Second Quarter 2016

TIAA GLOBAL ASSET MANAGEMENT

# Natural Resources & Infrastructure Quarterly

## What's Inside?

The Natural Resources & Infrastructure Quarterly features overviews of the following:



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CREATED TO SERVE.

## Moving into the second half of 2016, the world finds itself reacting to the surprise of the "Brexit", market dislocation, and further divergence in global approaches to monetary policy.

The shockwaves related to the surprise outcome of the much anticipated "Brexit" vote will not fully be known for years. Policymakers are already attempting to modify course to account for the uncertainty Europe's turmoil will cause. Despite some healthy signs of growth in the American economy, Fed Chair Janet Yellen remains cautious on her views of labor market fundamentals, seeing reason to remain dovish on monetary policy. Overseas, the ECB's easy policy continues to aid Europe's recovery, though the full extent of disruption caused by Britain's exit will be an ongoing overhang for the foreseeable future.

Despite the long-standing relationship between the United Kingdom (UK) and European Union (EU), the UK voted in a non-binding referendum to leave the EU by a 51.9% to 48.1% margin. Prime Minister Cameron has resigned and will leave office by October, the EU has entered an emergency session, and the financial markets went into a tailspin. A few short weeks following the "Brexit" vote, equity markets have noticeably recovered, while residue remains in currency and sovereign bond markets. There remains a great deal of political uncertainty, as to when the now well-known Article 50 of the Lisbon treaty will be invoked, starting the separation negotiations and leading toward the UK's future relationship with the EU. With the uncertainty as major asterisks, the Eurozone remained on a steady pace of recovery, under an easy monetary policy.

In the U.S., forecast 2Q 2016 GDP growth is strong at 3.1%. Supporting the figure are strong personal consumption data in April and May followed by healthy wage growth; GDP may be revised upward if there is any positive contribution in June. Although strong consumption in 1Q 2016, there is not yet enough sequential positive data to forecast significant long-term improvement in consumer behavior. The Fed remains dovish on the Funds rate, likely until more positive long-term trends emerge. Ms. Yellen, however, surprised the markets with her sentiment on labor markets, noting that job growth has slowed and wage growth has seen only intermittent growth. Expect the Fed to have an increased focus on the economy, while cautiously evaluating its actions, in light of improving growth fundamentals.

In China, economic deceleration continued, driven by a slowdown in private investment. China's economic transition continued under a massive stimulus regime. Forecasted real 2Q 2016 GDP growth is expected at just over 7%. Fixed asset investment and private investment are key indicators, as the economic slowdown in China continues. With fixed asset investment growing at 9.6% year-over-year, the slowest growth in well over a decade, and the private investment growing at just 3.9%, expect continued reaction from the state to manage decelerating growth.

As the second half of the year is underway, expect advanced economies to watch the fallout in Europe closely, along with political struggles in both the U.S. and Europe. Under current conditions, policymakers worldwide will remain under a microscope.

### Key market metrics, as of June 30, 2016

| | 6/30/16 | 3/31/16 | 12/31/15 | 12/31/14 | 12/31/13 | 12/31/12 |
|---|---|---|---|---|---|---|
| **Key market prices** | | | | | | |
| U.S. 10 Year Treasury | **1.49%** | 1.78% | 2.27% | 2.25% | 3.04% | 1.78% |
| U.S. 30 Year Treasury | **2.30%** | 2.61% | 3.01% | 2.75% | 3.96% | 2.95% |
| Initial Unemployment Claims | **264k** | 276k | 285k | 293k | 337k | 363k |
| Unemployment Rate | **4.7%** | 5.0% | 5.0% | 5.6% | 6.7% | 7.9% |
| CB Consumer Confidence | **98.0** | 96.1 | 96.3 | 93.1 | 77.5 | 66.7 |
| S&P 500 | **2,099** | 2,060 | 2,044 | 2,059 | 1,848 | 1,426 |
| **FX markets*** | | | | | | |
| USD-CAD | **1.30** | 1.30 | 1.38 | 1.16 | 1.06 | 1.00 |
| Euro-USD | **1.10** | 1.14 | 1.09 | 1.21 | 1.38 | 1.32 |
| USD-BRL | **3.20** | 3.55 | 3.96 | 2.66 | 2.36 | 2.05 |
| AUD-USD | **0.74** | 0.77 | 0.73 | 0.82 | 0.89 | 1.04 |

* FX table displays 1 unit of first currency in terms of second currency (e.g. 1 USD is currently equivalent to 1.30 CAD)
Sources: Federal Reserve Board, United States Department of Labor, Haver Analytics

## Bonds

U.S. Treasuries rallied in response to the “Brexit” vote on June 23. After starting that week at 1.57%, the yield on the bellwether 10-year note dipped to 1.46% by July. For most of the second quarter, however, the 10-year yield trended between 1.70% and 1.85%, settling at 1.49%. Spreads between the 10 and 30 year have also widened by as much as 9bps from the tightest levels of the year. With the world further awash in low and negative-yielding assets after the U.K. vote, US Treasuries remain attractive.

## FX Markets

Relative to the U.S., accommodative monetary policies in the Eurozone and Asia weakened currencies, while soft fundamentals in emerging economies contributed to divergent performance in 2Q16. Year-to-date, the USD weakened against the Euro, however, for 2Q16 the trend reversed in light of “Brexit” vote-related fears within the Eurozone. Meanwhile, declining commodity markets has many emerging economies reeling from losses against the USD.

## Employment and Earnings

Labor participation rates remained at the lowest since the late 1970s, while wage and income growth has experienced some of the strongest improvement since the Global Financial Crisis. Although wages are rising, consumption is improving and inflation is starting to increase, there is little data to support a confirming trend. The unemployment rate improved to 4.7%, while the number of unemployed has declined slightly since August 2015.

## Energy

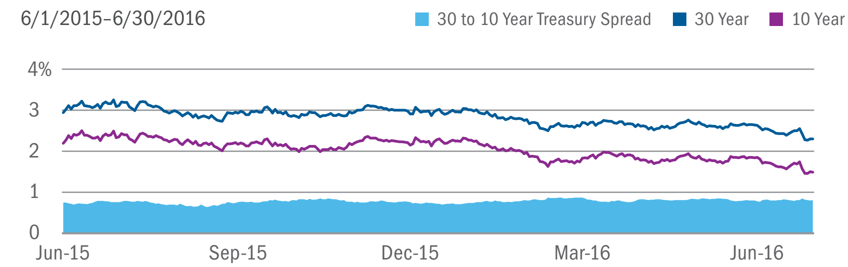
The energy market continued to recover during the quarter with increases in both natural gas and oil prices as production declined. Even though the crude oil market remains oversupplied, recent sustained price increases suggest the market fundamentals have improved. As expected, continued declines in U.S. production has been restoring the balance between supply and demand.

## Agriculture

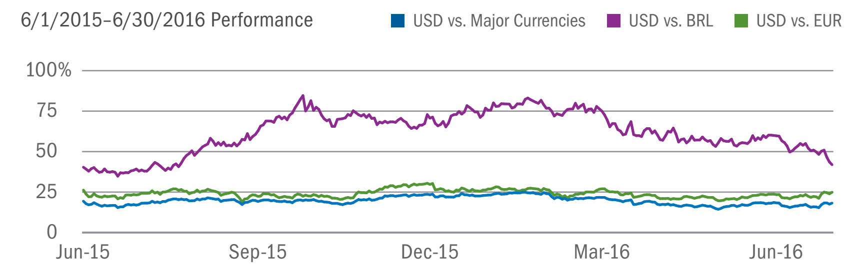
Agri-commodity prices broadly strengthened in 2Q16 on strong global demand paired with supply challenges in South America. Global row crop price developments in 2H16 will depend largely on weather in the U.S. Midwest this summer and the possible evolution of a La Niña weather pattern in 2H16. Despite record or near record 2016/17 production estimates throughout the tree nut complex, growers remain profitable, yet more demand is needed to stem future price declines and preserve grower profitability.

Sources: U.S. Federal Reserve Board, Haver Analytics, U.S. Census Bureau, U.S. BLS, Standard & Poor’s, Commodity Research Bureau, TIAA-CREF analysis

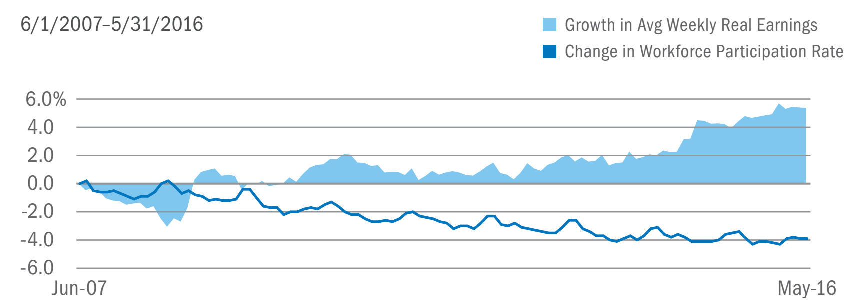
### 10 & 30 Year U.S. Treasury Bond yields



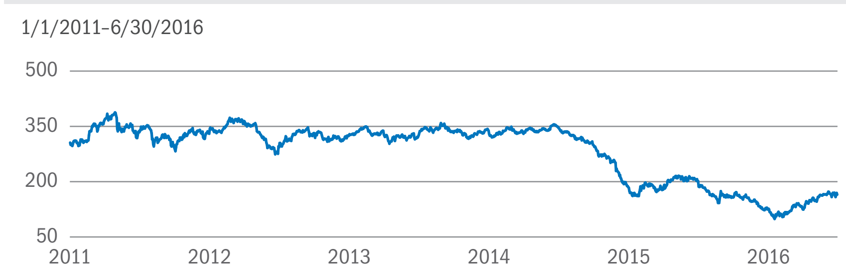

### U.S. dollar vs. major currencies, BRL, & EUR




### Economic laggards—participation and earnings




### S&P GSCI Energy Spot Index




### CRB Foodstuffs Index

## Market Review

- Crude oil prices continued to recover during the quarter with WTI and Brent reaching $49 and $50, respectively, at the end of June.
- Natural gas prices improved with prices ending at $2.86 due to declines in production levels and anticipated summer demand.
- Total U.S. crude oil production declined from its April 2015 peak of 9.7 million bbl/d to 9.1 million bbl/d in March 2016. The decline reflects reduced capital investment by operators which is supported by U.S. rig counts which are down 77% since the year-end 2014 according to Baker Hughes.
- Saudi Arabia, Russia, Qatar and several other leading oil producing nations failed to agree to a production freeze at an April meeting in Doha, symbolizing OPEC's inability to deliver coordinated market decisions. Nevertheless, analysts continue to believe declines in U.S. production will be the predominant balancing force in the global oil market.
- A major wildfire in Northern Alberta and Saskatchewan caused significant damage to oil sands production in the region, leading to the disruption of approximately 1 million bbl/d. After nearly six weeks of fire-related outages, the affected oil sands facilities returned to full production at the end of June.
- Centennial Resource is seeking to become the first U.S. E&P company to debut on the public markets in more than a year, signaling increasing public market appetite for energy companies. Further improvements in oil and gas prices may encourage additional public offerings by energy companies.
- Private equity firms with over $970 bn of dry powder are readying to deploy capital into the global oil and gas sector as the industry rebounds. According to a June 2016 EY global survey of 100 PE firms active in the sector, 43% of those surveyed are planning acquisitions within the next 12 months, suggesting renewed interest for the sector.

## Outlook

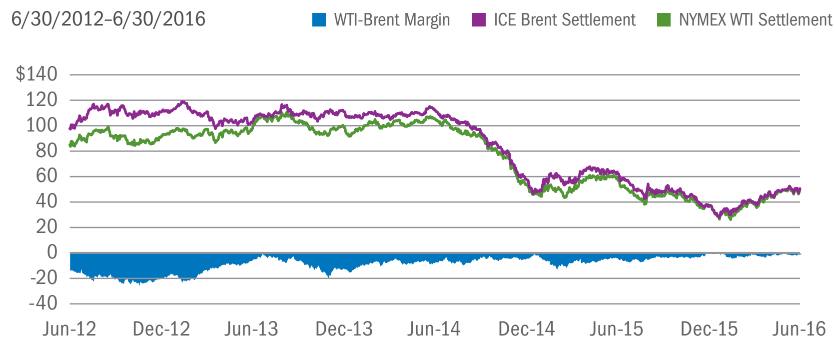
- EIA's June 2016 report forecasts Brent crude oil prices to average $43/bbl and $52/bbl in 2016 and 2017, respectively. The forecast for WTI is slightly lower than Brent's in 2016 and the same in 2017. EIA's average price forecast for Henry Hub in 2016 and 2017 is $2.22/MMBtu and $2.96/MMBtu, respectively.
- The EIA forecasts U.S. crude oil production to decline to an average of 8.6 million bbl/d in 2016 and then decline further to an average of 8.2 million bbl/d in 2017.

[1] Item as of 5/31/16, [2] item as of 4/30/16. Sources: Haver Analytics, Energy Information Administration, CME, TIAA-CREF analysis

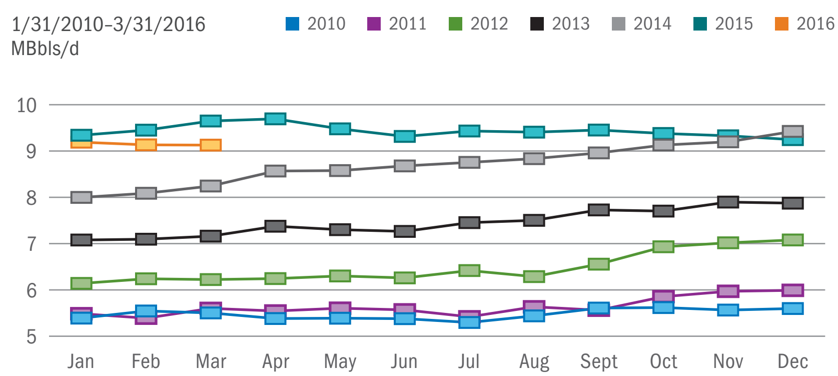
### Key market metrics

| | 6/30/16 | 3/31/16 | 12/31/15 | 6/30/15 | 6/30/13 | 6/30/11 |
|---|---|---|---|---|---|---|
| NYMEX WTI Crude Oil | **$49.88** | **$38.34** | $37.04 | $59.47 | $96.56 | $95.42 |
| ICE Brent Crude Oil | **$50.61** | **$39.60** | $37.28 | $63.59 | $102.16 | $112.48 |
| WCS Crude Oil | **$34.53** | **$25.19** | $23.79 | $47.47 | $82.31 | $74.92 |
| Henry Hub Nat. Gas | **$2.86** | **$1.96** | $2.34 | $2.83 | $3.57 | $4.37 |
| Alberta Nat. Gas | **$1.88** | **$0.71** | $1.87 | $2.09 | $2.87 | $3.87 |
| Wtd. Avg. $/kWh in U.S. | **N/A** | **10.01** | 10.00 | 10.64 | 10.45 | 10.26 |
| OPEC Prod. (Mbbls/d) | **N/A** | **32.4M** | 31.6M | 31.8M | 30.6M | 30.1M |
| U.S. Oil Imports (Mbbls/d) | **7.6M[1]** | **8.0M** | 7.9M | 7.3M | 7.7M | 9.2M |
| U.S. Gas Output (Bcf/d) | **89.5B[2]** | **91.1B** | 90.9B | 89.0B | 79.5B | 77.1B |

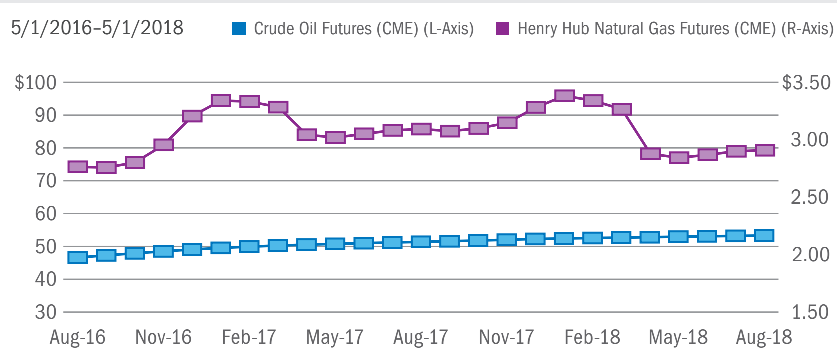
### Crude oil exchange prices




### U.S. crude oil production




### Futures curve—crude oil and natural gas



## Market Review

- Strong demand from existing and new investors looking for diversification and yield and a robust global pipeline of primary and secondary opportunities drive market dynamics.
- P3 supportive legislation in the United States increased to 34 states and Puerto Rico; Canadian authorities continue to support the regime, removed the Building Canada Fund's screening process for procuring projects over CAD 100 mm.
- Contracted renewables and transportation assets with demand risk dominate deal flow in North America.
- Core assets continue to see higher valuations and lower yields (e.g. EV/EBITDA multiples of 12.5x for French heating business Coriance and 28.5x for London City Airport); simultaneously, investors have been willing to accept greater risk profiles for such assets (e.g. termination risk in M6 toll road).
- The United Kingdom's exit from the European Union increases uncertainty for public and private investors; an estimated 64% of infrastructure investment in the country is from private sources while the European Investment Bank invested € 7.7 bn in 2015.
- Political debate over the role of P3 investment in Australia remains a chief constraint in an otherwise successful market.
- The asset class continues to expand into new sectors such as airport equipment leasing (TCR Group) and funerary services (Westerleigh Group). Growing, capital-intensive sectors such as telecommunications provide further opportunities.
- According to Preqin, fundraising softened in 2Q16 with eight funds closing $4 bn in capital 2016 compared to 24 funds closing $12 bn in capital in 2Q15.

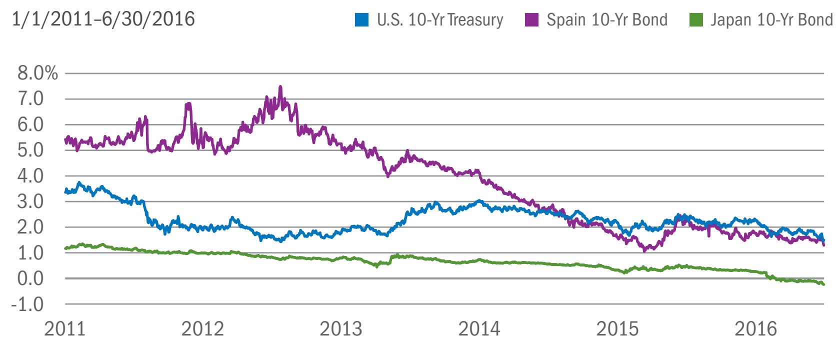
## Outlook

- Governmental support, asset recycling, and strong investor demand continue to drive marketplace dynamics.
- Opportunities with expansion into new sectors such as telecommunications and other capital intensive businesses.

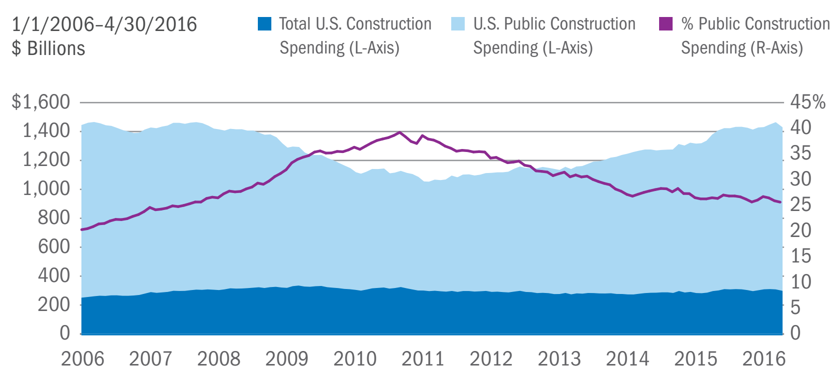
### Key market metrics

| | 6/30/16 | 3/31/16 | 12/31/15 | 6/30/15 | 6/30/13 | 6/30/11 |
|---|---|---|---|---|---|---|
| U.S. Pop. Growth from '00 | **14.2%** | **14.0%** | 13.8% | 13.3% | 11.5% | 9.9% |
| U.S. Inflation Rate (Y-o-Y) | **1.0%[1]** | **0.9%** | 0.7% | 0.1% | 1.8% | 3.6% |
| Y-o-Y U.S. Real GDP Grow. | **2.1%[2]** | **2.1%** | 2.0% | 2.7% | 0.9% | 1.7% |
| U.S. Deficit as % of GDP | **1.8%[2]** | **1.8%** | 2.9% | 2.1% | 1.9% | 6.5% |
| U.K. Deficit as % of GDP | **1.3%[2]** | **1.3%** | 1.7% | 2.1% | 3.8% | 3.5% |
| FTSE Utilities* | **479.1%[3]** | **473.9** | 434.6 | 440.3 | 390.3 | 395.0 |
| FTSE Constru./Manufact.* | **621.2%[3]** | **645.3** | 609.5 | 646.7 | 531.4 | 566.7 |
| U.S. Inv. Priv. Structures** | **$478.2B[2]** | **$478B** | $490B | $504B | $454B | $371B |
| Freight Transport Index | **121.1[4]** | **119.5** | 121.3 | 121.9 | 116.2 | 110.3 |

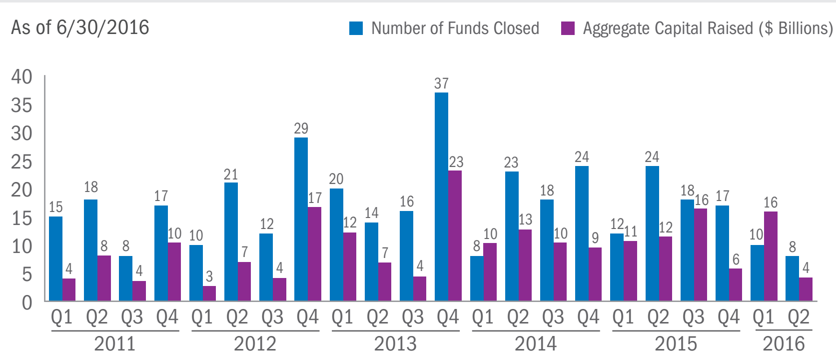
### 10-year benchmark government bond yields by country




### 10-year U.S. construction spending




### Unlisted infrastructure fundraising by year




* Global, Total Return Index; ** Total investment ($) in non-residential structures in the U.S.; [1] Items are as of 5/31/16; [2] Items are as of 3/31/16; [3] Items are as of 6/29/16; [4] Items are as of 4/30/16.
Sources: Federal Reserve Board, U.S. Census Bureau, Haver Analytics, U.S. Treasury, Banco de España, Ministry of Finance Japan, Preqin Infrastructure Spotlight, TIAA-CREF analysis

## Market Review

- In the Pacific Northwest (PNW), log exports to China have trended upwards since last fall when volumes reached the lowest level in three years. An uptick in domestic demand has also buoyed prices in the PNW. Despite rising housing starts, sawtimber prices in the U.S. South remain subdued to high levels of standing supply. While the pace of the U.S. housing recovery remains slower than expected, underlying demographics signal a stronger long-term recovery.
- South America remains the world's capital of pulp production, with Brazil and Chile offering the most competitive pricing. Per RISI, global production of hardwood pulp is increasing with expansion in South America and Asia. In addition, RISI data suggests an expanding global supply of softwood timber. Despite low prices in the global pellet market, several biomass projects have moved forward, supported by policies that encourage renewable energy.
- In the largest transaction during 2Q16, Rayonier and FIA acquired Campbell's Menasha holdings in the PNW for an unspecified amount ($500+ mm). Hancock purchased a hardwood property in the range of $200 mm in Michigan, and Acadian, the public timberland company, terminated its sale process. Lastly, Weyerhaeuser announced the sale of its pulp mills to International Paper for $2.2 bn.

## Outlook

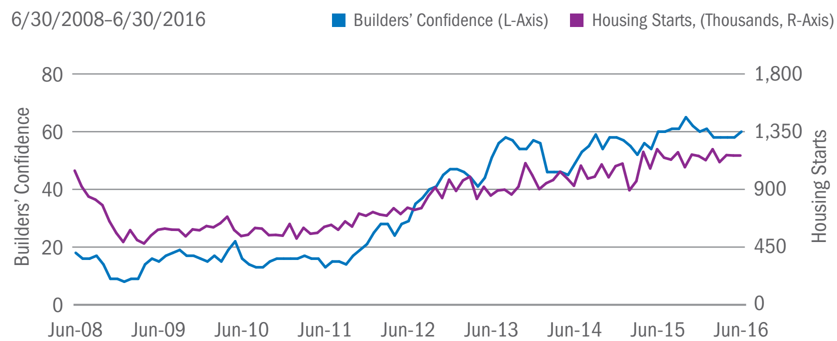
- China's projected timber deficit and log market development, combined with the timing of U.S. housing recovery, will play a central role in pricing in the PNW. On the export side, headwinds are expected due to the strength of the U.S. dollar. In the U.S. South, prices are expected to rebound moderately, aligned with U.S. housing demand and available timber supply.
- Pricing expectations for disposals are high with discount rates at historic lows in developed markets. Some implied discount rates are believed to be ~4% real driven by high institutional interest, an expected U.S. housing recovery, and strategic buyers. Hancock's Red River in TX is the largest expected sale.

### Key market metrics

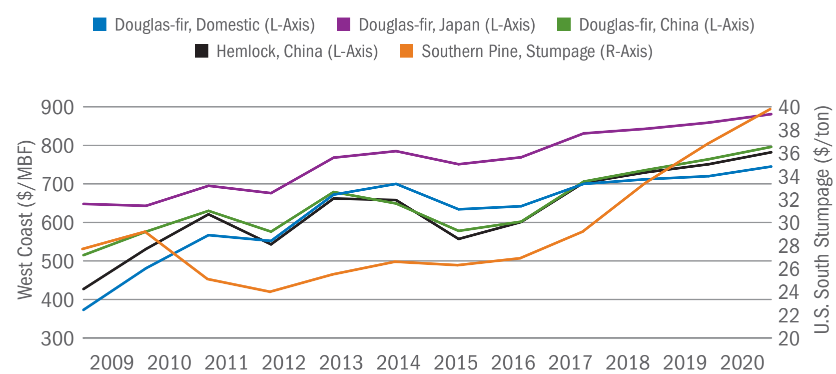
| | 6/30/16 | 3/31/16 | 12/31/15 | 6/30/15 | 6/30/14 | 6/30/13 |
|---|---|---|---|---|---|---|
| Total Res. Construction | **$458B[1]** | **$475B** | $457B | $441B | $369B | $323B |
| Housing Starts, SA (Vol) | **1,164k[1]** | **1,113k** | 1,160k | 1,213k | 928k | 852k |
| Building Permits (Vol) | **1,138k[1]** | **1,077k** | 1,201k | 1,334k | 1,015k | 951k |
| US S. Sawtimber Index | **NA** | **$25.6** | $25.6 | $25.6 | $25.2 | $24.6 |
| CME Lumber ($/1,000BF) | **$304[1]** | **$311** | $258 | $288 | $335 | $298 |
| NBSK US Pulp Index | **$991** | **$954** | $940 | $980 | $1,030 | $940 |
| Paper&Paperboard Prod.* | **6,490k[1]** | **6,454k** | 6,534k | 6,544k | 6,645k | 6,735k |
| Industry Capacity Use (%) | **65%[1]** | **67%** | 69% | 67% | 72% | 70% |
| World Timber Index | **$903** | **$979** | $1,010 | $1,083 | $1,049 | $854 |

### Builder confidence vs. housing starts

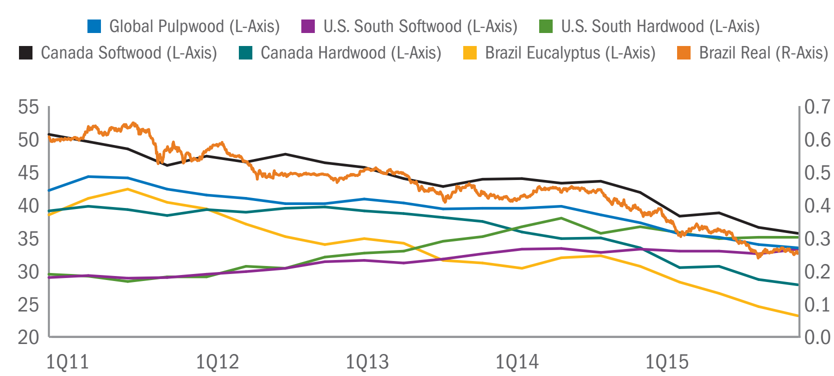
6/30/2008–6/30/2016




### Softwood sawlog prices




### Global pulpwood prices




* U.S. Total Production, in Tons; [1] 5/31/2016. Sources: Haver Analytics, Bloomberg, FAO, TIAA-CREF analysis

## Market Review

- Agri-commodity price movements were mixed in 2Q16. Soybeans and corn posted gains on lower production out of South America due to El Niño induced drought, and sugar prices continued their rally (up >30% over 1Q) on a growing global deficit and weather-related harvesting delays in Brazil. Wheat prices softened on strong U.S. winter wheat yields and burgeoning global stocks. Global price developments in 2H16 will depend largely on weather in the U.S. Midwest over the next two months and the possible evolution of a La Niña weather pattern in 2H16.
- Improving soybean and corn prices are positive for U.S. row crop farmers who have faced reduced margins over the last two years. However, recent upward movement is not solely the result of a change in fundamentals (inventory and production estimates remain at or near multi-decade highs); much of the recent upward volatility was driven by a softening of early season acreage and production estimates with crop condition and final acreage numbers moving in 2Q16.
- Following a brief weakening of the dollar in 1Q16, a spike in global uncertainty (e.g. 'Brexit') incited a flight to safety, resulting in appreciation of the dollar to multi-month highs. Meanwhile, the relative value of the Australian dollar and Brazilian real remain near multi-year lows, which continues to aid the competiveness of Australian and Brazilian exports. Given expectations for continued macro uncertainty, U.S. exporters will likely continue to face currency headwinds for the foreseeable future.
- Record or near-record 2016/17 walnut, pistachio and almond crops are predicted on increased bearing acreage and favorable weather. While still profitable for producers, 2016/17 walnut, pistachio and almond prices are predicted to be below their ten-year averages. The lower prices are increasing consumption among both domestic and international buyers; yet, more demand is needed, particularly for walnuts, to stem future price declines. Demand for premium California wines remains strong and the 2016/17 wine grape crop is developing nicely.

## Outlook

- Rising commodity prices may delay the prospect of attractive 'buy' opportunities in the U.S. row crop space. Furthermore, excellent winter rainfall in Australia and strong likelihood of La Niña developing in late 2H16 have bolstered grower expectations in both Australia and N. Brazil, leading to tightening land markets.

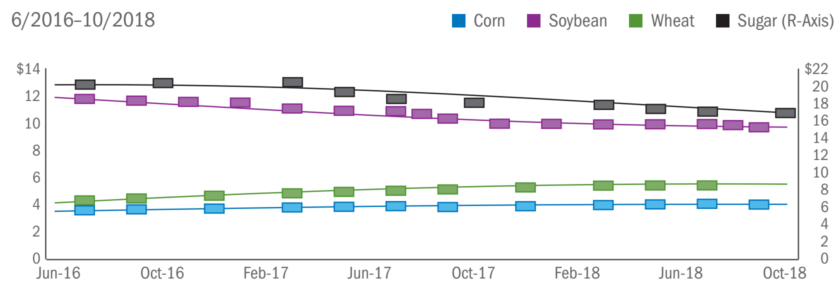
[1] Most recent value as of 5/31/2016. Sources: Haver Analytics, TIAA-CREF analysis

### Key market metrics

| | 6/30/16 | 3/31/16 | 12/31/15 | 6/30/15 | 3/28/13 | 6/30/11 |
|---|---|---|---|---|---|---|
| Corn ($/bu) | **$3.59** | **$3.51** | $3.59 | $4.14 | $6.95 | $6.29 |
| Soybeans ($/bu) | **$11.75** | **$9.11** | $8.71 | $10.56 | $14.05 | $13.06 |
| Wheat ($/bu) | **$4.31** | **$4.73** | $4.70 | $6.15 | $6.88 | $5.85 |
| Sugar ($/100 lbs) | **$20.15** | **$15.35** | $15.24 | $12.28 | $17.66 | $28.36 |
| Cotton ($/100 lbs) | **$62.82** | **$58.44** | $63.28 | $67.51 | $88.46 | $159.79 |
| Ethanol ($/gallon) | **$1.62** | **$1.44** | $1.40 | $1.61 | $2.45 | $2.56 |
| S&P GSCI Agri. Index | **323** | **284** | 288 | 293 | 448 | 494 |
| CRB Foodstuffs Index | **364** | **352** | 331 | 378 | 410 | 490 |
| FAO Food Price Index[1] | **163** | **151** | 153 | 165 | 213 | 235 |
| USDA Farmer input Price Index[1] | **107** | **107** | 106 | 111 | 106 | 100 |
| Baltic Exchange Dry Index | **608** | **383** | 519 | 699 | 745 | 1433 |

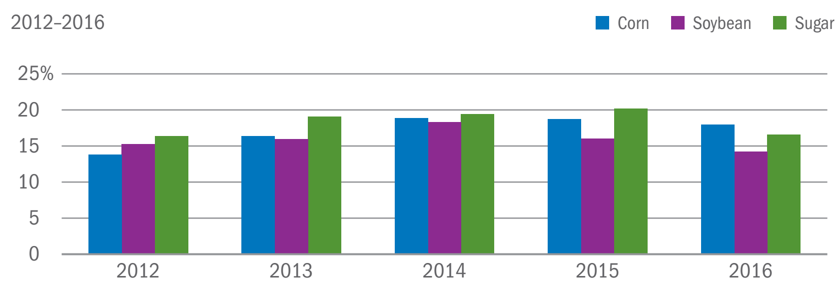
### Futures curve—key agricultural commodities

6/2016–10/2018



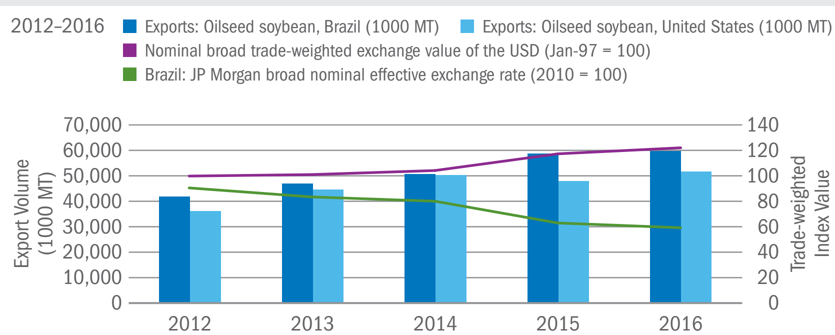

### Global stocks-to-use for key agricultural commodities

2012–2016




### Impact of FX on soybean export volumes in the U.S. and Brazil

2012–2016



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