Macro-economic and Energy Factors Driving the Agricultural Outlook

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Wells Fargo

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Inter-connected Markets

- **Economic growth**
  - GDP, Population and Income
  - Currency competition

- **Federal Reserve policy**
  - Beliefs
  - Influence versus control

- **Energy and Ag Issues**
  - Changing model
    - Ethanol losing its “price setting status”
    - Protein regains the lead
  - Energy pricing remains problematic
Economic policy and currency

- **Extraordinary Fed Policy**
  - Interest rates
  - Money supply

- **Exchange linkages**
  - General trade
  - The “agricultural” dollar
  - The “energy” dollar
  - The Brent/WTI spread effect
Forecasting madmen

History + futures

Fed Funds

Source: FRED, Wells Fargo Ag Industries

4 Countries 50% plus of exports

US Major Ag Currency Relationships

Stronger USD

Weaker USD
Trade balance positive but slowing

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Bulk</td>
<td>27.6</td>
<td>38.0</td>
<td>28.5</td>
<td>33.5</td>
<td>37.1</td>
<td>36.5</td>
<td>18.2</td>
<td>14.7</td>
<td>-19%</td>
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<tr>
<td>Intermediate</td>
<td>2.9</td>
<td>3.7</td>
<td>5.0</td>
<td>6.7</td>
<td>4.3</td>
<td>4.0</td>
<td>0.9</td>
<td>3.2</td>
<td>264%</td>
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<tr>
<td>Consumer Oriented</td>
<td>(12.4)</td>
<td>(7.4)</td>
<td>(6.7)</td>
<td>(6.3)</td>
<td>(4.0)</td>
<td>(2.2)</td>
<td>(3.1)</td>
<td>(2.7)</td>
<td>-15%</td>
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<tr>
<td>Forest Products</td>
<td>(12.1)</td>
<td>(7.5)</td>
<td>(4.5)</td>
<td>(4.5)</td>
<td>(3.0)</td>
<td>(4.6)</td>
<td>(2.4)</td>
<td>(3.5)</td>
<td>47%</td>
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<tr>
<td>Fish Products</td>
<td>(9.5)</td>
<td>(10.0)</td>
<td>(9.2)</td>
<td>(10.4)</td>
<td>(11.3)</td>
<td>(11.4)</td>
<td>(7.0)</td>
<td>(7.1)</td>
<td>1%</td>
</tr>
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</table>

US Ag Net Trade in Billions of dollars

Always volatile by nature

Monetary Policy

Fiscal Policy

Economy
Not growing like we used to

GDP Growth Factors

What’s wrong? Assumptions ...

GDP versus Potential GDP
Economic growth creates jobs ...

Payroll and GDP

- Year over Year

Payroll and Nominal GDP

Jan-00 Jan-02 Jan-04 Jan-06 Jan-08 Jan-10 Jan-12

They can change their minds ...

Policy operates on beliefs as much as facts
Ag and Bio-fuel issues

- Ethanol to corn pricing is fading
  - Weekly feedback loop much weaker
  - Corn to alternative crop pricing
  - Livestock to feed pricing
- Crude is “over-priced”
  - Highest priced “BTU”
  - Market could be years correcting
  - Long-term technological factors at work

Starting weaken this connection

Major Cyclical Indicators

- Nominal GDP
- Oil
- Corn
A major shift in mentality

<table>
<thead>
<tr>
<th>Corn</th>
<th>07/08</th>
<th>08/09</th>
<th>09/10</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
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<tbody>
<tr>
<td>Beginning stocks:</td>
<td>1.3</td>
<td>1.6</td>
<td>1.7</td>
<td>1.7</td>
<td>1.1</td>
<td>1.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Production</td>
<td>13.0</td>
<td>12.1</td>
<td>13.1</td>
<td>12.5</td>
<td>12.4</td>
<td>10.8</td>
<td>13.8</td>
</tr>
<tr>
<td>Co-products</td>
<td>0.8</td>
<td>0.9</td>
<td>1.2</td>
<td>1.3</td>
<td>1.3</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Imports</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Total supply</td>
<td>14.4</td>
<td>13.7</td>
<td>14.8</td>
<td>14.2</td>
<td>13.5</td>
<td>11.9</td>
<td>14.5</td>
</tr>
<tr>
<td>Feed</td>
<td>5.9</td>
<td>5.2</td>
<td>5.1</td>
<td>4.8</td>
<td>4.6</td>
<td>4.4</td>
<td>5.1</td>
</tr>
<tr>
<td>Ethanol</td>
<td>3.0</td>
<td>3.7</td>
<td>4.6</td>
<td>5.0</td>
<td>5.0</td>
<td>4.7</td>
<td>4.9</td>
</tr>
<tr>
<td>Other</td>
<td>1.3</td>
<td>1.3</td>
<td>1.4</td>
<td>1.4</td>
<td>1.4</td>
<td>1.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Exports</td>
<td>2.4</td>
<td>1.9</td>
<td>2.0</td>
<td>1.8</td>
<td>1.5</td>
<td>0.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Total use</td>
<td>12.7</td>
<td>12.1</td>
<td>13.1</td>
<td>13.1</td>
<td>12.5</td>
<td>11.2</td>
<td>12.7</td>
</tr>
<tr>
<td>Ending stocks</td>
<td>1.6</td>
<td>1.7</td>
<td>1.7</td>
<td>1.1</td>
<td>1.0</td>
<td>0.7</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Crop Year Billions of Bushels

How do they get to 4.9?

Ethanol Usage and Production in Billions of Bushels
It was a tight connection

Spot IA Corn v. Spot IA Ethanol
2008 to 2009

$2.5
$3.0
$3.5
$4.0
$4.5
$5.0
$5.5
$6.0
$6.5
$7.0

$ per bushel

y = 0.0241x - 0.3522
R² = 0.8546

100 120 140 160 180 200 220 240 260 280 300

Cents/gallon

Marginally connected today

Spot IA Corn v. Spot IA Ethanol
2012 to 2013

$5.25
$5.75
$6.25
$6.75
$7.25
$7.75
$8.25

$ per bushel

y = 0.0081x + 4.8142
R² = 0.101

175 195 215 235 255 275 295 315

Cents/gallon
The exports/imports matter

Marketing issues

- Ethanol
  - Stagnant growth
  - Loses price leader status
- Feed markets will resume their leader status
  - Who is the lead protein?
  - Cattle remains a disaster
  - Export focus is very problematic
- Exports need to be “reopened”
Slowly stabilizing

52 Week Gasoline Distributions

Millions of barrels per day

Jan-01 Jan-03 Jan-05 Jan-07 Jan-09 Jan-11 Jan-13

Lowest miles since 1996

Miles per capita in the US


Source: DOT, Wells Fargo Ag Economics
New cars will lower fuel use

Fuel Efficiency of New Cars Purchased weighted by total sales

A slow turn-over

Effective Miles per Gallon US Automotive Fleet
Natural gas issues

• **Price ratio is unsustainable**
  – Favors oil production over natural gas
  – Favors natural gas demand over oil
  – Fuel cell technology could be disruptive

• **Long-term investments needed to be hedged**

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**The market can stay stupid longer ...**

**Historical and Futures: NG v. WTI**

- NG wellhead

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![Graph showing historical and futures prices for NG vs. WTI](image)
How fast will the market correct?

Price Ratio: WTI BTU / NG BTU

Recent uptick is noise? ...

Monthly Rig Count

- Oil rigs
- NG rigs

Jan-98  Jan-00  Jan-02  Jan-04  Jan-06  Jan-08  Jan-10  Jan-12

371 394
No monopoly on reserves

Look at China’s position

Table 2. Top 10 countries with technically recoverable shale oil resources

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Shale oil (billion barrels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Russia</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>U.S.1</td>
<td>58 (48)</td>
</tr>
<tr>
<td>3</td>
<td>China</td>
<td>32</td>
</tr>
<tr>
<td>4</td>
<td>Argentina</td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>Libya</td>
<td>26</td>
</tr>
<tr>
<td>6</td>
<td>Australia</td>
<td>18</td>
</tr>
<tr>
<td>7</td>
<td>Venezuela</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>Mexico</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>Pakistan</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>Canada</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>World Total</td>
<td>345 (335)</td>
</tr>
</tbody>
</table>

1 EIA estimates used for ranking order. ARI estimates in parentheses.

Table 3. Top 10 countries with technically recoverable shale gas resources

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Shale gas (trillion cubic feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>1,119</td>
</tr>
<tr>
<td>2</td>
<td>Argentina</td>
<td>802</td>
</tr>
<tr>
<td>3</td>
<td>Algeria</td>
<td>707</td>
</tr>
<tr>
<td>4</td>
<td>U.S.1</td>
<td>665 (1,161)</td>
</tr>
<tr>
<td>5</td>
<td>Canada</td>
<td>573</td>
</tr>
<tr>
<td>6</td>
<td>Mexico</td>
<td>545</td>
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<tr>
<td>7</td>
<td>Australia</td>
<td>457</td>
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<tr>
<td>8</td>
<td>South Africa</td>
<td>390</td>
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<tr>
<td>9</td>
<td>Russia</td>
<td>285</td>
</tr>
<tr>
<td>10</td>
<td>Brazil</td>
<td>245</td>
</tr>
<tr>
<td></td>
<td>World Total</td>
<td>7,299 (7,795)</td>
</tr>
</tbody>
</table>

1 EIA estimates used for ranking order. ARI estimates in parentheses.
It’s beautiful thing

US Crude Oil Production

US Crude Oil Production

This real money for the US

Net Imports US Petroleum

Net Imports US Petroleum

$235 billion improvement in
Final thoughts

• **Policy**
  – Beliefs
  – Influence versus control

• **Intersection of Energy and Agriculture**
  – A true competitive advantage for the US
  – Ethanol policy is broken
    • Technological change
    • Price substitution

• **Watch the global impacts**