U.S. market share in global wheat trade is eroding due to larger global supplies, less global wheat trade and the strong U.S. dollar. (See Exhibit 3.) Over the last ten years, the U.S. share of global wheat exports has fallen from 23 percent to 16 percent. Meanwhile, the former Soviet Union (FSU) countries have expanded their presence as a wheat exporter increasing their share of global wheat trade from 18 percent to 27 percent.

2015/16 marks the third consecutive year of record global wheat production. Shifting foreign import/export policies have also influenced the level of global wheat trade. Russia recently lowered the export tax imposed on July 1, 2015, in the face of another large Russian harvest that will be just 4 percent below the record. Ample supplies, the reduced export tax, and a depreciated

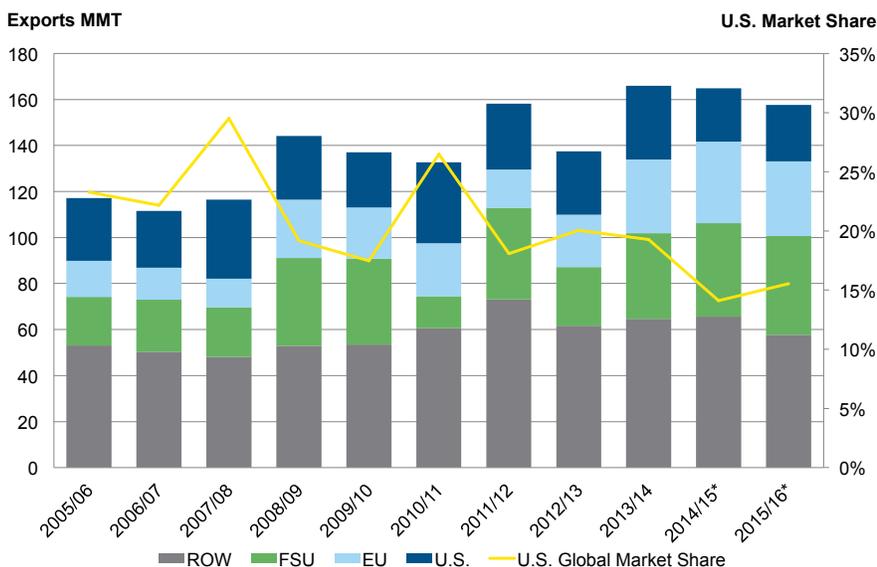
ruble may further erode U.S. competitiveness in wheat. Large domestic supplies of wheat in India and Iran have encouraged these countries to introduce import duties, further upending global trade.

Weather will be an important factor for U.S. wheat price movements in 2015/16. The still-developing El Niño event, reportedly one of the strongest on record, is expected to intensify through the end of the year. El Niño events could bring dry conditions to Australia; however, recent rains and a fast approaching harvest may limit El Niño driven losses in 2015. Weather events in South America may have impacted wheat production as rainfall creates soggy conditions in Argentina, and cold temperatures heighten the fear of freeze related losses in Brazil. It is still too early to know the extent of damages from unfavorable weather, but significant losses could increase South American wheat imports.

Weather driven production shortfalls could spur wheat price movement, although record global supplies will temper large price hikes. Increased domestic production of wheat amidst a third consecutive year of record global production is likely to keep wheat parked in U.S. storage for a longer time. Storage will likely command a premium

as sluggish new crop corn and soybean exports and old crop sales push more volume into the supply chain. Increased volume of grains could potentially create logistical challenges for terminal operators. For areas that service corn, soybeans and wheat, storage rates and crop specific basis strategies will be important with regard to flexibility of shipments and timing of sales.

Exhibit 3: Global Wheat Trade

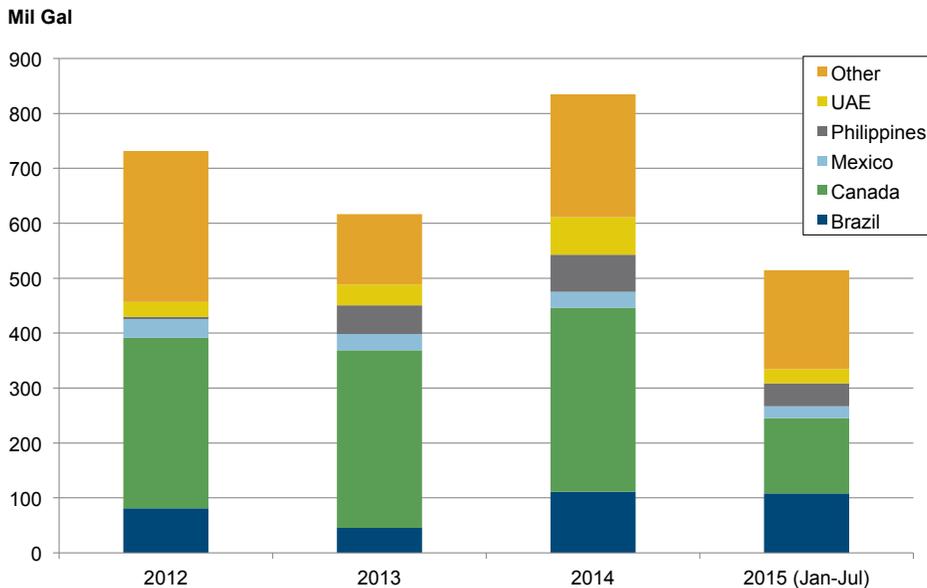


Source: USDA-FAS

Ethanol

After 18 months of record earnings, the U.S. ethanol industry has rebalanced in 2015. As oil and gasoline prices collapsed in late 2014, so did ethanol prices and plant margins. However, supply and demand have been well balanced in

Exhibit 4: U.S. Ethanol Exports



Source: USDA

2015, and producers have maintained positive earnings. Margins have been aided by strong exports of ethanol and distillers grains (DDGs) and corn prices that have hovered near multi-year lows.

Looking ahead, domestic corn ethanol use is unlikely to change materially. Policymakers at the Environmental Protection Agency (EPA) have indicated that they plan to support 10 percent blending levels (E10) in the U.S., but will not incentivize blend levels above E10. Additionally, Americans are expected to drive more as the U.S. economy continues to improve, but the U.S. Department of Energy projects that enhanced fuel efficiency in vehicles will offset the additional miles driven. Thus, U.S. fuel (and ethanol) consumption will remain flat.

Exports offer the best potential for ethanol demand growth, and the industry has been very successful in expanding export sales despite the strong U.S. dollar. (See Exhibit 4.) This success is due in large part to Brazil, which has increased its domestic ethanol blending requirements and is now unable to supply the global market as much as it has in the past. Ultimately, it will be the relative prices of ethanol and gasoline that will determine the level of global demand for ethanol, but

the U.S. will be well positioned to supply the world market in coming months.

Lower priced corn should be a tailwind for the industry's profitability well into 2016. Price volatility related to ethanol plants' revenue streams, though, will leave a lot of uncertainty about margins. Crude oil and gasoline prices are expected to remain volatile for the foreseeable future, which will influence ethanol prices. A move up or down of \$20 per barrel is very possible in the coming months, with significant impacts for ethanol.

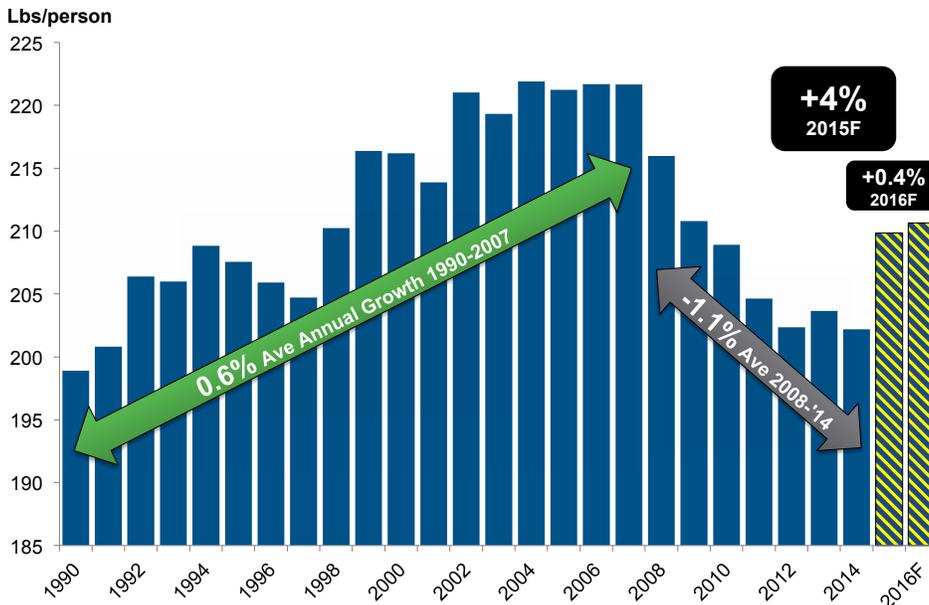
The ethanol industry has also grown very dependent on China for export sales of DDGs. Sixty percent of the U.S.'s year-to-date (YTD) DDG exports were sent to China, but future sales could be at risk. Most analysts believe that China will make changes to its grain pricing and importing policies in 2016, which could dramatically reduce its demand for corn-alternative feed grains.

Going forward, the industry's profitability outlook will remain vulnerable to either a policy change or adverse price movement. However, if the industry continues to demonstrate discipline by increasing production in line with consumption, it is likely to maintain marginally positive returns over the coming quarters.

Animal Protein Industries

The animal protein industries are at different stages of what promises to be an aggressive expansion of meat supplies, while dairy producers also are intent on bolstering output. (See Exhibit 5.) In recent years, the beef, pork and chicken industries have all been hard-hit by drought, elevated grain prices, disease, or productivity issues. In 2015, those diverse challenges have begun to give way and meat supplies are on the rise. The animal protein complex is now growing per capita meat supplies

Exhibit 5: U.S. Total Meat and Poultry Per Capita Supply



Sources: USDA, Livestock Marketing Information Center

at the fastest rate in nearly forty years. Larger supplies will likely cause prices to erode over the next two years, but should also improve capacity utilization for some links in the supply chain.

Going forward, suppliers will pay greater attention to bolstering export markets to absorb the larger supplies, but the strong U.S. dollar and slower growth in key markets abroad may limit potential export growth. Low feed costs will continue to benefit both animal protein and dairy sectors, but the dairy industry will face heightened risk in 2016 due to its growing export dependency and sharp increases in global and domestic milk supplies.

Beef

Two years of record high cow-calf operator profitability and dramatically improved pasture conditions have provided the catalysts for one of the most aggressive cattle herd rebuilding efforts in the industry's history. The beef cow herd is expanding at a historic pace, as indicated by nearly every metric available.

Herd expansion is expected to continue through the rest of 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 are still at 5 year lows. Given the production timeline, positive YoY beef output will begin in late 2016, but a significant increase in supply will not be realized until 2017.

Despite the tight supplies, prices are being pressured by headwinds in international markets, large supplies of competing meats, historically large carcass weights, and macroeconomic pressures. Fed cattle prices are in the midst of

finding a seasonal bottom, before an expected seasonal rally into the holidays.

Total U.S. beef production is expected to ease about 2 percent in 2015, with the decline front-loaded in the first half of the year. Slower cattle marketing has lowered this production forecast in the second half of 2015 as feedyards are continuing to feed cattle longer. YTD 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 1 to 2 percent increase in total output. The industry should experience continual YoY increases beginning in 2017.

However, price volatility in the marketplace and uncertainty about the consumer's willingness to continue supporting the current record-high beef prices will be ongoing concerns. Retail prices in August were down 5 cents from July, representing the largest monthly drop since early 2013. 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.

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 over \$400/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 for the remainder of 2015 and into mid-2016, intensifying competition to fill pens. The level of heifer retention

will also be a major variable in total placements into feedyards throughout 2016.

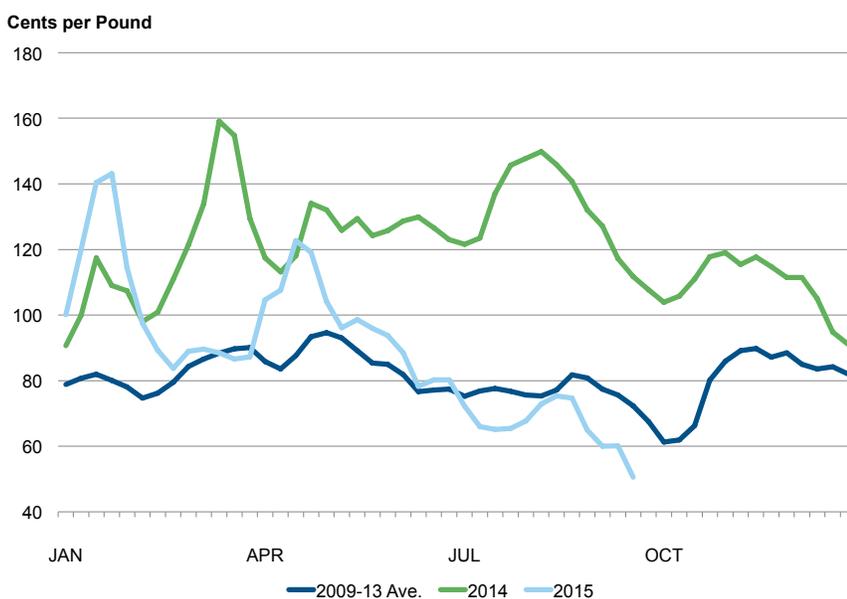
Since mid-July, beef packers have benefited from a sharp drop in fed cattle prices and a disproportionate drop in the beef cutout, resulting in healthy margins. Packers have gained bargaining leverage over cattle feeders as cattle are fed to record weights and feedyards' marketings have lagged, resulting in higher inventories.

Packer margins, however, have been negatively affected by a decline in drop credit values (i.e., the value of hides and offal). Drop credits are currently running about \$4 per hundredweight below year ago levels; the decline 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.

Longer days on feed have increased choice production and yield grades 4 and 5. The resulting increase in 50 percent trimmings production is weighing on the entire beef complex. The price of 50 percent trimmings has fallen to half what it was as recently as April 2014 – and is now at the lowest level since 2012. This price drop is also partly due to the surging pork and poultry supplies and their cheaper prices. This has been a main driver for downward price pressure as the 50 percent trim price contributes to all primal prices and accounts for about 10 percent of the overall carcass value. (See Exhibit 6.)

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 8 percent YTD through July 2015. Domestic demand at foodservice establishments also remains healthy, with the Restaurant

Exhibit 6: Beef Fresh 50 Percent Lean Trimmings



Sources: USDA-AMS, Livestock Marketing Information Center

Performance Index posting its 30th straight month above 100, indicating ongoing expansion.

U.S. beef exports are being hampered by the strong U.S. dollar and increased global competition. The weakened currencies of the U.S. industry's four major competitors (i.e., Australia, EU, Brazil and Canada) have made U.S. product more expensive on the global stage. Through July, beef exports were down 10 percent YTD in 2015. American exporters are focused on a pending decision on mandatory country of origin labeling (MCOOL) legislation. A failure to repeal or amend MCOOL would likely lead to sharp retaliation by Canada and Mexico against U.S. beef and pork exports, resulting in global market imbalances, volatility and uncertainty. Meanwhile, if successfully concluded, the ongoing Trans-Pacific Partnership (TPP) negotiations would open up new doors and opportunities for expanding U.S. exports in the coming years.

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 32 percent YoY, but a tightening of supply in Australia and quota limits will hinder 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

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 carcass weights, resulting in a 7.3 percent increase in total YTD production. Assuming that the trends of increased slaughter and an offsetting reduction in weights continue, the forecast for all of 2015 indicates a 7 percent gain in production, in sharp contrast to last year's decline due to PEDv reductions. The hog breeding herd expansion continues; and

“*The hog industry has recovered much faster from the Porcine Epidemic Diarrhea Virus (PEDv) than expected.*”

assuming that the average weight will continue to drift downward, pork production is expected to be flat to slightly down YoY in 2016.

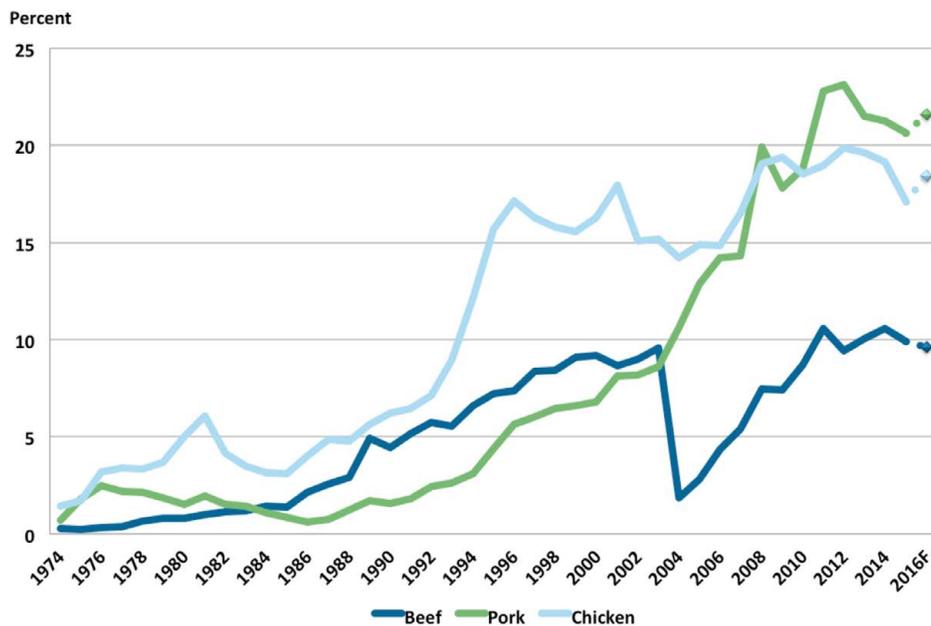
Producers are concerned about the possibility of a return of PEDv in the coming winter months. As older sows, which were exposed to the virus, leave the production system and are replaced with younger females, total herd immunity may be lower this year. However, the industry is optimistic that enhanced biosecurity protocols and successful vaccination programs will keep the disease impact at a minimum.

As we get closer to the seasonal peak in slaughter capacity during the closing months of the year, the industry is becoming less concerned about a shortage in packing capacity in 2015. However, producers are still worried about bumping up against seasonal packing capacity in late 2016, especially if hog numbers grow at a faster pace than forecasted. Two new packing plants that are scheduled to come online in 2017 should alleviate capacity concerns in the future – but won't help the situation next year.

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 returned the cutout value back to the 5 year average for 2009-13.

Despite several headwinds, export demand is recovering and is expected to help bolster pork prices. Exports YTD are down 5 percent, but are expected to gain YoY for the remainder of the year and should finish in positive territory for the year as a whole. (*See Exhibit 7.*) Analysts' expectations call for a 1 to 4 percent increase in 2015 annual exports.

Exhibit 7: U.S. Meat Exports Share of Total Production



Sources: USDA, Livestock Marketing Information Center

An increase in exports would help alleviate the mounting pressure on U.S. prices. The recent contraction of the Chinese pork supply and spike in Chinese hog prices simultaneously creates the greatest uncertainty but also the biggest opportunity for U.S. exports. Headwinds will remain, however, including the strong U.S. dollar and competition from relatively cheaper EU pork in the global market.

With lower feed prices expected to persist throughout the remainder of 2015 and into 2016, the outlook for producers' profitability will be determined entirely by hog prices. Buoyed by exports, hog prices are expected to remain at profitable levels, lifting commercial farrow to finish operating margins back into the black for the year. 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 and 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. Whether margins will actually improve going forward hinges on what happens to the cutout value, which depends in turn on the strength of demand. But it's not just the demand for pork that matters. 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 and 2016 as the markets will ration the available supply at the appropriate price level.

Poultry

Broiler production has been largely unaffected by the recent outbreak of Highly Pathogenic Avian Influenza (HPAI). Integrators are worried, however, about the possibility of a return of HPAI in the fall. The industry is focused on refining strict biosecurity protocols and carefully considering potential vaccination programs.

The proposed vaccination program would not be a panacea. Implementation of a vaccination program would be used by many U.S. trading partners as a rationale for the imposition of a non-tariff trade barrier to restrict trade. Our trading partners do not distinguish between broilers, egg layers or turkeys – poultry is poultry. The World Organization for Animal Health (OIE) considers avian influenza to be endemic in countries that vaccinate for the disease. Even without a vaccination program, trade bans imposed by U.S. trading partners add up to an estimated 18 percent of last year's U.S. export volume and have resulted in a significant increase in domestic supplies. It is extremely important to note that the U.S. does not allow the importation of poultry, poultry products, or eggs from a country where vaccinations for avian influenza are administered. We can only assume that our trading partners will treat us in a similar fashion.

In response to the current bans on imports from the U.S., inventories of leg quarters, a traditional export item, have piled up, and prices have adjusted downward. (See *Exhibit 7*.) The top ten 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 even greater abundance of broiler supply in the U.S. The resulting lower chicken prices could compress margins and apply negative price pressure onto the beef and pork complexes.

Broiler production continues to grow at a steady pace, with the hatchery flock stabilizing and increasing in early 2015. Gradual increases are expected throughout 2015 and 2016. Chick placements have increased 2.5 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 yields, 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 margins. Average live weights are expected to increase as more companies are shifting toward a larger proportion of big birds. 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, the export volume and prices for leg quarters 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 Industry

U.S. dairy product markets remain mixed. The domestic butter and cheese markets appear to be in balance, with prices drifting higher though they're still well below where they were a year-ago. But the other U.S. product markets – powder, dry whey, whey protein concentrate and lactose – are all performing poorly, with prices continuing to slump (albeit with a few glitches, up and down). Judging by futures prices, the market consensus is anticipating that U.S. dairy market conditions will stabilize over the next six months or so and then stage a cyclical recovery by mid-2016. (See *Exhibit 8*.) However, the risks to the U.S. dairy industry lie predominantly on the downside, and we suspect that the cyclical upturn will likely be delayed until early to mid-2017.

Dairy market conditions in the U.S. are tied loosely to the global marketplace. At this point, the global dairy product markets are all in shambles – grossly oversupplied with prices having tumbled, across the board, in an effort to clear the markets. Amidst this gloomy setting, dairy product prices on New Zealand's Global Dairy Trade (GDT) market staged a sharp rally in mid-September, catching global players totally off-guard. Some analysts maintain that this rally marks the beginning of a global recovery, but others disagree. The skeptics dismiss this isolated upturn in GDT prices as a market anomaly or glitch, the result of idiosyncrasies peculiar to the thinly-traded GDT. The rally, they maintain, does not signal the beginning of a global recovery. We concur. For the skeptics, global market fundamentals remain decidedly bearish.

Despite the pronounced downtrend in global dairy product prices, the world's major dairy suppliers – particularly, the EU and the U.S. – continue to expand output. Until global

producers curtail their milk production, product prices will continue to fall. Eventually, global producers and processors will respond to these market signals; and then, with a lag, global dairy product prices will bottom out and turn the corner. But the world's major dairy producers show no signs of getting ready to step on the brakes any time soon, and there will be no cyclical upturn until then. It's highly doubtful, moreover, that the U.S. dairy industry will begin its recovery before the global dairy markets have begun theirs.

Four primary risks pose threats to the U.S. dairy industry. All four hinge on U.S. dairy product exports, and thus on global market conditions.

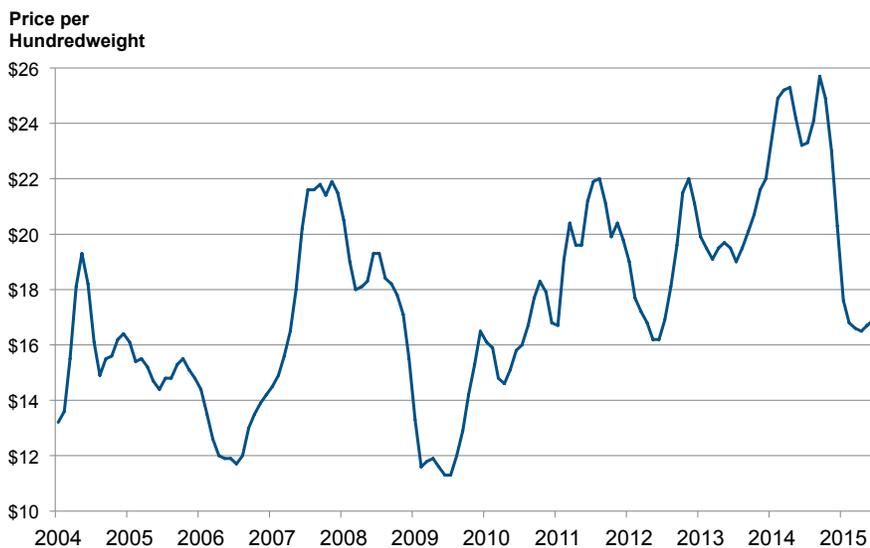
- At the top of the list is the appreciation of the U.S. dollar. Over the past 24 months, the U.S. dollar has risen 20 percent against the market-basket of currencies of the U.S.'s major trading partners. Over this same period, the U.S. dollar has risen 18 percent against the euro, which is significant because the EU dairy industry is a formidable competitor in the global marketplace.
- The EU's dairy quotas 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. Since the EU dairy quotas were lifted, its dairy production has grown about 2½ percent from a year ago. Because the EU dairy industry is about one-and-a-half times bigger than the U.S.'s, this extra 2½ percent represents a substantial amount of incremental dairy products, all of which must be absorbed into the marketplace, at home or abroad. Going forward, EU producers are poised for additional growth.

- Even as EU dairy producers and processors continue to expand their output, export sales to their best customer – Russia – remain blocked. In June, Russia announced that it was extending its sanctions against EU produce, in retaliation for the EU's sanctions. As a result of Russia's ban, the dairy products normally exported from the EU into Russia are being redirected to Japan, Korea, Saudi Arabia, Egypt, and Mexico – all traditionally good customers of the U.S. dairy industry. Despite the continued deterioration of Russia's economy, it doesn't look as if it will lift its ban on EU agricultural products any time soon.

- Chinese importers of dairy products, especially powder, remain on the sidelines. Their demand for milk powder slackened appreciably during the second half of 2014, following aggressive purchases during the first half. China's total dairy product imports for the first six months of 2015 were down 50 percent from a year ago. Moreover, China's own domestic production appears to be on the rise, perhaps substantially. Looking ahead, the consensus forecast calls for China's overstocked inventories to be whittled down over the next six months or so, to the point where the Chinese begin to step up their

Exhibit 8: U.S. All-Milk Price, 2004-15



Source: USDA

purchases. Some analysts, however, are beginning to question this scenario. One well respected dairy consultant recently stated that, “The great Chinese import rush that began in 2009 and reached a spectacular crescendo in late 2013/early 2014 will likely go down as one of the biggest – and most devastating – false tells in global dairy market history.”

And yet, despite these risks, dairy product futures prices are signaling that a cyclical recovery in the U.S. dairy industry will begin in early to mid-2016. This outlook presupposes that the four concerns outlined above get resolved by then. Perhaps they will, but we remain doubtful.

While global dairy product markets are generally bearish, there are some bright spots in the U.S. dairy product markets. In particular, U.S. cheese and butter prices are on the rise, even as global cheese and butter prices continue to fall. U.S. butter prices are now trading in the range of \$0.50 to \$1.00 a pound higher than global prices, and U.S. cheese prices are also trading at a premium. Considering that all other U.S. product

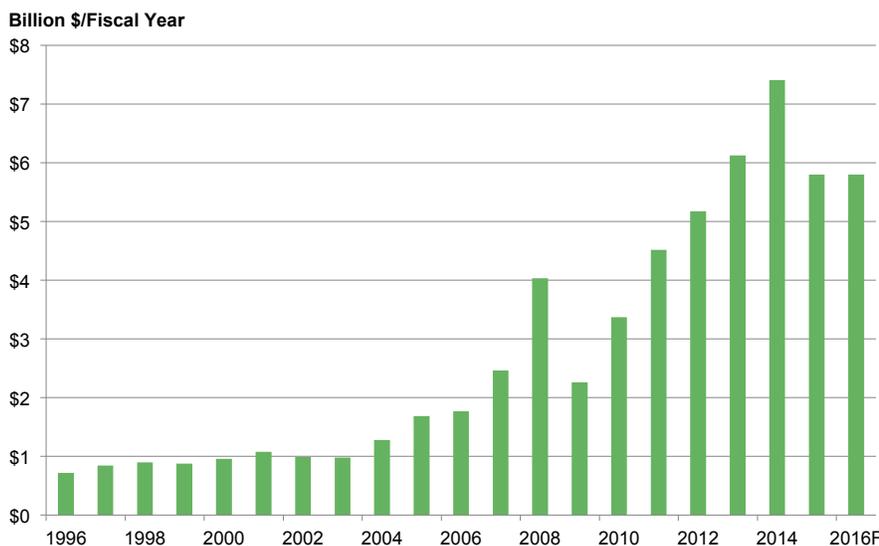
prices are falling in synch with their global counterparts, analysts have been puzzled by the strength displayed by U.S. butter and cheese prices. The most convincing explanation that we have seen for these two anomalies is that domestic buyers, having been burned last year in their inability to purchase enough product to keep their plants operating at full capacity, are “persistently pursuing forward cover” this year, thus perpetuating spot market strength. That said, most dairy analysts see this strength as a short-term phenomenon and are anticipating that U.S. butter and cheese prices will end up by year-end 2015 making a U-turn and aligning with global prices.

Current conditions for U.S. dairy product exports remain challenging. For the first seven months of the year, total U.S. dairy exports fell 11 percent in volume terms from a year ago – and a breathtaking 28 percent in value terms. (See Exhibit 9.) Going forward, and in light of the four constraints highlighted above, U.S. dairy product exports are likely to lose further ground, at least for a while. U.S. dairy product exports (on a milk solids basis) were equal to 14.6 percent of U.S. milk solids production in

June, bringing the YTD share to 14.5 percent. Hence, if the YoY decline in U.S. dairy product exports were to total 10 to 15 percent for the year as a whole, this slippage would amount to a 1.0 to 1.5 percent fall YoY in total demand, i.e., foreign plus domestic.

While U.S. producers’ margins have fallen from last year’s elevated levels, they’re still positive, providing operators with an incentive to continue expanding milk production. Going forward, U.S. milk production is on track to grow about 1 percent a year; and total U.S. domestic demand for dairy products would then have to grow at an above-average pace of 2.0 to 2.5 percent a year just to keep the industry on an even keel. In other words, in order for U.S. dairy product prices to stabilize in coming

Exhibit 9: U.S. Dairy Product Exports, 1996-2016



F: forecasts for 2015 and 2016, from USDA.
Source: USDA

months, either U.S. dairy product exports would have to stage a pronounced turnaround, or U.S. milk production would have to slow materially – or both. Otherwise, U.S. domestic dairy product consumption will have to grow at an accelerated pace in order to pick up the slack – an outcome that would necessitate a further erosion in prices.

In short, our medium-term outlook for the U.S. dairy industry is more bearish than the consensus. There are two reasons. First, we're doubtful that the U.S. dairy industry can stage a recovery without support from exports. In view of the four risks outlined above, we're pessimistic about the medium-term outlook for U.S. exports. Second, we do not see market fundamentals changing for the better until early 2017, notwithstanding current dairy futures prices.

Other Crops

Cotton

The U.S. cotton industry continues to fight an uphill battle in a world that is oversupplied with the white fiber. U.S. cotton plantings were at a 32 year low in 2015, but a global supply glut and weak world trade have stymied a recovery in prices. China continues to hold enough cotton inventories to satisfy its demand for two years, and world supplies are sufficient for one full year. As a result, this year the U.S. will export the lowest volume of cotton since 2000/01.

Macroeconomic conditions worldwide are also impeding a cotton recovery. Cotton use is highly correlated with global economic growth, which has been anemic and is unlikely to improve significantly through 2016. The recent decline in crude oil prices has also negatively affected cotton demand by making synthetic alternatives much less expensive to produce. Thus, synthetic fibers are dominating the apparel market today while cotton and cotton yarn prices are floundering.

These are medium-to-long term problems that face the U.S. cotton industry. Absent an unexpected major production shortfall somewhere in the world in 2015/16, cotton prices are likely to hover near current levels and

“The U.S. cotton industry continues to fight an uphill battle in a world that is oversupplied with the white fiber.”

cotton acres should remain flat in 2016. The cotton outlook will not improve until world stocks subside and global economic growth accelerates.

Rice

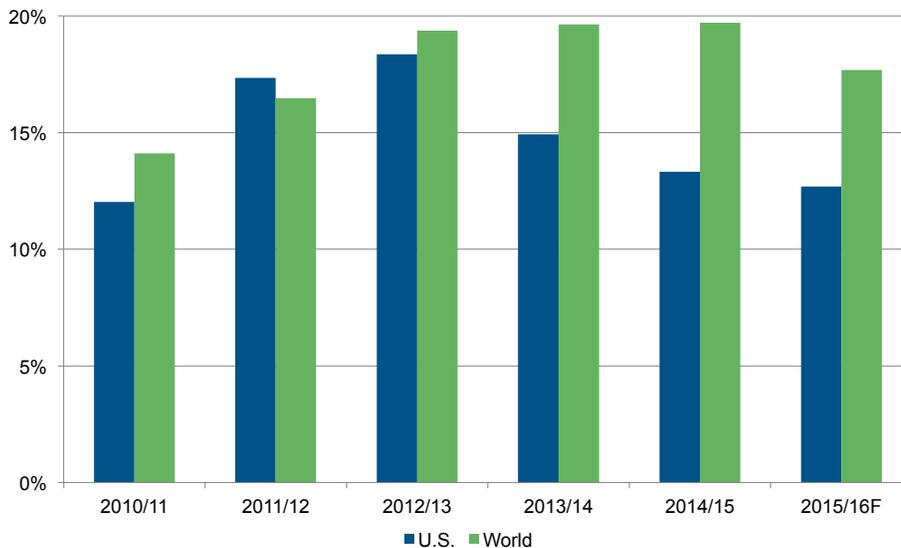
Rice prices have been unusually volatile during the past year. Prices declined from \$15 per hundredweight last year to \$9 earlier this year, but have since regained more than half of the loss. These violent price swings reflect the monumental shift in U.S. supply over the past two years, transitioning from a short supply in 2013/14 to an oversupply in 2014/15. Moreover, all signals are pointing currently to another tight year in 2015/16.

Unattractive long grain prices, drought in California and Texas, and heavy early-season rains in the Mid-South all led to an 11 percent decline in 2015 rice acreage. The Mid-South deluge was followed by extremely hot temperatures which damaged the crop there. The unfavorable growing conditions are largely responsible for current yield estimates which are slated to hit 4 year lows. Carryover stocks from last season are record high, however, which will offset some of the production decline.

World production will also slip in 2015/16, following 5 consecutive years of record production. Weather issues will trim production throughout Asia this year, which could benefit U.S. exports and U.S. prices.

The rebound in rice prices should incentivize larger U.S. plantings in 2016. Corn, soybeans, and cotton are all expected to trade lower and in a narrow band in coming months, so Mid-South producers are likely to have few good crop alternatives if rice markets are reasonably well balanced.

Exhibit 10: Sugar Stocks-to-Use Ratio



Source: USDA

Sugar

The U.S. and world sugar markets remain at odds, with a huge oversupply swamping the global market while U.S. supplies are still relatively tight. U.S. cane and beet sugar production are both expected to be up marginally this year; conversely, world sugar production will decline slightly even while supplies build to a new all-time high. Prices continue to reflect this divergence, with U.S. sugar prices (futures contract #16) pricing near \$0.24 per pound, more than double the world price (futures contract #11).

Next year, the U.S. and world sugar situations should begin converging in terms of fundamentals and pricing. (See Exhibit 10.) World production cuts should translate into smaller global stocks, and the U.S.-Mexico countervailing duty/anti-dumping dispute is expected to be resolved in coming months. A resolution would likely do away with the suspension agreement currently in place, and make way for a moderate increase in Mexican exports to the U.S. This would increase U.S. supplies and send prices lower, to the benefit of food manufacturers and to the detriment of U.S. sugar producers. If this scenario plays out, U.S. sugar markets could be well balanced by late 2016, but global markets are projected to remain oversupplied until at least 2017.

Specialty Crops

The two big headline stories for specialty crops are still the California drought and the devastation done by citrus greening to Florida's citrus crops. But the full extent of the damages won't be known until the harvests are complete.

California's drought, now in its fourth year, continues. However, this statement is misleading because its rainy season usually doesn't begin until late October or early November and extends to late April or early May of the following year. California's growers are coping with the state's worst drought of the past 100-plus

years, having had to fallow hundreds of thousands of acres, drill many new and deeper wells, and pay elevated prices to purchase water on the open market.

Many Californians are convinced that El Niño will be their deliverance, unleashing torrential rains that will end the drought. Climatologists at the National Oceanic and Atmospheric Administration (NOAA) have recently increased the likelihood that an El Niño pattern will occur in the Northern Hemisphere during winter 2015-16 to more than 90 percent, and the likelihood that it will last into early spring 2016 to around 85 percent. Such weather events typically bring above-average rainfall to central and southern California, and the El Niño that's currently brewing appears to be stronger than average.

However, even if an El Niño event were to end California's drought, the state's water woes will still persist. First, it's been the stronger El Niños that generally brought heavy rainfall, whereas mediocre ones have had a mixed track record. While NOAA scientists have heightened the probability of an El Niño event, the current odds say nothing about its probable strength. Second, California probably needs to get several years of heavier-than-normal annual rainfall just to restore the underground aquifers to the levels where they were prior to the onset of the current drought, and it would presumably take an

exceptionally strong El Niño event to produce that much rainfall. Third, past El Niños have dumped the greatest volumes of rainfall on central and southern California – and considerably less on northern California. While this rainfall pattern would help recharge southern California’s depleted aquifers, it would do little to replenish the state’s reservoirs, which are concentrated in the northern half of the state. What these reservoirs need is more snow, but an El Niño event will not necessarily produce more snow in northern California.

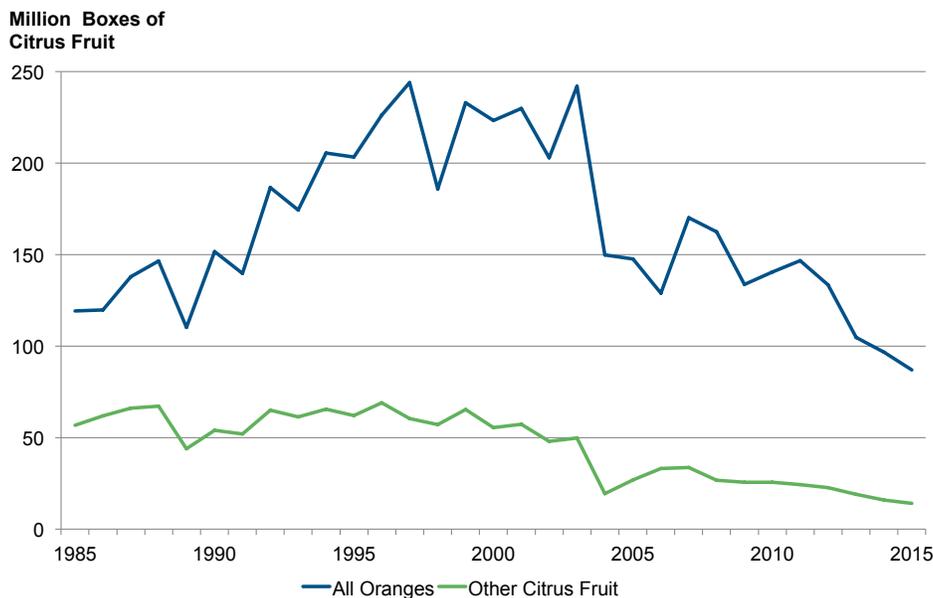
Florida’s citrus growers are braced for what is shaping up to be their worst crop of the past 50 years. Local, private forecasters have pegged Florida’s 2015/16 orange crop at around 87 million boxes, down from last year’s crop of 96 million boxes and less than half as much as the crops harvested in the early 2000s. (See Exhibit 11.) Industry experts attribute the problem to citrus greening (also known as Huanglongbing or HLB). This plant disease was first discovered in Florida in 2005, and the situation has gone from bad to worse – to worse still. (Florida’s

2004 orange crop totaled 242 million boxes.) As a result, Florida’s citrus crop has shrunk every year since 2004, and so has the total number of orange trees. Citrus growers have had to bulldoze tens of thousands of trees and have been reluctant to replace them.

The industry’s medium-term prognosis is not very encouraging. Florida’s citrus industry and the USDA have spent hundreds of millions of dollars over the past ten years to fund research in search of a cure. At long last, plant scientists recently made a promising discovery. They inserted a spinach defensin gene into the genome/ DNA of an orange tree, and the genetically engineered (GE) orange trees were found to be resistant to the Asian citrus psyllid that is responsible for spreading the disease. In April 2015, the Environmental Protection Agency (EPA) approved an environmental use permit (EUP) allowing citrus growers to field test the genetically engineered orange trees. EUPs are issued only after extensive testing has demonstrated convincingly that the subject plants are safe for consumption.

While this is positive news for Florida’s struggling citrus industry, it will still be several years before its orange groves have been restored to good health, assuming that the field tests pan out as growers hope. Additional testing is required before the EPA will approve the commercialization of the new tree, and it will then take several years before the GE orange trees will be available to replace diseased trees in Florida’s orange groves. At that point, growers will have to decide whether they would be willing to plant these GE trees, in light of potential consumer resistance. Alternatively, the USDA, Florida Natural Growers, and Coca Cola have funded separate programs designed to subsidize growers’ investments in planting new non-GE orange trees.

Exhibit 11: Florida Citrus Fruit Production



P: Projection
Source: USDA-NASS

Florida citrus growers continue to search for other remedies to citrus greening. Other plant scientists announced recently that they had succeeded in developing a nanotech mist used to administer antibiotics to orange trees, and that these antibiotics appear to fortify the trees' resistance to the Asian psyllid. These mists will eventually have to be field tested, but the EPA will not even consider issuing an EUP until the mists have been shown to be safe. Another promising therapy involves heat. Plant pathologists in Florida have found that encasing infected trees in plastic, opaque "tents to heat them up in the sunlight for about a week puts the citrus greening into remission and prolongs the trees' productivity. Yet another therapy involves rootstocks bred especially to be resistant to the psyllids. How well any of these promising therapies will catch on in Florida remains to be seen. Meanwhile, many Florida citrus growers may decide just to bulldoze their infected groves and replant the farmland to grow a different crop such as blueberries, peaches, or strawberries.

Banana trees have now been added to the watch list of disease-threatened fruits. The popular Cavendish banana variety is threatened by the soil-borne *Fusarium* wilt fungus, more commonly known as the Panama disease. The fungus invades the tree's vascular tissue through the roots causing discoloration and wilting – and eventually kills the tree. It has been spreading around the world for the past 20 years. (A strain of this same fungus was responsible for totally wiping out the Gros Michel variety of bananas, which used to be the most popular variety consumed worldwide until the 1950s.) Bananas are not grown in the U.S. But several U.S. based multinational produce companies import bananas from abroad, and banana sales account for 40 to 50 percent of their bottom lines, with even small price changes causing material swings in their earnings.

While the fungus has recently spread from Asia to North Africa and the Middle East, it has not yet reached Latin America and the Caribbean, which are the main exporters of bananas to the U.S. But plant scientists believe that the fungus will reach Latin America and the Caribbean within the next five to ten years. That may sound like a long time, but the U.S. based multinationals

“*Florida’s citrus growers are braced for what is shaping up to be their worst crop of the past 50 years.*”

that are the major importers of bananas are already trying to develop hybrids that are resistant to the fungus as well as developing a game plan for what to do when the plant disease does reach Latin America and the Caribbean.

Farm Supply/Crop Nutrients

The steep decline in farm income in 2014-15 will set up 2016 to be a pivotal year for agriculture. Persistently weak farm receipts will create headwinds for input sales through the remainder of the year as growers transition from fall crop harvest to planning for the 2016/17 crop. Production expenses are projected to edge downward less than 1 percent during 2016, a modest dip but the first one of any magnitude since 2009.

Fuel, fertilizer, and feed costs are all projected to fall, while interest expense will rise nearly 25 percent as farm debt expands and interest rates rise. Farm financial risk indicators, including the debt-to-asset and debt-to-equity ratios, are expected to rise but remain relatively low compared with historical averages. As grower cash reserves are drawn down, timing and volume of input purchases and grain sales will be impacted. While cash flow needs could incentivize more normal grain sales patterns, the farm supply sector could experience sluggish sales particularly in the crop nutrient sector.

Domestic fertilizer demand remained slow during the third quarter as growers prepared for fall crop harvest and winter wheat planting got underway. Fertilizer prices generally drifted lower during the quarter.

Urea prices declined through the third quarter. Currency depreciation has slowed typical sales volumes for key importing countries including Brazil. Prices may need to continue to work lower in order to entice sales. New domestic urea production is scheduled to come online in 2016, reducing U.S. reliance on import volumes. However, the uncertainty of domestic production

availability may add some price risk in the market. The reality of more domestic and international supplies amidst tightening grower economics, at home and abroad, will likely keep a lid on prices.

Domestic demand for ammonia remains seasonally slow. The downward trend in prices has kept retailers and growers reluctant to purchase it in advance of peak application seasons. The tonnage moving toward wheat pre-plant may pick up as the planting season progresses. Prices should be firm moving into the fall application season, but the availability of competing forms of nitrogen may prevent significant price escalation.

UAN demand also remains subdued. The potential for urea prices to decline will likely limit price hikes for UAN. Small volumes of UAN are moving into wheat pre-plant; however, lack of interest on the part of growers will likely keep retailers reluctant to purchase large volumes ahead of solid grower demand. If grain prices remain historically low, UAN prices may trend lower following the pattern set by urea.

Supply overhangs in the global diammonium phosphate (DAP) and monoammonium phosphate (MAP) markets have pushed prices lower. The strength of the U.S. dollar also weighs on international demand. Lackluster worldwide purchases and light domestic demand could push prices even lower in the near term. U.S. phosphate producers may need to lower prices to spur additional demand in the domestic market. Retailers and growers are reluctant to purchase tons in a falling price environment until prices have bottomed out.

A restocking of potash supply began last year, and will likely continue. Similar to phosphates, an oversupply weighs heavily on the potash market. Falling potash prices over the remaining months of the year will continue to favor buyers although demand remains weak. Potash Corp's recent bid for K+S Potash Canada may be a foreshadowing of companies seeking more supply flexibility in an oversupplied market.

Tightening grower economics, the strong U.S. dollar, and weak near term demand are all slowing fertilizer sales. In this environment, purchasing patterns will be volatile

and risk must be balanced among the manufacturers, retailers, and growers. Retailers and wholesalers may see more fertilizer tons offered on storage agreement or consignment as manufacturers work to put tons in target markets amidst sluggish grower bookings. It may become increasingly important for retailers to focus on products related to growers' margin management through input procurement and grain purchase strategies.

Infrastructure Industries

Power and Energy

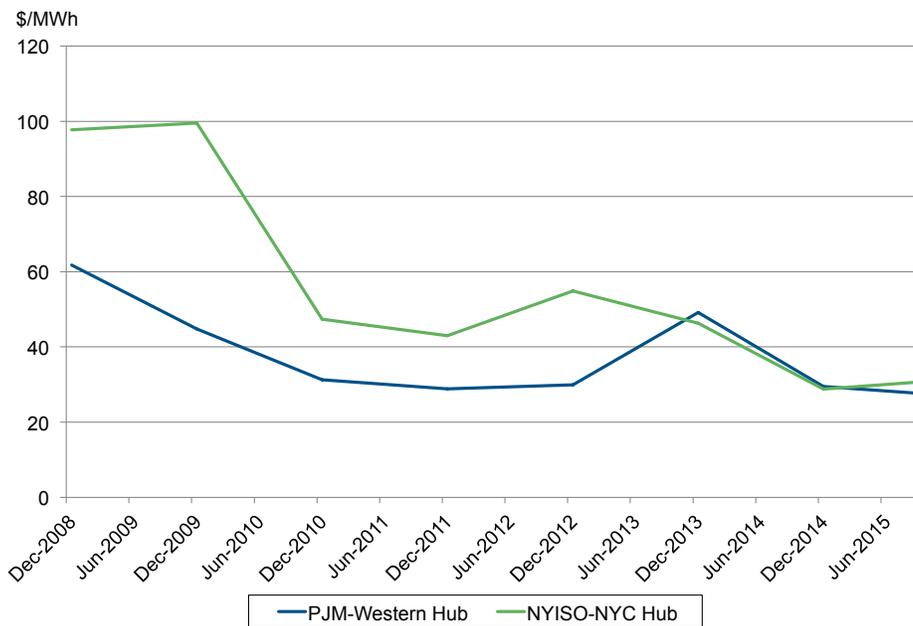
The U.S. power and energy industries continue adapting to what is often described as the "new normal," consisting of low natural gas prices and weak wholesale electricity prices. Predictions for a mild winter, driven by a strong El Niño, will pressure prices further. Despite lower wholesale energy prices, power generators were encouraged by the strong results of the PJM Interconnection's latest round of capacity auctions, which were the first to include performance requirements.

The power industry has retired approximately 12 gigawatts (GW) of coal-fired generating units YTD, with the total number likely to reach 16 GW by the end of the year. Retirements will continue through 2016 though at a slower pace, with total coal retirements coming in around 7 GW. Upwards of 70 percent of the remaining retirements will occur in the Midwest and Northeast.

Through September of this year, approximately 7.5 GW of new gas-fired units were built across the country. Another 4.5 GW and 2.1 GW of utility-scale wind and solar, respectively, also came online. Given persistent flat electricity demand growth, the build out of new generating units is in direct response to the wave of coal-retirements currently engulfing the electric power industry.

Despite growing gas demand from the power sector, natural gas prices are likely to remain low through the winter as supply outpaces demand, driven by a mild winter. Analysts expect supply to grow by approximately 1.8 billion cubic feet per day (Bcf/d), versus demand growth of 1.2 Bcf/d.

Exhibit 12: Convergence of Peak Power Prices in the Wholesale Electricity Market – PJM Interconnection and New York City



Source: Bloomberg

Projections for a mild winter reflect the growing consensus among meteorologists that North America will experience a strong El Niño this winter. Historically, strong El Niño events have brought warmer winter temperatures to the Midwest, Mid-Atlantic, Southeast and Texas regions. These are the same regions that are responsible for the vast majority of indoor heating fueled by natural gas.

Lower natural gas prices continue to pressure wholesale on-peak electricity prices in many regions of the country. For example, the New York Independent System Operator (NYISO) has reported that on-peak prices for Manhattan and its four neighboring boroughs averaged just \$40.99 per megawatt hour (MWh) since the start of July. These prices are shaping up to be a record low for the third quarter going back to 2006.

Furthermore, the NYISO's access to increasing volumes of natural gas from the Marcellus has reduced electricity imports from the neighboring PJM Interconnection. As a result, the spread between the peak prices in NYISO and PJM has narrowed to almost zero. (See Exhibit 12.)

Despite lower wholesale energy prices in PJM and other wholesale energy markets, PJM's recent capacity auctions, which include new capacity performance requirements, yielded strong results for generators. Under the new performance requirements, generators receive fixed payments for providing power capacity to the market when called on, but are also exposed to high penalties for not providing the agreed upon capacity during peak demand events. This new regulatory framework is aimed at improving reliability during demand spikes, without sacrificing long-term incentives for market participants to build new capacity.

PJM's first transitional auction that included capacity performance standards was held on August 26-27, and targeted 60 percent of capacity requirements for the 2016-17 delivery year to meet the new performance standards. This first auction cleared at \$134 per megawatt per day (MW-day) for all of PJM. The second transitional auction for delivery in 2017-18 targeted 70 percent of capacity requirements to meet the new standards, and cleared at \$151.50/MW-day.

PJM's base residual auction (BRA) for delivery year 2018-19 requires 80 percent of generation to meet the new performance standards, and cleared at \$164.77/MW-day. The latest PJM auction results fall within analysts' expectations and are viewed as extremely positive for generators, particularly those that are fighting to save older, less economically competitive coal and nuclear power plants.

These higher auction prices over the next three years reflect the value of reliable generation to meet peak electricity demand. Furthermore, strong capacity payments are critical to generators in an environment of sustained low natural gas prices that will continue to pressure wholesale electricity prices.

The power and energy industries continue adapting to the stricter environmental regulations and low natural gas prices. When combined, these market forces have resulted in historic coal-fired retirements. The current low price environment drives significant value for new, highly efficient gas-fired units. Low prices also increase the value of capacity payments to power generators in wholesale electricity markets. Therefore, the positive results of PJM's latest capacity auction will likely nudge other capacity markets to consider implementing similar regulatory structures that incentivize both reliability and long-term investments.

Water Utility Industry

The water utility industry continues to face many challenges, with renewal and replacement of aging infrastructure remaining at the top of the list. The situation gets worse with each passing year, as the inventory of existing water and wastewater infrastructure assets that have reached or extend beyond their useful lives gets longer and longer. However, masked by the ubiquitous statistics and commentary about the industry's crumbling infrastructure is an even more pressing and worrisome issue – its financial resiliency or, to be more precise, its lack thereof.

“*The water utility industry continues to face many challenges, with renewal and replacement of aging infrastructure remaining at the top of the list.*”

Top-line revenue growth remains a key concern for managers and executives across the water industry. New customers provide water utilities with a steady stream of much needed capital, but the numbers of new customers and hook-ups have dwindled in recent years. Furthermore, drought conditions across large swaths of the country have changed consumers' water consumption habits, resulting in lower volumetric sales. This reduction is further

compounded by conservation efforts by utilities and greater adoption of water-efficient appliances.

Reduced volumetric sales can wreak havoc on a water utility's budget. The majority of the typical consumer's total water bill is a variable charge based on the amount of water consumed, which is typically about 70 percent. However, the majority of a utility's costs are fixed. The misalignment between fixed and variable costs and revenues becomes an issue when there is a sudden and significant decrease in volumetric water sales.

The most common solution for trying to stabilize revenues in times of unpredictable demand is to shift from highly variable use-based rates to a rate structure that recovers a greater percentage of fees through fixed costs. However, such rate structures often introduce affordability issues for low-income and fixed-income residents, resulting in limited political will to change to new rate structures that would better align the cost of service with prices paid by customers.

Water professionals recognize that for most water and wastewater systems, the disparity between the cost of services and the revenues derived from consumers is going to increase over time. According to the American Water Works Association's State of the Water Industry survey for 2015, 97 percent of respondents felt that water utilities are currently unable to fully cover the total cost of providing service.

The financial resiliency of water and wastewater utilities across the country represents a major concern for the industry. Rising costs associated with the replacement of aging infrastructure, coupled with flat to declining revenues that reflect lower consumption, compound the issue. Innovation around rate structures that address the misalignment of fixed costs and variable revenue, without sacrificing affordability, is critical to the future financial sustainability of the water industry.

Communications Industry

Major structural changes are sweeping across the communications industry, reflecting consumers' video viewing preferences. U.S. Internet traffic quadrupled from 2009 to 2014, and double-digit traffic growth is projected

for the next five years. Video continues to be the primary driver of Internet traffic growth, with consumer video accounting for 73 percent of U.S. network traffic in 2014. During Q1-2015, Netflix subscribers around the world streamed 10 billion hours of video. By 2019, roughly one million minutes of video content will stream across the global network every second.

This surge in the demand for increased bandwidth is spurring network investment. A recent study of rural local exchange carriers' (RLEC) benchmarks found that their network investment rose in 2014 for the first time since 2011. All providers continuously strive to deploy the fastest speeds possible, with more and more communications companies offering gigabit (GB) plans in urban, suburban and some rural areas. The Rural Broadband Association's newly deployed gig-certification program recognized nine rural providers as capable of providing 1-gigabit service in their respective territories. Since 2008, U.S. network speeds have increased at a rate of 25 percent a year on average, and median network speeds reached 31.3 megabits per second in 2014. Despite these advances, the speed improvements have not been uniform across the country. Metropolitan areas boast far greater broadband speeds than rural areas.

To handle this growing volume of video, edge providers are relying increasingly on content distribution networks that store content on multiple servers located close to consumers, provide faster video content delivery, and shift a growing share of Internet traffic onto metro-area networks. Analysts estimate that metro-only traffic will outpace long-haul traffic by the end of the year and will account for two-thirds of all Internet traffic in five years. Last-mile and metro-area networks will require substantial upgrades to handle peak traffic flows.

WiFi usage is also growing rapidly. The vast majority of video consumed on wireless devices is viewed via WiFi networks. During the first half of 2015, for example, the average U.S. smartphone user consumed 8.1 GB via WiFi versus just 1.6 GB via cellular networks each month. Because WiFi usage ultimately rides wired networks, it is an important element of those networks and presents opportunities for carriers to assist their enterprise and

consumer customers with installing and managing their WiFi networks.

Wireless data traffic surged 54 percent in 2014 and is expected to sustain similar growth rates in the years ahead, thanks to viewers taking their video content on the go. A spike in North American mobile video traffic during the July 4th holiday weekend suggests consumers utilize the best screen available and are more often utilizing mobile video when away from home. In an effort to increase network capacity, wireless carriers are preparing for the Federal Communications Commission's (FCC) Broadcaster Incentive Auction (600 MHz) scheduled for March 2016, which is likely to be their last opportunity to acquire valuable spectrum at auction for the foreseeable future. Auction prices are expected to reach unprecedented levels; and the FCC has made a number of recent changes to license areas, auction rules, and bidding credits, all designed to assist small and rural wireless operators in winning spectrum.

Streaming video trends continue to be a boon to all segments of the communications industry with the exception of the traditional pay-TV model. Last year, the migration of consumers to Over-the-Top (OTT) video resulted in an 11 percent decline in TV viewership. Additionally, U.S. multichannel service providers lost more than 600,000 video subscribers in Q2-2015, the largest quarterly loss for this segment to date. Some analysts point to similar losses a decade ago, to suggest that this market segment may yet resume growing. However, this market has been shrinking in recent years as "cord-cutters" fail to re-enter the pay-TV market, and young consumers choose never to enter the market. Furthermore, two recent surveys of pay-TV subscribers found that nearly 10 percent plan to cancel their subscriptions in the coming year, and another 30 percent are considering downgrading theirs to a lower cost plan with fewer channels.

Small cable providers lately have benefited from favorable regulatory winds at their backs, but the FCC's assistance with pricing rules and retransmission agreements will likely fail to protect the traditional cable business model. National pay-TV providers are already beginning to

experiment with new business models and customer offerings. The newly merged AT&T/DIRECTV emphasizes the mobile component within its bundles, while Comcast introduced a low-priced, streaming-only plan to woo “cord-nevers.” With pay-TV video under fire, broadband competition will intensify as legacy cable providers continue to shift their focus to increasing and retaining broadband market share.

Burgeoning growth of the Internet of Things (IoT) and cloud-computing markets will also continue to boost data traffic and provide additional opportunities. Reports from July 2015 reveal that the number of IoT devices currently in use totals 13.4 billion, twice the world’s population. Moreover, the number of IoT devices is expected to skyrocket nearly 300 percent over the next five years and reach 38.5 billion by 2020. Cloud computing is another growth area. Spending on cloud IT infrastructure is expected to amount to \$33.4 billion by the end of 2015, up 26 percent from the previous year. Researchers predict that the number of hosted IP telephony and unified communications users will reach 41.9 million in North America by 2021, up five-fold over the 8 million users reported in 2014. The IoT and cloud computing segments represent a number of new revenue prospects for communications companies, including increased data traffic, retail sales, cloud products (software services, storage, and security), and assisting customers with set-up and maintenance of their networks and devices.

The FCC eschewed the typical summer slowdown. It tackled a number of complex issues during Q3-2015, including an update to the proposed support model for rate-of-return providers, revamped spectrum bidding credit rules, a timeline and procedure for the 600 MHz

“*Burgeoning growth of the Internet of Things (IoT) and cloud-computing markets will continue to boost data traffic and provide additional opportunities.*”

Auction, and guidelines for copper plant retirements to further facilitate the transition to Internet Protocol. FCC Chairman Tom Wheeler’s preference for implementing consensus-based regulations and incorporating fact-based feedback and solutions is resulting in some wins for the rural segment. Rural advocates are expected to continue to work closely with the FCC in coming months to hammer out net neutrality-related enhanced transparency rules for small operators and provide additional input on the long-term support model for underserved and high-cost rural areas.

The competitive structure of the communications industry is also in flux. Merger and acquisition (M&A) activity has been on the rise since the start of 2015, with no end in sight. In July, the FCC approved the AT&T and DIRECTV merger, and a handful of regional and rural players announced mergers and acquisitions as well. Communications companies are striving to consolidate and strengthen competitive positions with diversified service offerings and scale. ■

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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