Perspectives on Agriculture in a Commodity Downturn

51st Colorado Business Economic Outlook Forum
Denver, CO
December 7, 2015

Presented by:
Dan Kowalski, Director of Industry Research
Knowledge Exchange Division, CoBank, ACB
E-mail: dkowalski@cobank.com
This is what the media has been telling us about commodities. Is it this simple?

Forbes
Why Commodities Are Toast
March 18, 2015

CNBC
As US dollar soars, commodities get crushed
September 3, 2014

Bloomberg
Commodities Head for Record Losing Run on Oil to Dollar
December 30, 2014

FT Financial Times
Fate of commodities is linked to dollar
May 5, 2015

THE WALL STREET JOURNAL
China’s Weak Economy, Dollar Strength Dim Commodities Rebound
March 10, 2015
At first glance the Dollar is to blame for commodity price woes

U.S. Dollar Index

- 24% from 2014 low; now at 13-year high

S&P GSCI Commodity Index

- 50% from 2014 high

Source: Bloomberg
But the commodity sectors have not all performed the same.

S&P Commodity Price Indices

Source: Bloomberg
And individual commodity prices have moved in a wide range.

Index of Commodity Prices and the U.S. Dollar

Source: Bloomberg
Crude Oil vs. The U.S. Dollar

How important are crude oil and the dollar to commodities?
Several commodities have had a strong inverse correlation with the dollar, but others are far less correlated.

1 Year Correlation with US Dollar Index

0 = No Correlation
1 = Perfect Correlation

Sources: CoBank, Bloomberg
Several commodities have also been strongly correlated with crude oil, but not all.

1 Year Correlation with Crude Oil Prices

0 = No Correlation
1 = Perfect Correlation

Sources: CoBank, Bloomberg
How important is China to commodities?

Sources: WSJ, NY Times
China has a disproportionate impact on metals prices

- **Metals – China consumes:**
  - 40% of the world’s copper
  - 50% of the world’s iron ore

- **Energy – China consumes:**
  - 12% of the world’s oil
  - 48% of the world’s coal

- **Agriculture – China consumes:**
  - 52% of the world’s pork
  - 31% of the world’s cotton
  - 31% of the world’s rice
  - 29% of the world’s soybeans

All 3 sectors are fueled by the rising middle class

- But ag and energy consumption continue higher without declines
- Metals consumption has fallen since 2014 as China’s economic expansion has slowed

Sources: USDA, BP, WSJ, Censere
China’s GDP has been on a steady decline, dropping to the lowest level since the worst of the financial crisis.

The transition from an export-led economy to a consumer-led economy has been bumpy.
China’s debt problem - $26 trillion increase since 2000

China
Debt-to-GDP ratio (%)

By country, 2Q14

<table>
<thead>
<tr>
<th>Country</th>
<th>Government</th>
<th>Non-financial corporate</th>
<th>Financial institutions</th>
<th>Households</th>
<th>Total Debt ($ Trillion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>56</td>
<td>65</td>
<td>125</td>
<td>38</td>
<td>282</td>
</tr>
<tr>
<td>South Korea</td>
<td>44</td>
<td>58</td>
<td>105</td>
<td>81</td>
<td>286</td>
</tr>
<tr>
<td>Australia</td>
<td>31</td>
<td>61</td>
<td>89</td>
<td>113</td>
<td>274</td>
</tr>
<tr>
<td>United States</td>
<td>89</td>
<td>36</td>
<td>67</td>
<td>77</td>
<td>269</td>
</tr>
<tr>
<td>Germany</td>
<td>80</td>
<td>70</td>
<td>54</td>
<td>54</td>
<td>258</td>
</tr>
<tr>
<td>Canada</td>
<td>70</td>
<td>25</td>
<td>60</td>
<td>92</td>
<td>247</td>
</tr>
</tbody>
</table>

Total debt ($ Trillion)

Sources: IMF, McKinsey, WSJ

Local-government debt as a percentage of GDP

Projections
But despite all the bad news, urban Chinese have more money to spend

China Urban Household Disposable Income (Q3)

Chinese yuan

Source: National Bureau of Statistics of China
...and they are using some of that extra income to buy pricier food

China Urban Household 'Real' Food Spending (Year-over-Year)

Source: National Bureau of Statistics of China
Summary: Macro forces are affecting commodities...but the effects vary significantly

- Macro forces are having disparate effects on commodities
  - Heavy effect on metals (Loss of China growth as production has increased)
  - Some effect on energy (slow economic growth, slow growth in energy consumption; but more supply-driven than weak demand)
  - Much less effect on ag (slow econ growth slows EM wealth effect for meat/dairy, but this is much less pronounced than metals and energy; A supply rebuild story)

Source: CoBank, Cagle
Outlook: Strong dollar and higher interest rates won’t help commodities

- The dollar is having some effect on all commodities
- Outlook for the USD – will remain high in 2016
- Fed rate hike; Euro QE, slow growth; Japan easy monetary policy, stimulus; China weakness
- Interest rate increases are good for banks, usually not for commodities

Check out CoBank’s 2012 Outlook report
Agricultural commodity outlook

- Some buying interest likely to return to some commodities in anticipation of supply peak, especially if inflation returns.

- Ag price volatility will remain lower than past several years with large supplies slow to recede; Cattle is the exception.

- China economy to struggle, with heavy debt burden, excess capacity, and slower gains from consumer vs. industry. But ag consumption will continue to increase.
Agricultural Supply & Demand

Sources: UC Davis, NY Times, CoBank
Global ag consumption moved consistently higher through the economic crisis; demand has not been a problem.
We have transitioned: Demand to supply driven market

Source: USDA
Most ag markets are oversupplied; 2013 was a historic supply build year for corn

Largest Consecutive Year Increases in World Corn Supply

Sources: CoBank, USDA
The combination of 2013 and 2014 soybean supply increases have swamped the market.
Same story in dairy: 2015 will be the 3rd consecutive year of significant supply increase.

Largest Consecutive Increases in World Milk Supply

Sources: CoBank, USDA
The pork supply increase is a domestic story, but historic nonetheless and caused prices to crater in late 2014.

Largest 1-Year Increases in U.S. Pork Supply

Year | Increase (Thou MT)
--- | ---
1979 | 1,000
1998 | 800
2015 | 700
1971 | 600
1967 | 600
1988 | 600
2008 | 600
1980 | 600
1992 | 500
1974 | 500

Sources: CoBank, USDA
Domestic rice supplies increased 11% in 2014; Prices over the past year have fallen 33%
Price volatility has been record high over the past decade; Will it subside for Colorado ag commodities?

Futures Price Index

- Corn
- Wheat
- Live Cattle
- Feeder Cattle
- Milk Class 3
- Lean Hogs

D-09 D-10 D-11 D-12 D-13 D-14 D-15
### US CORN SUPPLY AND DEMAND (Million Bushels/Million Acres)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Planted Acres</td>
<td>97.3</td>
<td>95.4</td>
<td>90.6</td>
<td>88.4</td>
<td>88.4</td>
<td>90.1</td>
</tr>
<tr>
<td>Harvested Acres</td>
<td>87.4</td>
<td>87.5</td>
<td>83.1</td>
<td>80.7</td>
<td>80.7</td>
<td>82.7</td>
</tr>
<tr>
<td>Yield</td>
<td>123.1</td>
<td>158.1</td>
<td>171.0</td>
<td>169.3</td>
<td>169.3</td>
<td>169.0</td>
</tr>
<tr>
<td>Carryin (Sep 1)</td>
<td>989</td>
<td>821</td>
<td>1,232</td>
<td>1,731</td>
<td>1,731</td>
<td>1,720</td>
</tr>
<tr>
<td>Production</td>
<td>10,755</td>
<td>13,829</td>
<td>14,216</td>
<td>13,654</td>
<td>13,654</td>
<td>13,972</td>
</tr>
<tr>
<td>Imports</td>
<td>160</td>
<td>36</td>
<td>32</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Total Supply</td>
<td>11,904</td>
<td>14,686</td>
<td>15,479</td>
<td>15,415</td>
<td>15,415</td>
<td>15,722</td>
</tr>
<tr>
<td>Feed &amp; Residual</td>
<td>4,315</td>
<td>5,040</td>
<td>5,315</td>
<td>5,300</td>
<td>5,300</td>
<td>5,525</td>
</tr>
<tr>
<td>Food/Seed/Ind</td>
<td>6,038</td>
<td>6,493</td>
<td>6,568</td>
<td>6,555</td>
<td>6,595</td>
<td>6,540</td>
</tr>
<tr>
<td>Ethanol for Fuel</td>
<td>4,641</td>
<td>5,124</td>
<td>5,209</td>
<td>5,175</td>
<td>5,225</td>
<td>5,175</td>
</tr>
<tr>
<td>Domestic Use</td>
<td>10,353</td>
<td>11,534</td>
<td>11,883</td>
<td>11,855</td>
<td>11,895</td>
<td>12,065</td>
</tr>
<tr>
<td>Exports</td>
<td>730</td>
<td>1,920</td>
<td>1,864</td>
<td>1,800</td>
<td>1,800</td>
<td>1,900</td>
</tr>
<tr>
<td>Total Use</td>
<td>11,083</td>
<td>13,454</td>
<td>13,748</td>
<td>13,655</td>
<td>13,695</td>
<td>13,965</td>
</tr>
<tr>
<td>Carryout (Aug 31)</td>
<td>821</td>
<td>1,232</td>
<td>1,731</td>
<td>1,760</td>
<td>1,720</td>
<td>1,757</td>
</tr>
<tr>
<td>Stocks/Use</td>
<td>7.4%</td>
<td>9.2%</td>
<td>12.6%</td>
<td>12.9%</td>
<td>12.6%</td>
<td>12.6%</td>
</tr>
<tr>
<td>Farm Price ($/Bu)</td>
<td>6.89</td>
<td>4.46</td>
<td>3.70</td>
<td>3.35-3.95</td>
<td>3.75</td>
<td>3.65</td>
</tr>
</tbody>
</table>

Source: Informa
## Wheat

### US All Wheat Supply and Demand (Million Bushels/Million Acres)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>USDA</td>
<td>Informa</td>
<td>Informa</td>
<td>USDA</td>
<td>Informa</td>
</tr>
<tr>
<td>Planted Acres</td>
<td>55.3</td>
<td>56.2</td>
<td>56.8</td>
<td>54.6</td>
<td>53.5</td>
</tr>
<tr>
<td>Harvested Acres</td>
<td>48.8</td>
<td>45.3</td>
<td>46.4</td>
<td>47.1</td>
<td>45.9</td>
</tr>
<tr>
<td>Yield</td>
<td>46.2</td>
<td>47.1</td>
<td>43.7</td>
<td>43.6</td>
<td>45.8</td>
</tr>
<tr>
<td>Carryin (Jun 1)</td>
<td>743</td>
<td>718</td>
<td>590</td>
<td>753</td>
<td>889</td>
</tr>
<tr>
<td>Production</td>
<td>2,252</td>
<td>2,135</td>
<td>2,026</td>
<td>2,052</td>
<td>2,103</td>
</tr>
<tr>
<td>Imports</td>
<td>124</td>
<td>172</td>
<td>149</td>
<td>125</td>
<td>135</td>
</tr>
<tr>
<td>Total Supply</td>
<td>3,119</td>
<td>3,025</td>
<td>2,766</td>
<td>2,930</td>
<td>3,127</td>
</tr>
<tr>
<td>Food Use</td>
<td>951</td>
<td>955</td>
<td>958</td>
<td>967</td>
<td>970</td>
</tr>
<tr>
<td>Seed Use</td>
<td>73</td>
<td>77</td>
<td>81</td>
<td>72</td>
<td>71</td>
</tr>
<tr>
<td>Feed &amp; Residual</td>
<td>365</td>
<td>227</td>
<td>120</td>
<td>180</td>
<td>200</td>
</tr>
<tr>
<td>Domestic Use</td>
<td>1,389</td>
<td>1,259</td>
<td>1,159</td>
<td>1,219</td>
<td>1,241</td>
</tr>
<tr>
<td>Exports</td>
<td>1,012</td>
<td>1,176</td>
<td>854</td>
<td>800</td>
<td>950</td>
</tr>
<tr>
<td>Total Use</td>
<td>2,401</td>
<td>2,435</td>
<td>2,013</td>
<td>2,019</td>
<td>2,191</td>
</tr>
<tr>
<td>Carryout (May 31)</td>
<td>718</td>
<td>590</td>
<td>753</td>
<td>911</td>
<td>936</td>
</tr>
<tr>
<td>Stocks/Use</td>
<td>29.9%</td>
<td>24.2%</td>
<td>37.4%</td>
<td>45.1%</td>
<td>42.7%</td>
</tr>
<tr>
<td>Farm Price ($/Bu)</td>
<td>7.77</td>
<td>6.87</td>
<td>5.99</td>
<td>5.00</td>
<td>4.90</td>
</tr>
</tbody>
</table>

Source: Informa
Meat supplies are rising; Cattle and beef prices next to fall

U.S. Meat and Poultry Production

<table>
<thead>
<tr>
<th>Year</th>
<th>Beef</th>
<th>Pork</th>
<th>Broiler</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015F</td>
<td>-2.2%</td>
<td>7.3%</td>
<td>4.2%</td>
</tr>
<tr>
<td>2016F</td>
<td>3.6%</td>
<td>0.3%</td>
<td>2.2%</td>
</tr>
<tr>
<td>2017F</td>
<td>4.3%</td>
<td>2.3%</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

Source: Livestock Marketing and Information Center
Colorado has the fastest growing milk supply of any state in 2015.