Session 2: What Lies Beyond the Horizon for Farm Income?
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Corn Crop Situation and Outlook in 2012

The poor crop weather of 2012 has interrupted bankers’ concerns about a “land price bubble,” and replaced it with worries about commercial hedgers’ risk exposure to smaller earnings and a (possibly) inverted futures market.

Corn and soybean farm prices have risen to historically high levels since 2010, with corn in the $6.00 range and soybeans above $12.00. Crop input costs have increased, but moderately. And, land prices, reflecting the sudden profitability of the two crops and the very low prevailing interest rates, have bolted up—by about 25 percent in each of the past two years.

As bankers this spring began to worry about a “farmland price bubble,” the hot and dry conditions of June and early July intervened on center stage. Instead of a new record corn crop of 14,790 million bushels forecast by the United States Department of Agriculture (USDA) (May and June World Agricultural Supply and Demand Estimates), we will likely see about 2,000 million bushels less than this—barely above the size of old crop 2011, with its tiny carryout. How the USDA could have missed the target so badly is puzzling. But, the weather humbles us all.

The hot and dry conditions this year can be compared to a slightly reduced version of 24 years ago in 1988, or certainly to an expanded version of 2002—when the eastern Cornbelt took the brunt of the troubles by itself. The 2012 pattern is shown in the bubble map, with big losses from Indiana and Illinois west to Kansas, but with decent output still likely in Nebraska, Minnesota, and, especially, the Dakotas (Chart 1).
The supply-demand table shows that with the small carry-in from 2011-2012, the new crop 2012-2013 supply will be no greater than old crop, and so the pressure will remain and intensify for price rationing of demand (Table 1). In the present table, we have reduced exports and also fuel ethanol usage. The idea is that motor fuel refiners and blenders in the next year will use their carry-over of Renewable Identification Number

Table 1: United States Corn Supply-Demand

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Crop year: (Sep-Aug)</th>
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<tr>
<td>Carry-in</td>
<td>MMB</td>
<td>4518</td>
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<td>Area planted</td>
<td>MMB</td>
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<td>Area harvested</td>
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<td>Production</td>
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</tr>
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<td>Imports</td>
<td>MMB</td>
<td>74</td>
</tr>
<tr>
<td>Supply (including imports)</td>
<td>MMB</td>
<td>10679</td>
</tr>
<tr>
<td>Carry-out</td>
<td>MMB</td>
<td>1078</td>
</tr>
<tr>
<td>Disappearance (Total)</td>
<td>MMB</td>
<td>9484</td>
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<tr>
<td>Food &amp; Industrial Use</td>
<td>MMB</td>
<td>5611</td>
</tr>
<tr>
<td>Food &amp; Industrial Use</td>
<td>MMB</td>
<td>190</td>
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<tr>
<td>Agricultural ethanol</td>
<td>MMB</td>
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</tr>
<tr>
<td>Ethanol</td>
<td>MMB</td>
<td>3504</td>
</tr>
<tr>
<td>Domestic Use</td>
<td>MMB</td>
<td>7911</td>
</tr>
<tr>
<td>Exports (-)</td>
<td>MMB</td>
<td>1576</td>
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<tr>
<td>Carry-out-to-use ratio</td>
<td></td>
<td>11.6%</td>
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<tr>
<td>US Farm Price</td>
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<td>282</td>
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With dramatically reduced yield, demand rationing sets in. Lower exports likely, and fuel ethanol mandate will need to absorb surplus RINs rather than real corn.
(RIN) certificates to comply with the Renewable Fuel Standard (RFS) mandate, as opposed to blending more physical gallons of ethanol.

Some grain merchandisers are talking about the desirability of the Environmental Protection Agency’s (EPA) waiving the RFS in view of the poor corn yield, but this is unlikely. EPA has already refused a waiver request from the state of Texas in 2008, based on high corn prices causing “severe economic harm.” At that time, EPA said that it had interpreted the waiver provision as providing only narrow waiver authority. EPA would have to determine, with a high degree of confidence, that the implementation of the mandate itself would severely harm the economy; it is not enough to determine that implementation of RFS would contribute to such harm. Obviously, the RFS did not cause the poor weather.

But if EPA remains steadfast in this stated policy, there is the definite chance that Congress could intervene, and possibly invoke some sort of legislative “off-ramp” from the mandate in years of poor corn yields. It is difficult to see this happening rapidly.

It is still too soon to forecast risk management conditions ahead into harvest, but grain elevator earnings often suffer with small crops and weaker spreads in the futures market.

**Future Corn Yield Trend and Deviation**

The poor yield of 2012 forces us to adopt the long-term trend of 1974-2012, with a considerably lower yield in 2020 than previously modeled—and high corn and soybean prices if demand stays strong.

Three years ago, forecasters looking ahead had considerable optimism. The corn yield trend of 1996-2009 was on a much higher slope than the 35-year trend of 1974-2009 (Chart 2). The new trend, being driven perhaps by the continuing technology of genetically modified organism (GMO) seeds, promised yields by the year 2020 that were on the order of 10 bushels per acre higher than the 35-year trend. This would make the job of providing for domestic feed, exports, and the fuel mandate look fairly easy. In fact, some corn growers worried about the return of surplus corn and low prices.

But now, after below trend yields in 2010, 2011, and 2012, such optimism has completely faded. In the 140-year record of U.S. corn yields, instances of *three or more*
consecutive years below trend are rare. Perhaps two or three times, depending on the method used for the arithmetic—though surely in 1932-1935 and 1974-1977.

No arrangement of atmospheric patterns—such as El Nino/La Nina, the Arctic Oscillation, or any other of dozens of indexes—has been found to explain the warm-dry spring and June-July drought in the middle U.S. cornbelt, leaving 97 percent of the rest of the world’s surface to proceed normally. So we must assume that the odds for next year’s cornbelt weather is the same as always, but also we must assume that the remarkable lack of volatility to the yield trend in the last 15 years or so is over. In other words, there is little choice but to revert to the longer term trend, let’s say 1974-2012, as our “normal.” This gives us a much smaller yield in 2020, and this makes the job of jointly satisfying domestic feed use, (growing world) exports, and the fuel mandate look much more challenging.

Chart 2:
U.S. Corn Yields
What Lies Beyond the Horizon for Farm Income?

Table 2:
PRX Blue Sky Model #28 Implications for Input Costs and Net Returns of U.S. Corn and Soybean Sector

<table>
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<tr>
<th>Item</th>
<th>08-09</th>
<th>09-10</th>
<th>10-11</th>
<th>11-12</th>
<th>Crop Year</th>
<th>12-13</th>
<th>13-14</th>
<th>14-15</th>
<th>15-16</th>
<th>20-21</th>
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<td>Corn + Soybeans gross value</td>
<td>$bil</td>
<td>78.7</td>
<td>78.7</td>
<td>102.1</td>
<td>114.5</td>
<td>120.9</td>
<td>108.9</td>
<td>101.9</td>
<td>104.6</td>
<td>114.5</td>
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<td>10.6</td>
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<td>12.7</td>
<td>12.8</td>
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<td>Chemicals cost</td>
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<td>10.1</td>
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<td>Total variable costs</td>
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<td>Gross return over variable costs</td>
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<td>68.7</td>
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<td>Machinery &amp; oth overhead costs</td>
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<td>18.5</td>
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<td>73.5</td>
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<td>86.1</td>
<td>86.1</td>
<td>90.9</td>
<td>108.2</td>
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<tr>
<td>Net return over Total Costs</td>
<td>$bil</td>
<td>10.8</td>
<td>6.8</td>
<td>28.6</td>
<td>33.3</td>
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<td>22.8</td>
<td>14.4</td>
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<td>CCC Expenditures</td>
<td>$bil</td>
<td>2.3</td>
<td>2.8</td>
<td>2.5</td>
<td>2.7</td>
<td>2.0</td>
<td>2.0</td>
<td>1.9</td>
<td>1.8</td>
<td>1.3</td>
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<td>Net return with CCC</td>
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<td>13.1</td>
<td>9.5</td>
<td>31.1</td>
<td>36.0</td>
<td>35.8</td>
<td>24.8</td>
<td>16.3</td>
<td>15.5</td>
<td>7.7</td>
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With a downward revision of yield potential, it is difficult to project a substantial reduction in farm prices or in gross income to the average acre of U.S. corn-soybean cropland [Table 2]. What we get when we take this income (shown in the table as Corn + Soybean gross value) and then deduct estimated input costs is a picture of continued good “Net Return Over Total Costs,” with no serious need of federal transfers (Commodity Credit Corporation or CCC).

As shown by chart 3, we expect land values to be flat for a few years, and then once again to increase—providing we are right in our assumption of continuing demand from (1) China, and (2) fuel ethanol (Chart 3). Our forecast of “flat” land values for a few years derives from a kind of “confidence shock” after the 2012 yield problem, even with 80 percent coverage of crop insurance).
Our forecast of “continuing demand” from the two big political episodes now underway is chancy—and our defense of this forecast will occupy the rest of this report.

Politics and the Structure of World Grain Demand

For the past 160 years, world grain demand has been dominated by about one dozen politically driven episodes, laid atop slow-moving trends, dominating commercial attention. Episodes typically come to peaks, mature, or collapse entirely.

Origins. In the 1840s, Britain led all nations in factory-made finished goods such as textiles. Factory owners wanted to extend this advantage, and they sought to repeal the country’s tariff protection on wheat and other grains—so that cheap grain would lead to cheap bread in English cities, holding down the pressure for higher labor rates. After several years of debate, Parliament adopted a new “free trade” approach, and the first episode of intercontinental grain trade began.

Imported grain came to London from North and South America, Australia, the Black Sea, and elsewhere. The volume of the episode grew at about 4 percent per year for 68 straight years, benefiting from cheaper steam-powered vessels and transoceanic cable communications (Chart 4). But Germany and other European countries sought to compete...
with Britain for control of factory goods markets, leading ultimately to the Great War, followed by a collapse of the grain demand episode.

**Chart 4:**
**British Wheat and Feed Grain Imports 1840-1920**

![Chart 4: British Wheat and Feed Grain Imports 1840-1920]

**Chart 5:**
**Major Politically Driven World Demand Episodes, 1847-2025 by Region with Peak Grain Volume Estimated in Million bushels of Corn Equivalent**

![Chart 5: Major Politically Driven World Demand Episodes, 1847-2025 by Region with Peak Grain Volume Estimated in Million bushels of Corn Equivalent]
About One Dozen Political Episodes Since Second World War—the Latest the Greatest. Politically driven grain demand episodes sit atop slow-moving demographic and economic trends. These episodes command commercial attention because they emerge quickly and grow much more rapidly than the underlying fundamentals. But most of the political episodes are like shooting stars—they have beginnings, middles, and ends.

Three simultaneous episodes are at work today—the first of which is Brazilian sugarcane ethanol, then China’s food/feed import demand (by far the largest in volume), and the third is the U.S. corn ethanol demand. The combination of China soybean imports and U.S. corn ethanol usage has driven income of the U.S. corn-soybean sector to new record highs. Brazilian sugarcane (and also expanded soybean and corn production in all of South America) competes with the U.S. for farm income.

**Question.** Which of these three political episodes will last the longest—and how long will this be?

**Three Political Episodes Driving Grain Markets Today**

After about 2005, world grain and oilseed prices began to rise under the influence of the three political demand episodes already mentioned, and grain prices also began to display “covariance” with crude oil price. But any given crop, say corn, has its own life, including flukes of weather.

**Relative Size and Speed of Three Episodes.** The increasing acreages involved in today’s three dominant political demand episodes are plotted in the chart below (Chart 6).
The acreage scales for China and the United States are the same, topping at 60 million acres, emphasizing that China’s soybean imports require twice the area (somewhere in the Americas) as does corn ethanol, adjusted for the corn feed value of dried distiller grain (DDG).

The acreage scale of Brazil sugarcane is set at half that for China and the U.S. However, it should be noted that production per acre of sugarcane is double the tons per acre of either soybeans or corn (that is, corn seeds, not including the stover). Thus, from a visual standpoint, the three charts as stacked give a fair representation of scale and rate of growth for all three episodes now at work together in affecting market prices.

One reason why today’s market action is difficult to follow is indeed this overlapping and interacting of three very different supply-demand tables: (1) The 5-year perennial sugarcane; (2) the China soybean situation, in which beans are not rotated with corn but domestically remain a limited kind of “specialty food crop” (for soy sauce and tofu), and (3) the giant U.S. corn table, with the other triple uses of domestic feed, foreign exports, and RFS-directed ethanol.
What Lies Beyond the Horizon for Farm Income?

Chart 7:
Annual Real Price Indexes of Major Crops, 1960-2011

Not Only Episodes but Statistical “Flukes.” The price chart shows the long decline in real prices of the major commodities until about 2005, when the grains began a covariance with crude oil price (and propelling the biofuel age) [Chart 7].

But note the situation with corn price for 2010 and 2011, increasing in real terms well above crude oil and the “rest of the family.” This independent rise is due to the happenstance of two mediocre yield years in the US (2010 down 4 percent from trend, and 2011 down 9 percent).

There is thus no getting away from the obvious: Political episodes are at risk of being overturned by flukes of crop weather as much as changes in elections or economics. —We now face an almost unprecedented third mediocre yield year that transpires in 2012.

World Row Crop Acreage Increasing, but Not in United States

Over the past decade, world acreage of the ten major row crops increased by 184 million acres, of which only 8 million were in the US. The two other major export hubs, South America and the Black Sea, increased 90 million acres, accounting for half the world increase. But, the two political demand episodes of U.S. corn ethanol and China soybean and corn imports accounted for 52 million acres, or 28 percent of the world
increase—and their rate of growth was 13.3 percent per year, dwarfing everything else. Brazil sugarcane, a perennial crop, grew at 6.1 percent per year.

The purpose of giving the full USDA-FAS table on the next page is to place our concept of today’s three politically driven demand episodes in a convincing context [Table 3]. Please study the table and observe carefully the following eight things about world and regional crop acreage:

1. Over the past 10 years, 2003-2012, the total acreage of the world’s ten major row crops has increased by 184 million acres, a growth rate of about 1 percent per year.
2. Only 8 million acres of the increase has been in the U.S., where corn has grown but other row crops have declined.
3. The total growth of 176 million acres in the rest of the world is roughly equivalent to the world having added an entire other “cornbelt,” though with about two-thirds the yield.
4. About 99 of the 184 million acre total world increase occurred in the three “major export hubs,” namely the U.S., South America, and the Black Sea. This was a 2.2 percent rate of growth for South America and a 2.7 percent growth for the Black Sea. (Lines 27-29.)
5. The major importers grew by only 86 million acres, led by China (yes!) at 31 million acres (mainly corn), altogether only a 1 percent per year rate of growth. (Lines 31-34.)
6. By type of grain, growth in meatstuffs led with 69 million acres, and foodstuffs followed with 59 million acres. (Lines 35-38.) It should be emphasized that the role of US corn and soybeans is the production of meat for those with the money for it—not for “food” to feed the poorest.
7. Note especially the two politically driven demand episodes shown in lines 39 and 40. U.S. corn for ethanol grew by 18 million acres, and China corn and soybean imports by 34 million acres. Together the two episodes represented growth of 52 million acres, or 28 percent of the total world increase. And the rate of growth over the decade of the two episodes dwarfs everything else at 13.3 percent.
8. Brazil sugarcane (a perennial crop), shown in line 43 separately from the annual row crops, grew by 9.4 million acres, a growth rate of 6.1 percent.

Acreages, of course, represent different qualities of land, and thus different yields. For instance, the usable biomass from sugarcane acreage is roughly twice that of feed grain acreage. Oilseed crops have half or less the yield in bushels as feed grains, but their protein and oil content is much higher—and thus, too, their price per bushel. But the raw acreage numbers give a useful overview of the structure of the growth in world agriculture over the past ten years.
Table 3: World and US Area Harvested of Ten Major Row Crops 2003-2012

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<tr>
<td>2. Corn</td>
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<td>3. Sorghum</td>
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<td>5. Wheat</td>
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<td>513</td>
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<td>6. Peanuts</td>
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<td>7. Proso Millet</td>
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<td>8. Soybeans</td>
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<td>12. Cotton</td>
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China’s Soybean Imports Require Twice the Acreage as Corn Ethanol

China’s soybean imports, and now probably increasingly its corn imports as well, is the largest demand episode underway today—and one which should continue despite a shift in China’s economy away from export growth and towards consumer demand.

Chart 8 shows China’s imports of all grains, oilseeds, and food oils since 1985.

The boom in soybean imports began in the late 1990s with a few million tons, and today in 2012 will exceed 60 million tons.
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Three points about this vast tonnage of soybeans should be made: (1) China now accounts for about 40 percent of all world trade in soybeans and soymeal; (2) China imports about three-fourths of all its consumption of food oil, through soybeans and palm oil; and (3) China’s imports of soybeans requires over 50 million acres of quality cropland in the Americas, land that could deliver over 7.5 billion bushels of corn. Thus, in terms of overall world grain demand, China is twice as important as fuel ethanol—and especially to the combined corn-soybean sector of the US.

Could Economic Slowdown = Soybean Import Slowdown? We think not, and we cite the former Soviet Union’s grain demand episode of the 1970s and 1980s as a precedent. In other words, a slowing of China’s export economy, and a shifting towards a consumer economy, argues that a leadership with money (China) would make even greater grain purchases, to keep its urban meat-eaters happy. Finally, China’s corn yield is half that of the U.S., and not rapidly increasing—and branded genetic seeds are not a possibility without full protection of intellectual property rights. So it makes sense, as shown in Table 4, to project growing corn imports as well as continued soybean imports.

Table 4:
China Meat Production vs. Corn and Soybean Import Demand

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<th>Pork</th>
<th>Poultry</th>
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<td>11.8</td>
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<td>108.0</td>
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<td>1.0</td>
<td>118.0</td>
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<tr>
<td>2010</td>
<td>5.6</td>
<td>51.1</td>
<td>12.6</td>
<td>69.2</td>
<td>177.2</td>
<td>1.0</td>
<td>129.0</td>
<td>1.89</td>
<td>15.2</td>
<td>53.3</td>
<td>53.0</td>
<td>44.0</td>
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<tr>
<td>2011</td>
<td>3.6</td>
<td>49.3</td>
<td>13.2</td>
<td>68.3</td>
<td>191.8</td>
<td>3.0</td>
<td>131.0</td>
<td>1.92</td>
<td>13.5</td>
<td>36.9</td>
<td>39.1</td>
<td>47.3</td>
</tr>
<tr>
<td>2012</td>
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<td>31.9</td>
<td>13.7</td>
<td>70.6</td>
<td>182.0</td>
<td>7.0</td>
<td>137.0</td>
<td>1.93</td>
<td>13.1</td>
<td>61.9</td>
<td>63.4</td>
<td>39.7</td>
</tr>
</tbody>
</table>

Annual Growth of Imports implied at Current Meat Growth Trend:

- Beef: 1.4
- Pork: 9.6
- Poultry: 1.88
- Total Meat: 1.2

Annual Growth of Imports implied (2010-2020) at Likely Future Meat Growth Trend (PDN):

- Beef: 2.5
- Pork: 5.0
- Poultry: 2.90
- Total Meat: 2.3

PDN Forecasts. (1) China corn imports to increase at 2 mm/yr (the other 3 mm/yr from China's increasing yield trend. (2) China soybean imports to increase at about 3 mm/yr.
China and US Biofuel Policy Combine to Drive Record Farm Income

The two political demand episodes have pushed combined soybean and corn area planted to a new record, absorbing the former paid land diversions. Whether the income boom will last depends on our assessment of the two simultaneous political episodes causing it.

Unlike most of the United States’ economy, the country’s corn-soybean sector is fully employed, expanding, and profitable. Chart 9 shows the area planted of corn and soybeans, which together has grown to a record above 170 million acres. Corn area has
What Lies Beyond the Horizon for Farm Income?

been driven by the federal mandate for fuel ethanol—the acreage that completely absorbs the former “surplus area” that required paid set-asides as recently as the 1990s. Soybean area has been simultaneously driven by China’s imports—a demand equivalent to over 50 million acres in the US, Brazil, and Argentina.

Chart 9:  
US Corn & Soybean Area Planted with Corn Area Set-Aside for Government Programs
Chart 10 plots the extent of prosperity in the U.S. corn-soybean sector—from three previous decades of financial loss (made good only by government transfers via the CCC) to the present five years of record net profits.

Farmland Price Bubble? The price of good corn-soybean land has risen 20 percent or more for two straight years. Purchases, however, have been helped by very cheap credit—and the increasing land costs are reflected in the net earnings above. The projection, of course, is no better than the joint assumption being made in our current Blue Sky Model—that both the China import episode and the U.S. corn ethanol episode will continue, and not come to sudden collapse.

The purpose of this essay is to bring into our intellectual view the whole family of past political episodes, and to make a call. Our own conclusion is that there is a better than 50-50 chance that China’s imports will not go bust, and that US ethanol policy (as complex and contradictory as it certainly is) will muddle through.

What Starts Political Demand Episodes?

Politicians respond to “clear and present dangers” with schemes designed to help their economies cope and to stay in power. Dozens of policy mechanisms have been employed. There is no one guaranteed approach.
What Lies Beyond the Horizon for Farm Income?

As shown below (and in a different format previously on page 7), there are about one dozen political demand episodes making up world grain demand—apart from the underlying domestic grain demand in every country of the world, each of which moves along slowly with income growth. Our thesis here is that it is the large, rapid growing political episodes which mainly drive world grain prices. The main political features of these episodes are shown in Table 5. What usually initiates an episode is a “clear and present danger” to the country involved. The politicians are neither professional economists or strategic planners—they are leaders seeking to find ways and means of preserving their power and making their economies work under the perceived conditions which threaten them. They select political schemes they think will work and on which they can achieve enforceable consensus. The mechanisms employed are diverse. Each episode has unique initial conditions, longevity, and final outcome.

The three main episodes affecting world grain demand today—China, U.S. corn ethanol, and Brazil sugarcane—are shown in table 5, color coded green for bullish to the U.S. corn-soybean sector and red for bearish.

Chart 11:
World Corn Imports 1960-2012
Table 5:
Major Politically Driven Grain Demand Episodes, 1846-2012+
and Impact on U.S. Corn-Soybean Income

<table>
<thead>
<tr>
<th>Episode</th>
<th>Goal</th>
<th>Main Policy Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Grain Imports, 1846-1914</td>
<td>Alternative Food &amp; Feedstuffs</td>
<td>Rapport grain tariffs to enable cheaper imported grain to reduce domestic labor costs, helping foreign export of surplus manufacturing capacity, partly by controlling regional market access.</td>
</tr>
<tr>
<td>FSU Grain Imports, 1973</td>
<td>Supplement Food &amp; Feedstuffs</td>
<td>Use windfall profits from rising crude oil price after Arab Embargo to purchase cheap feed stuffs from Americas, to increase meat supply, contain discontent.</td>
</tr>
<tr>
<td>China Corn Exports, 1968-2000</td>
<td>Export Earnings</td>
<td>With change to controlled market economy, rural grain stocks become surplus, easier to export until growth of urban meat demand caught up.</td>
</tr>
<tr>
<td>Asian NICS Grain Imports, 1970-2012+</td>
<td>Consumer Food &amp; Meal Demand</td>
<td>With rapid income growth (sometimes assisted by FSU defense interests), but small agricultural capacity, imports of food &amp; feedstuffs fill consumer demand.</td>
</tr>
<tr>
<td>N Afr, M East, &amp; SE Asia, 1990-2012+</td>
<td>Consumer Food &amp; Meal Demand</td>
<td>With rapid income growth (sometimes assisted by FSU defense interests), but small agricultural capacity, imports of food &amp; feedstuffs fill consumer demand.</td>
</tr>
<tr>
<td>China Soybeans Imports, 1995-2012+</td>
<td>Alternative Food &amp; Feedstuffs</td>
<td>Import cheaper imported grain to increase meat and food oil production for new urban consumer base, helping foreign export of surplus labor manufacturing capacity, partly by controlling currency.</td>
</tr>
<tr>
<td>US Corn Use for Ethanol, 2005-2012+</td>
<td>Alternative Fuels</td>
<td>Mandate domestic blending of corn ethanol to reduce petroleum imports, using surplus food grain acreage, mainly by compliance trading system to pass costs of Alternative Fuels directly to public at retail pump.</td>
</tr>
<tr>
<td>Grain Sugar Use for Ethanol, 1975-2012+</td>
<td>Alternative Fuels</td>
<td>Mandate domestic blending of sugar ethanol to reduce petroleum imports, using surplus cane acreage, mainly by enabling flex fuel auto fleet so that petroleum and ethanol could compete at retail pump.</td>
</tr>
</tbody>
</table>

How Long Do Political Episodes Last?

A careful look at the entire catalog of grain demand history arrives at an obvious conclusion: There is no way to say how long any politically driven grain demand episode will last. Episodes usually have beginnings, middles, and ends—but some can extend in a “flat” condition well beyond their peak.

The longest running political episode on record was the British grain import episode at 4% per year for 68 years—beginning with “free trade” in 1846, and ending with the First World War in 1914 [Chart 12]. Of the episodes after the Second World War, the European Union (EU) grain import episode lasted over 20 years; the Soviet grain import episode lasted a little less than 20 years; and the China corn export episode also lasted less than 20 years. The Japan grain import episode began and peaked after 30 years, and has remained flat another 20 years—as the country’s economic growth has
continued while the country’s agricultural resources are obviously small. The same pattern is true for the East Asia newly industrializing countries (NICs) (South Korea, Hong Kong, Singapore, and Taiwan).

Chart 12:
European Union, Former Soviet Union and Japan Corn Imports
The growth patterns of North Africa, the Middle East, and Southeast Asia are less “politically driven” and more “economic growth driven,” although one can find plenty of politics in Western assistance to all of these regions (especially “security” assistance to the Persian Gulf) [Chart 13]. Nonetheless, the plots in the bottom chart above are much more along the lines of what economists consider fundamentals than are displayed by all the other in our family of “political episodes.”

Second Winds. Perhaps it can be said that no episode can last more than a generation (or some long period of time) without a “second wind.” This was true of the British grain import episode, in the application of steam power to ocean cargo vessels in the 1870s, the laying of trans-oceanic cables for improved market communication (and thus better risk management/lower prices), and the full opening of the U.S. prairie lands (the cornbelt) after the Civil War—using British railroad technology to move grain to the U.S. east coast and onto steam vessels to Europe.
What Lies Beyond the Horizon for Farm Income?

Future of US Corn Ethanol Demand

The odds favor that EPA will “muddle through” the problems and (probably before 2015) provide a reasonable new RFS3 for future required renewable fuel volumes. After the poor weather of 2012, however, there is a fair chance that Congress will attempt to provide an “off-ramp” to the RFS.

Five years ago, when the Energy Act of 2007 was being debated, the price of crude oil had risen to $140 per barrel and represented a “clear and present danger”—driving politicians to agree on a new Alternative Energy program of vast scale.

But today, that danger seems in the distant past. The price of crude oil has dropped to $85 per barrel and may continue down even more. The Organization of Petroleum Exporting Countries (OPEC) has a glut of oil, and new supplies of domestic oil and natural gas abound. The ideological question of humanity’s need (immediately) to adopt alternative fuels in place of fossil fuels is much more difficult politically than the $140 price amidst hot war in the Middle East.

Another dramatic change from 2007 is the federal budget, which after the financial crisis of 2008-09 is now in perilous deficit. Happily, the RFS of the Energy Act of 2007 does not require subsidies from the Treasury. The RFS is a straightforward mandate for refiners to blend greater and greater volumes of certain alternative fuels, the cost of which is passed on directly to the public at the retail gas pump.

From the Washington point of view, what could be better? In other words, the RFS is not costing the government anything, and without it there would be no Alternative Energy program at all!

A further change from 2007, however, is that the degree of “organized combat” among stakeholders affected by the Act (and/or by any other of our laws) has sharply intensified. Every side of every law and regulation is noisily argued, and political agreement seems virtually impossible. In the case of the RFS, stakeholders who see themselves harmed by the higher grain prices (such as domestic livestock feeders) argue for repeal of the entire rule. So, too, do defenders of free enterprise and advocates of limited government. And add to this some environmentalists, who say that biofuels do not strongly contribute to reducing GHG emissions, and/or that today’s corn-soybean agriculture is not sustainable.
But these political positions lack a “clear and present danger.” Unless, of course, such a condition arises from the poor crop weather of 2012.

Could EPA waive the RFS in response to conditions? No, probably not, here is what the agency said in refusing such a request from the State of Texas in 2008:

- Section 211(o)(7) of the Clean Air Act allows the Administrator of EPA, in consultation with the Secretaries of Agriculture and Energy, to waive the requirements of the national renewable fuel standard, in whole or in part, if the Administrator determines, after public notice and opportunity for public comment, that implementation of the RFS requirements would severely harm the economy or environment of a State, a region, or the United States.
- EPA interpreted the waiver provision as providing only narrow waiver authority: EPA would have to determine (with a high degree of confidence) that the implementation of the mandate itself would severely harm the economy; it is not enough to determine that implementation of RFS would contribute to such harm.

The difficulties facing EPA in executing the RFS are well known. These problems include (1) The E10/E15 Blend Wall; (2) The lack of cellulosic biofuel production; and (3) The coming contradictions between the RFS rules and the new Corporate Average Fuel Economy (CAFÉ) rules.

Simplified Forecast. We think the odds favor that EPA will “muddle through” these troublesome issues (and that Congress will not successfully change the Law). Dealing with the E10/E15 Blend Wall requires mainly a rise in the price of RINs, probably sometime in 2013, when the current surplus of D6 Conventional RINs diminishes. Dealing with the lack of cellulosic biofuel has so far led EPA to rule in favor of “other advanced biofuels” to fill the gap, but EPA has full authority to “waiver cellulosics without creating a gap” (that is, without incentivizing large imports of Brazil sugar ethanol that could displace corn ethanol). EPA is competent to recognize conditions in the world sugar market that support this route. Furthermore, the text of the 2007 Energy Act compels EPA—in the wake of significant waivers of cellulosics—to modify the Renewable Volume Obligations for 2016-2022. Upon review with the Department of Energy (DOE) and USDA, EPA can be expected to respond, we believe, with a reasonable new RFS3 rule for the future.
What Lies Beyond the Horizon for Farm Income?

The new CAFÉ rules may incentivize electric vehicles and disincentivize flex-fuel vehicles, at the further loss of liquid fuel markets. But such an outcome is many years away; in the meantime, automakers are arguing in favor of joint designs of high compression engines and high octane liquid fuels that could lead to ultra-low emissions, and the possibility of wide-spread mid-level blends in the range of ~E30. No one knows how these additional rules will play out.

Our idea of just how the EPA’s “muddling through” will look is shown below.

Table 6: Annual Applicable Volumes of the RFS

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Renewable Fuel</th>
<th>Total of which Advanced Diesel</th>
<th>Conventional (of which ethanol)</th>
<th>Advanced Diesel</th>
<th>Flex fuels</th>
<th>RFS</th>
<th>RFS Blue Sky</th>
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<tr>
<td></td>
<td>at least 10%</td>
<td>at least 40%</td>
<td>at least 80%</td>
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<td>at least 40%</td>
<td>at least 80%</td>
<td>at least 10%</td>
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<tr>
<td>2009</td>
<td>11,100</td>
<td>9,000</td>
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<td>9,000</td>
<td>0,200</td>
<td>10,000</td>
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<tr>
<td>2010</td>
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<td>9,900</td>
<td>2,000</td>
<td>9,900</td>
<td>0,200</td>
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<td>2,000</td>
<td>0,200</td>
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<td>2013</td>
<td>18,300</td>
<td>2,750</td>
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<td>13,000</td>
<td>13,000</td>
<td>1,300</td>
<td>28,000</td>
<td>8,000</td>
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<tr>
<td>2020</td>
<td>30,000</td>
<td>15,000</td>
<td>15,000</td>
<td>15,000</td>
<td>1,500</td>
<td>30,000</td>
<td>8,000</td>
</tr>
<tr>
<td>2021</td>
<td>33,000</td>
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<td>16,000</td>
<td>16,000</td>
<td>1,600</td>
<td>33,000</td>
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<td>2022</td>
<td>35,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>1,800</td>
<td>35,000</td>
<td>8,000</td>
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</table>

Future of US Competition with Other Grain Export Hubs

The U.S. share of world grain trade will likely gain slowly on the two other world export hubs. Substantial contingency, of course, surrounds all of our forecasts in this report.

The world market share of U.S. corn (and other grain) exports vs. the other two major export hubs has declined from the levels of the 1970s and 1980s, but the volume of U.S. exports has held constant. The advantages of the United States—in terms of consistent high quality product, year-around availability, and commercial finance and risk management options—will likely push the U.S. share slowly back up in the coming years. Both South America and the Black Sea have enormous infrastructure problems, and the Black Sea has an extreme northerly climate more fickle than its competitors.
Chart 14:  
World Corn Exports, 1960-2012

Chart 15:  
Three Politically Conditioned Supply Responses
What Lies Beyond the Horizon for Farm Income?

Table 7:
Current PRX Blue Sky 10-year Forecast and Contingencies

<table>
<thead>
<tr>
<th>Factor</th>
<th>PRX Current Idea</th>
<th>Contingency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather volatility up</td>
<td>Crop prices up</td>
<td>???</td>
</tr>
<tr>
<td>But land values flatter</td>
<td></td>
<td>???</td>
</tr>
<tr>
<td>China import demand episode</td>
<td>50-50% to continue</td>
<td>World finance, economy, exchange rates ??</td>
</tr>
<tr>
<td>US competitiveness vs. other Export hubs</td>
<td>2012 bough, but then gradual, small improvement</td>
<td>Greater foreign investment in infrastructures</td>
</tr>
<tr>
<td>Crude oil price</td>
<td>Range of $80-95/bbl</td>
<td>???</td>
</tr>
<tr>
<td>Ethanol Blend Wall</td>
<td>50-50% with high RINs we’ll reach 15 bbl gas</td>
<td>RINs = untested mechanism</td>
</tr>
<tr>
<td>Congress revises RFS</td>
<td>Becoming more likely with the bad weather!</td>
<td>If Congress re-opens, trouble for corn</td>
</tr>
<tr>
<td>Ethanol imports and exports</td>
<td>50-50% no huge sugar imports or 2-way vessels</td>
<td>For 2010-2012, EPA followed its own reason</td>
</tr>
<tr>
<td>Cellulosic waiver &amp; “Other Advanced” biofuels</td>
<td>EPA must revise RIVOs for 2016-2022, will be logical</td>
<td>EPA (w/DOE &amp; USDA) may not be reasonable</td>
</tr>
<tr>
<td>RFS vs. CAFE</td>
<td>??? The two laws are not coordinated</td>
<td>If CAFE favors Electric vs FFV, negative corn</td>
</tr>
</tbody>
</table>

As happened in the drought of 1988, when the concept of Anthropogenic Global Warming (AGW) blossomed into one of the most powerful political ideas of modern times, there will be many claims that “The hot-dry conditions of 2012 are consistent with the AGW climate change models.” Possibly so, but the conditions were not predictable, even a few weeks in advance. And next year will be unpredictable too, as will the following years, one by one. We have only history for guidance—and as previously mentioned, the 2012 conditions are very rare in the record.

Our assumption for 2013 yield will be “normal,” right on trend. For the other years to 2020, we will use a deviation pattern typical of the past 40 years.

Strategic Caution. We observed that the EPA itself is not likely to waive the RFS in connection with the poor yield of 2012. But the possibility of Congress revising the RFS is higher. The 2007 mandate is remiss in essentially ignoring variations in annual crop weather, as though biofuels policy could rely every year on a guaranteed volume of biomass output. The odds are good that agriculturalist members of Congress will offer legislation (known as “off-ramps” to the mandate), but it is not foreseeable that such amendments will pass or in what form.
I am the token youngster you heard about earlier today. [laughter] Ambassador Yeutter talked about the youngsters and how they are running things now. I don’t think I run things, but I’m definitely one of the youngsters. The reason I can say that is most of our colleagues who will speak to us today will refer to mentors and most of their mentors are either deceased or retired. My mentors are sitting throughout the audience here today. So that makes me a youngster, I suppose.

My official responsibility in this session is to be a discussant. I’m not exactly sure what that means. We’ve gone over it a couple of times with Jason [Henderson]. As I can see everything that’s gone out, I’m going to talk somewhat about what has been said and add a little bit of my own color from our perspective at RaboBank.

RaboBank is a large, primarily agriculture-focused, lending bank that is global in its reach. I am one of 80 professionals globally, who focuses specifically on analyzing and researching agriculture in all of the major markets throughout the world. So we have analysts in China, Brazil, Europe, Black Sea, Australia. And anywhere you can think agriculture happens, we have analyst professionals there.

What I’m going to present for you today is a compilation view of what we see happening and what I view is on the future of farm margins, at least in the United States, and how that is impacted by other countries. Let me illustrate a couple of things for you before I start. I want to introduce some terms. This illustrates a little bit of what Secretary Yeutter was saying earlier today. Just to give you some background, this particular driver ran through a barricade, he hit the side of the wall, his wheels kept going, and he flipped over and landed on the cliff where you see him. So you can see what happened.

The first term I want to introduce to you is called “systemic risk.” Systemic risk is anything to do with the road or system that is built into the system. It is anything that
might have to do with the curve of the road, the strength of the barricades, anything to do with the process that will be there consistently.

The second term is “random risk.” Random risk is anything that might happen with weather. It might happen because of wildlife running across the road, driver impairment, or something not built into the system.

The third term I’d like to introduce to you is “risk potential.” As I click the notch, you see that I’ve suddenly taken this from the most unlucky person in the world to probably the luckiest. Hey! This is something I’ve heard several times today. Ambassador Yeutter said, “You have to be aware of everything.”

There are other risks we have to be aware of in agriculture, because they all have an effect on what’s happening on all markets here in the United States and also on farm income.

First of all, talking about structuring market risk: In the United States, we have completely restructured market risk over the last five years. One of my associates – some of you might know him – Bob Wisner, who is a professor at Iowa State University – and Mike Boehlje can verify this because he has been around about as long as Bob – that at this particular time in his life is the most significant change he’s ever seen in agriculture. We’ve restructured both systemic risk and random risk and need to be able to grasp this as we go forward to understand what is happening in agriculture, especially with farm margins.

Let’s start off by looking at price. This is just a simple graph of corn prices since 1950 [Chart 1]. We talked about a few different types of risk today. We talked about weather. Weather is a random risk in agriculture. It is something we’re very used to dealing with. It happens one year and the next year it’s different. We get changes in planting due to the weather. Sometimes the pendulum swings back and forth, but it’s generally not long-lasting and it will happen almost every year. That is a supply-side risk.
Chart 1:

These two events we talked about as well -- the globalization of the grain trade in the early 1970s when livestock stopped being in the residual marginal buyer of grain and importers took that position. Now all of a sudden you now have a demand-side shift. Demand-side shifts tend to be more stable. They tend to be more long-lasting. In 2006, we had the same type of event. Bill [Hudson] just talked about some of the critical factors that drove that event.

Chart 2:
Ethanol. This is a plot of all the ethanol plants in the United States, along with the acreage it would take to supply each one of those ethanol plants if it were running at nameplate capacity with 2011 yields – a pretty visual illustration of how much ethanol actually consumes from grain [Chart 2]. It is a demand-side disruption. It is going to be consistent and in place as long as the political winds roll that direction. So, it is a political risk.

The other issue everyone has talked about specifically is China. This again is a demand-side risk. Going forward, we now have a projection of nine billion people by 2050. If we look at that against arable land, arable acreage, or what we estimate as being available, the acreage per capita begins to decline fairly rapidly and continues to put pressure on our ability to produce grain over that period of time. At the same time, and I’ll talk about this a little more, yield seems to be affected by this change in acreage, as well.

China is critical to this conversation. Everyone who has been here today has mentioned China. China has several things happening within its agricultural economic system right now. One of those is, whenever GDP growth outpaces animal production growth, you get higher prices. You get higher prices for protein, and that translates into higher prices for the grain to feed that protein, as you expand herds.

China has another phenomenon going on within its borders right now and that is the industrialization of its animal protein complex. In 2001, 74 percent of their animals were raised in a backyard environment. What does a backyard environment mean? It means you can feed them rice hulls. It means you can feed table scraps. It means you can feed just about anything there. The reason swine is such a big product in Asia is because it is very easy to grow.

By 2013, its official government policy trying to enforce this could change from a 74 percent backyard industry to a 30 percent backyard industry, going into confinement systems that are about 1,000 or so head or larger in those systems.

What does that mean when you go from backyard to confinement? It means you need what? It means you need protein and you need energy – corn and soybean meal. China has had a policy to discourage the production of soybeans and oilseed and encourage coarse grain production, which is particularly corn. Over a period of time, as
Bill said, they have become the dominant player in soybeans globally. This has put a squeeze on acreage for corn as well, as you draw soybeans out of the United States and Brazil.

At the same time, China also is industrializing or moving its poultry herd into a confined environment. By 2015, about 7 percent of their poultry herd will be in a backyard environment [Chart 3]. These things together are even creating movements within China’s official policy, where it was announced last year officially they would be adding about 4 million tons of imported corn per year for the foreseeable future.

**Chart 3:**
Herd Size of Poultry Farms in China

Now we look at China being the dominant player in soybeans and all of sudden, since 2009 zero corn imports and this year they are going to be somewhere in the 10 million ton range. We estimate by 2015 they will be over 50 million tons of imported corn, which is a fairly dramatic increase. And it’s not necessarily being driven by economic development. It’s being driven by government policy to become more efficient in agriculture. It doesn’t necessarily rely on China’s economy, but it relies on this movement, which is very much underway.

If we go back to this just for one second, we say China now and India later. China has a much older population curve than India. India has a very young population curve and they will be over in the future demanding – if not raw agricultural commodities – at
least competing for the raw inputs that go into agricultural commodities. India has a stated objective to begin to buy assets that would allow them to produce their own inputs globally, because it gives them a better position for bargaining in the future.

That’s the demand side. It’s a brief rehash of a lot of what you heard this afternoon. China is very important. Other countries and emerging markets are also important, including Europe, which is rapidly losing the ability to feed itself. Other countries that have a policy as well. That’s the demand side.

What about the supply side? What I will lay out for you is case for volatility with an upward bias, particularly as we look at these specific commodities. Over the last 10 years, the re-trade, or proportion of the re-trade, has shifted from the United States to the Black Sea area. The Black Sea now represents about 26 percent of global wheat trade. What does that mean?

Let’s walk back to 2010. Russia has a drought. Before that, we were expecting a significant amount of grain to come out of Russia – particularly wheat. Countries like Egypt are bargain-basement buyers and are out there and in the market. So what do they do? Russia has the drought and all of a sudden in August they announce a ban on exports, down on exports. Not necessarily just a ban on future bookings, but a ban on exports – period.

Subsequently, they asked their neighbors – Kazakhstan and Ukraine that make up the bulk of the Black Sea’s production – to also ban or quota exports to save enough for Russia to feed its poultry flock.

How many in here know what it means when Russia asks a neighbor to do something? It means it generally gets done or you’re not going to get any natural gas this winter and you’re going to freeze. So, they actually did ban exports out of Ukraine, and Kazakhstan doesn’t have a choice because they have to ship across Russia anyway.

All of a sudden, 26 percent of the world wheat trade is gone. All of the countries that are looking for low-price wheat, like Egypt, are forced into the market and have to buy wheat at higher prices, immediately driving up the price of wheat in most countries and helping create unrest globally.
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The point is we are most subject now to political policy from other countries than we ever have been and it’s critical to understand from a supply perspective what that means and how it will impact us.

Now, I’ll ask you the question this year. We look at Russia. They are 26 percent of the world wheat trade now. It’s more than from the United States. Why does that matter? Isn’t that diversity? It’s diversifying our production, but it’s moving into a system that is twice as volatile as the United States for production.

Last year: Good harvest or not? Anyone know? Good crop. Year before that? Drought. Year before that? A good bumper crop. Year before that? Early frost. This year? From 56 million tons to 45 million tons. Twice as volatile as it has been in the past. Understanding what is happening in the Black Sea has become that much more important in the United States on the price side.

What has happened in the United States? If we look at the growth of where corn is produced in the United States, which areas have grown the most in this production process? Kansas? The Dakotas? 160, 170, 200 bushel yield areas – no. 120, 130 bushel yield areas [Chart 4]. This brings me to a point. The yield curve. If we are rebalancing where we are reproducing all of this grain, why do we weight our yield curve based on a system that is overweighting the Midwest historically? Looking at what the yield is, we are very similar to what Bill had. Our estimate at the beginning of the year was about 158 bushels per acre. That is where our beginning yield curve was. That’s where we felt like the mean percentage was.

Chart 4:
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What has this done then for soybeans? Soybeans have moved west. They have moved out of the Midwest. They are continually moving west.

What about wheat? Wheat has moved west, north, and east. This is winter wheat. Each time you make these movements, you’re moving into more volatile areas. So, supply volatility is increased. We can expect higher supply volatility in the future.

Why does this matter? If we look at what happened post 2002, when China took away its monopoly status from its state-owned companies, immediately there was a consumption of their stocks [Chart 5]. Now the stocks estimates, these are the best numbers we can get out of China. It’s difficult sometimes to know exactly whether it’s accurate or not. But, if you look at the rest of the world, that blue line is pretty flat. Add China in and you can see why we are so tight with our stocks position right now.

Chart 5:

World Stocks to Use Ratio

What we have done is made the stocks position more vulnerable to these shocks and disruptions. So I get the opportunity to go around the United States and meet with a lot of farmers. I present myself as an economist, and then I apologize [laughter]. And then I tell them as an economist I can predict the weather, which usually gets a pretty good laugh, because economists didn’t even predict 2008, did we?

Then I say, “There’s going to be a drought this year. Somewhere in the world there is going to be a drought, and it’s going to affect your markets more than it ever has
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in the past. In order to be a good manager and understand what’s happening with your margins, you are going to have to understand what’s happening all over the world instead of just right here.”

In the end, and this particular outlook is changing daily for 2012, our outlook is for prices to be higher and more volatile [Chart 6]. It’s a fairly high range that we have, but we are looking at prices averaging somewhere between $5 and $6 going forward.

Chart 6:
Farm Received Corn Price

Now I’ve made the case for volatility, both on the demand side and on the supply side, with prices bouncing around but in the end the weight of pressure keeping it higher, above the $5 mark.

What does that mean for farmers? Now I’m taking a slightly different look at this, because I knew what Bill [Hudson] was going to look at and I wanted to present a slightly different view.

This groups some of the inputs together [Chart 7]. The blue line there is our estimate of returns to the operators, so it’s returns to profits. The green line is the percentage of the value of the crop that goes to machinery. The orange line is the percentage of the value of the crop that goes to land. And the blue line on top is the percentage of the value of the crop that goes to seed, chemicals, and fertilizer.
If you look over time, they have been fairly consistent as to how much the value of the crop they have consumed, leaving whatever residual for profits. This includes government transfer, or at least LDP and countercyclical payments. If we take those out, then we go from this to this. Again, I reiterate how important over the last decade government payments have been in providing a safety net and keeping farm incomes where they could actually be profitable at certain points.

In the future, our expectation is that we will settle a price. We go all the way back to that first chart that I showed. We’ll find us a price, because over the long term, commodity prices tend to be stable around an average and rotate around that average. Input costs will reclaim their proportion or value of that crop.

What does that mean from a land perspective? This was a fascinating project and I can’t take complete credit for this. Mike Duffy, who studies land values at Iowa State University, came up with this idea and I advanced it.

I went back to 1970 to calculate the mortgage payment [Chart 8]. If you were a farmer making the decision whether to buy or to rent in that year, what your mortgage payment would be if you bought that year versus what your rent payment would be. It was very interesting. In the 1980s, the mortgage payment far outpaced where rent payments and returns to land and profit would be. Then it came back down and it came together.
Going ahead to 2006, the same type of phenomenon started, where mortgage payments were starting to outpace rental payments significantly as it had been over the last 20 years until this year, when rent values there is this extreme amount of pressure – as we were talking about earlier – on rental values. So it is driving up those rental values until the point where the averages are starting to become in line with where mortgage payments are. Fundamentally, this gives me a little feeling of comfort that there is some basic value behind these mortgage values big farmers are paying or investors are paying to buy land. If you look at the 2012 estimate of where returns to land and profit are, land being the residual claimant on agricultural commodity profits, there looks to be more upward pressure.

My forecast as we look forward is that land values will flatten out, because in surveys and discussions we’re doing we are hearing the exact same thing that there is concern land values have gone too high, too fast and there is going to be some backing off. We are also seeing lot sales with compatible land where you’re seeing one lot go and the next one go slightly lower. There is a backing off in some of these cases from what we’ve seen. That gives a bit of an outlook that they’ll flatten out in the future.

However, rental values probably still have some room to go up. We calculate this and put it altogether. We have a model, and I’ll say this for the sake of one of my mentors Dave Miller, who just came back into the room. (I used to work for Iowa Farm Bureau
before I worked for RaboBank.) This model does not include any of Farm Bureau’s intellectual property. [laughter]

We take all these new systemic risks from where the crop is being raised. There is systemic risk from the price, the randomness from the price, and also the systemic risk from the price, all the distributions and correlate those, put them together, and do this outlook with this model. What we see are decreasing farm margins with a fairly strong, a fairly wide, range of probabilities. Starting in 2012, I ran this last week before we had these price spikes – with the top level conceivably at $8.50 for the corn price’s top range, all the way down to a loss of $100 per acre [Chart 9]. It’s a fairly large range of probabilities that can still happen. Looking out, it just continues to increase in that range.

**Chart 9:**

In fact, if we pull it all together and look at the probabilities, we actually see in 2013 the probability of loss going down some. We talked a lot about 1988 and say this is a similar drop to 1988. What is the difference between this year and 1988? In 1988, we were coming into that year with over 50 percent stocks. This year, we are coming into 5 percent or 6 percent and we are nowhere as built up as we were back in 1988 and that translates over into 2013, if we continue to have this dry weather. It looks as if the corn crop is fairly well done at this point.

So 2013 prices go up. Probability of yield, because you may have a better yield next year, we see a better chance for profits, but then after that continual pressure to the point where the red represents zero or lower, the yellow represents about where we would expect 10 percent working capital to be built with this particular model we’re looking at.
By the time you get out to 2016, there is over a 50 percent chance of there being very tight or negative margins [Chart 10]. The probability of negative margins continues to increase as we go forward, and most of this because import costs catch up with the price of the commodities.

**Chart 10**

- Probability of Margins Less Than $0.00/bu and Greater Than $60/bu

Wrapping up, confidence is generally the feeling you get just before you completely understand the situation. What our objective is for farmers is to manage their balance sheet. We are telling farmers to continue to manage income, but to also manage their balance sheet. To look forward five years from now and to understand what you are going to have to do in order to build personal equity instead of lose it.

Secure liquidity is going to be essential in these very high periods of volatility, especially as we tighten those margins going forward and they become more and more susceptible. Our recommendation is 20 percent and a lot of times I’d say 20 to 40 percent. It just depends on whether you want to be the consolidator or the consolidated.

Maintain very good credit lending standards. This is essential as we look forward. In my view, this is one of the keys to whether you will avoid a farm crisis or not. Actually maintaining good lending standards – and we’ll hear more about that tomorrow – in talking about debt.

We should also look for farmers to start exhibiting behavior consistent with margin management. At this point, there have been strong tailwinds in the agricultural economy with wild liquidity, and these farms if you call the auctioneer that actually does this auctioning, a lot of times they will give you a pretty good story. “Yeah, that sold for
$13,000.” And one of the neighbors walked in and said, “I’m buying this land.” The other one said, “No, you’re not.” They both had enough money to put 50 percent down on the land. They put it down and they bid it up. That wouldn’t be behavior consistent with what I would expect to see in margin management. As concern starts to increase, I would expect to see more of that.

Finally, the most critical factor out there is interest rates. Because of everything that has been said this afternoon, a lot of this has been built on interest rates. Interest rate increases will have multiple effects. First, it has a direct effect on land value and asset value. Second, it has a very large potential effect on the value of the U.S. dollar. Right now, as you look at what the United States has become globally, we achieved something we hadn’t since World War II in the last couple of years. We became a net exporter of beef. It’s a very good position to be in, if we are trying to export, because the U.S. dollar has been fairly weak. The same thing has happened with dairy. The fact we’ve become somewhat of the incremental supplier of dairy products globally has helped dairy farms avoid catastrophe in some cases. An increase in interest rates, and the potential impact that could have on exports, would also be a big factor. Interest rates are a major factor to watch as we go forward.

Of course, I would be amiss if I didn’t say the final result of the 2012 harvest will have an enormous effect. If I were to run this same model earlier this year, assuming even 157 bushel yield at 96 million acres planted, under normal harvest conditions, we would have a strong chance of building stocks. With that being gone and that continually deteriorating make the outlook for price even higher, and as we started to say $8.50, unprecedented territory, is possible. Driving those prices up higher and incenting costs of production to increase incrementally make an outlook for even higher costs, higher prices, and margin change.
Chad Wilkerson: Thanks, Sterling, for those comments. We now have a couple of perspectives on grains incomes for the future. And we will be anxious to hear what questions the crowd has for either of our presenters. If you have questions, please come forward to the microphones. We covered a good amount of material and I am anxious to see what questions folks have.

Kyle Bauer, KFM Radio: With natural gas prices coming down as much as they have, why haven’t we seen nitrogen prices come down hardly at all?

William Hudson: The United States is still a net importer of nitrogen. Right now, nitrogen prices are tracking European gas prices much more closely than they are tracking U.S. gas prices. That’s largely due to the fact that we still import a lot of the anhydrous we use to produce, they both apply and create urea. There has been a lot of discussion about expanding nitrogen production in the United States, which would probably drive some of that margin out of the market. But, as long as we continue to be a net importer, the prices are more likely to track global prices rather than domestic production prices. Does that answer your question?

: Good afternoon. By tonight, we may see corn above $8. It’s trading very close at $7.95, options fed?

You both talked about China. This is an election year. Both of the parties are talking about China, China, China. Should we be worried about any kind of a tariff for China or anything like that in the coming year that will affect ag trade, or with the election-year politics we shouldn’t be worried about it?

William Hudson: Tariff on China? Gosh, I don’t think so, but if Carter gets in again then …. [laughter]
Sterling Liddell: We talked a little bit today and there was a great question that was asked about normalizing and standardizing relationships with Russia. The better we can standardize these relationships, the better off we’ll be as agriculture. Hopefully, there is a good education effort underway to help people understand that. Strong trade relations will be beneficial for us, especially in agriculture in the United States. Hopefully there won’t be any kind of action on the tariff front.

William Hudson: The degree to which the public misunderstands agriculture and misunderstands most of the industries in this country is shocking. Clayton talked about that earlier in terms of the staff on the helm -- the 32-year-olds. The way they think, so far as I can pick it up, they don’t exactly think in terms of economics or history, they think in terms of how a deal can be framed. What can we put together that’s going to sell? What is the consensus for what’s politically possible? That’s the realm they’re operating in, and I claim that’s the realm that politicians have always acted in. That’s what has given us these episodes that float on top of the macroeconomy for a while and control the picture for a while, until they flop. That’s just how wise we are as specie.

______________: I was presented with another way of thinking of this demand for world grain and not in the mindset of U.S. resources, as far as land and climate, but more in terms of water. The presenter was saying, “China is not importing corn and soybeans. They are importing water, because they do not have enough available to combine with their land resources to produce grain.” Any comments on that thought?

William Hudson: One of my mentors was Julian Simon. To him, the ultimate resource was human imagination and human vision. Yes, I know you can around and count how many gallons of fresh water there are, but it is essentially an energy problem. If we ever have the ability to have pure fusion energy, we could desalinate the ocean. I’m reluctant, as many times as we have, to say because of scarce resources we’re going to do this or that. It just hasn’t been a beneficial thing for commercial thinking. Maybe it’s a philosophical way to think about the earth or how the earth ends.

In the case of fertilizer – back to fertilizer – the fertilizer industry is an oligopoly. One of the main reasons the price isn’t coming down is that they don’t have to. The other thing I tried to show with my market shares is that, when the earnings from the corn-soybean sector are so good, all of the input suppliers – seeds, chemicals, machinery, and
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everything else – they know in a yield start from a natural gas price, particularly to get the fertilizer price, if you are a fertilizer company, you say, “How much of a share of the farmer’s income can I get?”

That’s what is on their mind. It’s not what my cost of natural gas is.

Sterling Liddell: Just to answer your question also. Right now, that isn’t true. China does have some serious challenges with water. They also have very serious challenges with arable land. They estimate they need 120 million hectares in order to feed their population. If you study aerial photography of China, they don’t have 120 million hectares at this point. There is so much illegal conversion happening at the province level they haven’t accounted for. It is a serious issue. They are trying to grab resources any way they can and secure them externally.

We saw it in Brazil where they were buying land and then the Brazilians decided to interpret a law that was passed back in 1978 that disallowed foreign ownership of land. So then China became the number one foreign direct investor in Brazil at that point. They started to build infrastructure, so China owns the infrastructure in Brazil. China is trying to secure resources any way they can.

One comment I will make about China, though. If you go to the northern Chinese Province of Jolin where most of the corn is produced and visit the state-run farms that are most similar to the western farms with planters, soil-testing, and combines, what you will find is they can produce about 8½ tons of corn per hectare, as compared with the United States where we produce 10 tons.

The smaller farms that dominated Chinese agriculture production produce about 4 tons. So there is opportunity to grow yield in China. It’s just a very slow challenging prospect when you have so many farmers and the farms are so small. They don’t have property rights to be able to capitalize anything.

_____________: Bill, you had a chart in there that gave an estimate of the total monies needed for grain consumption. (I think it was slide 5.) Do either of you have a perspective of whether or not the banking system has that capital available in that extreme-case scenario – another $20 million worth of working capital to buy all this? If so, would the people who are borrowing that money be …. 
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**William Hudson:** You said grain consumption. You meant grain risk management, right?

______________: Right. Grain purchasing and hedging.

**William Hudson:** Well, the banks that finance the commercial hedgers go to the Fed or whoever else to get money and I’ve not been led to believe we don’t have enough money.

**Sterling Liddell:** I think there is a little bit of shock left over from 2008 when we did make the system illiquid by suddenly doubling or tripling the price and all of a sudden these enormous margin calls start rolling in and banks were shocked. I’d like to equate it to taking a tub of water and a syringe and yanking back on the syringe. You’re not going to get capital flow or you’re not going to get water flow into that syringe as quickly as you want, but eventually it’s going to fill up.

Over the last several years, a lot of banks have reassessed and are looking at these ranges. In fact, a lot of instruments that are being put out or should be put out have built into them the ability to expand in sort of an accordion dynamic, so you can actually cover some of these high-level margin calls.

One thing we have to get used to doing in agriculture is betting against the tails. One of my mentors – Dave Miller – came back into the room. In 2004, we started talking about this and you have to be able to cover the tails. In the past, we haven’t necessarily thought about it that way. But if we are going to survive, we have to cover the whole distribution curve, not just the center but also the tails.

**William Hudson:** I wonder how many commercial bankers thoroughly understand the way an elevator makes money. I wonder how many understand the role of the spreads and the role of the basis came from buying cheap in the fall and selling it in the spring, and that really understand the risk picture that is faced by grain merchandizing. That quantification that we did is tricky, messy, you look at the Commitment to Traders Report and you gauge this and that. It is not high financial accounting practice. It’s squeegee. It looks like the right ballpark things, and I can imagine bankers preferring that they trusted something that was more definitive.

______________: In the early 1970s when we saw a boom in U.S. agriculture, we basically encouraged investment in South America from capital from all over the world.
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Most all of the world sees the same things we’re seeing here today. One of you talked about investment from India in long-term production. With them being closer to the Ukraine and the eastern shore of Africa, is that an untapped area that could be brought into production and increase production with the right amount of capital put into it that we are really not giving the full weight to or is it just a too unstable government?

**Sterling Liddell:** There has been a marked increase in the amount of investment in places like Mozambique and other parts of Africa. So where you are seeing stability, you are also seeing some investment and some increase in a desire to be involved in those parts of the area. In fact, there are farmer groups in the United States that are investing in Africa and taking an active role in managing those assets in those countries. It is something that would develop, but the instability is really the big question and how long it would take to overcome it.

India tends to want to secure other sorts of resources if they can, for example, potash or phosphate or natural gas, so they can produce nitrogen. The question will be because in a potash situation where it really is an oligopoly, it is very hard to invest. It takes so long to create and develop a mine – seven to ten years – and it’s a $1,000 to $2,000 per ton of investment. It’s very hard to get into that market, but if you have an India that doesn’t care about the economics, will they start to secure some of the global resources – and China as well? You need to know what their drivers are. That is the bigger concern there, just as how India and China will move out to secure natural resources to help stimulate what production they can do internally.

**William Hudson:** Lew Batchelder, who retired three or four years ago as president of ADM Grain has been doing a certain amount of international consulting. He told one of our meetings that he was hired by Ukraine to do a complete study of their grain infrastructure and come up with what it needed in the way of investment to make it first class. He did that for eight or nine months and then he led a team trotting around the world with an investment portfolio.

The only country or person he could get as the lead investor was China. So he went merrily back to Ukraine and they wouldn’t take it. They just didn’t want China in that much command of that system. Political considerations, political friction still has a role in the way the world is run.
**Sterling Liddell:** Chad, if I can just answer a question that was asked earlier about land values in other countries, I think that was asked. We did a global analysis of land values, trying to assess what was happening in trends in different parts of the world. Europe is similar to the United States and any country that has had these very low rates is similar. Brazil has not been as rapid a grower, because Brazil has had strong inflation. They have had challenges with having to increase interest rates. They have not seen the same type of land increase, although they are starting to see some now.

Australia has also been growing more rapidly than it has in the past, but not similar to the United States. Those are the real major systems you could look at. China, of course, doesn’t have property rights to exchange property and India would be more controlled as well. Just in those systems, that would be the answer to your question. I don’t know who asked it.

**Chad Wilkerson:** Thank you, Sterling, for addressing the earlier question. Let’s give the presenters a round of applause. [applause]