A Symposium Sponsored by
The Federal Reserve Bank of Kansas City

Kansas City, Missouri
July 19-20, 2011

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Session 1:
Balancing Global Food Production and Consumption

Symposium Introduction

Transcript

Alan Barkema

Senior Vice President and Director of Research

Federal Reserve Bank of Kansas City

Good afternoon, ladies and gentlemen. My name is Alan Barkema, and I am senior vice president and director of research here at the Federal Reserve Bank of Kansas City. And I am delighted to welcome you to the Bank's 2011 Agricultural Symposium, "Recognizing Risk in Global Agriculture.

This Bank is one of 12 regional Reserve Banks in the Federal Reserve System, with responsibilities in monetary policy, supervising commercial banks and bank holding companies, and providing payments services to depository institutions. The Bank's region spans seven states: Wyoming, Colorado, Nebraska, Kansas, Oklahoma, the western third of Missouri, and the northern half of New Mexico. Agriculture is a vitally important enterprise in this part of the nation, and research on developments and prospects in the industry has long been an area of particular focus for the Bank.

At this Bank, we have positioned responsibility for research on agricultural and rural issues—including this Symposium—in our branch office in Omaha, Nebraska. The Omaha Branch is led by my good colleague, vice president and branch executive Jason Henderson. Jason, who holds a Ph.D. in agricultural economics from Purdue University, has been with the Federal Reserve Bank of Kansas City for more than 10 years, and he has headed up our Omaha office since 2006.

This is an extraordinary period in agriculture. At our Symposium in this room one year ago, a strong consensus emerged that a surge in global food demand driven by a potent combination of population and income growth in the developing world would stretch agriculture's capacity as it strained to double production by the middle of this century. Today and tomorrow at this year's symposium, we will consider the risks the industry faces as it takes on that challenge.

Those of us in the room today are not the only ones attune to the risks ahead. Agriculture is in the spotlight, and leaders around the globe and at home are focused on the industry's potential rewards and downside risks. Our diverse audience is ideal for probing these topics. This room is filled with participants from across the country, representing production, agribusiness, finance, academe, and government – including staff members from the offices of Senator Roberts, Senator Moran, and Congressman Yoder. One of those concerned leaders, Kansas Senator Pat Roberts, who is the ranking member of the Senate Committee on Agriculture, Nutrition and Forestry. Senator Roberts is unable to attend the symposium today but he offered to share his thoughts with you in a brief video presentation.

Video Message

Transcript

Senator Pat Roberts

Kansas

Hello. I'm Senator Pat Roberts. I really apologize for not being there in person, but I can assure you I am working hard in our nation's capital to help solve some of the very serious issues we face as a nation. And, one of them falls right in line with the very theme of your symposium – Recognizing Risk in Global Agriculture.

Our producers have a very large task at hand. By the year 2050, just a couple of decades, the global population will rise to over 9.3 billion people. That's a lot of mouths to feed.

Now, to meet this challenge, we must double our agriculture production in order to feed this troubled and hungry world. This is no small task. It will take advancements in technology and efficiency, ensuring that new products can be brought to market. Doubling agriculture production will only occur through farmer techniques that combine the use of important conservation practices with the use of improved seed varieties that increase drought and disease resistance while increasing yields.

I think we can all agree that a well-fed world is a much safer and more stable place that, in turn, leads to stability, economic growth, and peace. Hungry people lead to discontent, instability and, yes, even extremism. We must give our farmers and ranchers the tools they need to be successful. Over 9 billion people in a world hungry for nutrition, peace, and stability are depending on it.

Thank you for listening.

Outlook for U.S. Agricultural Exports (Remarks)

Joseph Glauber

U.S. Department of Agriculture

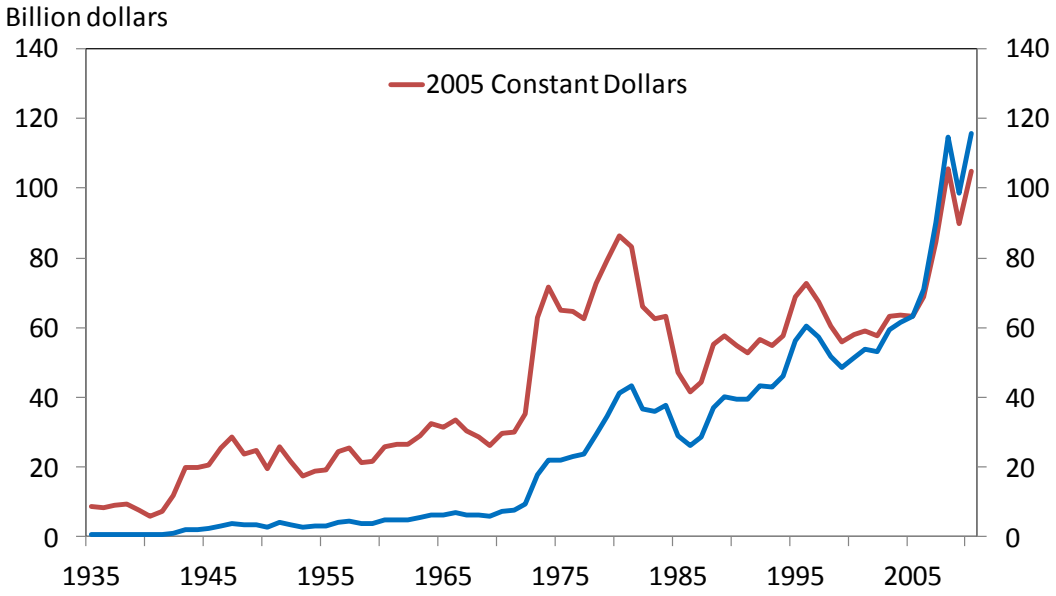
I was asked to talk about the outlook for U.S. agricultural exports and go over some of the trends we've seen over the last few years. It's a little different than what I normally do. We give a lot of outlook speeches, obviously, and talk on a variety of other issues. This was a nice opportunity to climb back into some of the data and look at the longer-term trends we've seen.

As many of you know, the USDA puts out a 10-year baseline every February. My analysts there do this on a regular basis. It was quite useful for me.

For a couple of years, I served as U.S. agricultural negotiator in the Doha Talks. There, too, you get an appreciation for a variety of the markets that could be of interest to the U.S., which has given me a bit of perspective on this.

Let me review some of the trends. The graph shows U.S. agricultural exports by calendar year for the last 75 years, adjusting for inflation and in nominal terms [Chart 1]. U.S. exports have been at record levels over the last two or three years – 2008 now followed by 2010. Agricultural exports in 2010 are both nominal and real records. The U.S. had a big export jump in the early 1970s, when we started selling a lot of grain and oilseeds to the former Soviet Union, followed by the big activity in the late 1970s, both to China and also to the former Soviet Union. In the early 1980s, exports really plummeted, reflecting a strong dollar, weak economic growth, and agricultural policies that maintained U.S. prices above world levels. But since then, we've seen a pretty strong progression, particularly over the last five or six years.

Chart 1: U.S. Agricultural Exports



We often like to point out that production from one out of every three acres is exported. But you can see that really varies by commodity. Generally, if you look at the percent of production by decade over the last several years [Table 1], you can see how that has changed. In particular, you can see how some export shares declined for grains. In the 1960s and 1970s we had a lot of concessional sales – things like Food Aid, when a lot of surplus U.S. grain was being dropped on world markets. In the 1970s, that changed as China and the former Soviet Union came into the markets -- but again U.S. export shares generally declined.

Table 1: Share of U.S. Crop Production that is Exported

Period	Wheat	Corn	Rice	Soybeans	Cotton
1960-69	53.8%	12.3%	51.0%	37.9%	34.4%
1970-79	57.8%	24.6%	58.9%	38.0%	44.1%
1980-89	58.9%	26.2%	52.5%	38.8%	47.6%
1990-99	48.7%	20.8%	46.0%	34.4%	39.8%
2000-2010	49.5%	17.6%	49.3%	38.9%	70.3%
2011-2020 [1]	46.0%	14.9%	53.0%	47.3%	81.3%

[1] USDA Long-Term Agricultural Projections, Feb. 2011

The last row shows projections [Table 1], based on USDA's 10-year baselines. These values show how much our analysts believe will be exported as a percent of production. The decline in corn exports as a percent of production reflects the fact that an increasing portion of the corn crop now goes for ethanol production. What has happened is that, while the export numbers haven't changed much – in fact, USDA projects increasing corn exports over the 10-year period – corn production is increasing even more to accommodate growth of bio-fuels production.

Over the last several years, we have seen the increase in soybean exports, primarily to Asian markets – especially China – which USDA expects to continue over the next 10 years.

For cotton, the large increase in exports as a percent of production is due to a variety of factors – both with the phase out of the multi-fiber agreement and also just the general competitiveness of the U.S. textile industry. Most of the textile industry has now moved offshore. Cotton exports, which formerly would account for about 40-45 percent of the U.S. crop, now accounts for 70-80 percent of the crop in any given year.

For livestock, the importance of trade has grown particularly over the past 15 years [Table 2]. Prior to the early 1990s, U.S. livestock, dairy and poultry markets were insular, with few commercial exports and imports controlled by quotas. Over the past

15 years, the U.S. has become a significant exporter of pork and poultry, export more than 15 percent of production. While this past decade saw the growth in beef exports stagnate due to the discovery of BSE, exports have rebounded in recent years. This year USDA anticipates U.S. beef exports to exceed is exporting much, much higher quality beef despite the discovery of BSE, which in the pre-BSE levels and USDA forecasts that beef exports will account for about 10 percent of production over the next 10 years.

Table 2: Share of U.S. Livestock Production that is Exported

Period	Beef	Pork	Broilers
1960-69	0.2%	0.7%	2.0%
1970-79	0.4%	1.5%	2.3%
1980-89	1.8%	1.3%	4.3%
1990-99	6.9%	4.2%	3.1%
2000-2010	6.8%	13.1%	16.5%
2011-2020[1]	10.3%	22.0%	16.9%

[1] USDA Long-Term Agricultural Projections, Feb. 2011

While the table does not include dairy, dairy exports have grown in recent years and could see further growth as Asian consumers demand more dairy products. The U.S. is already a significant exporter of nonfat dry milk. If you look at the U.S. share of world exports [Table 3], the U.S. share has seen a decline for most commodities over the years, largely because of increased competitiveness abroad. World demand has increased significantly. And, as I mentioned, if you look back to the 1960s and 1970s, the U.S. dominated a lot of those markets by virtue of surplus disposal through food aid and concessional sales.

Table 3: U.S. Share of World Crop Exports

Period	Wheat	Corn	Rice	Soybeans	Cotton
1960-69	42.3%	52.4%	19.0%	87.6%	24.7%
1970-79	43.2%	67.8%	21.5%	87.8%	19.7%
1980-89	37.4%	67.4%	20.1%	74.7%	20.4%
1990-99	30.1%	67.2%	13.8%	62.8%	25.0%
2000-2010	24.2%	59.5%	11.6%	44.6%	37.9%
2011-2020[1]	17.9%	52.8%	10.9%	39.3%	35.1%

[1] USDA Long-Term Agricultural Projections, Feb. 2011

In the world wheat market, the U.S. faces competition from developed markets like Canada, the European Union, Australia, but also emerging markets like the Black Sea region, India, Argentina, and some other developing countries.

The U.S. has long been the dominant player in the corn market, though its market share has declined with competition from Argentina, South Africa and more recently, from Russia. Russia has increased production dramatically over the last five or six years, apart from last year's drought. While the U.S. exports about half of what it produces, U.S. rice exports are a small part of the world market, accounting for about one-fifth of what is traded. Most of the competition coming from, not surprisingly, the Southeast Asian markets like Vietnam and Thailand.

Finally, cotton – where the U.S. has become a much bigger player by virtue of the fact we [the U.S.] are now exporting a large portion of our crop – you can see the U.S. increased its market share to around 30-40 percent of the world market, with significant competition from India, who in the last five or so years has increased productivity through the adaption of Bt cotton and now has become a major cotton exporter. Brazil, with similar adoption of Bt cotton, has increased exports, as have other areas like central Asia and sub-Saharan Africa.

If you look at the meat markets, 20 years ago, you would have seen a market dominated by Europe, at least for beef and pork (Table 4). Now the U.S. has become a much bigger player in those markets. With broilers, we face a lot of competition from Brazil since they have increased their market share as other countries have dropped off.

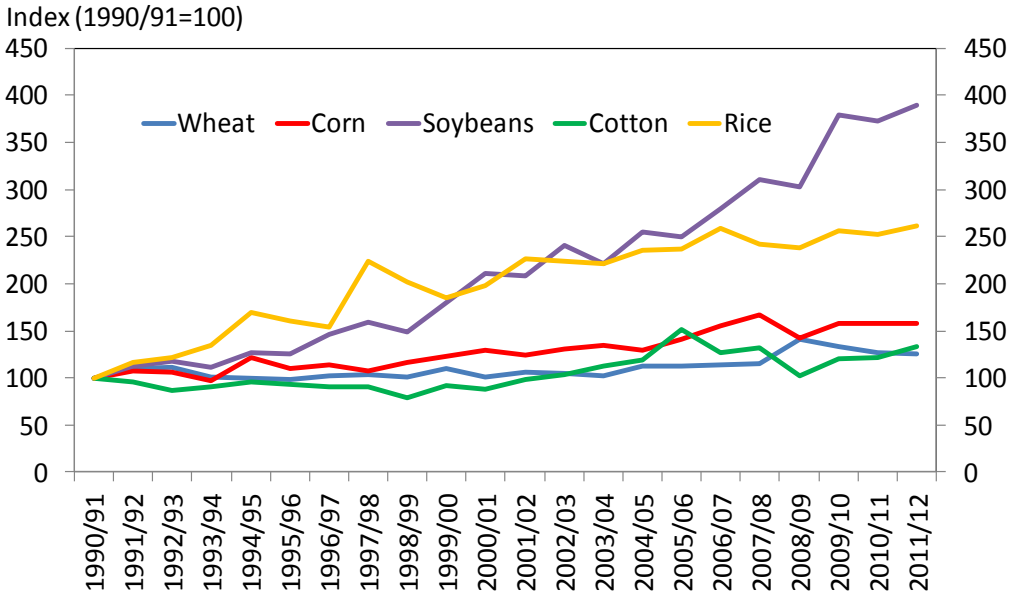
Table 4: U.S. Share of World Livestock Exports

Period	Beef	Pork	Broilers
1960-69	1.0%	3.3$	16.4%
1970-79	1.2%	4.3%	12.4%
1980-89	3.6%	2.4%	16.5%
1990-99	12.6%	10.1%	40.0%
2000-2010	11.8%	29.1%	37.7%
2011-2020[1]	18.1%	37.6%	36.6%

[1] USDA Long-Term Agricultural Projections, Feb. 2011

Chart 2 shows growth in world trade. Here I normalized trade in terms of comparing growth rates since 1990-91 levels. Growth rates for wheat, corn, and cotton have averaged between 1 to 2 percent per year.

Chart 2: World Crop Trade

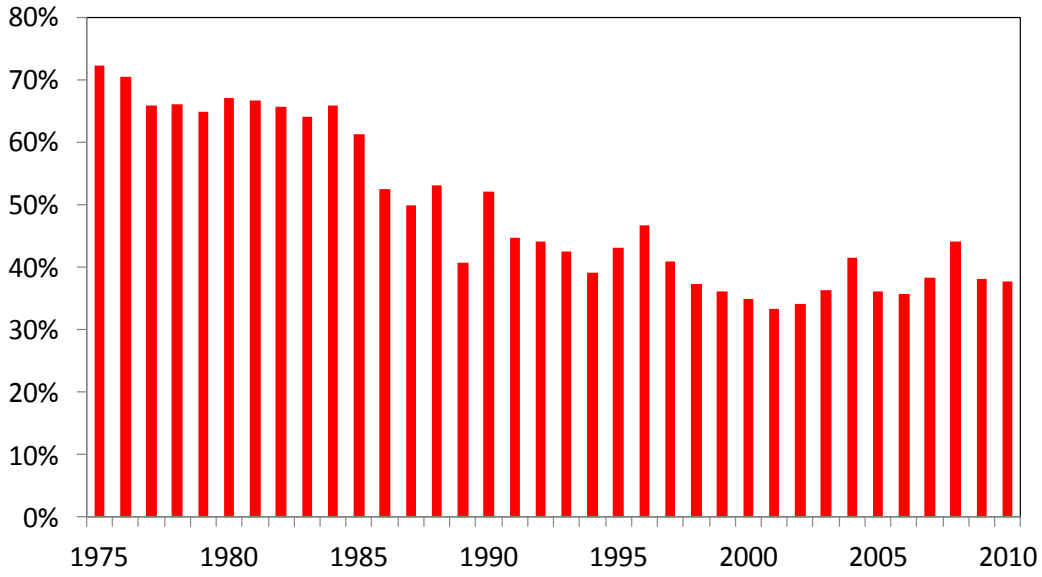


The real growth we've seen certainly has been in the soybean market. I'll show that again as we look at consumption a little later on. There has been a steady progression. If we break that out by country, you'll see how important countries like China are to world trade.

In general, the picture for U.S. agriculture, those record levels I was talking about, the composition of trade has changed a lot from the mid-1970s when we were exporting a lot of wheat and coarse feed grains and soybeans. That has now declined, whereas we've seen a shift toward growth in high-value products, such as fruits, vegetables, and meats, and to a lesser degree in some of the intermediate meat and soybean meal and soybean oil products.

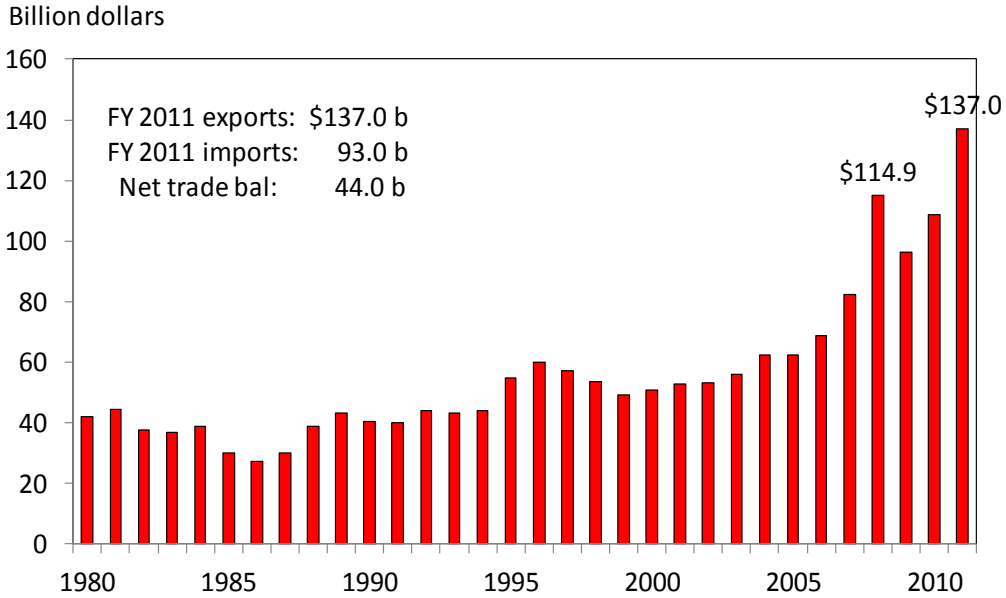
As you remember from Chart 1, trade has increased dramatically over the last five years and almost doubled over the last ten years with bulk exports holding at about 35-40 percent [Chart 3]. Even though the overall percent in terms of total exports has remained flat, obviously in value they too are doubling and not losing ground to the other commodities.

Chart 3: Bulk Exports as a Percent of Total U.S. Agricultural Trade



Let's look now at the current picture. USDA just put out revised numbers in May and are now forecasting for fiscal year 2011 total U.S. agricultural exports of $137 billion. Again, this is a record high, both in nominal terms and after adjusting for inflation.

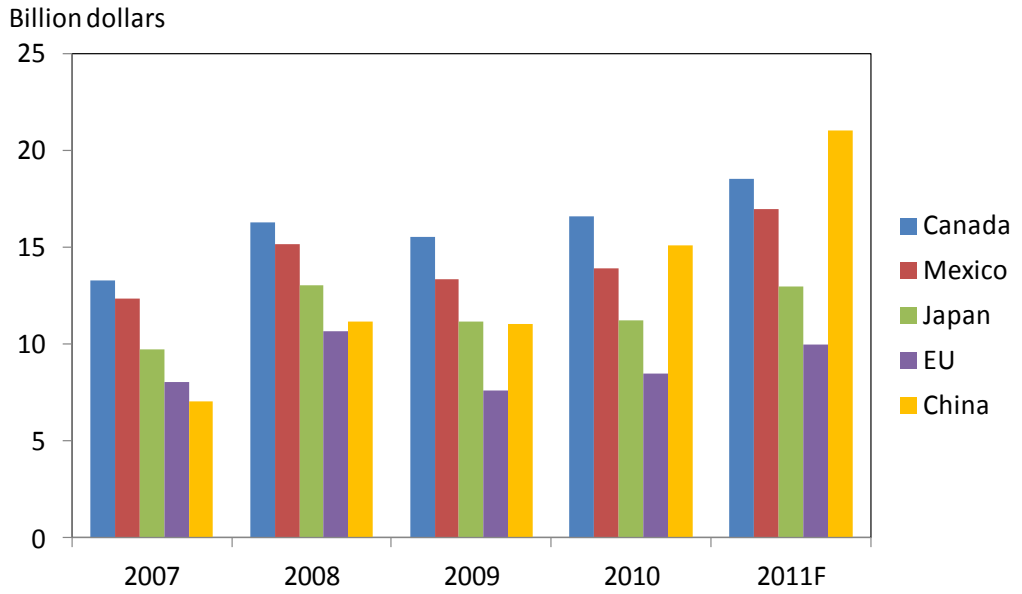
Chart 4: U.S. Agricultural Exports – Fiscal Year



Imports are projected at $93 billion, also a record. The U.S. imports a lot of counter-seasonal fruits and vegetables and a lot of tropical products not produced in very large quantities here in the U.S., such as bananas, sugar, and beverages like coffee. The U.S. net trade balance for agriculture is $44 billion, a nominal record and second largest net trade balance, adjusting for inflation. It is often heard this is one bright spot in the overall U.S. trade picture. Agriculture has been not only just increasing exports, but also increasing the net trade balance.

Not only have we seen much growth in agricultural exports, U.S. markets have changed over time. If we were to look at the top five destinations by value back in the 1960s and 1970s, our top markets would have been in the European Union and Japan. Those markets, while important today, have declined relative to our North American neighbors, Canada and Mexico, due to passage of the Canadian-U.S. Free Trade Agreement and then NAFTA. Canada and Mexico became our first and second-largest partner respectively over the past 15 years. You can see that in the relative position of our top five markets in Chart 5. The real story here has been the growth in exports to China which has gone from fifth largest market in FY 2007 to projected number one market in FY 2011.

Chart 5: U.S. Agricultural Exports by Top 5 Destinations



It is instructive to look at the composition of exports to these five countries [Table 5]. The bottom line shows the overall composition for total U.S. exports. As I mentioned, bulk exports – grains, cotton, soybeans – comprise about 41 percent. Next you move into the intermediate products – soybean oil, soybean meal. Then you move into the consumer-oriented products, like fruits and vegetables.

Table 5: Composition of U.S. Agricultural Exports: 2010

Country	Consumer-oriented	Intermediate	Bulk
China	6.6%	15.9%	77.4%
Canada	77.3%	17.4%	5.4%
Mexico	38.5%	24.1%	37.4%
Japan	42.9%	11.1%	46.0%
EU	46.0%	27.7%	26.3%
Total US	39.2%	20.0%	40.8%

You can see how the mix changes among countries. Canada is dominated by fruit and vegetable exports and processed products.

Look at China, which was dominated by bulk commodities – primarily soybeans and, to a lesser degree, cotton. Even with intermediate products, we have things like cattle hides, which are quite important products to China. But consumer-oriented products – fruits and vegetables – are less important. Obviously, there is a lot of potential. That is the good news.

The vulnerability is that exports to China are dominated by just a handful of products. The other markets show a bit more diversity if you look at the first 5 or 10 products. With China, the first 2 or 3 products account for about 80 percent of their trade, but of course they are very important and show very little sign of letting up. Certainly, soybeans have shown a bit of a lag in shipments lately, but I don't think anyone is thinking China will stop importing soybeans or that soybean exports will decline in the future. China has decided to get their protein requirements from the world market.

In the USDA monthly WASDE reports, most of the attention is given to the bulk product trade or perhaps a little bit to trade in intermediate products. Little attention is given in the monthly forecasts to the more consumer-oriented products or fruits and vegetables.

It is instructive to look at the role China plays in many important markets. Almost 60 percent of soybeans in the world go to China right now [Table 6]. Most long-term forecasts – and that would include USDA or Food and Agricultural Policy Research Institute (FAPRI) -- are maintaining that level if not increasing a bit. For soybean oil, I haven't listed India here, but between China and India, they import about one-third of world trade in soybean oil. They are very important emerging markets.

Table 6: China's Imports as Percent of Total World Trade

	2009/10	2010/11	2011/12
Soybeans	58.0%	57.9%	59.6%
Soybean oil	17.3%	17.3%	19.4%
Corn	1.4%	1.6%	2.2%
Cotton	30.1%	33.5%	39.8%

Source: WASDE, Jul 2011

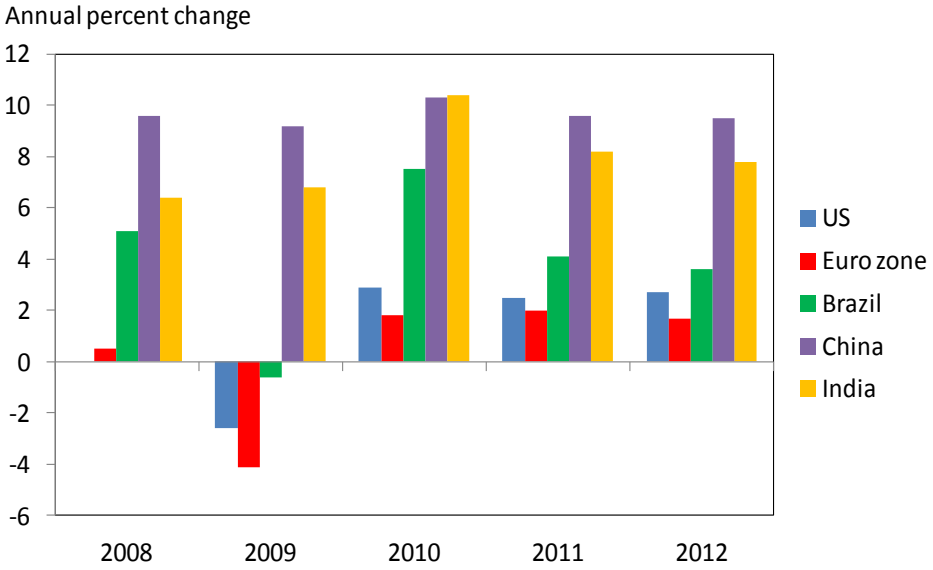
For cotton, 40 percent of the world's cotton goes to the textile trade in China, if you include some of the other Asian markets, you are talking about almost 80 percent of cotton going to those markets. That is up over the last 10 years when it was closer to 50 to 60 percent, which shows a dramatic change in that the world textile industry is centered in Asia right now. As a consequence, world raw cotton fiber is flowing there.

I put corn in here only because corn has received a lot of attention. Certainly, for many years, China has been a large exporter of corn at times. There has been a lot of recent speculation about when China would start moving to become a much larger importer of corn. China has seen a very rapid increase in industrial use of corn – much like what we've seen here in the U.S. – so there has been a lot of corn-based fuel production as well as increases in starch production and other nonfood and nonfeed uses of corn in China. With China's rapid industrialization of meat production, particularly

poultry and pork, we are seeing a much more rational feed use. We have seen the consequences of that rationalization in terms of increased soybean imports. Many analysts speculate that we will see similar future growth on the caloric front, implying more corn imports. The U.S. upped its most recent estimate of corn imports to China this past month. The Grains Council and others have been speculating these numbers will increase a lot more over the next few years. The USDA's baseline shows an increase. Again, given the activity we've seen over the last few weeks, China could become a very regular participant and importer of corn.

If you look at some of the growth factors that affect U.S. trade, you have to look at world output – that is, gross domestic product (GDP) growth [Chart 6]. It is important for low- and middle income countries as they obviously have a much higher propensity to consume with some small increases in income, as diets change and households move to more diversified diets, which include moving to more meat products which then have an effect in terms of meat consumption. Where that meat is produced can have an impact on grains and oilseeds.

Chart 6: World Gross Domestic Product



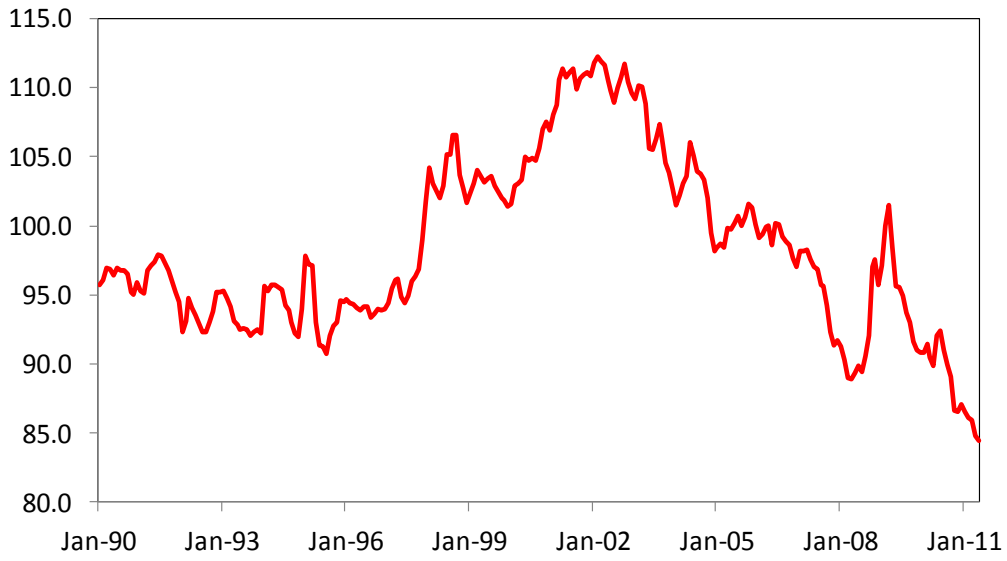
Source: IMF *World Economic Outlook Projections*

While most of the developed world was going through a serious recession in 2009, we still were seeing pretty large growth in China and India, less so in Brazil, but

their growth rates rebounded far better than the U.S. and the EU, but still not nearly as high as what we've projected in China and India.

Competitiveness of U.S. products is another factor affecting U.S. agricultural trade. One aspect of a weakened U.S. economy has shown up in the value of the dollar [Chart 7]. What this index represents is the value of the dollar versus the currencies of those countries that import U.S. agricultural products. USDA weights it by the imports by country. The dollar has fallen a lot over the past several years, particularly after the recession in 2009 where the low value of the dollar made the U.S. product very competitive. I could put up a similar chart that would compare the value of the dollar vis-à-vis U.S. competitors in agricultural markets. It would look much like this chart, I might add, which is not surprising. If you think of the EU, Australia, Canada, and Brazil, all of their currencies have had strong appreciation vis-à-vis the dollar. When countries are looking at importing a commodity, obviously the weaker dollar gives some advantage to the U.S.

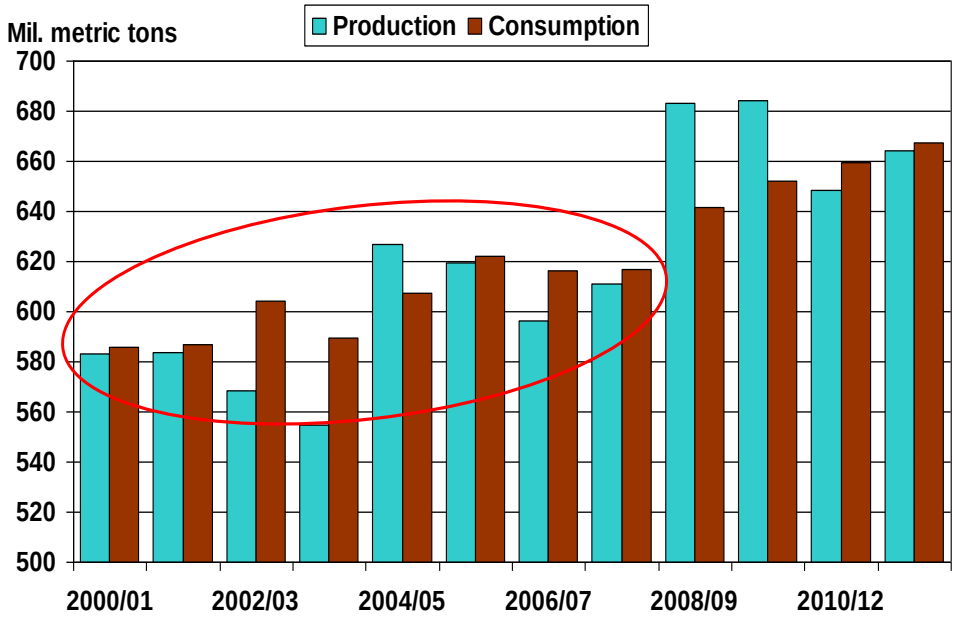
Chart 7: Trade-weighted Value of the U.S. Dollar



Briefly, let's go through some commodities. On the wheat front, going into the 2007-08 period, we had a lot of years where production fell short of consumption [Chart 8]. We saw stock levels go down to about 125 million tons on a global basis. That fall

we had very high prices. That was followed by two outstanding years – global records for 2008-09 and 2009-10 – where the world really responded to high prices, came back in hard, and rebuilt stock levels. Then in 2010, there were problems with the Black Sea crop in general and also a lot of quality problems – rains in Australia – quality problems coming out of Canada, and some drawdown in stocks. If you think back a year ago, events in the Black Sea area was one of the things that first started to boost prices generally for grains and oilseeds.

Chart 8: World Wheat Production and Consumption



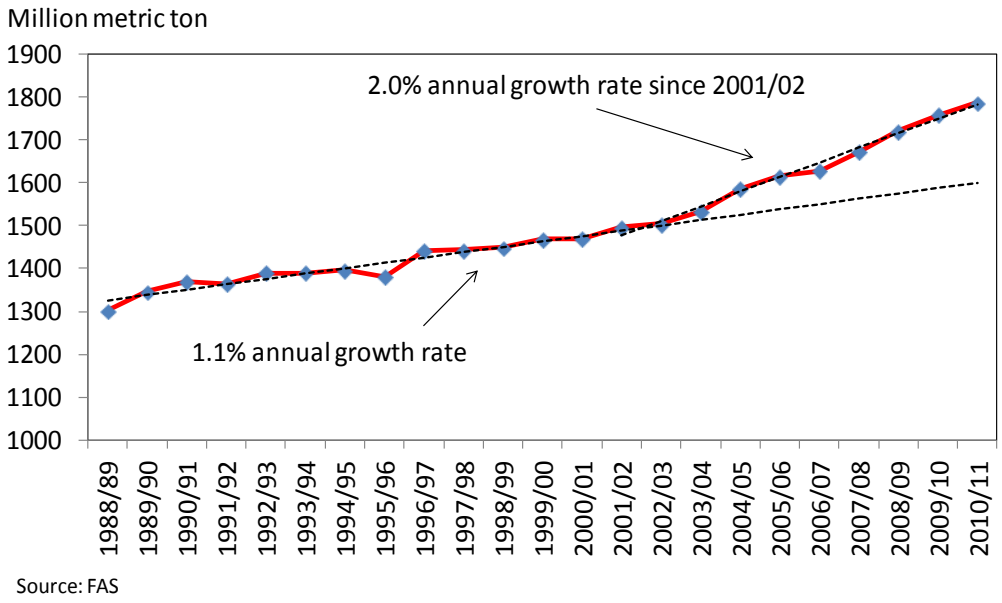
Source: USDA-WAOB, *World Agricultural Supply and Demand Estimates*, April 2011..

This year, we are looking at some rebound, but obviously we have a lot of problems in the southern Plains in the U.S. There was a problem with planting due to a wet spring, which has affected the Canadian crop. The European crop, too, has come back a bit but also had problems with drought this spring.

That said, USDA still projects a rebound in production from last year. Again, note the strength on the consumption side. That means taking down world stock levels just a bit more. Production is not nearly as tight as what we saw in 2007-08, but still tight.

Looking at world wheat and coarse grain demand, there you really have seen the change from a very low growth rate – remember that chart I showed you on world exports where wheat was one of those lines on the lower part of the graph with very little growth – so small growth [Chart 9]. That has changed a lot, because this is built in with coarse grain demand, you have a lot of that being driven by U.S. bio-fuel production. The increase there we have seen on the demand for corn at least. Also we have seen increases – as evidenced by the previous chart – in terms of wheat consumption. You can see those brown lines trending upward.

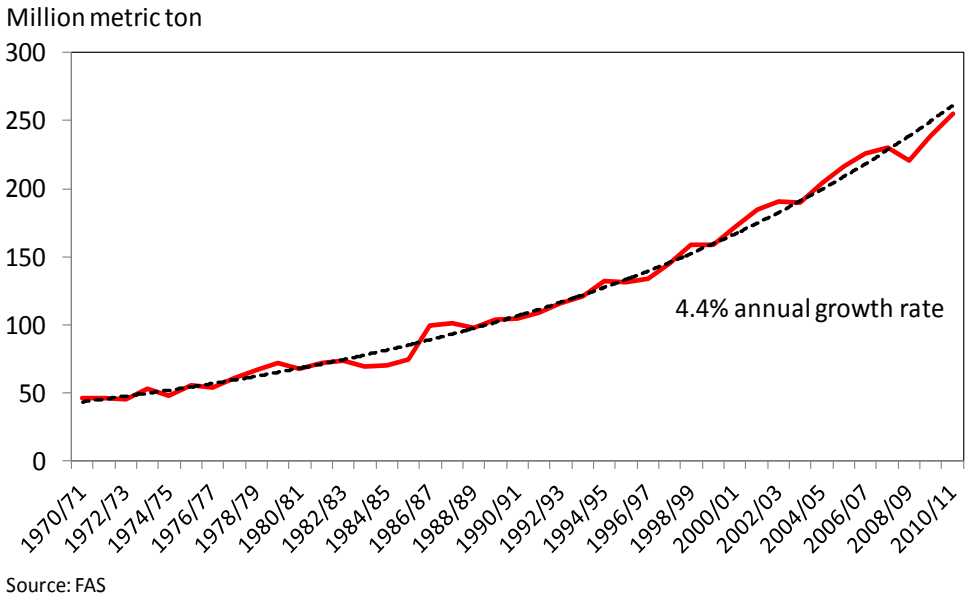
Chart 9: World Wheat and Coarse Grain Demand



Source: FAS

If you move over to soybean supply, there too, USDA projects a drawdown going into 2008-09. Remember the droughts, particularly in the southern hemisphere, where we had very poor crops out of Argentina and Brazil that brought world stock levels down. We've had very good crops generally since then. South American crops look good again this year. With a strong *real*, the increase in soybean prices has not been translated quite as fully to Brazil because of the currency appreciation over that time. Nonetheless, we have seen some strong production come out of that region. Certainly, the U.S. is still in a pretty tight situation for soybeans.

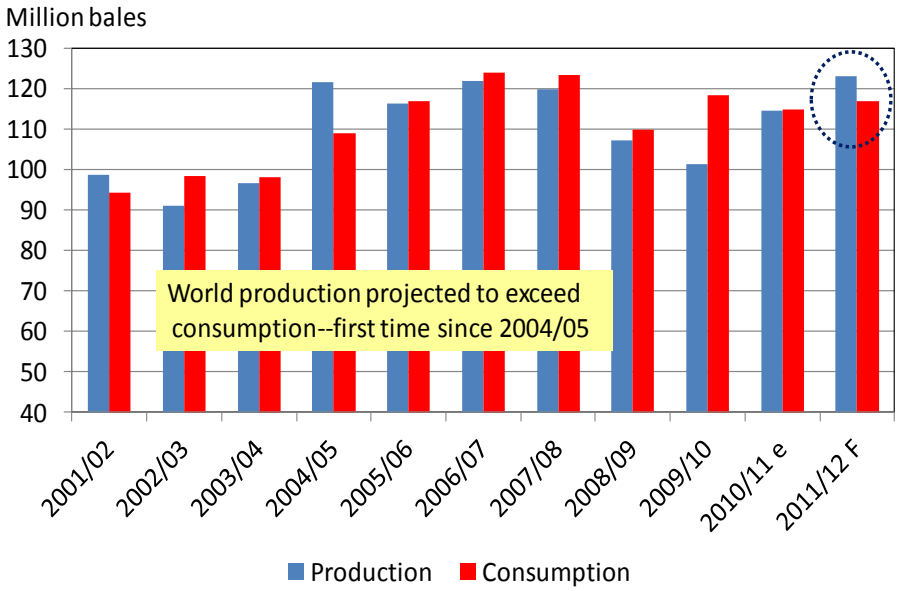
Chart 10: World Soybean Demand



Soybean demand has been remarkable, though [Chart 10]. This is a trend that goes all the way back to 1970. Soybean demand has been growing at an incredible rate of about 4.4 percent per year since 1970. It doesn't really show many signs of letting up.

Cotton, of course, had record prices over the last year or so and prices are still very strong, despite the recent collapse. We're trading more down in the dollar range for cotton, far below the peaks we saw in the spring but high relative to historical levels. There has been a big world production response to the high prices which has contributed to the more recent fall in prices. The only worldwide problem with cotton is what is happening in Texas, due to the unprecedented drought decimating the crop there. It also looks like we are going to see record abandonment of area in the cotton regions of west Texas and other parts in Texas. So that has taken a little bit off world production potential. All the same, we should see a good response globally.

Chart 11: Global Cotton Production



With the remaining time I have, I want to point out some issues facing U.S. agricultural trade. We are focusing a lot on income. I have talked a lot about currencies, which are important. Certainly, as we've seen the growth of producers like Brazil and others that are competing with the U.S. over a variety of commodities for these lucrative markets, what does come up a lot are barriers to trade.

The easy ones are tariffs. Yet, for agricultural products, with the exception of some key markets, tariffs have come down a lot. Certainly, they are low in the U.S. Even in a lot of developing countries where the bound rates are high, the applied rates have been lowered, because the markets are so tight that countries see benefits of bringing in products. So their applied rates – at least what they are charging on the books – are quite low.

Out there are still critical markets that have been very difficult to get into. Most challenging has been the non-tariff barrier side, particularly the sanitary and phyto-sanitary issues, as well as other barriers. Where we've seen barriers has been on GMO [Genetically Modified Organism] products. Less so recently, but always potential problems, are subsidies, both production subsidies that distort market signals for producers but also export subsidies and more explicit forms of subsidies that affect trade.

Trade agreements can boost trade by lowering these barriers. We currently have a pending free-trade agreement with Korea that based on estimates done by USDA's Economic Research Service would bring benefits on the order of $1.9 billion a year in increased trade. Likewise free-trade agreements with Colombia and Panama, while having smaller impacts on trade than Korea, would still have a significant impact on products such as livestock and dairy products.

The broader round of negotiations in Doha, which include all 155 or so WTO [World Trade Organization] members, is a far more encompassing agreement in that it would affect not only tariffs but domestic support disciplines and also export competition disciplines. Most of the deadlock on Doha right now is surprisingly enough not due to the agricultural negotiations but the nonagricultural issues.

Trade disputes can have very large ramifications. The U.S. has had a long-standing dispute on cotton with Brazil. We are currently embroiled in country-of-origin labeling dispute with Canada and Mexico. Actions other countries have taken against us include China, who has imposed restrictions on poultry imports from the U.S. and issues with Mexico over trucking, which hopefully now is settled.

These bilateral and multilateral issues are not easy things to solve. Just take Doha, for example, where we're some 10-odd years in there and still a long way from completing it, but it can have very large impacts on trade.

I would conclude by stressing how the engine for world growth in consumption and trade continues to be in the developing world. That's where we see the large income gains. That's where we are seeing shifts in household food consumption. I think the recovering U.S. economy will likely mean foreign currencies will continue to be strong relative to the dollar. That should help and enhance U.S. competitiveness. That said, the U.S. can expect to face continued competition from exporting developing countries. Countries like Brazil, Argentina, and even India are big players in markets for things like cotton and wheat and have been strong competitors. Eastern Europe and the Black Sea region are areas that 10 years ago weren't very big factors on world markets but now are. For the U.S., it is not surprising that we may see declining world shares. However, with growing world markets, we will still see growth in those markets for the U.S. and trade

will remain a very, very important part of each individual balance sheet as we move forward.

If you look at these overall trade agreements, it is important for the U.S. to be an active player. Other countries certainly are pursuing that path. You can't afford to stand still or you risk being isolated, as other countries pursue more trade liberalization agendas.

With that, I conclude.

Industry Panelist

Transcript

Mike Baroni

Archer Daniels Midland Company (ADM)

Thank you, Dr. Glauber, for your very informative overview. It's really a pleasure to be here this afternoon. We're here talking about some of the most important issues facing U.S. and global agriculture.

While most of you here in the room are somewhat familiar with ADM, I should tell you that our perspective on all of the various topics we will talk about today is really shaped by what our position is on this global agricultural value chain.

We don't grow crops at ADM, with some very rare exceptions – maybe a little sugar in Brazil and we've experimented with some Stevia in Paraguay. But, for the most part, we don't grow crops. What we primarily do is source crops. We source corn, oilseeds, wheat, and cocoa from all over the world. Then we either sell or trade those crops where and as needed. Or we will transport them to our processing plants, using a huge network of trucks, railcars, barges, and ships. In those processing plants then, we will transform them into a very broad range of different products from food ingredients to various animal feeds, fuels, biofuels, and other industrial products, which we then distribute to large commercial companies around the world.

Our corporate overall growth strategy and all our investment decisions today are driven largely by these same fundamental forces that are shaping the future of our planet, and its people that Dr. Glauber talked about – namely, population growth, income growth around the world, urbanization (a key trend), and the resulting need from all of that for a lot more food and a lot more energy.

While we tend to think these forces are inexorable and inevitable, we also know, of course, and we recognize there are any number of conditions or developments that could impact these projections one way or the other. Things like major economic shocks, some type of global health crisis, maybe the population trends not quite going the way we thought, or unforeseen changes in diets very specifically related to meat consumption,

could very easy affect these trends in a big way. If the unusual weather events, economic gyrations, and political upheavals of the last few years are any indication, it has taught us that none of us can really anticipate every possible turn of events that will occur.

So, from our perspective, what's ultimately the most important isn't really so much whether or not these demand estimates vary from what we're projecting, but how the global food industry and the entities that govern it respond to these changes in both supply and demand one way or another.

Many of the companies in our sector are accustomed to managing through volatility. In fact, we consider risk management and market forecasting two of ADM's core competencies. We view our vast network of origination, storage, trading, transportation, and processing as a global shock absorber. A supply and demand shock absorber that is helping to smooth out these supply and demand bumps by moving raw materials and finished products from surplus regions to deficit regions, as needed.

Many food companies, including us, are investing billions of dollars to expand their base of assets to develop new products, access new markets, create new markets and operating efficiencies, and otherwise ensure that we're prepared to serve a vast and growing number of new consumers and to deal with these market imbalances as they occur. Now that's our role. We can do these things. And we can do them extremely well, particularly when we work in partnership with growers, governments, NGOs [non-government organizations], and other key stakeholders such as yourselves throughout the whole agricultural chain.

Together, we are confident and know we can create an environment conducive to agriculture's ongoing growth and developments by focusing on three areas in particular. First, we believe it is critically important to have clear pricing signals to guide investment, to guide growth, and to help market participants manage risk. To help ensure such signals are clearly transmitted, governments and regulators can be thoughtful in their responses to recent price volatility and mindful that any abrupt actions can sometimes exacerbate already challenging market conditions. It is important to remember that the utility of markets in translating pricing information and managing risk should always be the priority.

In recent months, there has been a lot of talk about the possibility of developing an international database, what they are calling the Agricultural Market Information System, or AMIS, at the FAO [Food and Agriculture Organization]. This system will help gather and disseminate national-level information on supply stocks and usage data. We think this idea has merit. It is the kind of practical technology that may well facilitate better decision-making from governments all the way down to growers.

Next, we at ADM believe it is important that public policy serve to facilitate the flow of food from where it is grown to where it is needed. We have seen in the past several months that export bans, import tariffs, and other types of trade restrictions can and have sharply limited the availability of grain and oilseed supplies to those who need them the most. And we think they have contributed sharply to recent price volatility as well. That is why we are actively working with fellow industry participants in the World Economic Forum's G-20 Working Group on Food Security to help talk to governments and try to convince them these types of barriers to international commerce should be discouraged or even prohibited.

Finally, we need better infrastructure in developed and developing markets to help link growers to world markets. We need more roads, better roads, railroads, waterways, bridges, ports, and on and on. And we need to prevent the waste of millions of tons of grains and oilseeds that are lost every year to after harvest. We need to build storage capacity to absorb overages and handle shortages.

Clearly, it is important that agricultural infrastructure investments promote an enhanced productivity. But, at the same time, we have to work to make more of the crops that we already grow. That's why we at ADM, in addition to the billions of dollars in investments we are making as a company to expand our global network of storage, transportation, and processing assets, recently founded the ADM Institute for the Prevention of Post-Harvest Loss at the University of Illinois. This research center is focused on finding ways to help farmers in the developing world protect the crops they already grow today with a view to maximizing the value of the total world harvest. It's probably a bigger problem than many people realize.

In 2007, the last year data were available, it was estimated that as much as 30 million tons of corn, 20 million tons of wheat, and 3 million tons of soybeans were lost

after harvest to things like bad storage, weather contamination, but also to lack of access to markets for farmers to sell their surplus.

In conclusion, based on both the enormous increases in agricultural productivity the world has already experienced in recent decades and on the innovations, investments, and partnerships already forming throughout the agricultural value chain, we at ADM believe the world has the ingenuity and the determination to meet this growing demand. We look forward to continuing to collaborate with many of you in this room, including innovative companies such as that represented by David, our next speaker, to achieve these common goals.

So thank you and I look forward to the discussion in a few minutes.

Industry Panelist

Transcript

David Fischhoff

Monsanto

Thank you very much. It's a great pleasure to be here today to speak to this group. I'd like to build on some of themes we've heard already in the first two talks, starting out with our view at Monsanto. I'm sure, and as you've heard already, we're not unique in this view on the demand side. It's abundantly clear from what we've heard already and what we all know that demand for grains, in particular for food and feed as well as fuel, are going to increase dramatically in the coming years.

From our analysis, this is especially the case for corn and soybeans. The trends there, especially in terms of the shift in diet toward increasing amounts of animal protein in developing countries, really highlight this increased demand for corn and soy, which isn't to say there won't be increasing demand for other crops such as wheat and rice. But we would expect that demand to grow more slowly – albeit needing some of the same types of innovation and technological improvements that I'll talk about in a few minutes, specifically with reference to corn and soy.

At the same time as we see populations increase and diets shift leading to this increased demand, agriculture – whether it is in the United States or in many other parts of the world – is under increasing pressures in terms of production to meet that demand. The amount of arable land that could be put into production is quite small. We can even expect decreases in arable land in many parts of the world, as we see increased urbanization and other trends.

At the same time, there are increased pressures on water. Agriculture accounts for about 70 percent of the fresh water withdrawals already. Again, with increasing population and increasing urbanization, water use is going to become even more critical as we go forward.

Then there are additional pressures on agriculture – for example, from global climate change, although there may be some near-term benefits from global warming in

some regions of the world – for example, in the northern part of the Northern Hemisphere as well as perhaps the southern part of Latin America. At the same time, long term, the trends as illustrated in the various IPCC [Intergovernmental Panel on Climate Change] studies would indicate that instead we will see more extreme weather patterns, more extreme droughts, for example, in parts of the world that are already quite dry, including the southwestern part of the U.S.. Although we can't make precise predictions on local weather patterns with any great degree of confidence today, overall the trends are pretty clear, and they are not especially promising.

The question for all of us – not just us at Monsanto working on the technology side of agriculture, but all of us involved in food production and the agricultural food chain – is, "What can we do in the face of this increased demand for increased production?"

The good news from our perspective, and I hope for all of you, is that we see great promise in technologies as applied to agriculture to help meet this demand. I'll illustrate this specifically with reference to corn and soybeans, especially in the U.S., but I want to touch also on other crops in other parts of the world and some of the conditions that will be necessary for all of this to come to pass.

At Monsanto, as we have looked at this quandary over the past several years, we've concluded that a realistic goal, not necessarily a slam-dunk by any means, but a realistic goal, is to aim to double production in terms of total yield or average yield per acre in the major row crops – such as corn and soybeans – by the year 2030 compared with the year 2000, which we picked simply because we had good data available going back to 2000 for many crops in many parts of the world. We're already about 10 years or so into that 30-year horizon that we identified.

If you think about it, what that would mean for U.S. corn, as an example, is going from somewhere on the order of 150 bushels an acre up to close to 300 bushels an acre, as average U.S. corn yields over that 30-year timeframe. To put that into perspective, if you turn the clock back to 1970 or 1975, U.S. corn productivity on a bushel-per-acre basis actually doubled in that timeframe from 75 to about 150 bushels an acre. Although it is a dramatic change to increase by another 150 or so bushels an acre, on average, by the time we get to 2030 it is certainly within the historical norms we've seen in the past.

In many other parts of the world, as we heard in the first talk, there is really significantly more headroom than in the U.S., because corn yields, for example, in many sophisticated agricultural systems like in Brazil don't yet approach the U.S. averages currently. With changes in practices there, we can see those increases occur even more rapidly.

So then the question is, "How might we achieve this kind of increased productivity on a per-acre basis?" The way we've looked at the problem, we see the solution being built on what we would think of as three pillars. One is increases due to plant breeding. The second is changes and enhancements based on agronomic practices of a whole host of types. And the third is new biotechnology traits.

Let me spend a couple of minutes describing how we see this playing out, again thinking about U.S. corn and soybeans as the primary example. First, we'll start with plant breeding. Plant breeding, although it has been around for a long time – since the dawn of agriculture – has undergone a very significant technological revolution in the last decade or two, something akin to what we've seen in biotechnology but perhaps not nearly as well-publicized. The main driver for this is a combination of technologies, the primary one being the use of DNA markers to really understand the genetics of crops – DNA markers of the same type you see on television shows like CSI or used in paternity tests and things like that. The way they are used in breeding for agriculture is we can much more precisely now understand the genetic makeup of the germ plasma that our breeders are using and do much more in the nature of predictive crosses of plants, identifying which parents really will lead to better performing progeny.

In our hands already at Monsanto, we have seen about a doubling of the rate of yield gains. You think of plant breeders historically as having increased average yields year after year after year, simply by tapping into genetic diversity and identifying better combinations. With the use of DNA markers, we can actually double that rate of gain. We're well on our way toward achieving these sorts of goals in plant breeding. That is accompanied by a whole variety of technologies, such as increased automation to allow the breeding operation to be much more efficient.

With the use of multiseason nurseries, for example, at Monsanto, our corn plants are grown three generations a year – sometimes even four – by taking advantage of the

Southern Hemisphere and especially utilization of land in Hawaii, where we can plant corn year round. We can make much more rapid gains on a yearly basis than simply a single cycle, as breeding was historically carried out on an annual basis. So, plant breeding is a key piece of this.

Going along with that are improved agronomic practices. These go hand in hand. One of the key changes in agronomic practices we've seen historically over the last 10 years or so, which has crept up on us, is increasing plant density, at least for corn. Plant densities are much higher than they have been historically and that has led to an increased yield per acre. You can't simply jam more plants into a given acre, unless the plants are adapted for that. And that is why breeding plus agronomic practices go hand in hand.

In addition to this, though, there is a whole variety of technologies, including more adoption of aspects of precision agriculture that we see moving ahead and allowing increased rates of gain through agronomic practices, as well.

Finally, there is biotechnology. Monsanto is maybe best known for biotechnology, but it is really only one piece of this pie. Each of these aspects I've talked about – breeding, agronomic practices, and biotechnology – are approximately equal contributors in our models for how we might double grain yields by 2030.

In terms of biotechnology, although it has been extremely well-adopted in some crops in some parts of the world – for example, U.S. corn and soybeans – it is important to reflect on the fact that it has only been around in a commercial sense for about 15 years or so. Really, when you look at it, we have only yet through biotechnology delivered two types of traits – primarily herbicide tolerance, largely glysophate tolerance, and insect resistance to yet just a handful of insects and in just a couple of crops, mainly corn and cotton.

As we look forward with biotechnology, we are beginning now – and this is just the beginning of this era – to see the possibility both for enhancing the types of traits we've already worked on, such as insect resistance, herbicide tolerance, some aspects of plant disease resistance, but also moving into new types of traits – the kinds of things we refer to as yield and stress traits. Examples of those would be single genes that can directly boost the yield potential of a crop. We have examples of this in our pipeline at Monsanto and many other companies do, as well, in both corn and soybeans where single

genes can give about a 5 percent increase in yield directly. Stress tolerance traits of the type that have traditionally been dealt with by plant breeding we now see at least the beginnings of those through biotechnology for traits such as drought tolerance.

If you add all of these together the way we have looked at it, we believe it is a realistic view to aim for doubling crop yields in places, in crops, and parts of the world where we can adopt all of these technologies. This won't come about just by Monsanto doing research in our own labs; it will take efforts across the whole agriculture value chain. For example, changes in agronomic practices go hand in hand with changes in equipment, as we go to increased plant densities – narrow rows for example or more precise application of fertilizers – all of which depends on other participants not just the breeding and biotech companies like Monsanto.

In order to make this possible, let me touch on a few final comments. What's really required – and this isn't just for Monsanto but for the whole agriculture value chain – in order to make this yield doubling a reality, we need more technology applied to agriculture and that depends not only on private-sector investment, but also really robust public-sector investment. Certainly, in the current atmosphere for public-sector funding of science and technology, especially agricultural sciences, the promise there is not as great as it might once have been. We can only hope for a return to increased funding for agricultural research on the public side.

The second thing we need, especially for the types of innovations I've touched on, is strong intellectual property positions, not just in the U.S. where we have good intellectual property laws, but to allow the dissemination of these technologies around the world really depends on intellectual property protection worldwide.

The third component, which relates especially to biotechnology, is a strong, robust, and science-based regulatory system. In the U.S., we have been lucky to have strong science-based regulations. In other parts of the world, we see regulatory bodies being more able to evaluate and then approve new biotechnology traits. We've seen a real sea change on that front in Brazil in recent years, which has one of the best track records now for evaluating, assessing, and finally approving biotech traits. Yet that is a challenge in many parts of the world.

Finally, what we need is a strong effort worldwide, not just by private-sector scientists, but by public-sector scientists to collaborate across the public-private divide. This is going to be especially true in crops that go beyond the main commodity crops here in the U.S. For the same types of efforts to be applied to – for example, rice in Asia – will depend strongly on public-private partnerships.

With that I'll end and look forward to the discussion. Thank you.

General Discussion

Transcript

Moderator: Jason Henderson
Vice President and Omaha Branch Executive
Federal Reserve Bank of Kansas City

Mr. Jason Henderson: My rule of thumb is that farmers always produce themselves out of prosperity. While we are in the middle of a commodity price boom, how long is this going to last and who is going to be producing themselves out of prosperity? Is it going to be U.S. producers? Or is it going to be a global supply response?

Mr. Joseph Glauber: I would say a global supply response. If you look at the big boost over the last five years, there is no question things like biofuel production had a very big impact on markets, just in the sense of the big boost in prices. In the U.S., under the Renewable Fuel Standard, corn-based ethanol is limited. It is limited both by the mandates themselves, but also limited currently by the blend wall. I'm not saying if that were solved in some way, given energy prices, you'd see a lot more corn going into ethanol. Given it is currently a constraint, you look and see productivity growth – that even with conservative assumptions on the 1 percent for corn, two bushels a year or whatever – over time you build stocks.

One of the problems over the last couple years is that not only have the markets been tight, but when you have a supply shortfall at that point, then you see prices spike. Over time, you will see a rebuilding. There are a lot of other things in play here. Over the long run, we still have a very big issue, if you look over 20, 30, or 40 years, if indeed we have to increase production by 70 percent or doubling production somewhere in that range. That's a challenge. There are certainly areas of the world where there are big gaps between potential and actual yields currently. There we could see some big improvements. The challenge will be to increase production, as Senator Roberts mentioned at the start of the program here. It is a challenge for the U.S. and other producers over the longer run.

Audience Question: In the 1970s, we added 60 million acres, or a 20 percent increase in supply, when we had the quantitative easing process that might be similar to today. We don't see those acres coming on. We can't respond in the U.S. like we did in the 1970s. So where are those acres going to come from? What are you seeing as far as the numbers?

Something that comes to my mind is that we see high prices in the U.S. but, for example, the Brazilian *real* or other currencies being strong, they don't see the same high price. Are we seeing the response in acres in those countries like we would expect? Or have we yet to get to a price to really stimulate 20 percent increase in supply?

Mr. Glauber: Let me address your last point first. You are right about the currency issue and I mentioned that briefly. If you are looking at the *real* and looking at soybean prices in those terms, the increases haven't been quite as sharp as we've seen in dollar terms. That explains a little bit why we didn't see the area response in Brazil. Now, we are seeing some response and we are seeing some higher production numbers come out of there. Clearly, the big difference between now and the mid-1970s is the fact that we have 32 million acres in the CRP [Conservation Reserve Program]. To bring that out, you'd have to look in the mix. It's a lot of wheat area and a lot of marginal wheat area to boot. You have to look at how much land is there where corn can be grown. The good news is. we are growing corn a lot more places than we weren't growing it in 1970, so it can expand that way.

As policymakers are looking forward and Congress and others are considering this, you are going to have these tradeoffs between environmental benefits and what you want out of the Conservation Reserve Program, for example, tradeoffs with that and meeting food production needs.

Mr. Kenneth McCauley, Past President, National Corn Growers Association: Dr. Glauber, I appreciate all of your insight into this. I have to agree with Jason. Looking at this from my point of view as a farmer, farmers tend to produce themselves out. Looking at the carryover, I'm not naïve enough to think we won't eventually build carryovers. But it looks like it is going to take quite awhile to do this, keeping farm profitability pretty high. How do you see the carryover building – over a shorter period or a longer period?

Mr. Glauber: Looking at the corn market, I have been saying for some time I thought it would take two or three years to build inventory. It's just hard to build it overnight, particularly given the area we see out there right now. The stock situation frankly has changed that a bit. We have 200 million more bushels than we might have thought before. Again, to think you are going to be back to a 2 billion bushel carryout, or 1.7 or 1.8 billion bushel carryout in corn, which we were carrying just a couple years ago, that takes a lot. It's going to take one or two years more to return to those levels, short of a huge record crop or big changes.

Look at this year, there are all of these high prices. Of course, all commodity prices are high, so you are competing with cotton. Unlike 2007-08 where it was essentially a corn-soybean tradeoff for the most part, here you have high wheat prices and you have high cotton prices, so it's tough.

What I was saying is over time you will see those yields build. As long as demand isn't keeping pace with that, you'll build stocks. It's hard to bet against 60 years of declining prices in real terms, if you are looking five or ten years out.

Mr. James Andrew, Andrew Farms, Inc.: I'm an Iowa farmer. Dr. Glauber, I don't think it's probably within your direct purview, but one of the biggest craws in my neck is the inaccuracy of the Crop Reporting Statistical Service. There is more cheap grain purchased and then the USDA or the government corrects that in the dead of winter after everybody without storage has sold their crop at a cheap price. I don't think that is right. In this era of satellite technology, computer technology, and hopefully a little sharper people, I think we could do a better job. Can you give me some idea that is being corrected?

Mr. Glauber: You obviously raise a good point. All you would have to do is look at the last two years of running reports. On stock reports with acreage for prospective plantings, we have had limit moves on almost every one of those days.

First of all, I'd also point out that when you are running stock levels as low as we've been running over that period, almost any information hitting the market and anything that surprises market analysts – and there are error rates on these surveys, the last thing I want to do is get into an apologist mode of saying, "Oh well, last year was particularly hard because it was this or that."

NASS [National Agricultural Statistical Service] has a tough job and all of us would like to go into a lockup and come out with a number that was saying, "That's exactly what we expected!"

You are absolutely right. What one does need to do, if there are big changes like that, is figure out why there are those changes. Are they legitimate changes or are they errors in measurement? There we spend a lot of time and absolutely that's an important thing to do. All of this stuff is built on these data. I tell people that I get the NASS numbers just like everyone else does and we incorporate them into the balance sheets, because they are the best numbers one way or the other.

They would be the first ones to tell you too that it is important to look at the methods and constantly review those things. Good point, though.

Mr. Andrew: Dr. Fischhoff, I have been privy to your presentations in the past and am always impressed with this doubling of yields. But I don't know that we've done enough as a clarion call to the rest of the country to get ready. I don't think we have the infrastructure to handle the output, the grain storage capacity to handle it, the trucks on the farm, and the combines to harvest it without dumping every 10 feet. There are a whole bunch of questions that come to my mind. I wish somebody would sponsor either a conference or a study as to all the ramifications of this, because 19 years is coming awfully fast.

Mr. Fischhoff: Well thank you. I think that's an excellent point and it would be great to have such a conference to engage all of the constituents and stakeholders in agriculture. That's a great idea.

Mr. Stephen Gabriel, Farm Credit Administration: I'd like to address this to Dr. Glauber. In your presentation, you pointed out quite clearly the importance of China as a source of demand for farm commodities and, of course, other commodities as well. Yet, we could list a litany of concerns that currently exist with respect to China's fragile banking system -- the potential for a hard landing as they rein in inflation, lack of transparency in the government, potential for social unrest, and these kinds of things. My question to you is, how much do you worry about China in terms of its future as a source of demand for farm commodities?

Mr. Glauber: That is a good question. It is a question that has been asked a lot, particularly as China has grown in prominence. It caught a lot of people off guard last year, as we began to forecast them as our biggest trading partner. As in the chart I showed, you see it has a very different trade profile frankly from other countries. Not surprisingly, they have grown very quickly. It is dominated by soybeans and, to a lesser degree, cotton.

Your question, then, should we be worried about that? I don't think this is the case of what we saw with, say, the former Soviet Union or China in the 1970s, where they were in one year and out the next. This has been a steady growth. So the bigger issue is, what would happen in the event of a collapse of the Chinese economy? Frankly, there the problems are far bigger than soybean exports at that point. Right now, China is a huge engine of growth for the world. If China has problems, there are problems. So, yes, it does, but probably for even broader reasons than agriculture.

There is no question at least right now it is still a very different trade picture. Over time, hopefully, there is a lot of indication that with increasing consumption they may be importing a lot more meat, in which case we may be beneficiaries of that for pork, beef, and poultry. That could start shifting that picture a bit. At this point, it is still developing very rapidly. Your point is well-taken in terms of how dominant that is. I would say it is a fairly diversified picture otherwise. We have a lot of trading partners, but if the Chinese economy were to collapse it would have far bigger implications around the world for trade in general and other things.

Mr. Henderson: When I go out in terms of speaking to different groups, one question I always get is, is this the new normal? In other words, for agriculture, is $6 a bushel corn the new plateau?

Mr. Glauber: One part of that the thought has to be that input costs have risen, driven a lot by petroleum costs. If petroleum prices stay at the levels they are, yes, ag commodities will settle at a similar plateau. They have to.

Mr. Fischhoff: I would second that. You took the words right out of my mouth. I was going to say, is $100 a barrel oil the new normal? That is a very important component here. Do we expect, for example, export values to decline? Yes, I would say they will probably decline. These are very, very record-high prices. Sometimes you

break records year after year but, certainly if we are looking at our own outlook, we expect those to fall somewhat, but still remain quite high. That is true with grain prices and oilseed prices. They may correct a bit, but they are still going to be far higher than they were ten years ago.

Mr. Bill Lapp, Advanced Economics Solutions-Omaha: Dr. Glauber, I have a question about the risk management agency, prospective plantings, and acreage reports … but I won't ask it today. [laughter]

Actually I wanted to ask you about 4.4 percent growth. I come up with similar calculations going forward for soybean demand. How are we going to meet that with yields not keeping up, where will the acreage come from, and what is your expectation for meeting that?

Then, Dr. Fischhoff, a large share of the growth, according to the data, has it come because we've put more plants into the same area – something like six per square yard now, given our population data? What is your expectation going forward? What share of the growth to get that doubling of yields is going to come from more dense population and what growth is going to come for larger kernels or something else?

Thank you.

Mr. Fischhoff: I think we would expect to continue to see increased density in corn, not as dramatic perhaps as what we've seen in the last decade or so. Physiologically, there are some limitations and we will probably be bumping up against some of those. Average densities in the mid-40,000s per acre are probably realistic. We already have seen some data that indicate for many hybrids – both our own and from other companies – densities on average are probably a little lower than they ought to be.

As we get to a better definition of the combination of genetics with soil type, as well as other agronomic practices, it's possible we will also see a shift to a more variable type of agriculture within a given field or certainly across fields where we will have hybrids that are better suited to high densities and some that are better suited to low densities. We will have the equipment available that allow us to do that kind of planting on the fly.

I don't think we've really sorted out the details in terms of these broad buckets between breeding agronomic practices and biotech. Certainly in the latter part of the next

decade when we get out into the mid-2020s and beyond, we expect a greater contribution to that yield doubling to come from new biotechnology traits – things that are either just emerging from our pipelines now or even in some cases yet to be really discovered.

In the near term, the combination of breeding and agronomic practices going hand-in-hand will be the primary contributor through 2020 or so. Separating the two out would show about equal contributions from those two.

Mr. Glauber: Let me just say, Bill, I would agree we faced this over the last two or three years, looking at where we can see land come in and how much additional land. Certainly if you compared 1996 plantings with 2007-08 plantings, there was a lot more out there planted. If you go into the details and drill down, all that additional area is really claims. What hits me are more wheat land and probably land that might be now fallow or used less intensively. You don't see a lot of idled acres in the prime Cornbelt. That's for sure.

For soybeans, the real issue there is how much double-cropped area you can get in. We've seen some pretty strong double-cropping over the last few years, but last year also saw one of the lowest levels on record. We've only been carrying double-cropped areas since 1978 or so. Outside of that, there is just not a lot of capacity, with the exception of the CRP. And CRP does contain a lot of wheat land and a lot of land in the Cornbelt as well, with a lot tied up in riparian areas and wetland restoration. Bringing it out again is a careful balance, looking at availability, food needs, and also environmental benefits – making sure what you are running is a pretty lean reserve with high environmental benefits. That makes sense. Land that is productive and has lower environmental benefits should probably be back in production. What we found in running this over time, it is not the easiest thing. It is not something you can turn a switch and say, "Okay, the land is eligible to come back in."

What comes in? You still find a lot of people who want to keep their land in a long-term reserve, because of a long-term return on things. That may have been more true in the 1990s where you were seeing potential prices fall. Again, I am much like everyone else in this audience, you saw land at high prices then followed by low prices. There are uncertainties there. In running a sensible reserve as we expand demand, meeting that is going to have to be done with bringing land out of CRP. Hopefully, what

you do is bring out the land that is more productive and leave the environmentally fragile lands in there and protected.

Mr. Henderson: I want to ask one last question before we close the session.

As we think about recognizing risk, a lot of times I ask people, what keeps you up at night? Or, in other words, what are the one or two factors that could really disrupt this outlook we see for agriculture? What do we have to think about going forward that could be the risk that upset the turnip cart?

Mr. Baroni: I want to go first. I think the world economy. Clearly, there are a lot of things to worry about: if we were to have another bad recession, or if you were to have, for example, a big increase in interest rates you would certainly have weakness in land markets and other things that could affect the farm economy. I don't see anything on the horizon that would suggest that. These markets have been remarkable in the sense of strong markets across the board for a variety of commodities.

Again, I don't want to take away from Dr. Glauber, who thinks it is going to be great from here on out. Markets do respond and we will have bumper crops and we will see prices fall. There is no question about that.

Generally, if you were to say one thing, it would be the world economy.

Mr. Fischhoff: From the technology perspective, there is always risk in technologies. The types of things I talked about are clearly long-term plays. Absent the scientific risk that we won't be able to do what we think we can do – which is always present – the bigger risk I see probably comes from government policies that would slow the adoption of new technologies in various parts of the world. We are lucky in the U.S. to have a good set of policies that foster technology, innovation, intellectual property rights, and a good regulatory framework. We are seeing that develop in many parts of the world, but it is still hit or miss. For various reasons, we run some risk of backsliding in certain parts of the world. An atmosphere where we can actually adopt and employ all of these technologies is the real key to avoiding that kind of risk.

Mr. Glauber: Right now it's this weather that is keeping me up at night, especially with the short stocks that we have! [laughter]

We recognize to meet this growing demand we must have increased production and increased productivity from the developing world. As we've talked a number of

times, there is not a lot of land left in the U.S. Obviously increasing yields here will go a long way. But, to really meet this, we are going to need a lot of productivity in what we call the developing world.

And there are a lot of political and economic issues standing in our way of that happening. We have to connect these small-holder farmers with global markets. You need infrastructure to do that and you need political and economic environments that allow that to occur. There are some parts of the world where we don't yet see a lot of good movement in that direction. But it's going to be essential. It is going to have to happen.

Mr. Henderson: Thank you. That concludes our first session.

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Session 2:
Overhauling Renewable Energy Markets

Impact of Alternative Biofuels Policies on Agriculture, the Biofuels Industry, Taxpayers and Fuel Consumers

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Introduction

It seems difficult to hold a reasonable discussion about the role that biofuels can and should play in helping us meet our energy current and future needs. Opponents of corn ethanol argue that it should play no role in our energy future because ethanol increases food prices, increases greenhouse gas emissions, relies too heavily on taxpayers subsidies and government mandates, and is too protected from competition from low-cost sugar cane ethanol. Proponents of government support for ethanol and biodiesel argue that biofuels have allowed American farmers to prosper as never before, that biofuels are responsible for hundreds of thousands of jobs that are at risk if subsidies are cut, that gasoline prices would skyrocket without ethanol, and that our nation is safer because of biofuels.

Perhaps it is asking too much for opponents and supporters of biofuels to seek common ground in the search for policies that will enhance the welfare of our country. After all, much more important problems, such as ensuring that the U.S. government does not default on its financial obligations and the future of healthcare in the United States, are treated as political footballs rather than as problems that need solutions. But the future of U.S. biofuels will be heavily influenced by decisions that will have to be made in the coming months. A good understanding of the economic realities of biofuels is crucially needed if we are to create a future for biofuels that meets our needs.

In this paper, I provide estimates of the extent to which the viability of the U.S. biofuels industry depends on taxpayer subsidies, mandates and protection from imports. Separate estimates of the impact of tax credits and mandates are made for the 2012 calendar year. Tax credits for both ethanol and biodiesel are set to expire on December 31, 2011, so these estimates provide insight into how vulnerable the industry is to their elimination. In addition, estimates are provided of the impacts of a variable tax credit for ethanol.

The paper then examines the implications of a proposal by Senators Klobuchar (D-Minnesota) and Thune (R- South Dakota) that would change the ethanol tax credit into a variable tax credit and would invest in fueling infrastructure that would allow for increased consumption of ethanol. The ethanol industry argues that future biofuel targets cannot be met without this infrastructure investment. But, ethanol is not the only biofuel that can be used to meet these targets. Synthetic gasoline and diesel that can be readily blended with petroleum-based gasoline and diesel are viable alternatives. Much more attention needs to be paid to the decision about investing in a fueling infrastructure that would lead to greater reliance on ethanol rather than these synthetic alternatives.

Overview of the Modeling Approach

Tax credits for biodiesel and ethanol expire at the end of 2011. In addition, biofuel mandates are slated to increase by 25 percent for biodiesel, by 4.7 percent for corn ethanol, and by 333 percent for other advanced biofuels. Thus, it makes sense to estimate the impacts alternative policies would have on the biofuels industry, taxpayers, farmers, consumers, and drivers in 2012. Yet, such estimates are not easy to derive because the impacts of tax credits and mandates depend on market-driven demand and on production costs.

The market demand for biofuels depends primarily on crude oil prices because biofuels are a substitute for gasoline and diesel. Thus, when the price of crude oil rises, so too does the demand for biofuels. The cost of producing biofuels is primarily determined by the cost of feedstock.[1] The difficulty in predicting the impact of alternative policies is that we do not know what 2012 crude oil prices or crop prices are going to be. Crop prices depend on crop production both this year and next year and on world demand for crops. Crude oil prices will depend on future OPEC policy, whether there will be a war in the Middle East, and on world growth, among other things.

One way of obtaining insight into the future impacts of alternative biofuels policies is to develop a model that takes into account the inherent uncertainty in crude oil

[1] For example, it takes about 7.6 pounds of soybean oil to produce a gallon of biodiesel. At current prices, 7.6 pounds costs $4.20, whereas a gallon of biodiesel sells for perhaps $5.00 per gallon. It takes about 0.36 bushels of corn to produce a gallon of ethanol. At current prices, corn costs $2.48 and a gallon of ethanol sells for $2.60.

prices and crop yields. Such a model will calculate the impact of alternative policies for a given crude oil price, corn yield, and soybean yield. The model can be solved for many different crude oil prices, corn yields and soybean yields. If the probability distribution of the 2012 crude oil prices and crop yields used to solve the model captures what market traders expect to occur in 2012, as well as their expectations about the amount of volatility that they expect to occur in 2012, then the average result from the model is an estimate of the expected impact of an alternative policy.

The model that was used to generate the results reported here is a modification of the stochastic, partial equilibrium model that was used by Babcock, Barr and Carriquiry (2010). Their model was updated to the 2012 calendar using information about crop supply and demand available in July, 2011. This information includes demand and supply estimates provided by USDA in their July WASDE report. The original model included the markets for ethanol in the U.S. and Brazil and the U.S. market for corn. The current model adds the markets for biodiesel, soybeans, soybean meal, and soybean oil. This addition was done to account for which biofuels will fulfill the advanced biofuels mandate that can be met by imported sugar cane ethanol or biodiesel. The model accounts for both 2011 and 2012 yield variability for U.S. corn and soybeans and 2012 soybean yield variability in Brazil and Argentina. Some of the key modeling assumptions are provided in the Appendix.

Impact of Eliminating Blending Tax Credits for Ethanol and Biodiesel

The first results to be presented show what the impact would be if blending tax credits are not extended to 2012. The current tax credits are 45 cents per gallon for ethanol and $1.00 per gallon for biodiesel. These tax credits increase blenders' willingness to pay for ethanol and biodiesel by the amount of the tax credit. In a supply and demand diagram, the tax credits cause a vertical shift in each fuel's wholesale demand curve by the amount of the tax credit. This shift in demand would normally result in a higher quantity of biofuels purchased and a higher plant-received price. How much biofuels producers benefit from tax credits relative to fuel consumers, farmers, and oil companies is much-debated. Insight into this question can be obtained by looking at some special cases.

The easiest case to analyze is when Renewable Fuel Standard (RFS) mandates bind, which occurs when the cost of increasing biofuels production in excess of mandated levels exceeds the market value of the additional production. In this case, the quantity of production is not determined by the intersection of a supply and demand curve but rather by the mandate. When a tax credit co-exists with a binding mandate, then elimination of the tax credit will not change biofuels production levels or the price received by biofuels producers because the mandate will still bind. Hence, none of the benefits of the tax credit accrues to biofuels producers or farmers. All benefits accrue to blenders and possibly fuel consumers if there is sufficient competition between blenders so that they are forced to pass on some or all of the value of the tax credit through lower fuel prices. In this case, the tax credit subsidizes the cost of meeting the mandate. Hence, its elimination would only hurt blenders and possibly fuel consumers. Taxpayers would benefit. Farmers and biofuels producers would not be hurt.

The next special case is when the biofuels industry is operating above mandated levels and at full operating capacity. In this case, most or all of the benefit of the blenders' tax credit accrues to biofuels producers, so its elimination would be primarily felt by them. Farmers would be hurt by its elimination only if biofuels production levels decreased so that the industry operated below capacity. Because all of the benefit of the tax credit is reflected in the price that blenders paid for biofuels, its elimination would not hurt blenders or fuel consumers.

These two special cases show why it is difficult for people to understand who benefits from the blenders' tax credit. When mandates bind, none of the benefits accrue to biofuels producers. When plants are operating at capacity, biofuels producers capture all of the benefit. When neither of these special cases apply, then the benefits of the blenders' tax credit are shared between blenders (and possibly consumers) and farmers.

If there is excess biofuels capacity, then the price of biofuels reflects both the cost of producing the incremental gallon of biofuels and its incremental value to blenders. Elimination of the tax credit in this situation would lower the blender value of biofuels, so they would demand less. A lower demand would translate into lower biofuels production. Given the importance of the biofuels industry in terms of overall demand for corn and soybean oil, a drop in biofuels production would decrease the market price of

the feedstock. This drop in the price of feedstock would hurt farmers but help biofuel producers. Thus, when there is excess capacity in the industry, the primary beneficiary of the blenders' tax credit is farmers. Therefore, its elimination would primarily hurt farmers, not biofuels producers. This explains why corn farmers have been the biggest advocates of maintaining the tax credits. When there is a lot of flexibility in bringing on and taking off production capacity, the aggregate profits of biofuels producers are largely unaffected by whether the tax credit is extended.

This discussion points out that the impacts of eliminating the tax credit are highly dependent on whether there is excess operating capacity in the industry and whether mandates bind, both of which depend on whether market demand for biofuels is high or low relative to the cost of producing biofuels. Because market demand depends on the price of gasoline and diesel, and production costs depend on feedstock prices, it is important that a study of the impacts of eliminating the tax credit considers a wide range of energy prices and crop yields.

Corn Ethanol Impacts

Table 1 presents the impact of eliminating the tax credit for ethanol averaging across all 500 energy prices and crop yields considered. Each pair of energy prices and set of crop yields generates one model solution, so Table 1 presents the average of 500 model solutions.[2] On average, elimination of the tax credit would decrease U.S. corn ethanol production by 600 million gallons (4.3 percent). [3] Average corn prices would decrease by about 46 cents per bushel (7.5 percent). The wholesale price of ethanol would drop by an average of 13 cents per gallon. This decline is much less than the value of the tax credit. The reason for this relatively modest impact on ethanol prices is that the higher quantity of ethanol produced with the tax credit lowers the market value of ethanol, because at higher volumes, ethanol prices need to be more heavily discounted due to limitations on the amount of ethanol that the U.S. vehicle fleet can use.

[2] The model captures reasonably current market expectations. Average monthly settlement prices in 2012 on June 23, 2011 were $2.70 per gallon for reformulated gasoline, $2.31 per gallon for ethanol, and $6.40 for corn.

[3] The 2012 conventional biofuels mandate is projected to be 13.2 billion gallons. Table 1 average production levels are below this level because the ethanol industry has large quantities of blending credits. (RINs) that they can use to meet 2012 obligations. The model imposes a floor on actual biofuel consumption of 12 billion gallons to reflect the existence of these credits.

Table 1. Average Market Impact in 2012 of Eliminating Ethanol Blenders' Tax Credit

	With Tax Credit	No Tax Credit
U.S. Ethanol Production (billion gal)	13.82	13.16
Corn Price ($/bu)	6.27	5.68
Ethanol Price ($/gal)		
Wholesale	2.43	2.28
Net Price to Blenders	1.98	2.28

These results indicate that the viability of the U.S. corn ethanol industry is not dependent on maintaining tax credits. If production levels are an indicator of help to the corn ethanol industry, then the ethanol industry is hurt by an average of 600 million gallons. But this is a poor measure of help to the industry because production levels do not measure profit.

Table 2 provides some indicators of who would be helped and who would be hurt from elimination of the tax credit. As shown, extending the corn ethanol tax credit would add more than $6 billion to the Federal budget deficit. A crude measure of profit to the industry can be obtained by multiplying the wholesale price of ethanol by the quantity of ethanol and then subtracting the net cost of corn.[4] On average, the drop in the price of corn would not completely offset the drop in the price of ethanol. This indicates that the ethanol industry, in aggregate, would be worse off from elimination of the tax credit by an average of $360 million. This result depends on the particular specification of the demand curve (see Appendix), but clearly a drop in production would reduce feedstock costs, which would partially compensate the biofuels industry for any drop in the ethanol price.[5]

[4] The net cost of corn equals the price of corn minus the value of distillers' grains, which is set at 85 percent of the price of corn. Thus the net cost of corn equals Pcorn*(1 – 0.85(17/56))/2.75, where it is assumed that one bushel of corn produces 2.75 gallons of ethanol.

[5] It is plausible that the ethanol industry could be made better off from a drop in production if the tax credit causes the demand for ethanol to be even more inelastic than assumed here and the tax credit pushes ethanol quantity towards the blend wall.

Table 2. Indicators of Impact from Elimination of the Ethanol Blenders' Tax Credit

	With Tax Credit	No Tax Credit
Cost to Federal Budget ($ billion)	6.21	0.00
Ethanol Industry Profits ($ billion)		
Revenue	33.56	30.00
Net Cost of Corn	23.36	20.17
Returns Over Net Cost of Corn	10.20	9.84
Gasoline Price ($/gal)	2.87	2.87
Fuel Price ($/gal)		
Tax credit passed on to consumers	2.78	2.81
Tax credit kept by blenders	2.83	2.81
Value of Corn Crop ($ billion)	87.50	79.27

With an average gasoline price of $2.87 per gallon, if fuel blenders have been passing on all of the benefits of the blenders' tax credits to their customers, then its elimination would increase blended fuel prices (90 percent gasoline and 10 percent ethanol) by an average of about 4 cents per gallon. If blenders have been keeping all of the benefits of the blenders' tax credits, then fuel prices would decrease by an average of two cents per gallon. The reality is likely somewhere between these two extremes, so that fuel prices might rise a penny or two per gallon, on average, if the blenders' tax credit was eliminated.

The group that loses the most from the drop in demand for ethanol is corn farmers, because the value of the corn crop declines by about $8 billion. But this overstates the loss from tax credit elimination if corn farmers were aware that the credit was going to be eliminated, because they would adjust their acreage somewhat. Furthermore, this loss due to lower corn prices represents a gain to world livestock producers because of lower feed costs. Thus, the overall impact on agriculture would be small.

These single year market impacts and calculations of losses and gains need to be put into perspective. In 2013, the conventional ethanol mandate increases to 13.8 billion gallons, and it rises to 15 billion gallons by 2015. Thus, the Table 1 and Table 2 results overstate the longer-term impacts of elimination of the tax credits because the mandate grows so rapidly after 2012.

Biodiesel Impacts

Estimation of the impacts of elimination of the tax credit for biodiesel is much easier than for corn ethanol because the market situation for biodiesel falls into one of the special cases discussed above. Across the 500 model solutions, there were no cases where the biodiesel mandate was not binding with the $1.00 tax credit in place, because the cost of producing biodiesel far exceeds its value as a replacement for diesel, particularly at the billion gallons of biodiesel that are mandated to be consumed. This means that elimination of the tax credit for biodiesel would have no impact on biodiesel producers and no impact on farmers or other feedstock supplies. The only impacted groups would be taxpayers who save $1 billion and biodiesel blenders who would find that it would cost them $1 billion more to use the mandated quantity of biodiesel.

Impacts on Imports

Elimination of the blenders' tax credit for ethanol removes any justification for maintaining the tariff on imported ethanol. Thus, the import tariff was removed along with the tax credit in the model. Its elimination had almost no impact on the model results. It is not really surprising that the U.S. would not see a surge of imported ethanol from Brazil with the elimination of the tariff. Brazil has had trouble meeting its own domestic demand over the last two years because of a lack of new investment in production along with strong growth in its fleet of flex-fuel vehicles. In addition, elimination of the tax credit decreases the incentive for Brazil to export to the US.

The final reason why we would not see a surge in ethanol imports in 2012 is that in almost all model solutions, Brazil is already exporting 494 million gallons of sugar cane ethanol to the U.S. to meet the advanced biofuels mandate in the RFS. In about 80 percent of model solutions, Brazil exports 494 million gallons of sugar cane ethanol to the U.S., while the U.S. exports corn ethanol to Brazil. This two-way flow of ethanol makes some sense if Brazil imports ethanol when its production shuts down in late winter. However, the model that generates this result is an annual model, so the model is predicting that ships will be crossing each other loaded with ethanol. The average export of U.S. corn ethanol to Brazil in these runs is 245 million gallons. It is ironic indeed that

so much bunker fuel will be burned (with associated greenhouse gas emissions) to import Brazilian sugar cane ethanol in order to reduce U.S. greenhouse gas emissions when market forces are trying to get U.S. corn ethanol into Brazil.

Impact of Adopting a Variable Tax Credit

One criticism of the ethanol tax credit is that it stimulates demand even when ethanol demand is already high. Currently, domestic livestock feeders are concerned that they might actually have trouble sourcing corn in late July and August before the new crop is harvested. There is plenty of corn around, but a significant portion of it is being turned into ethanol. A policy of subsidizing ethanol plants' purchases of corn through the blenders' tax credit when corn supplies are so tight is difficult to explain to the livestock industry and to food consumers. Charts 1 and 2 illustrate the problem.

Chart 1: Average Corn Prices Conditional on Gasoline Prices

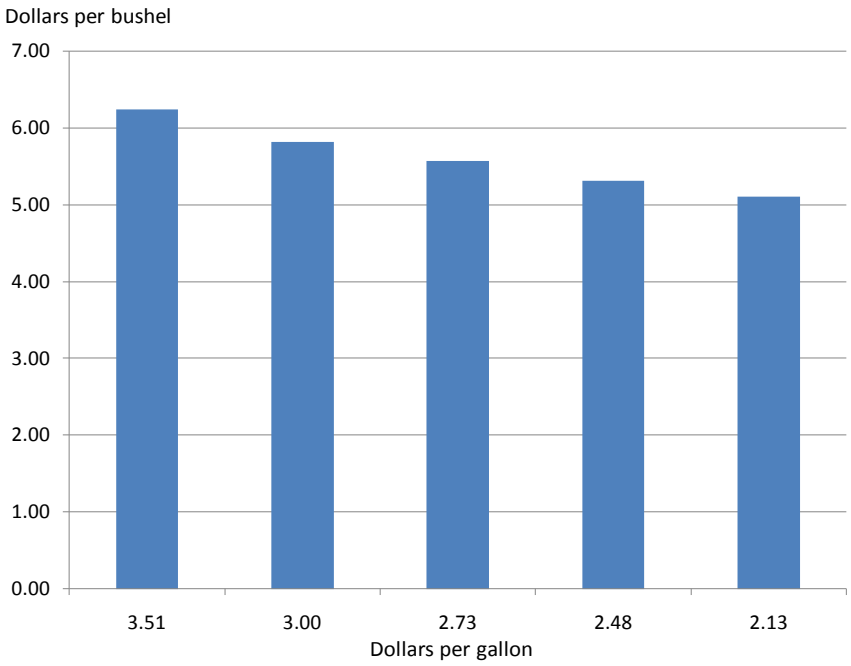
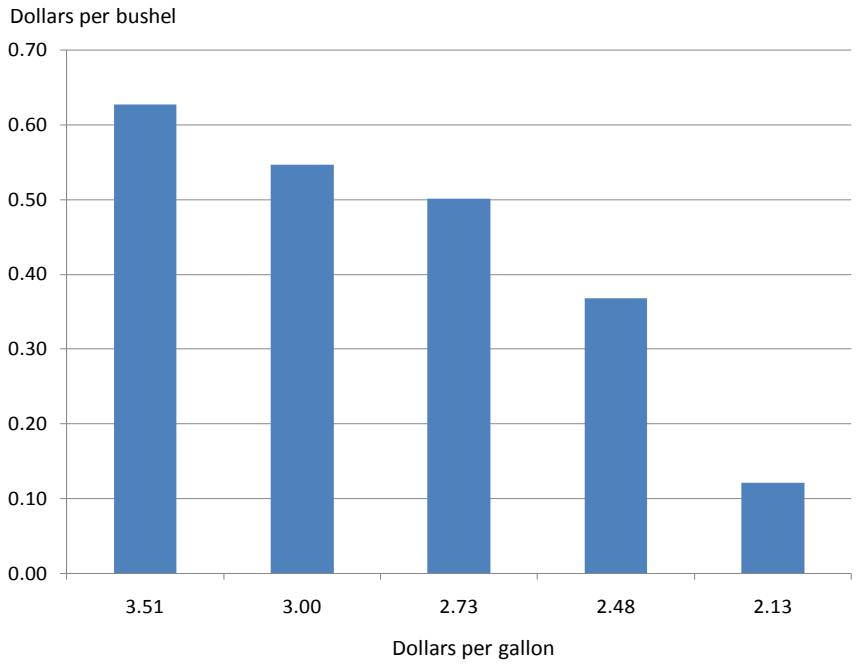


Chart 1 shows the impact of changes in wholesale gasoline prices on the price of corn. The chart's data were calculated by sorting the model results according to gasoline

prices and then averaging the price of gas and the associated price of corn by quintiles. As shown, on average, there is a direct relationship between gasoline prices and corn prices because the demand for ethanol increases as the price of gasoline increases. The amount of the increase in corn prices that is accounted for by the tax credit is shown in Chart 2. These data were calculated by subtracting corn prices from the model solutions without the tax credit from corn prices from the model solutions with the tax credit.[6] As can be readily seen, the impact of the tax credit is highest when the demand for ethanol is highest. This occurs because when gasoline prices are low, the market demand for ethanol is low and the mandate is more likely to be binding. When the mandate is binding, the tax credit has no impact on corn prices. As gasoline prices rise, the probability that the mandate binds decreases, so the tax credit has a larger impact. When gasoline prices are quite high, the mandate never binds and the tax credit has its largest impact. Clearly, a policy that increases the price of corn the most when the price of corn is highest does not work for the livestock industry.

Chart 2: Impact of the Ethanol Blenders' Tax Credit on Average Corn Prices Conditional on Gasoline Prices



[6] The same 500 gasoline prices and crop yields were used across all model runs.

If the mandate were not in place, then the impact of the tax credit would be much more uniform across gasoline prices. But then the ethanol industry would still have to defend a subsidy that pushes corn prices higher even when the market demand for ethanol is high and corn prices are high. In response to this feature of the current ethanol tax credit, a tax credit that varies with the price of crude oil is being floated by Senators Grassley (R-IA), Conrad (D-ND), Klobuchar (D-MN) and Thune (R-SD).

This recent proposal would replace the current fixed tax credit with one that varies with the price of crude oil. When oil prices are above $90 per barrel, the tax credit would fall to zero. For each $10 drop in the price of crude, the tax credit would increase by 7.5 cents per gallon until the tax credit reaches its maximum value at 30 cents per gallon. This particular proposal was analyzed across the 500 crude oil prices and crop yields to determine its impact.

Chart 3: Impact of a Variable Ethanol Blenders' Tax Credit on Average Corn Prices Conditional on Gasoline Prices

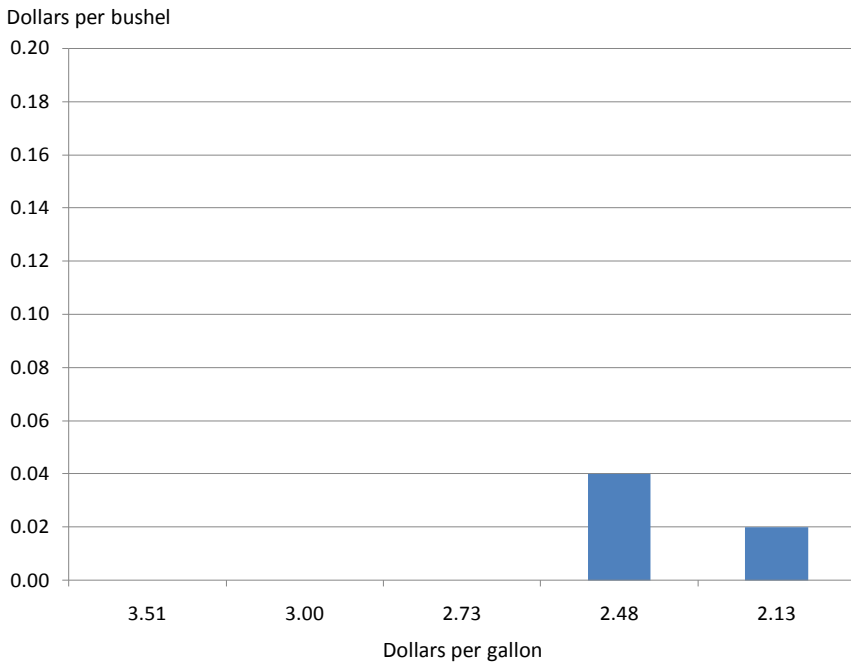


Chart 3 shows that this proposal would have almost no impact on corn prices over the range of gasoline prices that are likely in 2012. The reason is that for wholesale prices above $2.70 per gallon, the variable tax credit is zero. For prices much lower than

this level there is a good chance that the ethanol mandate will be binding, in which case the non-zero tax credit would have no impact on ethanol production levels or on corn prices. This shows that it would be a much cleaner to simply eliminate the tax credit.

Impact of Mandates

The reason why elimination of tax credits has such a modest impact on the biofuels industry is that Renewable Fuel Standard mandates keep demand high when market demand for biofuels drops off. Although tax credits have received much more recent attention than these mandates, this is likely to change in the near future because the cost of meeting these mandates may increase substantially. The cost of meeting mandates is reflected in model runs as the market price for blending credits—Renewable Identification Numbers (RINs)—that must be turned into the Environmental Protection Agency as proof that obligated blending quantities have been met. The price of RINs is the difference between the price that is needed by biofuel producers to cover their production costs and the value the biofuels has in the marketplace as a substitute for gasoline or diesel. If mandates are not binding, then the market value of biofuels equals the price needed to cover production costs, so the price of RINs is zero.

Table 3. Average Price of RINs Across All Model Solutions

	Conventional	Biomass-Based Diesel	Other Advanced
		$/gal	
With tax credits	0.01	1.88	1.26
Without tax credits	0.13	2.77	1.53

Table 3 shows the average RIN price for the three types of biofuels across all 500 model solutions. The low RIN price for conventional biofuels reflects the fact that the conventional mandate is not likely to be binding in 2012. This low probability reflects the existence of a large quantity of RINs from 2011, 2010 and 2009 that can be used to help meet the mandate in 2012. If the ethanol blenders' tax credit is eliminated, the price of RINs will rise modestly. The high RIN price for biodiesel reflects the high price of soybean oil relative to the price of diesel. Even with a $1.00 per gallon subsidy, the price

of RINs average almost $2.00 per gallon in 2012. This rises to almost $3.00 per gallon if the biodiesel tax credit is eliminated. This means that the cost of producing biodiesel from soybean oil is almost $3.00 per gallon higher than the cost of diesel.[7]

There are two advanced biofuels that can meet the advanced mandate: imported ethanol and either imported or domestically produced biodiesel. The model calculates the price of RINs from both and picks the biofuels with the lower RIN price as the one to meet the advanced biofuels mandate. With the tax credits in place, about 60 percent of the model solutions have imported sugar cane ethanol meeting the advanced mandate. Without the tax credit, 99 percent of model solutions meet the advanced mandate with sugar cane ethanol. This difference reflects the fact that the $1.00 per gallon biodiesel tax credit is much higher than the $0.45 per gallon ethanol blenders' tax credit. RIN prices are likely to continue to increase in the future because the mandates continue to grow.

Conventional biofuel mandates grow to 15 billion gallons in 2015. If biodiesel mandates stay at the 1.28 billion gallons that EPA has proposed for 2013, then other advanced biofuels, a category that includes cellulosic biofuels, grows to 3.58 billion ethanol-equivalent gallons. If all of these gallons are ethanol, then total ethanol mandates in 2015 will be 18.58 billion gallons. It is clear that increased scrutiny of these mandates is inevitable.

To obtain further insight into the impacts of these mandates, Table 1 shows what production levels and prices would be if the mandates were not enforced in 2012. The largest impact of the mandate is on biodiesel. Production would drop significantly from about a billion gallons to less than 200 million gallons. Production and biodiesel prices would drop even more were it not for the demand for biodiesel in Europe. Corn ethanol production would drop to an average of about 11 billion gallons across model solutions. This assumes that fuel blenders would continue to use ethanol in their blends if the price

[7] Current biodiesel RIN prices are around $1.25 per gallon. If the tax credit were not in place, this RIN price would be $2.25 per gallon. The higher RIN price in Table 3 reflects the higher mandate in 2012 (one billion gallons in 2012 versus 800 million gallons in 2011) and continued tight supplies of soybean oil.

were attractive enough relative to gasoline.[8] This result shows that the ethanol industry would be viable even without government support.

Table 4. Comparing Market Outcomes with and without Biofuel Mandates

	No tax credit	No tax credit or mandate
Production		
Ethanol (billion gals)	13.16	12.42
Biodiesel (billion gals)	1.0	0.145
Prices		
Biodiesel ($/gal)	5.49	3.42
Ethanol ($/gal)	2.28	2.16
Corn ($/bu)	5.68	5.28
Soybeans($/bu)	14.04	13.60
Soybean Meal ($/ton)	390	408
Soybean Oil (cents/lb)	60.4	52.1

Corn prices would drop modestly, but would still be high by historical levels. Table 4 results show that soybean prices are not strongly supported by biodiesel mandates. The reason is that soybean prices depend on both soybean meal and soybean oil prices. Increased biodiesel production increases soybean meal production, which lowers its price, whereas soybean oil prices are inflated by biodiesel production. The net effect of lower biodiesel production is slightly lower soybean prices.

Future Directions for Biofuels Policy

The results of this study provide some insight into some problems with current biofuels policies. The first observation and one that has been made repeatedly elsewhere (Just and De Gorter) is that having both a mandate and tax credit is redundant. A tax credit accomplishes little other than as a means of masking the true cost of meeting mandates. Furthermore, if excessive use of petroleum-based gasoline and diesel are the reason for the need to adopt a costly biofuels policy, then it makes sense for fuel users,

[8] The corn ethanol industry would likely characterize as naïve, the assumption that oil companies would continue to use ethanol at something close to current volumes if there were no mandate in place. But the blending infrastructure is largely in place to blend 13 to 14 billion gallons of ethanol so if ethanol is priced attractively, there is no economic reason for oil companies not to use ethanol in their blends.

rather than taxpayers, to bear the cost of biofuel mandates. Thus the current move to eliminate the ethanol blenders' credit and the biodiesel tax credit would be a policy improvement, both from the perspective of removing a redundant policy and having fuel consumers pay for biofuels, but also from a transparency perspective in that the true cost of meeting biofuels consumption targets would be reflected directly in the prices of biofuels relative to gasoline and diesel.

The second observation relates to our ability to consume ethanol. The RFS mandates 36 billion ethanol-equivalent gallons of biofuels use by 2022. The actual volume of biofuels will be significantly lower than 36 billion gallons because a gallon of some biofuels counts as more than a gallon of conventional ethanol. Even so, it will be difficult and costly for these mandated volumes to be met if non-biodiesel volumes are to be met with ethanol.

U.S. flex-fuel vehicles that can use up to 85 percent ethanol blends are dispersed across the country. There are relatively few fueling stations that dispense E85, and they are mainly concentrated in the Midwest. The expense of trying to expand E85 consumption by increasing fueling stations across the whole country seems much too high to be cost effective. Furthermore, automobile manufacturers are reluctant to increase production of flex-fuel vehicles until consumers signal that they want to buy E85. The lack of E85 consumption means that if more than about 14 billion gallons of ethanol are going to be consumed domestically, then a large proportion of the U.S. vehicle fleet will need to run on fuel that contains more than 10 percent ethanol. Simple arithmetic suggests that if 14 billion gallons is the upper limit on how much ethanol we can consume with 10 percent blends, then 28 billion gallons would be the upper limit if all almost all cars ran on 20 percent blends.

The Environmental Protection Agency (EPA) has approved 15 percent ethanol blends for all cars built after 2001. But the cost—both economic and political—of moving the U.S. vehicle fleet to E15 from E10 is looking like it will be high. New pumps need to be installed nationwide; state regulations need to be written to prevent misfueling, consumers need to be convinced that higher blends are good for their cars, and automobile manufacturers will need to extend their warranties to the new higher blends. Is it really feasible for the U.S. to move to high penetration rates of 20 percent

ethanol blends when it looks like it will be years before 15 percent blends are widely used?

An alternative to meeting existing mandates with ethanol is to meet them with so-called drop-in fuels. These fuels can travel through pipelines and be blended with gasoline and diesel at higher percentages than ethanol with less compromise on fuel mileage.

A key policy decision that is being considered by both the House and Senate is whether to adopt the recommendations of the ethanol industry and to authorize large infrastructure investments that would enable much larger volumes of ethanol to be consumed by U.S. consumers. Such a move would signal new fuel producers that they should concentrate their efforts and investments at producing ethanol rather than drop-in fuels. Investments in ethanol infrastructure makes sense if the U.S. chooses to commit to ethanol, as Brazil has done, and backs this commitment with new laws and regulations that allow higher-than-20 percent blends, new blender pumps, and more flex-fuel vehicles. If the U.S. is not ready to choose ethanol as the biofuels that will be used to meet the mandate, then such infrastructure investments would be wasteful because it is likely that they will be stranded as fuel producers find that the supply of ethanol outstrips the demand.

What is needed before a decision is made to invest in new ethanol infrastructure is to have a national discussion about ethanol's future. Are we really ready to follow Brazil's example and match the demand side of biofuels with the supply side? If so, then the decision to invest in more ethanol infrastructure would give a clear signal to investors that they should invest in ethanol. If not, the earlier that policy certainty is created by announcing that our biofuels future will be determined by whichever fuel can best fit into our existing transportation and fuel infrastructure the better it will be for all - investors, taxpayers, and fuel consumers.

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Appendix

Biofuel Policies

The U.S. corn ethanol mandate for 2012 is equal to 13.2 billion gallons. But significant carryover blending credits are available to meet this mandate if blenders choose to use them. Thus the "effective" 2012 mandate for corn ethanol is set at 12 billion gallons. The biomass-based diesel mandate is set at one billion gallons. No carryover credits are available to meet this mandate. The mandate for other advanced biofuels that will be met by imported sugar cane ethanol or biodiesel is 490 million gallons.

The policy alternative that extends the blenders' tax credit extends it at 45 cents per gallon for ethanol and $1.00 per gallon for biodiesel. The 'variable Volumetric Ethanol Excise Tax Credit (VEETC)' policy alternative has a zero blenders' tax credit if crude oil prices exceed $90 per barrel. The tax credit is increased by 7.5 cents per gallon for each $10 drop in crude oil prices up to a maximum of 30 cents per gallon.

Brazilian gasoline is assumed to contain 25 percent ethanol. The cumulative cost of transporting hydrous ethanol from Brazil's interior to the U.S. and converting it to anhydrous ethanol is set at 62 cents per gallon. This does not include an import tariff, because enough U.S. ethanol has been exported to Brazil to allow for a tariff draw back.

Yield Distributions

U.S. expected yields are obtained from simple linear trends from 1990 to 2010 of yield per harvested acre. Yield variability for 2011 is reduced because there is no chance that a disastrous drought hit the Corn Belt in 2011. The correlation between corn and soybean yields equals 0.75. The parameters are as follows:

	Corn		Soybeans	
	2011	2012	2011	2012
Mean	161.7	164	43.3	43.7
Std dev	7	11	2	3
Max	180	182	50	51.5
Min	145	130	39	35
alpha	2.498768	2.65321	2.424614	3.325093
beta	2.738171	1.404641	3.777886	2.82824

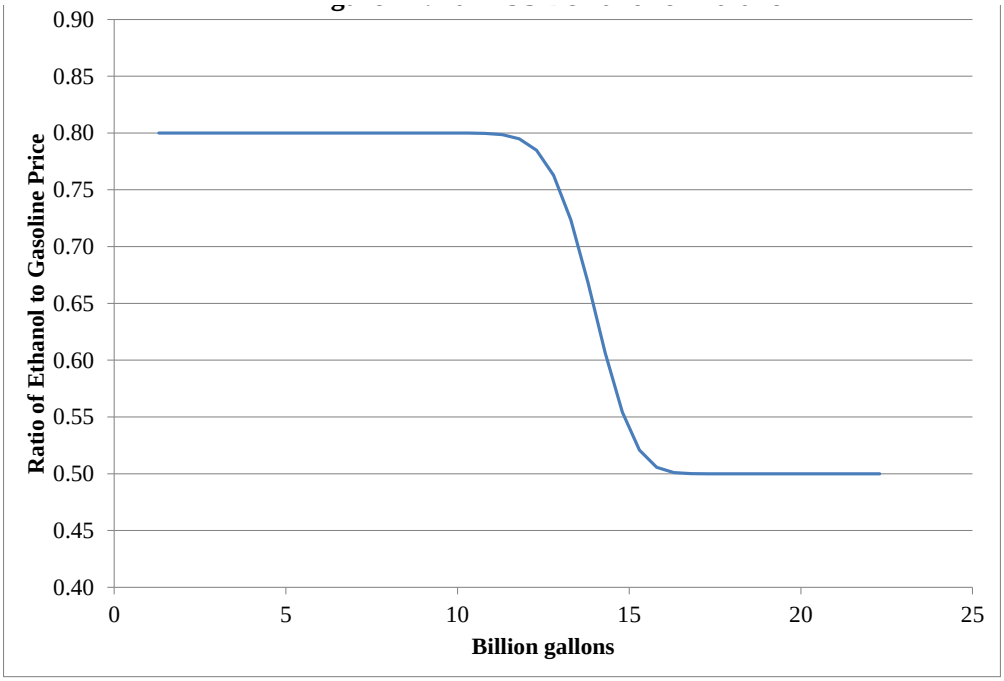
Argentinean and Brazilian soybean yield distributions for 2012 are as follows

	Soybeans	
	Argentina	Brazil
Mean	2.83	3.04
Std dev	.28	.18
Max	3.4	3.5
Min	1.9	2.5
Alpha	3.572117	3.6
beta	2.189362	3.066667

U.S. 2012 Demand Curve for Ethanol

Figure A1 below shows the ethanol demand curve that is used in this analysis. It was calibrated to recent prices and quantities. The demand curve is quite elastic at low volumes and high volumes. At low volumes, demand is assumed nearly perfectly elastic, because fuel blenders find it easy to substitute ethanol for gasoline. The value of 80 percent of the price of gasoline probably understates the willingness to pay for ethanol by blenders at such low volumes. The elastic portion of the demand curve at high volumes assumes that if ethanol is discounted enough then it will find a market in either export markets or in U.S. flex-fuel vehicles. The inelastic portion of the demand curve reflects the inherent limitation of the 10 percent blending limits in U.S. gasoline. Although the U.S. Environmental Protection Agency has approved 15 percent blends, limited market penetration of E15 is expected in 2012.

Figure A1. 2012 U.S. Demand for Ethanol



Impact of Alternative Biofuels Policies on Agriculture, the Biofuels Industry, Taxpayers and Fuel Consumers (Transcript)

Bruce A. Babcock
Iowa State University

Thank you. I really appreciate the opportunity to come to talk with you about renewable energy. I try to tow the direct line down to what I think is happening in the markets and try to understand the impacts of policy changes, but it seems like there is always controversy when you come to such an important topic as renewable energy and the role it plays in the future prosperity of agriculture.

If you are of the camp that attributes all of the current prosperity of crop agriculture to biofuels, and you think biofuels have come about only because of biofuels policy, then clearly a change in biofuels policy is a big risk factor to the prosperity of crop agriculture. If instead you think biofuels have largely been market-driven, then really a change in biofuels policy has a very small risk factor and the risk factors would be more on the market conditions for biofuels.

So what I want to do today is try to sort out a little bit about the market for biofuels and the role that policy plays to get a better understanding of what really are the risk factors facing biofuels. Right now it's clear that Congress is trying to make decisions about the future of biofuels. For example, the tax credit for ethanol is clearly on the table. With less discussion, the tax credit for biodiesel expires on December 31 of this year. Clearly some changes are going to be made. In addition, for the first time, in 2012 the advanced biofuels market is going to take off. There is about a 500 million gallon mandate in 2012 for advanced biofuels.

Is Congress going to allow that to continue? Are they going to allow the Renewable Fuel Standard (RFS) to continue as written? So there is a lot to talk about. I am going to talk primarily about ethanol and biodiesel and the tax credit and the RFS, because that is enough for the time we have.

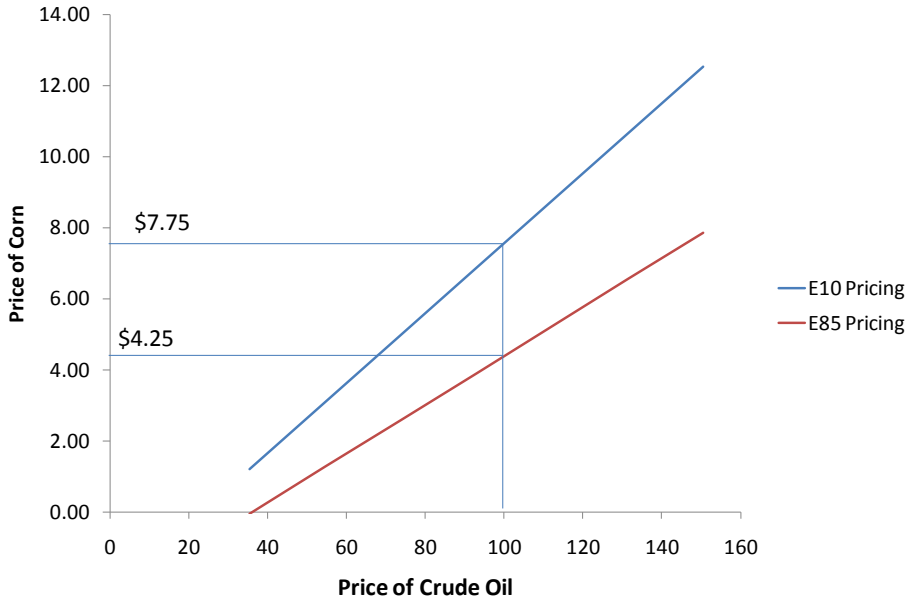
The first thing I want to talk about is the market value of biofuels. What do biofuels bring to the table? How can we generate value from biofuels? There are two values biofuels bring to the table. One is just a market value – how the market generates value or gives value to biofuels. The first source of market value is a source of BTUs. It is a substitute fuel. Ethanol is a source of BTU in an ethanol-gasoline blend. Biodiesel is a source of BTU. So it is a straight substitute as an energy source.

The second sourceof market value and an important one for ethanol is as an octane-enhancer. The refineries are willing to pay money for that attribute of ethanol. So there are two market values.

There are also nonmarket values. You hear those bandied about a lot about why we need a biofuels policy. If it were just left to the market, there is no role for a biofuels policy. So the nonmarket values are that biofuels reduce greenhouse gas emissions; ethanol, in particular, lowers air pollution; and they are a domestic source of fuel. It's hard to put a value on any of these factors – in particular, greenhouse gas emissions – when we don't have a market for carbon. It's also very hard to value the domestic source of a fuel. I am not going to try to place values on those, but those are the things that often drive the political debates. So I am going to put aside for a minute the nonmarket values and just focus in on the market value for biofuels.

I am going to start with ethanol. Because this is an agricultural forum, I am going to say, how does the creation of ethanol from corn affect the price of corn? What I have here is a chart that on the horizontal axis has the price of energy – the price of crude oil [Chart 1]. I have two lines going up there. Those lines translate the price of crude oil into a price of gasoline and a price of ethanol into a price of corn. All of the intermediate steps are gone. All you are doing is taking the price of crude oil and translating it into a price of corn. Given I am from Iowa, that is all that really matters anyway. [laughter]

Chart 1: The Ability to Pay for Corn in E10 and E85 Gasoline



You can see what we have are two lines. One is E-10 pricing and one is E-85 pricing. There isn't any doubt in the world that when you blend ethanol at low (10 percent) blends, you don't have to discount it that much relative to gasoline. How many consumers out there (1) know what E-10 is, (2) know there is slightly lower BTUs in an E-10 blend, and (3) they are probably getting lower fuel mileage from that? And (4), if all of the nation is driving E-10, what are you going to compare fuel mileage to – E-10 versus non-E-10?

I don't think you have to discount E-10 relative to gasoline at all, so it supports a higher price of corn. But, if you start running higher blends, the miles per gallon goes down, consumers will have more choice, and the price E-85 can support in terms of a corn price is going to be far lower, because you are going to have to discount ethanol in order to make up for its lower energy value, which is two-thirds that of gasoline.

Let's do this: We are at about $100 a barrel crude oil. The ability to pay for corn is almost $8 a bushel. You take into account the distillers' grains, the average productivity of an ethanol plant, it takes almost $8 corn at $100 crude oil. Whereas on E-85, it is only $4 a bushel of corn. The first point I want to make is, if the ethanol industry were to get its way and really start making us rely on ethanol for a far larger portion of

our fuel supply, it is going to support far lower feedstock costs, because it will reflect energy value.

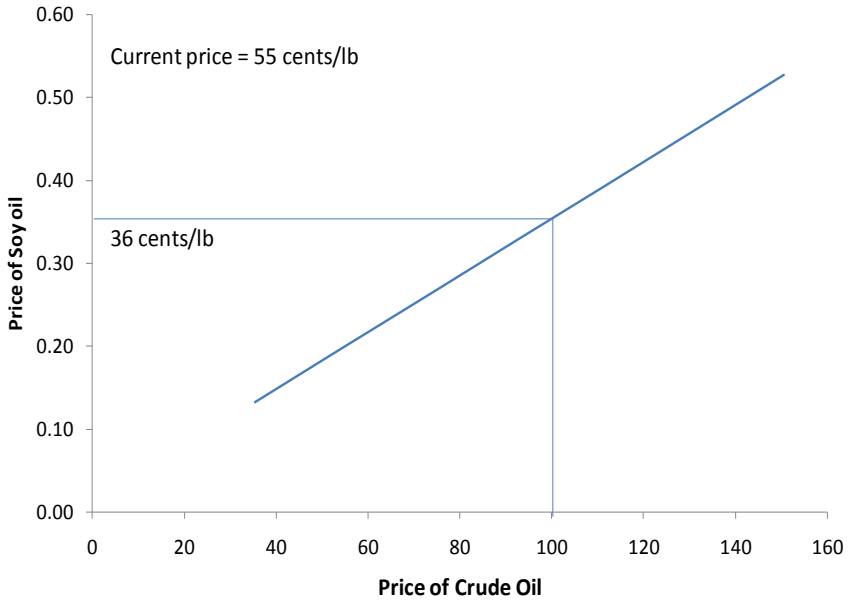
Think of E-85 as the energy value of corn through ethanol and $7.75 as the energy value through the price of gasoline. $100 crude oil supports ethanol corn prices pretty well. If you go to $120 crude, who knows what corn prices are going to be? I don't.

At $120 crude oil, you can see that really supports the price of corn. That is just the energy value of corn. There is no policy there, right? So if we are at $120 crude oil and corn is at $5 a bushel, say, it won't remain at $5 for very long, because the world will demand that corn to be changed into an energy source.

Conversely, if you go down to $60 crude oil, even at E-10, that supports about $3.75 per bushel of corn. Right away, in an E-10 world, you can see the one risk factor clearly is the price of crude oil. If you were relying just on the market, you can see how the price of crude oil is a big risk factor. But, if we are in $100 per barrel crude oil and we have a market response in terms of ethanol and the ability to change corn into ethanol that supports a quite high corn price. That is the first conclusion.

Let's look at soybean oil and biodiesel. Right now, at $100 crude oil, that supports a soybean oil price of about 36 cents a pound [Chart 2]. Do the same translation. Look at what the current price of soybean oil is – 55 cents a pound. How can we have a current price of soybean oil at 55 cents, but the soybean oil-based biodiesel sector is at 36 cents? Clearly, we are producing biodiesel right now from soybean oil. You can see there is a slight disconnect in the biodiesel market and we'll talk about that.

Chart 2: The Ability to Pay for Soybean Oil in Biodiesel



The market value summary is basically that the U.S. ethanol industry is competitive. It's a competitive industry. At $100 crude oil, it doesn't need government support; it's a competitive industry. If you stayed at $100 crude oil, you could probably still be competitive in an E-85 world. But the ethanol industry and corn growers would rather have the rest of the world be E-10, because you don't have to discount it as much as E-85.

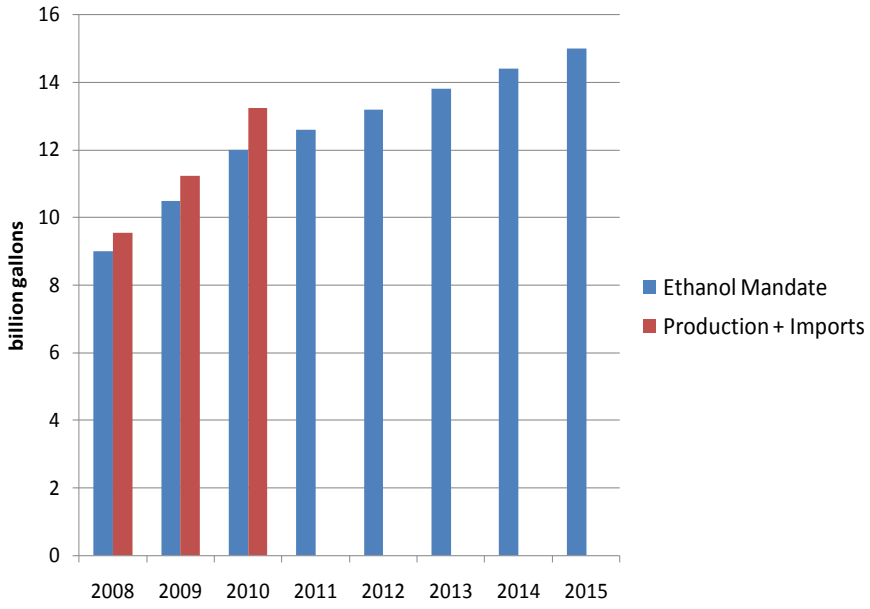
And biodiesel is simply not competitive using vegetable oil. The production cost from using soybean oil in biodiesel is at least $2 greater than the value in terms of the BTUs that biodiesel brings to the table. There is a striking difference of $2 per gallon between corn ethanol and biodiesel. That's my market summary. Again, the U.S. ethanol industry is cost-competitive, even at $6-$6.50 a bushel of corn, because the price of crude oil is so high.

We do have policies, and what are these policies? The two policies we have are tax credits. What those tax credits do is subsidize fuel blenders' ability to pay for biofuels. What it does is it lowers the net cost to these blenders of buying a gallon of biodiesel by $1 and a gallon of ethanol by 45 cents per gallon. That subsidizes their use of these fuels, so it increases their demand for these fuels.

The second big tool we have is mandates. These mandates force the purchase of minimum amounts or inclusion of biofuels into the blends. We'll talk about those now.

Let's look at the ethanol mandate. Here is the ethanol mandate, starting in 2008 [Chart 3]. This is the current Renewable Fuel Standard. This is not the total ethanol mandate. This is just the corn ethanol mandate, or conventional biofuels mandate. The conventional biofuels mandate means corn ethanol.

Chart 3: Ethanol Mandate and Historical Use



You can see we are sitting in 2011 and we're at 12.6 billion gallons of corn ethanol. That ramps up by 600 million gallons a year to 2015 at 15 billion gallons. The first observation you can see is, if you look at the capacity of the corn ethanol industry right now, it is at about 14.5 to 15 billion gallons. That is how much we could produce without building another plant. Largely, we've matched the RFS with the size of the current corn ethanol industry. That isn't a mistake. The investors in investment firms saw the writing on the wall and cut off the flow of investment into ethanol plants at the beginning of 2007. This is the industry we're left with.

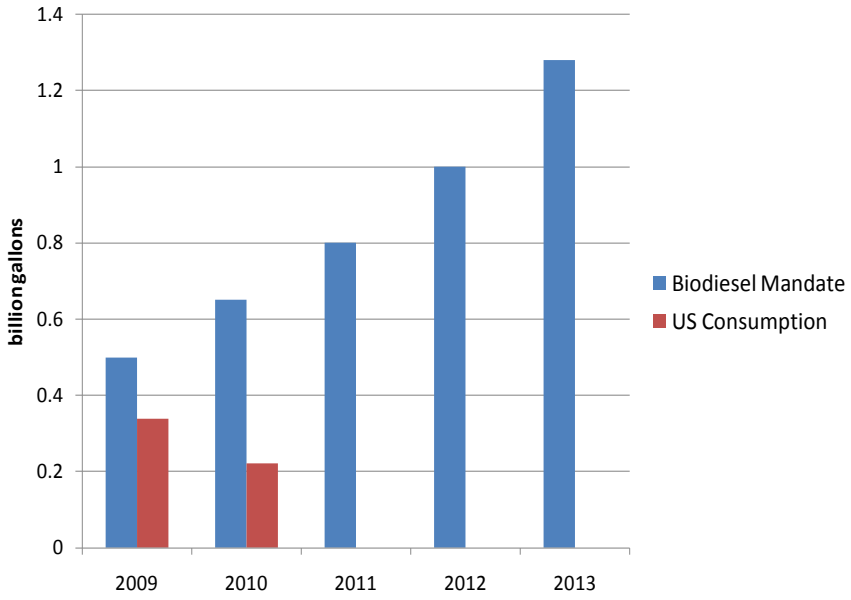
If we compare that mandate to the production and imports, which are our use levels, you can see the mandates haven't been binding. We've consumed more than the

amount the mandates have told us. That is, the economics of blending ethanol have been favorable enough, in part because of the tax credit that we have pushed beyond mandated levels.

If you look at the difference between the red bar and the blue bar, that shows the amount of excess blending that has taken place. That excess blending can be pocketed by blenders as a credit they can use to meet future mandates. We'll keep that in mind also. Basically, this shows you the market for ethanol has been largely unaffected by the mandates.

Here's the biodiesel mandate [Chart 4]. This is 2009 through 2013. The draft rule the EPA put out in July contains 2012 and 2013. You can see we are out 800 million gallons this year. In 2012, it is 1 billion gallons and, in 2013, it is 1.28 billion gallons. Now that is a lot of biodiesel, particularly if you compare it with what our consumption was. If you look at our consumption of biodiesel, you can see again that biodiesel is quite a different animal than ethanol. It's very costly to produce. The market for most of our biodiesel in the earlier years was exported to Europe, which basically has a very high price for biodiesel because they are trying to meet their own renewable energy standards.

Chart 4: Biodiesel Mandate and Historical Use



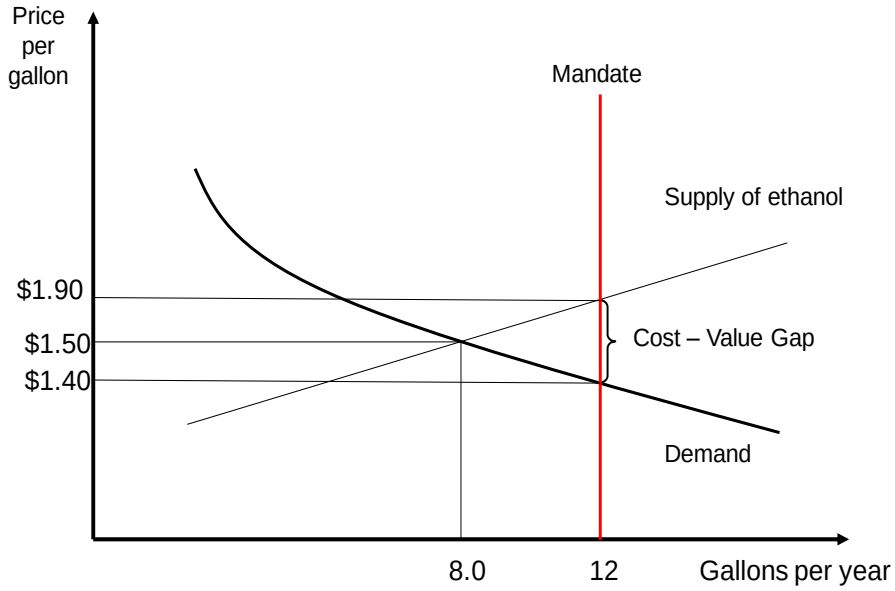
You can see it is going to be tough for us to meet these mandates, both because the production cost of biodiesel is so high, but also because we don't have as good of a blending infrastructure as we do for corn ethanol. These two different fuels have different pathways or viabilities in the market. Again, biodiesel in the 2012 and 2013 numbers are just draft rules.

Let's look at the economics of this mandate. With ethanol, if the market demand is high enough, the mandate has no impact on production, price, or consumption of biofuels. That is, if the price of the biofuel is low enough relative to its substitute or if its market value is high enough, then the mandate will have no impact on production, price, or consumption.

If demand is not high enough – that is, if the value the biofuels brings to the market isn't high enough to induce the private market consumption levels to meet the mandate – then there is going to be a gap. The production cost of biofuels is higher than the market value. That gap, if you are going to meet a mandate, has to be closed.

If you will forgive the economist in me, I can't go through a talk without a little supply and demand diagram to show how this works [Chart 5]. So we have a supply and demand of ethanol (and you can see I prepared this before oil hit $100 – it was at $80 a barrel here) in a hypothetical example. This is a free market for biofuels. We have a $1.50 per gallon price and 8 billion gallons per year consumption. If market forces were left to themselves that is the outcome we would have.

Chart 5: Impact of Mandate



If we suddenly put in a mandate, say, of 12 billion gallons of ethanol, you can see that in order to produce the 12 billion gallons, you have to have a much higher price than $1.50 per gallon. You need $1.90. The plants won't produce 12 billion gallons without a higher price. But the market at12 billion gallons won't suck up the biofuels, it needs to lower the price to $1.40 per gallon. So you can see there is a gap between the cost of production, which is $1.90, and the market value, which is $1.40. You have to make up that gap, which is a cost-minus-value gap. If you don't make up that gap somehow, you won't meet the mandate.

So how do you make up that gap? First of all, why close the gap? Nowhere else in society do we force a certain amount of consumption of a given item. We just don't do it. If the market says we should consume eight at $1.50, usually that's when the government intervenes and says you have to consume 12. We don't usually let that happen. But that is what we are doing potentially with mandates. There must be a reason, right?

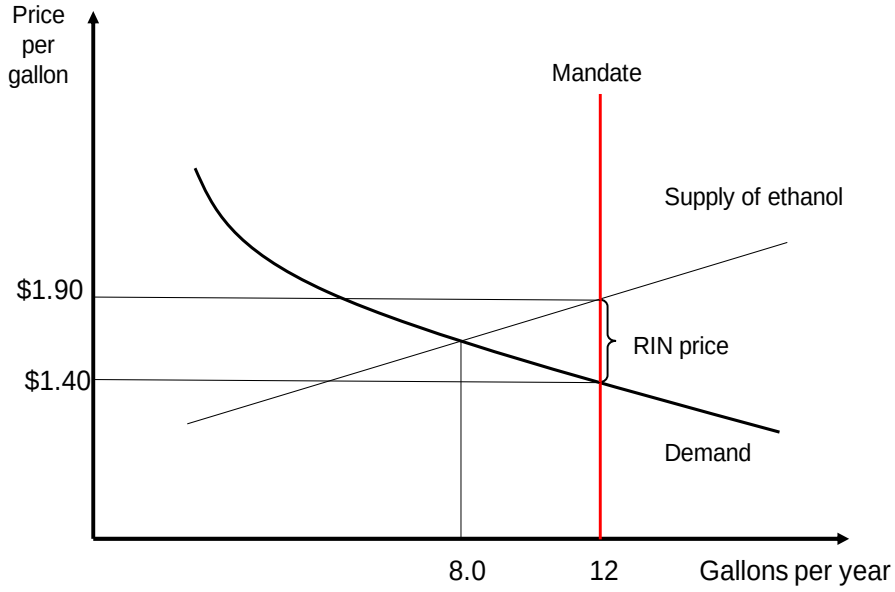
So why close the gap? Why do we do this? The only reason I can come up with is nonmarket values. Politically, are these the reasons? Politically, it is probably because we like high-priced corn. [laughter] But, as an economist, I am not going to say the

reason from society's point of view why we need to close the gap. You need to have some real justification, even if I'm from Iowa.

The nonmarket values are the reasons – reduction in greenhouse gas emissions, lower air pollution, and domestic source of fuel. Keep that in mind as the justification. (We'll come back to that in a bit.)

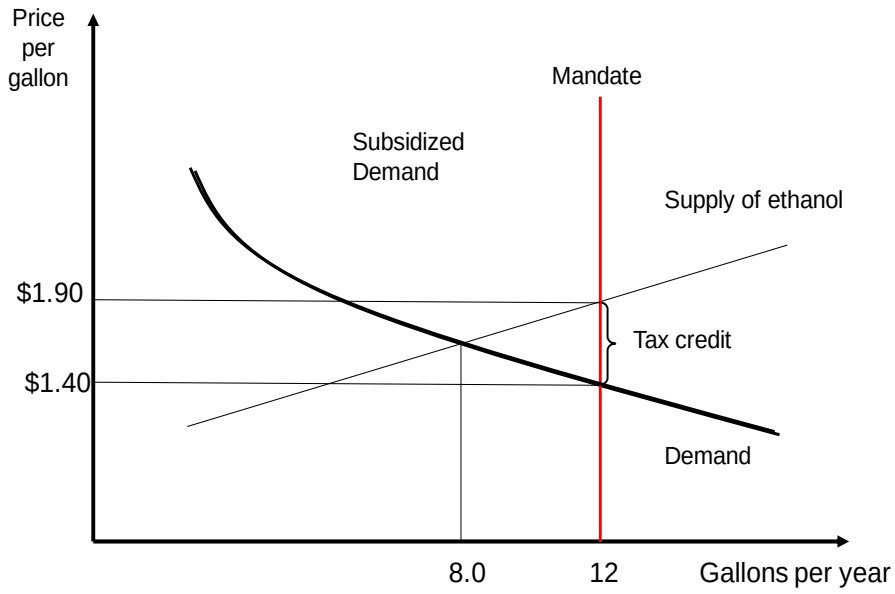
But this is the justification for closing the gap. How do we close the gap? There are two ways you can do it. You can subsidize the demand or you can create a floor in trade, just like a cap-and-trade system, like in the House of Representatives, the Waxman-Markey bill, which was a cap and trade on carbon. This is a floor and trade, where you force the consumption of a product and if you don't you have to buy a permit. You create a market for permits, just like you were creating a market for carbon. That gap is called the Renewable Identification Number (RIN) price [Chart 6]. So we now have a market for RINs. The market price for biodiesel RIN is $1.40. That gap between the market value and the price needed to produce biodiesel is $1.40. That is the first way you can do it. The market value of an ethanol RIN is about zero – 1 cent – because there is no gap. We are beyond mandated levels. This is no gap for ethanol. So that is the first way. Create a market for RINs.

Chart 6: Closing the Gap with RINs



The other way is to close the gap with a subsidy. Suppose, instead of a RIN value, you give a tax credit to the blenders [Chart 7]. What that tax credit does – watch this demand curve – it shifts out the demand, so the market demand intersects the supply curve right at that $1.90. That's the effect of a tax credit. It closes the gap to meet the mandate. Those are the two ways to do it.

Chart 7: Closing the Gap with a Subsidy



In the U.S., we have both of these ways. We have both a tax credit and a mandate. For biodiesel the tax credit covers maybe a bit more than half of the price gap. If the RIN value is $1.40, that means there is a $2.40 price gap, because the biodiesel blender gets a dollar. If you remove the dollar tax credit, that price gap would be $2.40 per gallon. The biodiesel tax credit covers not quite half and the RIN price covers the other half.

The ethanol tax credit, or VEETC, covers all of the gap. Furthermore, it pushes that demand curve that I slid out to the mandate – it actually pushes demand even farther up the supply curve. What that means is we are producing more than the mandated levels because of the tax credit. This gives us our first indication of what would happen if we discontinued the tax credit.

For biodiesel, elimination of the $1 tax credit would do nothing to the market. All that would happen is the RIN value would increase by $1. Production wouldn't change. The price of biodiesel wouldn't change. The price of soybean oil wouldn't change. The price of soybeans wouldn't change. It would do nothing.

All it is doing now is taking $800 million of taxpayer money and giving it to the buyers of biodiesel. That's it. There are no other market impacts. Furthermore, because the mandate is so binding, if you eliminated the mandate, biodiesel production would go down drastically. It really relies on that mandate. Getting rid of the tax credit, but keeping the mandate, nothing happens. If you also eliminate the mandate, then big things happen to the biodiesel market.

What about ethanol? With ethanol, the elimination of the tax credit – because we've pushed beyond mandated levels – would drop production a bit, would drop the price of ethanol, and would drop the price of corn a little bit. If you eliminated both tax credit and mandates, you would cause further adjustment in the market.

The magnitude of that impact is what I want to go to now. Take biodiesel off the table. We know what the impacts are. Corn ethanol is a bigger sector, so I want to go through that. I constructed a model with help from colleagues, and I am looking at the 2012 calendar year – next year. I want to know what that future looks like with and without the tax credit and with and without the mandate, to get an idea of how big of an adjustment the ethanol sector would be and to see how big a risk factor a change of policy would be.

If we look ahead in the key variables, we don't know anything about what the crude oil price is going to be, what the U.S. corn yield is going to be, and what next year's corn yield is going to be. What we do is we run the model over many different corn yields and many different crude oil prices and come up with an average effect to solve the model many times. Regardless of how accurate the [current] projections are, which are based on the NASS [National Agricultural Statistics Service] numbers, which we saw some criticism of and Joe Glauber danced around quite easily about the lack of precision on those things. They are the only numbers we have and the best numbers we have, so I've calibrated this model to the latest [USDA] supply and demand conditions. That's all we have and that's all anyone can do.

Let's look at some of the impacts. If we eliminate the ethanol tax credit, which seems likely, ethanol production adjusts somewhat. Across the 500 model draws, ethanol production goes down about 5 percent, or about 600 million gallons. Corn prices decrease about 9 percent relative to what it would be with extra demand simulation. Essentially when you take 600 million gallons of ethanol off the market, you are dropping the price of corn by about 9 percent.

Is this calamitous? It depends. I am not going to say if it is big or little, but this is what I estimate. The ethanol price decreases about 6 percent, because what you are doing is the "plant price received." Because their price drops, they can't pay as much for corn. The price of corn drops, the production drops, and the net cost to blenders increases 15 percent. So the two parties that are hurt by this are blenders, if they have been pocketing some of that tax credit, which I am sure they have, and corn producers, because the value of their corn crop goes down. Those are the two big affected parties.

Another way of measuring this is by looking at the taxpayer costs. This is a $6 billion tax credit that will be cut. By not renewing the tax credit, we are basically cutting the federal budget deficit by about $6 billion. The ethanol plant returns over corn costs, because their price of producing ethanol drops, their price drops but their costs drop, too. It is a small drop in ethanol plant viability. They are still viable operations.

The value of the corn crop decreases by $8 billion. That sounds like a lot, and it is a lot. But the corn crop is worth $80 billion – a big value. So $8 billion is a lot, but not relative to $80 billion. But I am not going to be judgmental. That's a lot of money. Fuel prices are either going up or down a bit, but consumers aren't going to notice too much change, only a penny or two one way or another. That is the impact of eliminating the tax credit.

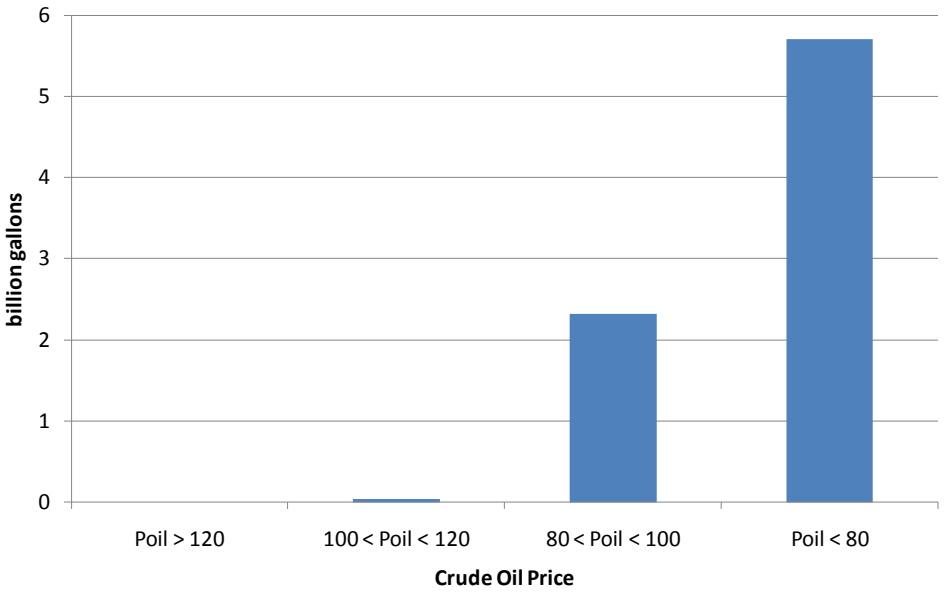
What if we also then eliminated the mandate? I am not advocating eliminating the mandate; I am not advocating anything. I want to understand how important these policy tools are in 2012 for the viability of the ethanol industry.

You can see U.S. ethanol production goes down by quite a bit, to 11 billion gallons. If you were to sit back in 2007 and 2008 and said ethanol production was only going to be 11 billion gallons in 2012 and you didn't know about the RFS, that's a huge market. That's a viable market by my way of thinking. The corn price is about $5.

Again, this is centered around what the futures markets are telling us about crude oil prices and crude oil price volatility.

What I want to show now is just a little bit about what that mandate actually does. If you look at when that mandate does anything, it does it when oil falls below $100 a barrel. If you have $100 crude oil, you don't need a mandate. The market will take care of things. But, if oil were to fall below $80 a barrel – and this is the average across the simulations where I did $80 crude – you can see ethanol production goes down a lot, almost 6 billion gallons [Chart 8]. But, if you keep oil expensive, eliminating the mandate does nothing. So what it does is basically stabilizes the ethanol and corn market for drops in crude oil prices and it does a much better job than any variable VEETC or anything else would do. Keeping the mandate there is what protects the corn and ethanol markets from a drop in crude oil price. You don't need the VEETC to do it.

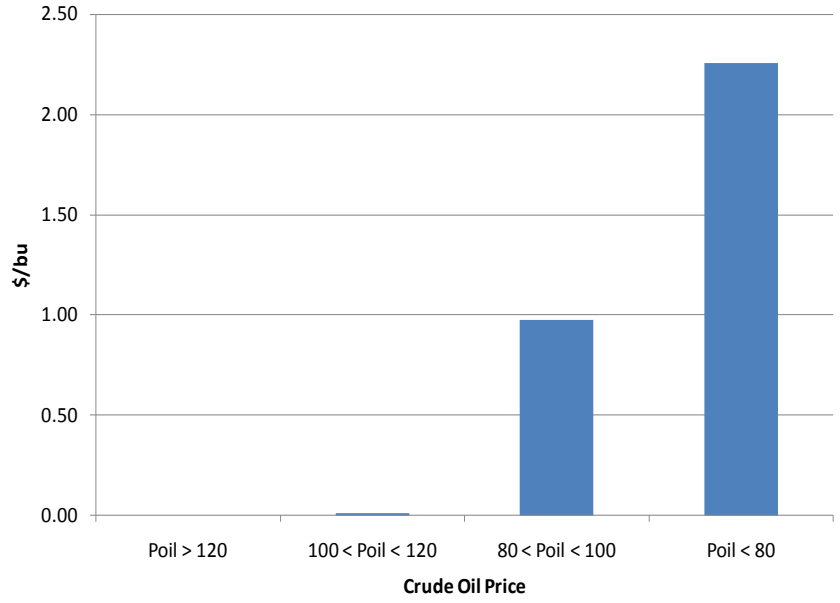
Chart 8: Drop in Ethanol Production from Elimination of Mandate



If you look at the corn price, you see the same effect. It keeps corn prices high. If crude oil falls and you keep the mandate, it only has an impact when crude oil falls below $100 a barrel and its primary impact is when crude oil falls below $80. Essentially, if I were a corn farmer and I was going to buy a risk management tool, I'd put all my

lobbying efforts into keeping the RFS, because it cuts off the tail end of the price shock to corn if the crude oil price falls.

Chart 9: Drop in Corn Price from Elimination of Mandate



I want to conclude by talking about some general policy implications. Before I forget, I am not just analyzing this from the perspective of corn. I am supposed to be here to analyze it from society's point of view. If we are really in the business of using biofuels to obtain nonmarket goods and services, we wouldn't be in the business of using biofuels to do it. They do offer nonmarket values, but there are far less costly ways of lowering greenhouse gas emissions.

The most cost-effective way of lowering greenhouse gas emissions is through a carbon tax. Period. End of story. So, if you want to lower greenhouse gas emissions, be in favor of a carbon tax. I am sure there are not very many advocates of that in this room, but I am letting you know that is the answer. Don't confuse things by saying we are going to lower greenhouse gas emissions, because we really need to do it … and, by the way, we are doing it through biofuel mandates.

If you wanted to reduce consumption of imported oil, you put in place a gasoline tax and mandatory fuel efficiency standards, but a gasoline tax is the most effective way

of doing it. You don't do it through subsidizing a domestic fuel. Also you count Canada as our 51st state and you allow that pipeline from Alberta to be built and come into the U.S., so we can obtain a stable supply of crude oil from a politically stable neighbor. That would do it, too.

If we are talking biofuels to achieve energy security, the lower cost way of doing it is to build that pipeline to Canada. Don't let it go to Vancouver where they are going to export it to China. We have to be clear why we are doing this. Ethanol may be a low-cost way of meeting air-quality standards, but the market will sort that out.

Okay, I am taking off my economist hat. That to me is pure economics about how you efficiently obtain nonmarket values. But when has Congress ever listened to an economist? Half of them seem to think there would be no impact if we default on our debt. This is minor compared with that.

I have some specific policy recommendations. If you are going to use biofuels to meet this, even if there are lower cost ways of doing it, it makes no sense to have taxpayers close the gaps through a subsidy. If these things are the nonmarket values of what you are after, who is causing the problem? It's not taxpayers. It is fuel users, so you should do it only through the mandates. You mandate these biofuels into the fuel supply and make fuel users use them. That is what I would recommend.

I'll leave it up to you. But does it really make sense to mandate a fuel that the substitute value costs $3, but it costs $5.40 to produce? There has to be a limit to how expensive these mandates are. We are going to discover after the tax credit goes away for biodiesel if we have reached that limit with biodiesel. It costs $2.40 more than its market value, so it is almost an 80 percent markup on biodiesel relative to its market value.

The last thing I want to talk about is other policy decisions. The current ethanol mandate is too large. How do I say that? It's too large without the complementary infrastructure investments that will allow us to use more ethanol in our vehicle fleet. Right now, we can only use about 14 billion gallons. Our mandate is going to 15 billion gallons plus 500 million gallons of advanced biofuels plus another 1 or 2 billion. So we are talking 17 or 18 billion gallons in a very short time. We can't use it at E-10, without expanding the ability of the vehicle fleet to use it. The first step was EPA allowing E-15

blends, but no one is going to go to E-15 without blender pumps. It's just not going to happen.

The question that Congress needs to wrestle with before they decide on subsidies for blender pumps is, do we want to hitch our future to more ethanol? If we do, then we should invest in the infrastructure that takes us there. But we should do it with our eyes open.

Is there an alternative to biofuels or ethanol? If we decide we don't want to go down the path of ethanol, that we want the market to decide how to meet the mandates, there are other types of fuels out there that private businesses and big companies are investing in. There is cellulosic ethanol, but that is still ethanol. It still has to come into a 14 billion gallon market. How are you going to do that?

The only way to actually go beyond 14 billion gallons of biofuels – unless it is ethanol – is to do drop-in fuels. Biobutanol might be one source where you could use starch from corn and make biobutanol. That is a drop-in fuel where you don't have the blend wall problem.

There are also synthetic gasolines and diesels that companies like Amyris in California are working on. Companies in Wisconsin are working on fuels that take sugars from either cellulose or from corn starch and have drop-in fuels that don't have that blend wall.

I would end by saying that before Congress starts investing a lot of money in irreversible investments that hitch our wagon to ethanol, we ought to think whether or not that is the molecule we want in biofuels or are we going to allow the market to decide how best to solve that problem. With that I'll end.

Outlook for Biofuels (Remarks)

Bob McNally

The Rapidan Group

Introduction

I am delighted to have been asked to discuss the outlook for U.S. biofuels policy. Before I begin, a quick word about my background and perspective. I approach this subject with 20 years professional experience observing and participating in energy markets and policymaking. The bulk of my career and current role is an observer and analyst of markets and policy, not issue advocate. With the exception of two and a half years' service on the White House staff during George W. Bush's first term, my responsibilities entail mainly helping investors and companies outside the Beltway understand – not influence –policymaking. So while I flew in from partisan Washington today, I am trying to call balls and strikes and have no professional stake in the biofuels, or any other policy discussion.

My outlook for biofuels is, in a word, stark. Hopefully my remarks today will convey three themes:

First, corn ethanol's political power in Washington has peaked and is now in surprisingly rapid decline. Future policy support is blocked, and past policy supports are being scaled back. No one expected such a dramatic turnabout, the speed and extent of which is startling. Corn ethanol will be lucky to hold on to a 15 billion gallon per year (bgy) blending mandate, and other, "advanced" biofuel mandates are likely to be reduced by future Congresses or the Environmental Protection Agency (EPA). This shift in policy support for corn ethanol is not yet fully factored into commodity market analysts' and energy investors' expectations.

Second, following from the first theme, Washington is unlikely to help ethanol surmount the main public policy impediment to greater biofuels blending – i.e. the 10 percent of gasoline "blend wall." Washington's new power constellation and fiscal austerity imperative will limit the future regulatory or fiscal support needed to push ethanol into intermediate blends (e.g. E15) or E85. In the absence of high public support,

future growth in ethanol will require technical breakthroughs that dramatically lower costs and allow for production at the commercial scale.

Finally, when ethanol is blended at levels below the blend wall, prices will depend on ethanol's suitability as a substitute for gasoline, which in turn depends on oil prices. Oil prices are likely to see greater cyclical swings as OPEC is not investing in enough capacity to retain an adequate supply buffer with which to dampen volatility. Greater oil price swings will reduce certainty and bedevil investment in conventional and bio-based energy.

As I elaborate on these three themes, let us briefly take a look back, around, and ahead.

Looking back

Biofuels were very much present at the creation of the modern U.S. transportation sector. Henry Ford supported ethanol and designed his Model T to run on either ethanol or gasoline. But, due to ethanol's relatively lower energy content and the discovery of large new oil supplies in the U.S., gasoline became the transportation fuel of choice.

Ethanol's chief attribute as a liquid transportation fuel was and remains that it is home-grown. Ethanol blending reduces dependence on imported oil and supports domestic farmers and workers. But, that attribute was not high on the priority list as long as we controlled the global oil market and could keep prices low and stable and import dependence small.

That all changed 40 years ago when OPEC supplanted the U.S. as the dominant force in global oil markets, oil prices rose and imports soared, and energy security became a top policy priority. To promote the growth of a domestic transportation fuel supply, Washington exempted ethanol from part of the federal motor-fuel taxes, placed a tariff protection on imports, mandated government fleet purchases, and extended loans and loan guarantees for ethanol plant investment and federal R&D.[9] Later, policymakers added pro-ethanol incentives in federal fuel economy rules and provided a volatility waiver to the formula in the oxygenated and reformulated fuels programs.

[9] Glozer provides a superb summary of the history of ethanol policy support in the United States.

Although President Reagan pared back some support for ethanol, Republican ethanol champions such as Senators Dole, Lugar, and Grassley, as well as longtime Senate Energy Committee Chairman Pete Domenici, protected the blending credit, and the tariff protection survived and was increased. Ethanol has historically enjoyed strong voting blocks in the House and Senate, and the importance of Iowa's role in the presidential nomination process is not lost on aspiring presidential candidates.

In the 1990s, another rationale for ethanol blending emerged: environmental protection. The 1990 Clean Air Act Amendments (CAAA) mandated oxygenates in gasoline to reduce carbon monoxide emissions resulting from gasoline combustion. As ethanol's chief competitor in the oxygenate market – methyl tertiary butyl ether (MTBE) – was phased out due to concerns over water contamination, ethanol benefited further. In the last decade, energy, security and environmental rationales for ethanol blending combined to create a third, and by far the biggest, political wave of support for ethanol. Terrorist attacks and oil price gyrations renewed national alarm about energy security, and the reduction of greenhouse gas emissions became the holy grail of the environmental movement. By offering benefits and political support to both causes, ethanol supporters succeeded, via the 2005 and 2007 energy policy acts, in achieving a new and powerful policy support for ethanol – a large and direct blending mandate. Specifically, in 2007 Congress ordered that the U.S. blend 15 bgy of ethanol into gasoline by 2015, which translates into a conversion of some 40 percent of the U.S. corn crop into 10 percent of the gasoline pool. The nation must consume another 21 bgy of advanced (cellulosic, not corn starch-based) ethanol by 2022. From an energy policy and political perspective, the ethanol mandate is probably the single most impactful energy policy Washington has implemented in the last 11 years.

From a financial market perspective, it is no secret that neither Wall Street nor the oil industry is terribly fond of ethanol on its merits. But market participants came to believe ethanol was a winner in Washington. As Senator Feinstein (CA) observed: "Ethanol is the only industry that benefits from a triple crown of government intervention: its use is mandated by law, it is protected by tariffs, and companies are paid by the federal government to use it." Investment in ethanol production and actual blending soared. Commodity analysts and traders began to assume a greater part of

future liquid fuel demand would be met by biofuels. And oil companies began to acquire ethanol facilities and started to view corn fields as upstream energy assets.

Looking around

As we turn to the near past and present, it is striking to watch how ethanol's fortunes have fallen so hard and so fast in Washington. The change was completely unexpected and is still underway, and market participants have been slow to realize it. I must admit, as one who has been noting the turnaround in ethanol's fortunes over the recent years, the collapse in recent weeks has been breathtaking.

With the benefit of hindsight, signs of the trend shift emerged in 2008, when agricultural commodity prices soared as ethanol was ramping up in response to the 2007 Renewable Fuel Standard (RFS). Of course, other factors were also at work in the commodity price boom. But, there had been no prior official analysis by the Energy Information Administration (EIA) or anyone else of the impact of the RFS on grain prices. Unusual for such a major energy policy initiative, Washington mandated first but analyzed and debated later. Now well underway, the food versus fuel debate will rage for years. Yet in Washington, perception matters as much as reality, and the perception was and is that biofuels mandates contributed to rising food prices.

The second shift came in 2009, when the always-tenuous alliance between the environmental community and the ethanol community began to sour. While green groups appreciated corn ethanol's utility in reducing carbon monoxide, they were irked by exemptions from tough rules limiting vapor pressure. Nor did they like the fossil fuel consumption, land-use impacts, and life-cycle carbon emissions associated with higher ethanol blending. But as long as cap-and-trade was on the table in the late-Bush and early-Obama administrations, green groups held their noses and allied with ethanol. Green groups did lay some traps in the path of potential corn ethanol growth by insisting in the 2007 RFS that biofuels blending above 15 bgy come from more efficient, less carbon emitting sources than corn, such as cellulosic ethanol. But in the last two years, the Great Recession and Republican gains in the 2010 election have taken cap-and-trade off the table, and as a result, the falling out has gathered steam. Now that the chief rationale for the ethanol-green alliance has fallen away, tensions are laid bare and the

gloves are coming off. Green groups are stepping up opposition to ethanol on grounds that it emits high amounts of carbon on a life-cycle basis and that blending credits are an expensive way to cut carbon emissions. (The Congressional Budget Office estimated blending credits cost about $750/ton of CO_2 equivalent reduction.[10]) Environmental groups joined with their usual foes on letters to Congress opposing E15.

The third, and I would argue most important, challenge corn ethanol faced was the emergence of fiscal austerity and the need to tighten fiscal policy, which is now the primary focus of the Republican-controlled House and also the top priority of the Senate and White House. And given the size of our fiscal imbalances and the election outlooks of most observers, it is fair to assume Washington's budget cutting imperative won't be going away soon. Even those without a strong anti-ethanol bias found it hard to justify continuing a blending credit for a product whose demand is mandated.

Long envied, courted, and respected, ethanol now finds itself vulnerable, low-hanging fruit and facing an "unholy coalition" of environmentalists, fiscal conservatives, the oil and food industries, and small engine manufacturers able and willing to block its growth and take back its prior gains.

The first tangible signs that corn ethanol was in trouble in Washington came during the E15 debate in 2010, when Congress and the White House failed to direct EPA to grant ethanol the sweeping waiver for E15 it desired. Then the Tea Party and Republican House came to town. Turning first to E15, the House voted twice to deny federal funding for E15 blending pumps and storage tanks, by 262-158 and 283-128, and by 285-136 to block E15 waiver implementation.

Then the $6 billon per year blenders' tax credit moved to the center of the bulls-eye. In June, the Senate voted 73-27 for a Coburn/Feinstein proposal to end the blending credit immediately rather than wait for end-year expiration. A strong reversal from the 1990s, when it was the anti-ethanol forces that typically lost Senate votes with counts in the 20s.

The most recent indication of how far corn ethanol's star has fallen came during President Obama's recent news conference – actually the first Twitter town hall. He raised eyebrows calling corn ethanol producers "probably the least efficient producers

[10] CBO

[compared with cellulosic]" and saying "it's important for even those folks in farm states who traditionally have been strong supporters of ethanol to examine are we, in fact, going after the cutting-edge biodiesel and ethanol approaches that allow, for example, Brazil to run about a third of its transportation system on biofuels. Now, they get it from sugar cane and it's a more efficient conversion process than corn-based ethanol. And so doing more basic research in finding better ways to do the same concept, I think is the right way to go." The President reportedly has put the blenders' tax credit on the table to help offset a continuation of the payroll tax cut.

Adding further support to the negative outlook for ethanol, official energy analysts making long term projections on fuel mix are becoming more cautious about biofuels growth. Whereas International Energy Agency (IEA) projections had ethanol accounting for almost half of gasoline demand growth in the last five years, IEA now projects the fuel will account for less than a quarter of demand growth in the next five years, despite higher projected oil prices,[11] due to higher corn prices and greater uncertainty around mandates.[12] IEA sees global biofuels rising from 1.8 million barrels/day to 2.3 million barrels/day by 2016, displacing some 5.3 percent of gasoline and 1.5 percent of diesel by 2016 on an energy content basis.[13] IEA does not expect cellulosic biofuels to achieve widespread cost competitiveness with conventional gasoline until 2030, despite aggressive mandates.[14] IEA projects advanced biofuels will rise from 20 thousand barrels/day now to 100-130 thousand barrels/day in 2016. Even the Department of Energy's (DOE) forecasting arm, the Energy Information Administration, projects the U.S. will fail to meet advanced biofuels targets by 2022.

[11] IEA, p. 90
[12] IEA projects global biofuels rising from 1.8 mb/d to 2.3 mb/d by 2016, displacing some 5.3 percent of gasoline and 1.5 percent of diesel by 2016 on an energy content basis.[12] As for cellulosic biofuels, IEA[12] does not expect cellulosic biofuels to achieve widespread cost competitiveness with conventional gasoline until 2030, despite aggressive mandates. IEA projects advanced biofuels will rise from 20 kb/d now to 100-130 kb/d in 2016.
[13] IEA, p. 20
[14] EIA, March 24, 2011. http://www.eia.gov/pressroom/presentations.cfm, slide 4.

Looking Ahead

With the blenders' tax credit all but dead and buried, the most important public policy issue now confronting the ethanol sector is the so-called "blend wall," where Washington appears to have mandated a major contradiction.

On the one hand, EPA limits ethanol blending to 10 percent of conventional gasoline, the sales of which are about 140 bgy – so the limit is 14 bgy. (Some think the practical ethanol limit is closer to 12 bgy because of inadequate distribution infrastructure and summer blending constraints in southern states due to high evaporative emissions associated with ethanol blends.[15]). On the other hand, the RFS has mandated 15 bgy of corn ethanol by 2015, requiring blending above the 10 percent level. Technically there is no explicit contradiction, because the RFS is designed like a cap-and-trade program where producers can fulfill their obligation by either blending the required amount of ethanol or purchasing blending credits, called RINs. Theoretically, if actual ethanol blending is limited to 10 percent of gasoline, but the RFS mandated more, RIN prices would rise as obligated parties sought to fulfill both mandates. But those higher RIN prices would be passed along to the pump, which would likely attract conservative opposition since it would amount to a tax penalty for refusing to blend an amount of ethanol Washington has simultaneously mandated and prohibited.[16]

Discussion about weakening the RFS has already started in Washington. Senator Inhofe (R-OK) and Representative Issa (R-CA) have introduced the Fuel Feedstock Freedom Act, which would allow states to withdraw from the RFS. However, state opt-outs are likely to be logistically difficult if not unworkable. Eventually, either Congress or EPA will probably reduce the mandate to prevent it from colliding with the blend wall and raising gasoline prices.

The ethanol lobby saw the blend wall danger and first tried to surmount it by getting EPA approval for "intermediate" blends above 10 percent, such as 15 percent ethanol or E15. Ethanol forces are trying to secure federal funding and indemnification for intermediate blend infrastructure and consumer acceptance. While EPA (grudgingly,

[15] Tyner, Dooley, Hurt, and Quear

[16] For a version of this argument pertaining to cellulosic RINs and involving economic scarcity instead of regulatory prohibition, see *Cellulosic Ethanol and Unicorns: The EPA punishes oil refiners for not buying a product no one makes*, Wall Street Journal editorial, July 15, 2011

I suspect) granted partial approval for E15 blends, they did so with the full knowledge that very little is likely to be sold due to large remaining infrastructure compatibility, cost and liability concerns, as spelled out in a recent GAO report.[17] Even ethanol-laden companies like Marathon and Valero said they would not offer E15. While ethanol forces took heart when Senator McCain's bill against ethanol pump funding failed 40-59, it is far from certain that Congress will be in the mood to grant ethanol additional funds or legal protection to enable E15 growth.

Some investors surveying the scene have concluded the future of the biofuels industry belongs to Brazil. Setting aside a recent surge in ethanol *exports* to Brazil, optimism stems from the fact that Brazilian sugar-cane ethanol will dominate the 5 bgy non-cellulosic slice of the 16 bgy "advanced" biofuels market that starts to come into effect in 2013. Companies like Shell appear to agree with President Obama that Brazilian ethanol is the future and is making plans to invest in new facilities that would export to the US.

As far as Washington policy support goes, optimism that Brazil will be the big winner following the recent decline in ethanol support is misplaced. Congress did not establish aggressive mandates to make the world safe for Brazilian ethanol. Talk has already begun in Washington about reducing "advanced" biofuels targets if EPA does not administratively scale them back.

Grains and oil converge

From a commodity market perspective, it is noteworthy that grain and fuel prices are becoming more correlated and volatility is going up. Wallace Tyner, of Purdue University, noted the rapid explosion in ethanol's market share has established a high and positive correlation between crude oil and corn that has not previously existed. Below the blend wall, the price of crude will drive ethanol prices. Above the blend wall, the price of corn will drive ethanol prices.[18]

There are also important linkages between the RFS and higher grain price volatility. As the RFS mandate rises, it will introduce a price-insensitive source of demand for corn. That in turn will impart greater price volatility back onto agricultural

[17] GAO
[18] Tyner

markets. Two academics recently estimated that at times when the RFS is driving ethanol demand instead of high oil prices relative to corn, inherent volatility in U.S. grain markets will rise by about 25 percent. In addition, volatility of U.S. coarse grain prices in response to supply side shocks in energy markets will rise by almost one-half.[19]

A word about biodiesel and wind energy

Biodiesel history has mirrored that of corn ethanol. The inventor of the diesel engine, Rudolph Diesel, actively considered agricultural feedstocks as a fuel. But petroleum distillate established a dominant position, though oil price hikes of the 1970s renewed interest in homegrown alternatives. Commercial production of biodiesel began in the 1990s, but only increased sharply since 2004 when a $1 blending/production credit was implemented. In 2005, supplemental credits for the "renewable diesel tax credit" ("renewable" diesel does not use alcohol in conversion) and "small agri-biodiesel production credit" also went into effect. Biodiesel production was around 30 million gallons before 2005, but by 2008 was over 700 million gallons per year, with a large portion exported (though the EU has since imposed an import tariff that has hurt U.S. exports).

Biodiesel remains expensive compared with petroleum distillate. Biodiesel economics feature a high correlation between soybean oil and conventional diesel prices, since it takes a gallon of soybean oil to produce a gallon of soy-based biodiesel. In addition, soy-based biodiesel has slightly lower energy content than conventional diesel. Bruce Babcock, of Iowa State University, has noted biodiesel marginal costs are $2 per gallon higher than diesel, requiring a $1.00 credit and $1.00 RIN price.[20] This makes most analysts cautious about the outlook for biodiesel growth. IEA projects biofuel-based distillate will account for only 4 percent of diesel demand growth in the next five years, compared with having taken 9 percent over the last five.[21] EIA expects U.S. biodiesel use to rise from 0.1 percent of total liquids supply or 0.6 percent of diesel fuel

[19] Hertel and Beckman
[20] Babcock
[21] IEA, p. 20

consumption in 2010 to 0.6 percent of total supply and 3.0 percent of diesel demand by 2035.[22]

The $1 per gallon biodiesel blending credit does not attract as much support or opposition as the ethanol blending credit. Because biodiesel blending, and therefore subsidy costs, have been lower, it has avoided the attention of the budget cutters, so far. But being small has its downsides too – Washington has frequently let the biodiesel credit expire with barely a whimper. When the credit last expired in 2010, the industry estimated production fell 42 percent and nearly 9,000 jobs were lost. Production fell despite a retroactive and rising RFS mandate, and exports were hurt by an EU import tariff.

Last month, biodiesel supporters in the House and Senate introduced a bill that would extend the credit for three years, until 2014. The bill would reform the biodiesel tax incentive from a blenders' excise tax credit to a production excise tax credit, which supporters say will benefit biodiesel producers and improve the functioning and credibility of the subsidy program. Views are mixed as to whether it will be extended this year. In past Congresses, extensions usually passed without a pay-for, but now a pay-for is required and any funding supplies are low and likely to be depleted during the debt limit and continuing resolution agreements to come. Biodiesel is not part of Feinstein-Thune-Klobuchar discussions.

In biodiesel's favor, it enjoys a "carve-out to the carve-out" under the RFS, which not only mandates a broad quantity of "advanced" biofuels, for which biodiesel qualifies, but also a specific bio-based diesel mandate. Whereas EPA slashed the RFS mandate for cellulosic biodiesel from 500 million gallons in 2012 to less than 20 million gallons due to a lack of large-scale commercial production, the agency sees plenty of idled biodiesel capacity and has ordered the mandate increased from 1.0 bgy in 2012 and proposed a 1.3 bgy target in 2013. It is possible that steadily rising regulatory demand for biodiesel will require shifting production from corn to soy, which will create a new set of antagonisms and tensions that will play out in Washington between ethanol and biodiesel, splitting the biofuels sector.

[22] Annual Energy Outlook, EIA, 2011

As for wind, challenges to large-scale commercialization are fairly well understood. They include intermittency, austerity, distance from load centers, political opposition, and low natural gas prices. However, I am skeptical that $4 per MMBtu natural gas will endure for too long, given questions about the economics and politics of shale gas production, as well as strong political opposition to new nuclear and coal build-out. Ultimately, wind cannot scale unless large cost and technological barriers are broken (not the least of which are storage and transmission) and public opposition on footprint grounds is overcome.

It is likely that, like ethanol, wind will have to get by with lower subsidies in the future. Wind enjoys a 2.2 cent/kilowatt hour incentive, though Congress has often let it expire and usually extends it by only 1-2 years. The renewable energy production tax credit expires at the end of 2012 and will face an uphill battle to be extended.

Reaching for a happy note

Corn ethanol is mature and has probably reached the end of its growth phase for the foreseeable future in the U.S. Congress is no longer in the mood to subsidize or mandate ethanol blending beyond current levels, much less to help ethanol over the formidable "blend wall." Ethanol will retain value as an oxygenate and octane enhancer, and when economical, as a volume extender. And political support to retain a 14-15 bgy blending mandate will probably remain in place. A good part of the U.S. oil sector is now invested in corn ethanol. However other RFS mandates should be placed on downgrade watch. The U.S. will have opportunities to export biofuels, as it is currently doing to Brazil and increasingly to Canada (which just introduced a 5 percent biofuels target).

Perhaps the greatest hope of jumping the blend wall is the commercially scalable development of thermochemical processing technologies that can turn cellulosic feedstocks into bio-based gasoline and diesel. Tyner estimates the crude oil break-even price for thermochemical processing to be $108 per barrel.[23]

Such crude prices are well within the range we have seen and, in my view, are likely to see going forward. Income-driven, price insensitive developing country oil

[23] Tyner

demand is strong, and the supply curve is steep. As a result, crude prices are likely to remain in the range of recent years' for the foreseeable future. Notably, that oil price *range* has been very wide – from $147 to $34 in recent years, in fact in one year. Such wild gyrations in price are also likely to endure, since OPEC is not investing enough to maintain sufficient spare capacity to stabilize prices. Short-run oil price elasticity of demand and supply remain very low, implying large price swings will be needed to balance net supply growth and consumption when they are unbalanced. Oil prices are likely to resemble a roller coaster ride for some time to come, which will retard investment in biofuels and conventional energy supply alike.

As Lucille Ball said, "Whether we're prepared or not, life has a habit of thrusting situations upon us." Market participants and officials are still coming to terms with a new and volatile energy situation, of which biofuels is now an important part. We must contend with declining public policy support for biofuels, daunting technological obstacles, roiling feedstock prices, and uncertain investment economics. To cope, we will have to learn to live with greater price volatility, devise more rational public policies, and accelerate research and development for alternative energy break-throughs.

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General Discussion

Transcript

Moderator: Mark Snead
Vice President and Denver Branch Executive
Federal Reserve Bank of Kansas City

Mr. Mark Snead: We have a few minutes for questions. I will just start out with, exactly how large a carbon tax were you recommending? [laughter]

Mr. Jim Andrew, Andrew Farms, Inc.: Dr. Babcock, I'm Jim Andrew, an Iowa farmer. I just returned from Washington lobbying for these very mandates and subsidies last week. There is one more nonmarket value of biofuels and that is jobs. That seemed to be the resonating point with every member of the Iowa Congressional delegation. If you talk about it, first, the high-paying jobs that were created and, secondly, the farmer investments that are made in ethanol and biodiesel plants are a consideration that should be in your chart.

Mr. Bruce Babcock: Jobs aren't a nonmarket value. They follow from the market price of the fuels. That's an economics lesson, and you are teaching me a political lesson. That has more political resonance than anything. I agree with that. You get to the point about these policies following the investments. I agree with you that you have these farmer investments in these plants without a mandate covering them and they could be a stranded investment. That's why I think it is important for the Congress to have a discussion about, do we want more stranded investments by investing in blender pumps and investing in pipelines and other flex-fuel vehicles?

Do we want to make that investment? Because as soon as you make that investment, then there will be people going to Congress saying we have to protect that investment by adopting policies that subsidize the use of these fuels, so our investments weren't wasted. I agree with you that the stranded farmer investments are one reason why politically you need the mandate. But, I would say, before we go on and make more investments that would create its own lobby to have it also protected, let's have that conversation about, do we want to do that with ethanol or other biofuels?

Mr. Andrew: Can I just add to this? What else would be required for a fully market-driven market for biodiesel?

Mr. Babcock: A big tax on diesel – but I guess that is not market-driven, is it? It's tough to find out how vegetable oil can be used economically in biodiesel. You saw that 4.4 percent growth in soybean consumption over time. The world wants vegetable oil and soybean meal or protein meal. The world wants it. You are working against that world demand. So maybe a tremendous oversupply of soybeans would help. If productivity grew by 5 percent for soybeans, that would lower the cost of soybean oil and that would allow it to kick in.

Mr. Kenneth McCauley, Past President, National Corn Growers Association: Dr. Babcock, my former friend.

Mr. Babcock: I didn't know I had any friends left on the _____

Mr. McCauley: I am not sure you do. [laughter] One thing I think is really important – your points are good – but, on the road getting to this point, we have to go back to remember why we did these things. We did a really good job of putting these things in place, because we had corn selling for way below the cost of production. We were farming for the government program. Really, corn got cheaper than grass and it affected a lot of things. We've built this industry.

Now your points are good, but the other part is that some of your presentation looked confusing to me, because we had biodiesel versus ethanol. Ethanol is standing on its own today. If things stay the way they are, we are probably in good shape. Talking about new fuels at this point doesn't look like the agriculture-friendly issue we want to talk about – in my opinion anyway. We've elevated agriculture to a place now where we are profitable across the board and one of the few good points about the whole U.S. economy.

I told my friend from Iowa to take his Valium, because he's not really happy with you either. But I think you have to recognize those things.

Mr. Babcock: Let me address the first point. When you say we've taken the industry higher, presumably that means we've put in place the policy tools that took corn higher. I disagree. High crude oil prices – MTBE plus the certainty of the policy – took corn higher.

Ethanol plants had margins of $1.30 a gallon that lasted 18 months. You can pay off a 100-million-gallon ethanol plant in about 11 months of those margins. Those margins are what drove the ethanol industry higher. It wasn't the government policy. So you cannot attribute the growth in ethanol and the high corn prices to ethanol policy. It was the higher crude oil and cheap corn combining to make big margins, which created a gold-rush fever into the ethanol market.

The paper I did just a bit ago would suggest we would have $5 a bushel corn today. Corn would be at $5 if we never had an ethanol policy in an E-10 world.

My last point is I hope I'm making the differentiation between ethanol, which largely can stand on its own. At $100 crude oil, even at $80 crude, it will be a viable industry, with or without government subsidies and policies. The mandate serves as an insurance policy against that from lower crude oil prices. Biodiesel is a different animal. The production costs are too high. So I hope I differentiated between the two sufficiently.

Mr. Snead: At the risk of broadening your final comments, could you talk a little bit more about unconventional -- both crude oil and natural gas – in the broader equation?

Mr. McNally: On the oil side, clearly there are real grounds for optimism. Mainly due to improvements in hydraulic fracturing and multistage hydraulic fracturing and so forth, we are able to not only unlock and make commercial resources of oil and gas we knew were there but not producible economically, we can do that now. So all that is real. If anything we're still underestimating in our consensus estimates of what the shale and the oil gas potential really is. It is a sector the U.S. is able and willing and we have seen _____take the lead in. We have the right kind of small, independent risk-taking companies. We have the technology. We have the profit incentives and so forth. So it's no surprise we'll lead the world in this. It is a very promising story. However, both for oil and for gas, in my view, there is enormous regulatory risk.

The U.S. public cares very little about global warming. They care very little about reducing carbon. But they care an awful lot about water, whether it is in the water-starved parts of the country or the water-rich parts, they just don't like people drilling through the water aquifers, not saying what they are putting in the fluids, causing little earthquakes, and taking out really gunky water. It makes them very, very nervous.

While I believe there is no real significant risk to water from hydraulic fracturing in my view, that almost doesn't matter because with water there is very low public tolerance for risk. So I think the industry and all of us have to come to terms that, while the resource is there, we have the technology to produce it, we may have to have a little higher gas prices to do so, we are going to have a real humdinger of a policy discussion and debate over how we balance protecting water against producing this energy.

Mr. Thomas Hoenig, Federal Reserve Bank of Kansas City: Bob, one of the issues that always comes up in this context – I don't know the answer to this and maybe it's zero – is what are the dimensions of the subsidy floor for carbon energy that goes on in this country, because we talk a lot about biofuels and ethanol, but what about this other energy source we compete for? Do you have any sense of that?

Mr. McNally: Off the top of my head, I have no firm numbers. Generally the industry response to that is the industry takes advantage of tax breaks, which are widely available to other sectors. Whether it's an investment tax credit or other kind of income tax breaks, they will say, "This isn't a specific tax break for the oil industry, we just happen to be the largest payer of this category of tax, because we pay the most taxes because we are so big."

In terms of specific directed subsidies, they would say it's quite small. Matter of fact, I have heard some of the large companies say, if I'm not mistaken even Exxon say, "Take away. Just take it away for everybody."

So they call out those folks on that ground. They say, "It's not just us who is getting it, it's everybody. If you want to take it away for everybody, that's fine and, if you want to take every little one we have, that's fine too."

I believe that's how they respond to that present headache.

[Audience Question]: I have a question on your prediction of a lower RFS. How much lower? What is your probability that happens? And when do you think that will happen?

Mr. McNally: You sound like you are one of my clients. [laughter]

Within the next year or two, I think the probability of touching the ethanol orifice, the 15 million gallons a year is low – so 15-20 percent. There is discussion of having a broad ethanol compromise discussion in the House where we finally work out although

we can't get blending credits done, but we work out some incentives for E-15, we take down the advanced biofuel targets, and maybe we tweak and adjust the 15 billion RFS. But that won't happen until it becomes visibly painful in a political way. That will happen only when you start to see what we haven't yet – and that is where the RFS is binding, where you are forcing that tax gap to be closed by RIN prices going up. Going with the price of gasoline and the *Wall Street Journal* saying, "Americans are paying a useless tax." We're sending taxpayer dollars to blenders – consumers of ethanol for no good reason because they are refusing to consume a product that cannot be produced by law. That's ridiculous!

If that discussion starts and comes into full bloom, that is when we will tweak it. The chances of that happening in the next year or two are pretty low, so I'd be low on that.

In terms of the RFS for the advanced biofuels, I think that could come within next year or two. Maybe we would have to wait through an election. By 2013, I'd be surprised if either EPA, using its authority under the Clean Air Act, or Congress hasn't drastically taken down some of those advanced biofuel targets.

Mr. Snead: May I add one more element to the discussion? Many are arguing the game changer is carbon constraints. Can you think out loud a little bit what the potential for biofuels will be if and when we see that first real carbon constraint?

Mr. Robert McNally: Depending on how the policy would be implemented, it could be significant, as Bruce said. They peg carbon tax on fuels and it will help certainly cellulosic. The problem is there is a debate - and again, as the Greens and the ag community fall out and start arguing more and more - what is the real carbon impact of biofuel subsidies and mandates?

Some would argue on a lifecycle basis, it's a loser. So it's chief for corn ethanol. It's very unlikely we'll put a carbon constraint on. It's more likely we will go to an energy tax of some sort in an eventual fiscal workout. Nevertheless, if we were to put a carbon constraint on, it would rekindle this debate about whether corn ethanol is really helpful in that way. What you do is steer more interest in investment and consensus to help the cellulosic and biodiesel and other forms of unquestionably less carbon-emitting biofuels.

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Transcript

Thomas M. Hoenig
Federal Reserve Bank of Kansas City

Thank you very much. First of all, thank you, Paul, for a very warm introduction. Thank you all for coming here. Paul said this Bank is interested in agriculture. But, to begin with, we are a regional Bank. I am going to tell you, I value the regional Federal Reserve System as much as I value any element of how we govern this country or how we think about this country, because it really is one of the most grass-roots systems in the American democracy today.

We have 12 Banks across the country. We have constituents from every corner of the country who provide input into monetary policy that is really quite unique. It is extremely important we continue it, and therefore, our Bank has focused on things that are unique, or important at least, to this region. Agriculture is one of those areas. So it is our honor and our privilege, really, to have this program.

One of the other areas, and why it mixed so well today, is we are also a big producer of energy in this region and in almost every element of energy production in this region. It really does make sense that we have this conference and that we talk about these important issues.

This evening, though, I've been asked to kind of "macro it" a little bit. We've talked a lot about production economics, which is extremely important. I think Bruce Babcock and Bob McNally today gave compelling stories for us to think about and to listen to because it does affect the future of the country. In a way, it is going to come into play in my remarks here this evening.

But I am, first of all, going to set the context, and that is what I think of as our current state and what the outlook is for our national economy, in a global context perhaps, and then talk about some of the issues we have to confront as a nation. Because if we don't, it puts more and more pressure on the Central Bank to do more and more bad

things to give short-term remediation to long-term problems. They almost always end up in worse long-term problems.

So I begin by saying the outlook for the U.S. economy – and this is my opinion – is that we will continue to grow at a modest pace of somewhere between 2½ percent, and on a good quarter 3 percent, for at least next year and perhaps the year beyond. I say that because the U.S. economy is adjusting to the excesses and poor policy of the last 15 to 20 years. I wish there were a shortcut to taking care of those problems, but the way we are all reacting and acting, I doubt there will be any kind of even intermediate solution to this.

The most important thing for us to realize is, for all the money that is out there, and we have printed a lot of money over the last three years, there is still an enormous amount of debt we have to deal with. In all of the sectors of the economy, if you think about it, the consumer in this economy of ours made a choice approximately 15 years ago to be a consuming economy and less of a producing economy. And we did that by lowering interest rates to incredibly low levels and by encouraging leveraged debt at all levels.

So the consumer in this country increased their debt-to-disposable income the last 15 years from about 80 to 90 percent, depending on when you start, to 125 percent at the peak. Through all this adjustment we've gone through, it is now 114 percent. That is hardly a deleveraged position. So we are dealing with that. When they say the consumer is not really doing their part in all this, I think they are quite remarkable in that they continue to consume, given the leverage they have to deal with at the same time. To me, they have been a very positive force in this recovery, because they haven't collapsed.

You see that in the fact that, although the savings was almost zero at the peak of that 125 percent, it is now 5 to 5½ percent. Our long-term average is 8 percent, so you see where you have to go there. Yet, they are going there slowly, as the economy slowly recovers. With that kind of leverage, it is unfair to ask the consumer to stay at 70 percent as a portion of GDP, up from its long-term percent of about 66 to 67 percent. We have to adjust that. That reflects my first point – that we decided to be a consuming nation rather than a producing one- because of the fact with our current account deficit running

negative or with the fact we consume more than we produce as a nation, it is clear we are a consuming nation and not a producing nation.

We were saying at my table during dinner that my hometown of Fort Madison used to be a manufacturing center. It has been pretty much hollowed out. A lot of those services and a lot of the products they provided to America are now produced elsewhere. So when you say you want jobs, you have to first say you want products and services. We've moved that somewhere else. We are still consuming it, but we are producing it elsewhere.

The second thing is that our debt is also pretty significant at the state level. States can't run large deficits; we know they have these balanced budget amendments. But they have these promises that are the same as debt. The only way they can meet those promises is to take away from something else, and that's why you see our universities starved, our education system starved, as we fund these long-term commitments to my generation, if you will, but that is just the facts.

At the national level, we are also enormously leveraged. We made a decision as a nation to go into debt to help satisfy our consumption at all levels. Our debt to GDP today – and I use gross debt, I don't have any use for this "debt held in the hands of the public", because any debt outstanding has a federal IOU on it, is debt that someone is going to claim someday – is 100 percent of our GDP and our average interest rate on that is 2½ percent.

So imagine what happens when interest rates start to go up. We are already at 100 percent and we have a future liability on everything I can think of that we promised to one another. When Bruce and Bob were talking today, think about it. The reason we can't get this debt ceiling addressed is because we all want something from the government. We all have decided that we are going to, if you will, refuse to be weaned from the government. Think about it.

Agriculture is one. You heard about it today. That is just one. Housing is another. Social Security is another. Medicare is another. These are all subsidies in one form or another. And they amount to trillions of dollars of future liabilities. If you put it on a balance sheet, depending on the time horizon you use, it is anywhere from $20 trillion to $50 trillion. So there is no easy solution to that.

And the fact we can't come to a solution is because we all have something to lose in the short term, and we are not willing to give it up, because the long term is enough in the future that we won't worry about it today. Someone else will.

Last year, we had the Bowles-Simpson Commission come forward with a bipartisan proposal that had all kinds of important elements to it. One of them was tax reform, which meant subsidy reform as well as tax reform. Another was that we were going to systemically decrease the debt to GDP over a generation. But, because it took away, it was dead on arrival. And now we are in this stalemate that can only lead to harsher times ahead.

Let me tell you how I suspect the pressure will come to solve this problem. I suspect that, as we have done in the past, we will look to the Central Bank of the United States and the world's central banks to inflate our way out of this, because it is so much easier. It is such a nice *hidden* tax. You don't have to take responsibility for it until it gets so bad it starts harming the economy and that is much higher than 2 percent or 3 percent or 4 percent. But that is what I suspect. What happens is, as these deficits continue to be in place at 10, 8, 9 [percent]

We will let those go forward, rather than come to an agreement on a deficit-reduction plan that all have to sacrifice to make work. We will do that. The debt will grow and what happens when that takes place, as the economy begins to recover, is real interest rates rise.

When real interest rates rise, it begins to slow the economy. When it begins to slow the economy, no one asks you to print more money. I promise you. The only thing they ask you to do is to make sure interest rates go down. Guess what? In the short run, the only way you can do that is to print more money. As you print more money, you've changed the inflation environment, and then inflation expectations begin to change the dynamics of the economy. Now debt to GDP is less, because you've grown nominal GDP so much more rapidly. And of course you have undermined the strength of your economy and your economic system, which countries tend to do, especially on fiat currencies.

My concern is that this is the course we are on. And you say, "Ah, that's nonsense, Tom. That's not possible."

QE2 was the monetization of $600 billion of debt. It was out there in the public and would have caused interest rates to be higher – maybe only marginally in the short run. But now it is on our balance sheet, and all those dollars are out there to be circulated at some point in the future. If you can do that in this instance, you can do it in the next instance and the instance after that.

Let me give you two comparisons. I am often told this, "Tom, don't worry about it. Inflation is low and labor costs are low."

In the mid 1960s, inflation in this country was 1.4 percent. We went into one war; we now have three. In the early 1970s, we went off the gold reserve standard because it made it easier to manage the economy. Then we went to wage and price controls, because inflation was starting to rise. We got up to 4 ½ percent. When that didn't work, because of misallocated resources, we went off controls and inflation went higher, the economy started to slow, and the Federal Reserve lowered interest rates in the mid-1970s. In the early to mid-1970s, inflation started to rise; that is when we did the Whip-Inflation-Now, or "WIN", buttons. That was a real success. [laughter]

Then we got off that and the economy started to slow, so we lowered interest rates. The economy started to return, inflation started to rise, and we began to increase rates and the economy slowed. We increased rates again, until *finally* inflation rose to 13 percent in the late 1970s and 1980, and then we had to crash the economy to get inflation under control. That's the scenario you do, when you think monetary policy can solve all your problems. Make sure you have all your subsidies in place and reform your tax structure so that all special favors go away, that's what you get – inflation. It's unavoidable.

The second example I'll give you is a recent one – 2002-03. We had the technology bubble bust, we had 9/11 – a horrible experience, we lowered interest rates to 2 percent, but then we wanted to insure. It was called an insurance policy to make sure unemployment came down. In 2003, we had interest rates down to 1¼ percent and unemployment was an unacceptable 6½ percent in this nation. Unacceptable! We had to buy more insurance, so we got the interest rates, policy rates, down to 1 percent and left them there for an entire year, even though the economy started to recover and we began a wonderful credit boom, led by housing — that became a bubble, that became a bust, and

now we have unemployment at 9.2 percent. Is that the tradeoff we would really make if we knew all the facts? I hope not.

I asked you that question, because here we are today with interest rates from the Federal Reserve at zero – 0.11 – whatever you want to call it. But I consider it zero. We have had QE2, which means even at zero we've bought another $600 billion of government securities – put the reserves out there – and what do we have? Well, inflation is still modest, it's rising, but don't worry. We have plenty of time to take care of it. It will take care of itself. Labor costs aren't going up rapidly yet, so let's not worry about it.

Now agriculture land values, when the cap rate is now down to – pick a number – 3½ or 4 percent. Be conservative, say 4½ percent. When the long-term average is 7½ percent, we are fine. When mergers and acquisitions transactions are being fed by low interest rates, the fund mergers and acquisitions further the consolidation rather than production process. You are taking production out as you consolidate. And the outcome is, of course, bubbles.

I don't predict bubbles. Maybe the land thing will pass. They will make the adjustments. We won't have any problems. Maybe the high-yield market will adjust and there won't be any problems. Maybe the mergers and acquisitions won't have a problem. Maybe the junk bond market won't have a problem. Maybe. But maybe not.

I can't tell you which one is a bubble. But I know the conditions. I have lived through three crises now. I know the conditions are ripe for bubbles. Guess what? Zero interest rates create the conditions. And you have them.

Now we won't remove it quickly, because why? No one wants to be the one responsible for lost jobs. That is the reason given. Even though from the last time, we didn't want to be responsible for lost jobs, we now have eight million more people unemployed. No one wants to take that step forward. That's what we are in the middle of right now – the inability to face hard choices.

I ask you this: You are in the commodities business. Do you know of any commodity that you trade that trades well at zero? Is there a market for zero? Do you allocate resources well at zero? Do you make wise decisions at zero? The answer is, I hope, no. Well, you are not going to do it with credit either, as illustrated by the largest

institutions in this country almost taking this country down because of zero-type interest rates that they all speculated on and will do so again.

Bruce, you thought you were giving them a bad message. Bob, you thought you were giving them a bad message. Well, I am giving you one too. My ending point is a point of hope. That is, this is the largest economic system in the world. It is still the most market-oriented system, even though it has its issues. It still has the most productive people in the world. And, if we step up to these issues, then we can solve them and remain the largest and most successful economy in the world, but it does take choosing.

Everyone is mad at Congress, because of the standoff. But my example, with the subsidies, is to point out to you that you are the problem whether you are agriculture or housing or Social Security or Medicare. They only do what you tell them to do. And they are doing exactly what you told them to do. They are playing politics. They are standing off, rather than making the hard decision. So it's up to us to make the changes. And that's my point.

So I am going to end on that cheerful note. [laughter] We have time for questions. I am *very* happy to take accusations or questions, either one, if you have them. [laughter]

Mr. Andrew Gottschalk, HedgersEdge.com: You mentioned QE2 purchasing another $600 billion in bonds and this money is out here somewhere. Later, you suggested it went into bank reserves. Bank lending hasn't picked up at all, and it's at $58 billion since September of last year. So is this money really circulating somewhere or is it still being isolated as reserves within the banking sector? If so, *why* is it being held? Is it because the banks have liquidity problems themselves? Is that what the Fed is trying to prop up or what is the issue?

Mr. Thomas Hoenig: I'll give you my opinion; others will disagree. If they live in New York, they will disagree. [laughter]

Here is how I look at it. First of all, banks can borrow at 25 basis points, basically reserves from us. They can invest in government securities, which ostensibly are low risk. Next week may prove it differently, but right now it is low risk. So they get a 2½ percent spread with no risk. What that does is give you an earnings flow that allows you

to amortize your losses. These large banks, for all the TARP they wanted to pay back, still had – in my opinion – losses. And you can see that by some of the announcements -- the reduced reserves and so forth, in terms of their earnings outlook, but they have been amortizing losses. In that kind of circumstance, you tend not to engage in lending.

If you look at the pattern, when the crisis occurred, lending dropped dramatically. Now it is not dropping anymore; there is barely a net increase in loans. From the largest institutions, there is a little more business lending going on at the banks; less than $50 billion, but it is marginal as well. Part of the reason is, if you are amortizing losses and you're rebuilding your capital, you can't lend. Part of the reason is that, given the economy is uncertain and given we are not building plant and equipment, there is not the demand you would normally see there. So it is a demand-supply situation, as well, but importantly affected by finishing up the amortization of losses and rebuilding capital among the largest institutions.

Mr. Gottschalk: If I could, I have a second question for you. Would you care to comment on the concentration at the banking level, especially with the top five?

Mr. Hoenig: I would be delighted to comment on the concentration. I do it all the time. [laughter]

It is a concern to me. I tell people, if you look at the history of this country and this economic system of ours, for most of our history we have had a distribution of financial institutions in size that mirrored the distribution of businesses – from very large to small – across the United States. We were unique in that. We had a broad base of lending. It was a basis for our innovation and entrepreneurship across most communities of any size in America.

When we put a safety net – and I can't just talk about the size, I have to talk about the causes – when we put a safety net over the financial institutions, starting with the Fed, but in the Great Depression, one of the things we did then is we separated out commercial banking from investment banking and high-risk activities. If you are a pure market person, that would not be very good. But, if you are a pure market person, you wouldn't have the safety net there. But when they did that, at least they had the good sense to separate it out.

The commercial banking industry was the payments system we all rely on and the intermediation – the lending process – we all rely on. And the investment banks were the cowboys for high-risk stakes, *but no safety net*. So they really did self-regulate in that sense. That became very comfortable and they began to tear down those walls.

Then we passed what was called Gramm-Leach-Bliley that eliminated that separation. So that's taking the high-risk guys and giving them access to the candy store. And they did exactly that. They took this very low cost of funds and low cost of capital around the concept they were too big and too important to be allowed to fail. And we confirmed that really with Continental Bank of Illinois. You created the risk exposure dramatically *and* you lowered their cost of capital, because of too big to fail. That allowed them to grow at a tremendous competitive advantage, in my estimation, to the rest of the banks – regional and community banks. We've done the studies and there is evidence that is exactly what happened. There is really good evidence to that.

So here you are. If you give someone a subsidy, and too big to fail was a subsidy around the safety net, like any subsidy, you grow it. In 1913, when the Federal Reserve was formed, the first safety net, the 5 largest institutions in this country – and this was when everyone hated the individual J.P. Morgan – controlled, in terms of their assets under management, our estimates are about 2½ percent of GDP – 2½ percent of GDP. As late as 1980, just before we went through that crisis and then eliminated Glass-Steagall, the 5 largest controlled in assets under management about 14 percent of GDP. Today, those 5 largest banks control 60 percent; the largest 20 banks controls 80 percent. The other 7,000 banks control 20 percent. We have concentrated this country. In terms of the distribution of businesses, we have this line and the distribution of financial power; we have it much more highly concentrated.

If you are a very large institution, you want to deal with very large credits. It's more efficient. Remember that word, *efficient*. It's very costly, and I know some of the larger firms have small-business lending and so forth. But it much more efficient to do the other and that builds further concentration.

Where I have an issue with some – like Larry Summers, the former head of the Administration's National Economic Council, saying all we needed was five, because that is what Canada had and it worked out fine for them – I just don't agree. Canada has

a different system. They are not as innovative perhaps. I love Canada, but they are not as innovative and they have a different system that is not as democratic, if you will, as ours in the sense of access to credit. It's a sad story.

I don't want to limit size, because that causes other distortions perhaps. But, I do want to force commercial banks to be commercial banks under the safety net and then take the risk out with the hedge funds activities that Citi does, and the derivatives business out, and put private capital back to risk, so you receive better pricing on risk and a better distribution over time of wealth.

I will tell you, if it weren't for too big to fail, we wouldn't have an institution in this country that is over $2 trillion. This last crisis would have disciplined that. That is my short view. I have a longer view, but I'll stop with that. [laughter] Any others? We have five minutes or so.

[Audience Question]: President Hoenig, I just want to once again … I think the whole room thanks you for the courage of your convictions in being the lone wolf of reason on the Federal Reserve Board. [applause]

Secondly, I can't tell you how much you relieved me in validating that the Oscar-winning *Inside Job* is an accurate portrayal of the banking crisis in this country.

Mr. Hoenig: Thank you. If you haven't seen the movie, it's an Oscar winner, so I recommend it to you. It's pretty revealing, as well.

Thank you very much for your comments.

Are there any other questions or praise, whichever?

[Mr. (first name?) Edwards, Iowa State University]: You are an Iowa State grad. That's enough.

Mr. Hoenig: Well, I have to agree.

Mr. Edwards, Iowa State University: What do you think will happen if Congress doesn't raise the debt ceiling?

Mr. Hoenig: It is like anything else. It depends on how the Administration would decide to deal with this crisis. If they were to prioritize, and I don't know what their plan is.

We are the fiscal agents. So we are in charge of the distributions and we made it known we will put them where they tell us to put them. But they have to tell us where to put them and it's up to them.

Even if they prioritized, the hard, cold facts are that the action taken is failure to act. And the failure to act does create further uncertainty and further delays on decisions that might otherwise be made about economic choices. It would delay businesses' ability to make choices. It would raise the cost of doing business in this country, and therefore, would only harm the country further.

We need to get this settled. But remember it is a budget crisis. And what I cannot forgive the leadership of this country for is not seriously taking up Bowles-Simpson – a bipartisan commission that went through all this discussion and came to a compromise that, yes, some people liked more than others, but everyone disliked to a certain degree and everyone liked to a certain degree, that had reform in it that gave us a way out. And we just let it fall like an anchor to the bottom of the sea.

Now what do we have? We don't have a solution. We don't have a plan. We don't have projections that show debt to GDP coming back down. We have greater uncertainty. We've diminished our productive capacity because of it. We've raised other costs of doing business. That's what is so unforgiveable. *And* we will pay a dear price for that if we don't come to an agreement and we let this thing go unattended. That is what I think of this standoff. It's hurting the American people. Yes?

Mr. Larry Dreiling, High Plains Journal: President Hoenig, I am Larry Dreiling from *High Plains Journal*. My question relates to farmers, consumers, and people who live in small-town America that the Kansas City Fed serves. What you would tell the consumer today about their behavior? If you were that banker sitting in one of these seats out here, what would you tell them to tell the consumer about their spending and saving habits? And where should we go in terms of the future?

Mr. Hoenig: I think consumers react to incentives just like everyone else. If you are going to subsidize debt over savings, you are incenting them to spend. So they are going to spend. I can give them advice and say it is good to save. But, if you don't get anything for saving, you tend to not want to save. You tend to say, "All right, I'll take it now, because I get nothing for it, and I'll save later."

My advice is, pay attention to what we do and push us to get this country's debt or budget crisis under control, so we can then work on renormalizing monetary policy as we reconfigure fiscal policy. Then we can spend time, as a nation, focusing on what we do about our future productive capacity, because we have to produce as much as we consume – or nearly so, if not more so – and look at the long-term choices we have to make and can make. But we have to take care of our debt. We have to get our policy renormalized for monetary policy. And then we have to get our policies working on how we build.

You can't say, "Create jobs."

"Create jobs" is dig a ditch out here with spoons and pay people for it. That's creating jobs. No, create the ability to produce goods and services people want to buy here and around the world. Then we will have an economy that once again is the strongest in the world, the most productive in the world, and the most successful in the world, because we do have the markets to do it. That is my advice to Americans. It is not just about consumption. It is about much more than that.

I am told we issued a prescription for Prozac outside here when I am all done. So have fun. [laughter] Thank you all for being here. I look forward to tomorrow. Thank you. [applause]

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Session 3:
Weathering Unexpected Downturns

Weathering Unexpected Downturns in Agriculture

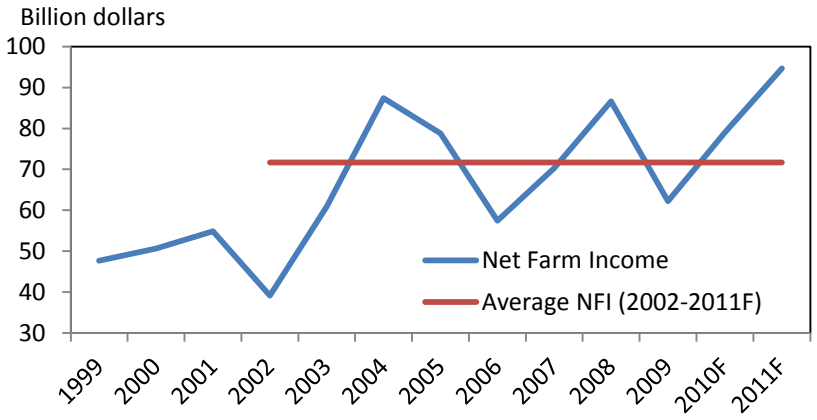
Paul Ellinger
University of Illinois

Introduction

A consensus among economists is that production agriculture was one of the strongest sectors coming through the financial crisis and economic downturn. The financial crisis affected global economic growth, which subsequently contracted aggregate demand for agricultural commodities. The impact of the crisis on agricultural lending institutions was delayed and not as pronounced as the impact on many of the global institutions. Many of the agricultural-related lending institutions did not participate in higher-risk housing lending procedures, nor were they significantly invested in the structured securities that lost substantial market value. Therefore, the financial crisis did not have a pronounced effect on the credit availability to much of commercial agriculture. Prudent risk management and strong agricultural profitability have resulted in agricultural lending that is well-positioned to meet the continued financial needs of farmers.

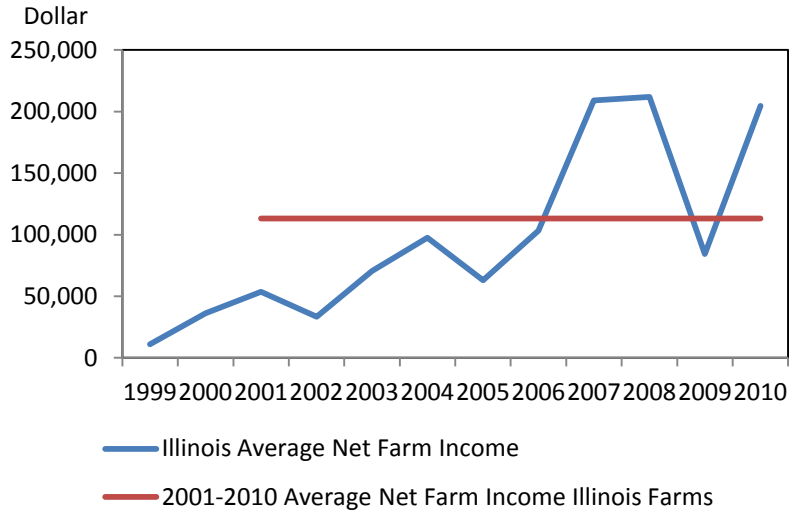
Recent trends in agricultural profitability of U.S. farms are illustrated in Chart 1 (USDA 2011a). The profitability of U.S. farms exceeds the 10-year average in three of the past four years. High profitability is even more pronounced in the Corn Belt. The average farm income level on Illinois farms has exceeded $200,000 in three of the past four years (Chart 2). Given the projected farm profitability prospects, farmland prices have also increased substantially since 2005. Annual farmland prices in the U.S. increased 5.6 percent from 2005 to 2010 (USDA 2011b). Increases in Illinois and Iowa exceeded 8 percent annually. The rate of increase in Illinois farmland in 2011 is estimated at 18 percent (USDA 2011b).

Chart 1: U.S. Net Farm Income



Source: Economic Research Service

Chart 2: Average Net Income of Illinois Farms



Source: Illinois Farm Business Farm Management

High profitability and rapidly increasing farmland prices raise concerns about a farmland bubble similar to the recent housing crisis or a repeat of the farm financial crisis in the 1980s. Federal Deposit Insurance Corporation (FDIC) Chairperson Sheila Bair indicates that signs of instability exist in farmland markets and require close monitoring. Yale economist and housing expert Robert Shiller recently described farmland as a "dark

horse" bubble candidate, partially because the environment is similar to the 1970s in the U.S. when a food price scare sparked the last farmland bubble.

Although recent profitability in agriculture is strong, risks in commercial agriculture are also high and likely increasing. Recent commodity market and input price volatilities are at unprecedented levels. Interest rate and inflation risks are looming. Increased contract production has increased legal and contractual risks, while the recent financial crisis highlighted the significance of counterparty risks. A key element in the continued health of the sector will be risk management strategies employed by industry participants. Another critical factor will be how the risks are distributed among producers, investors, lenders, insurance companies, agribusinesses, government and others. For example, do the various participants most able to bear the risks incur the risks? Are the risk weights changing among the participants? There is a general view that agricultural producers are shouldering an increasing share of the total risk in commercial agriculture. Given evolving risk environments and a fragile global economic climate, a fundamental question to address is, "Are the key players in commercial agriculture healthy enough to withstand an unexpected downturn in agriculture?"

The primary objective of this paper is to provide an overview of the financial health of commercial agricultural producers and lenders. Data from the Economic Research Service (ERS) and the Illinois Farm Business Farm Management Association (FBFM) are used to assess the current financial health of agricultural producers. ERS data provide aggregate measures of financial health while farm-level Illinois data provide additional information on the distribution of financial health measures across producers in a geographic region with volatile commodity prices and increasing land values. Commercial bank and Farm Credit System (FCS) call report data are used to measure how the financial system might be able to respond to a weaker agricultural economy.

Farm Financial Stress on U.S. Farms

A frequently cited U.S. Department of Agriculture (USDA) measure of financial health for the agricultural sector is the low aggregate debt-to-asset ratio (approximately 10 percent). The cited measure is based on all farm assets employed and all farm debt incurred. Although it does signal a low overall debt usage in the agricultural sector, it is

not a measure of average debt usage by farm operations. Moreover, if a farmland bubble does exist, the market-based measure of aggregate leverage may be understated.

A recent study by Briggeman uses 2008 Agricultural Resource Management Survey (ARMS) data to show that a financial shock of an increase in interest rates and a decline in farm income increases financial stress substantially, especially among livestock producers who hold approximately half of the total farm debt. The Debt Repayment Capacity Utilization (DRCU) ratio, defined as outstanding farm debt divided by how much the borrower could afford to repay with farm income at current interest rates, is a measure of financial stress used in the study. Ratios less than 1.0 indicate that income is more than sufficient to meet farm debt. Ratios above 1.0 indicate higher levels of financial stress. Briggeman showed that a one-year, 30 percent drop in income and an interest rate increase to 8.5 percent would have the greatest stress on livestock producers and young operators. The proportion of livestock producers with DRCU ratios greater than 1.0 would increase from 49 percent to 67 percent and the proportion of young operators with DRCU ratios above one would rise from 50 percent to 65 percent.

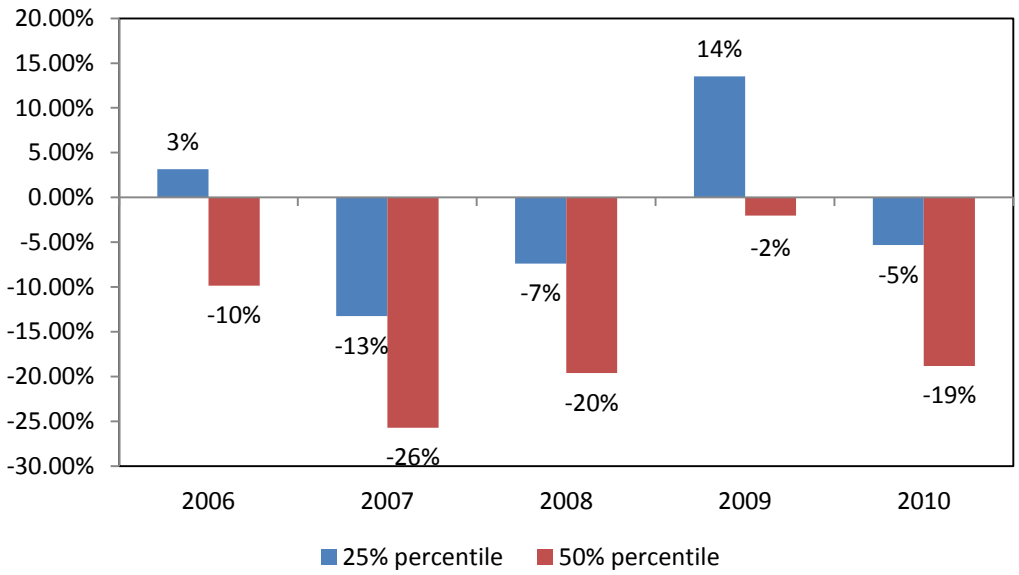
Although the DRCU ratio is a good measure of farm sector financial stress, it does not measure the ability of a farm business to generate cash flow to repay loans. The DRCU measure may be overstated when an operation has a substantial amount of operating and short-term debt that is paid from cash flows and not net earnings. Detailed cash flow and longitudinal data are not reported in the ARMS data. To further evaluate the balance sheet impacts of a downturn in the agricultural economy, data from Illinois Farm Business Farm Management Association are used. Although not representative of the entire U.S. agricultural sector, Illinois data provide detailed cash flow, income and balance sheet information for a farming region that has high revenue volatility and rapidly increasing land prices.

The three common sources of loan repayment for a farm borrower are (1) farm and nonfarm earnings, (2) liquid assets, and (3) equity. Each of these areas is evaluated to measure the impact of lower profits and falling asset values on the financial health of farm operations in Illinois.

A commonly used earnings and debt repayment measure used by farm lenders is the term debt coverage ratio (FFSC). This measure incorporates farm and nonfarm

income, as well as family living expenditures. A standard benchmark for adequate repayment capacity is 1.25. Data from 2006-2010 are used to measure the percentage change in total revenue that would have resulted in repayment capacity equal to 1.25 for each farm in the data.[1]

Chart 3: Revenue Change to Benchmark Repayment Capacity



Source: Illinois Farm Business Farm Management

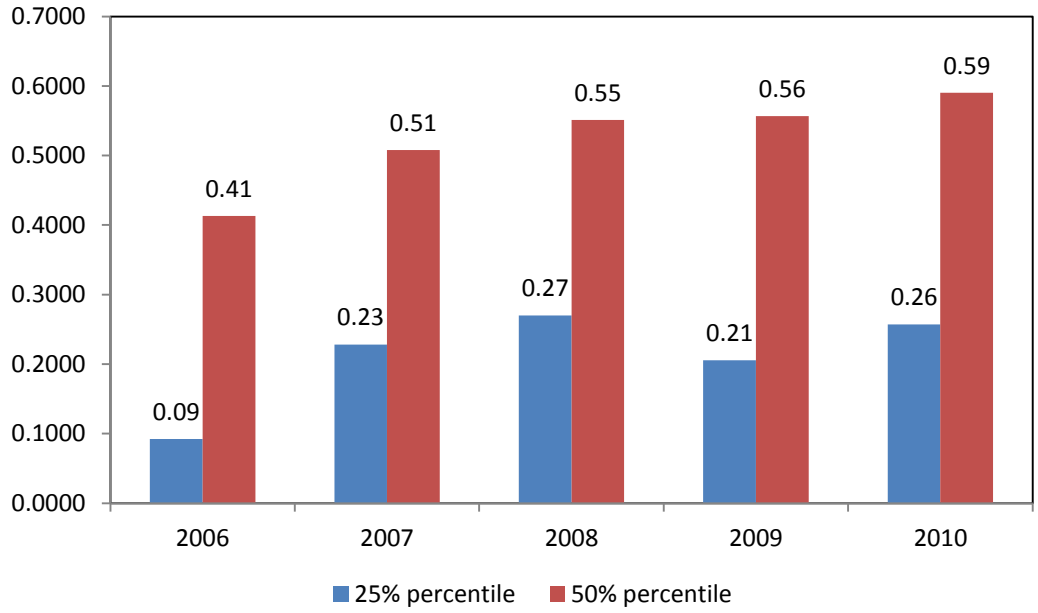
The results are summarized in Chart 3. On average, a gross revenue reduction of 15 percent would result in one-half of Illinois farms just meeting the repayment capacity benchmark, while only a 2 percent decline in gross revenue would result in one-fourth of Illinois farms emerging at or below the benchmark. A 2 percent decline in gross revenue would eliminate the repayment cushion for 50 percent of livestock farms. Distributions for young operators (less than 30 years of age) and large farms (gross revenue > $1 million) are similar to the baseline case. In summary, repayment capacity results illustrate notable sensitivity to modest changes in revenue.

A second level of defense for downturns in profitability and management of risk is maintaining adequate levels of liquidity. Also, as price, yield, revenues, and costs

[1] Similar to Briggeman, only farms with debt are included in the analysis.

increase, operations should increase levels of liquidity. A commonly used measure of liquidity that incorporates the size of the operation is working capital to gross revenue. On average, the level of liquidity on operations has increased from 2006 to 2010, signaling that some of the excess profits earned have been used to improve liquidity positions on farms (Chart 4). Moreover, over 75 percent of the farms have levels greater than 20 percent for each of the past four years.

Chart 4: Working Capital to Revenue

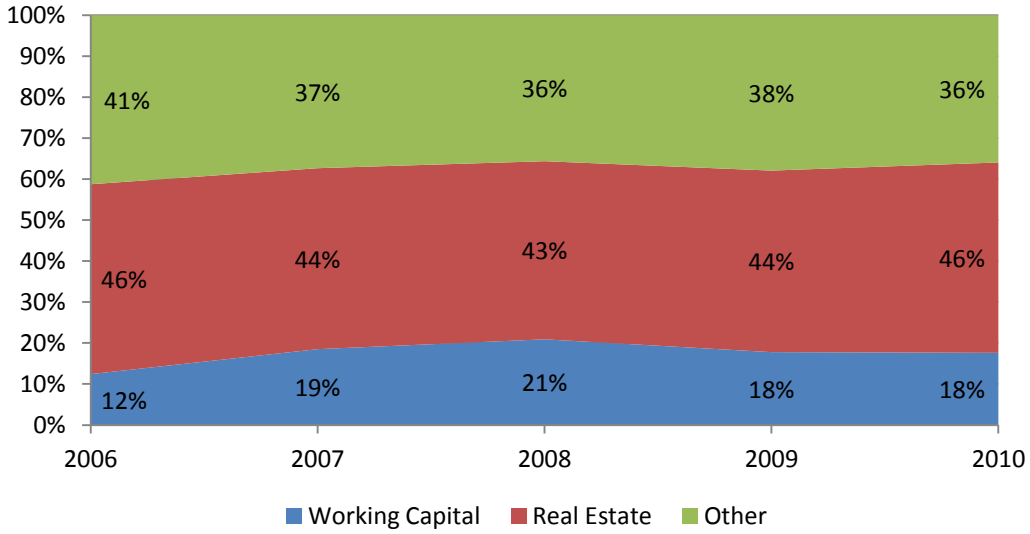


Source: Illinois Farm Business Farm Management

A third level of defense for profitability downturns is equity capital. The average debt-to-asset ratio for Illinois FBFM farms in 2010 was 0.24. Briggeman cautioned that the current aggregate leverage measure could be understated due to the recent upswing in farmland prices. A commonly cited financial health measure for consumers is the percent of housing wealth to total wealth. An analogy for farm enterprises is to calculate net farm real estate wealth. To illustrate, equity is separated into three components: (1) working capital, (2) net real estate equity, and (3) other equity. Despite the increases in market value of farmland, the equity component shares remained relatively constant from 2006 to 2010 (Chart 5). The constant shares imply that growth rates in working capital

and other non-real estate wealth (machinery and equipment) have kept pace with increases in real estate.

Chart 5: Components of Farm Equity

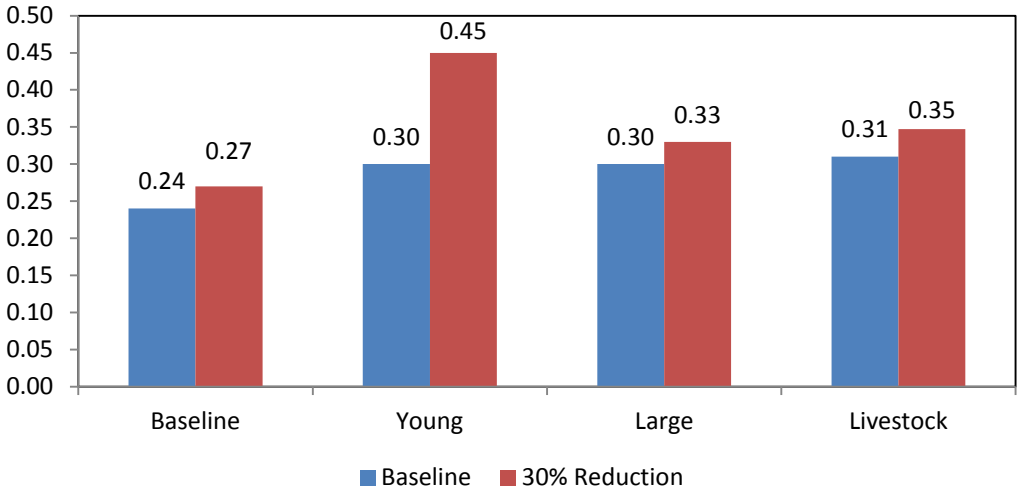


Source: Illinois Farm Business Farm Management

As indicated by Briggeman, interest rate changes impact borrowers' cash flow. However, the largest effect of interest rate changes could be the huge headwind for farmland prices. Schnitkey and Sherrick propose scenarios that suggest capitalized farmland value declines could exceed 20 percent to 30 percent if interest rates increased 100 basis points. Scenarios presented included changes in earnings as well as a change in farmland capitalization rates.

Farmland prices in Illinois have increased 30 percent from 2006 to 2010. Figure 6 shows the impact of a return to 2006 levels, or a 30 percent decline in farmland prices on the leverage positions of Illinois farms. A price decline of 30 percent would result in modest increases in the leverage ratios for baseline, livestock, and large farms. The debt-to-asset ratio for the baseline farm increases from 0.24 to 0.27. Young farms exhibit the highest sensitivity to changes in land values due to fewer financial assets and other non-real estate assets. The average debt-to-asset ratio for young farmers increases from 0.30 to 0.45.

Chart 6: Leverage Changes Resulting from a 30% Decline in Farmland Prices



Source: Illinois Farm Business Farm Management

On average, farms in the Midwest have reserves that should allow them to weather a modest downturn in profits and land prices. However, there is considerable distribution of financial health positions across farms. Highly vulnerable farms would be farms that have high sensitivity to changes in revenue and land values and low levels of liquidity. To gain perspective on the proportion of vulnerable farms, a hurdle rate for each of these measures is established. High vulnerability farms are defined as those that would have debt repayment capacity reduced to benchmark values with a 10 percent reduction in revenue, working capital to revenue ratios less than 15 percent, and debt-to-asset ratios that would exceed 50 percent with a 30 percent land value decline. Although these benchmarks are arbitrary, the analysis provides a measure of the range of distribution measures for vulnerable farms. Approximately 6 percent of farms met the three criteria. Moreover, 37 percent of these vulnerable farms are either large, young, or livestock farms.[2]

Lenders' Response to the Economic Downturn

Agricultural lenders are not immune to potential downturns in the overall economy. However, credit risk management procedures for agricultural lending

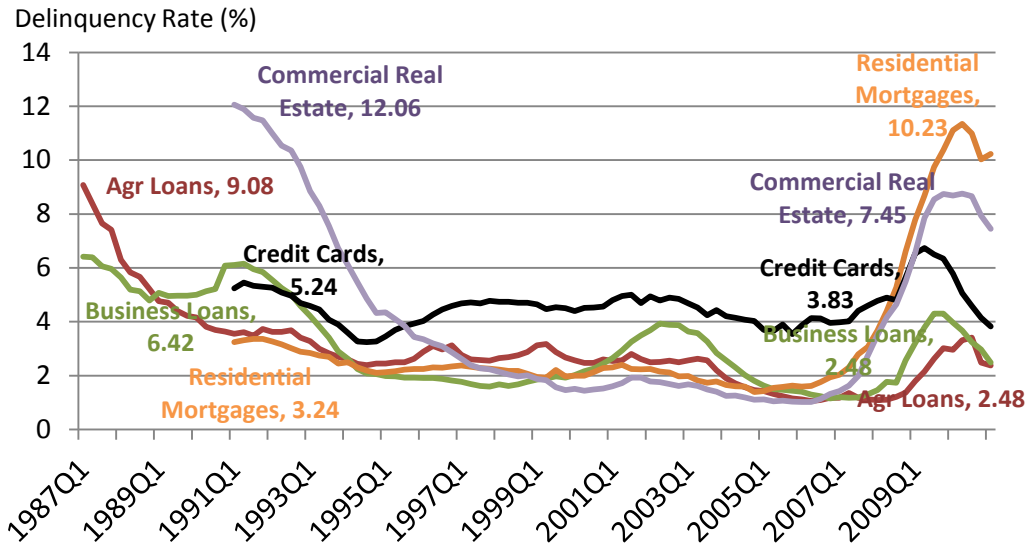
[2] Farms classified as livestock, young or large farms make up 25% of the entire sample.

institutions have certainly evolved since the agricultural financial crisis of the 1980s. Loan-to-value ratios on farmland are often set at 65 to 70%, providing a cushion for farm real estate declines. These ratios often exceeded 80% in the early 1980s. Loan documentation, farm financial information, and underwriting standards have also improved. Similar to the 1980s, a downturn is likely to affect non-real estate lenders first. Shrinking profit margins and the tendency to use operating lines of credit to pay term debt during a downturn will result in short-term lenders experiencing the first wave of potential delinquencies.

Commercial banks and FCS hold 84 percent of total agricultural debt. Ethanol, hogs, dairy, forestry, and poultry are the portfolio segments experiencing the most stress across the FCS. Cumulatively, these segments represent about one-fifth of FCS's portfolio. Capital levels and profitability of Farm Credit Associations remain strong. Rate of return on assets for 2011:Q1 was 2.19 percent for all FCS associations. The capital to assets ratio for FCS associations exceeded 17 percent with nonperforming loans at 2.39 percent of gross loan volume. At year-end 2010, 16 FCS associations had ratios of nonaccrual loans to total loans exceeding 5 percent. All of these associations were in the South, with 10 of the 16 associations in Florida, Texas, and Georgia.

Given the wide range of commercial banks lending to agriculture, some banking institutions are quite vulnerable to a downturn in the agricultural economy. Losses in consumer, real estate, construction, and development loans have weakened the financial positions of a number of rural and urban banks. However, delinquency rates on agricultural loans at commercial banks are the lowest across other major loan types and substantially lower than the financial crisis of the 1980s (Chart 7).

Chart 7: Delinquency Rates for All Commercial Banks
Seasonally Adjusted



Source: Board of Governors of the Federal Reserve System

A higher proportion of problem loans for commercial banks occur in the South. Problem agricultural loans to total equity is used to assess a stressed bank lending to agriculture.[3] As of year-end 2010, 68 banks had agricultural problem loan to total agricultural loan ratios exceeding 20 percent, and 232 banks had ratios exceeding 10 percent. These banks hold 1.5 percent and 4.7 percent shares of bank loans to agriculture, respectively. Over 30 percent of the banks with agricultural problem loans to equity ratios greater than 20 percent had head offices in Florida or Georgia.

Although credit conditions have improved across the commercial banking sector, a substantial number of bank failures have occurred. Over the first four months of 2011, 34 banks closed, and over 150 banks failed in 2010. Collectively, these banks held about $1.2 billion of agricultural loans. Only 2 of these banks had more than $100 million of agricultural loans. There have not been substantial credit delivery disruptions to farmers and ranchers because of commercial bank failures.

While the financial health of agricultural banks has improved, these institutions face new and significant challenges. Small banks have a higher floor on cost of funds

[3] Problem agricultural loans are defined as agricultural production loans and loans secured by farm real estate that are accruing and delinquent more than 30 days or designated as nonaccrual.

and do not benefit as much as larger banks and the FCS in these extremely low interest rate environments. New regulations from the Dodd-Frank Wall Street Reform and Consumer Protection Act will add regulatory compliance costs. Typically, as a share of total operating costs, these compliance costs are greater for smaller banks. There will likely be continued pressure to merge institutions and gain potential cost economies and synergies. The profitability of banks with concentrations in agriculture improved in 2010, but still remains at modest levels in comparison to FCS. The average rate of return on assets (ROA) for banks with concentrations in agriculture was 0.88 percent in the fourth quarter for 2010, exceeding the average for all commercial banks (0.64 percent).

In general, the capital levels at banks lending to agriculture remain strong. Table 1 shows the distribution of banks lending to agriculture by level of equity capital to assets. Less than 10 percent of the share of agricultural bank loans are held by banks with equity capital to assets less than 8 percent. However, these include over 800 commercial banks.

Table 1. Distribution of Agricultural Loans at Commercial Banks By Equity/Asset Ratio [1]

December 2010	Large Banks [2]		Other Banks	
Equity to Assets	Share [3]	Number	Share	Number
less than 4%	0	0	0.6%	86
4-8%	1.2%	8	7.0%	714
8-12%	16.5%	33	56.0%	3605
> 12%	6.0%	22	12.7%	1235

Source: FDIC Call and Income Reports

[1] Agricultural loans are loans used for agricultural production plus loans secured by farm real estate

[2] Banks with assets exceeding $10 billion.

[3] Share of all agricultural loans held at commercial banks.

Table 2 shows the distribution of banks by equity capital to assets after applying a net loss of 10 percent of agricultural loans at each bank. Although a 10 percent loss exceeds historical agricultural loan losses, the shock level provides a metric that measures the ability of commercial banks to weather an economic downturn. The number of banks with less than 4 percent equity capital to total assets would increase by 96 banks, while the number of banks with ratios less than 8 percent would increase by over 1,000.

Table 2. Distribution of Agricultural Loans at Commercial Banks By Equity/Asset Ratio After an Equity Shock of 10% of Agricultural Loans [1]

December 2010	Large Banks [2]		Other Banks	
Equity to Assets	Share [3]	Number	Share	Number
less than 4%	0	0	4.2%	182
4-8%	1.2%	8	32.6%	1644
8-12%	16.6%	34	32.7%	2902
> 12%	5.9%	21	6.9%	912

Source: FDIC Call and Income Reports

[1] Agricultural loans are loans used for agricultural production plus loans secured by farm real estate

[2] Banks with assets exceeding $10 billion.

[3] Share of all agricultural loans held at commercial banks.

Summary

Recent financial market volatility has migrated to risks in commercial agriculture. Supply disruptions and low levels of inventories resulting from drought and other weather conditions could accelerate these risks. Considerable uncertainties regarding commodity prices, input costs and interest rates combined with inherent production risks in agriculture will result in winners and losers among agricultural producers, as well as their lenders. Strong producer balance sheets and liquidity levels will provide a cushion for many producers and their lenders. Crop insurance has also been an effective short-term risk management tool for many grain producers. However, this analysis shows that financial stress could increase quickly if commodity prices decline – especially for livestock producers and young farmers. Interest rate changes could have the largest impact on land values and equity positions of farms.

On average, lenders have strong capital positions and have mitigated agricultural loan losses. An extended downturn in agriculture could certainly erode capital positions, especially for many agricultural lenders that have incurred losses in the livestock sector and lenders in the South that have already incurred losses to their agricultural and non-agricultural portfolios. Monitoring risk positions of existing borrowers and increased evaluation of underwriting standards will be essential for agricultural lenders.

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Weathering Unexpected Downturns (Transcript)

Paul Ellinger
University of Illinois

It is really an honor to be asked to speak on this topic. I am going to step back a little bit and put on my research hat. Having talked about the publications that are out there, we as researchers – especially in agricultural finance – rely a lot on what they do at the Kansas City Fed. It goes back to Alan Barkema and Mark Drabenstott. For a long period of time, they have paid close attention to agricultural finance. It is highly appreciated by academics, but it is highly appreciated by the industry, as well. They truly are the leader in terms of doing research in the area of agricultural finance. I appreciate that.

What I hope to do is be able to frame some of the issues. We characterize agriculture in a very aggregate way at times. What we have to do, and we can't do it all today, is to drill down a bit more and look at how much diversity we have in agriculture. We can talk about what is going to happen, on average. Somebody might talk about whether we weathered the 1980s. Well, a lot of you are here. Did we weather the 1980s? It's your definition of weathering. Did we weather the housing crisis? Some would say we have winners and losers in all this. What I will try to do is evaluate some of the vulnerabilities in production agriculture.

The other aspect of the initial question is measuring the size of the storm. Can we weather a downturn? What we tend to do when we look at regulations like those that we recently passed, is to try to fix the last crisis and the events that were around the last crisis. As we look to the next crisis, what is this going to be combined with? Is it just going to be market volatility? Is it going to be interest rates? Is going to be international trade? What other combination of factors do we have?

In the 1980s, the issues with oil in Texas and savings and loans were combined with inflation. These issues and events are intertwined, and, as you try to look at whether we can weather this or not, it certainly presents challenges. So that is my hedge

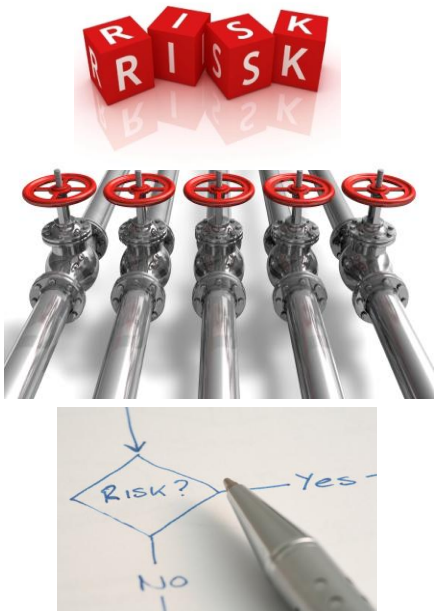
as an economist in terms of saying we have a definitive answer. I'd like to move on. It certainly ties into the next session about risk management tools.

What I'd like to do is talk about risks in general, and talk a bit about agricultural producers, using some of the data we have at the University of Illinois. We are limited in some sense of really drilling down and doing a lot of distributional research on whether firms can manage downturns. I was also asked to talk about the lending community and whether they can weather a downtown. Then, I'll leave it to some of my colleagues on the panel to drill down to some of the "on the ground" things.

To start, I have a couple of quotes. The noted Robert Shiller gets a lot of attention with the Case-Shiller Home Price index, but when he talks about farmland being a dark-horse-bubble candidate, people listen. FDIC Chairman Sheila Bair did this as well. It characterizes the same question the Fed asked this panel to discuss, is there a farmland price bubble? That is one of the issues we will try to address, as we move forward in this session.

This slide is a complicated, and probably not well-done, graphic here [Figure 1]. To set this up, Jason [Henderson] talked about there being more risk in agriculture. When I attend a meeting like this, I ask if there is more risk than there was in the past. Most people would shake their head and say yes. So, the risk pie is bigger. But look at this as a big funnel. Risk is going down this funnel, and it is going to be shared by a lot of participants -- farmers share this, lenders have part of it, government, input suppliers, and so on.

Figure 1: Agricultural Weight Risks: Different from the 1980s?



Portfolio / Magnitude
Higher or Lower?

Weights Different?
- ❖ Farmers
- ❖ Lenders
- ❖ Suppliers
- ❖ Government
- ❖ Investors
- ❖ Insurance Cos.
- ❖ Consumers
- ❖ Others

Can the "new" risk bearers manage the risks?

As we go down this risk path, each of the risk bearers has different tools. Farmers have crop insurance, government programs, enterprise diversity, portfolio management, futures and options, before we even get to the balance sheet. Then, farmers have liquidity, profitability, and equity. Lenders have underwriting standards, covenants in place, and equity. So they are managing that risk as it flows through the pipeline.

The key question to ask is, are the weights different than they were in the 1980s? Is more of that risk falling back to farmers than it did in the past? Are the risk weights any different in terms of where this risk is falling? Is it falling in different patterns and in different levels? What comes through the risk pipe? What is not being covered by crop insurance?

As we think about risk coming through a pipe, what sort of residual risks are still hanging on here? If we are pushing risk back to the producers, are we pushing it back to different risk holders and can they bear the risk? Hopefully, Mike [Swanson] can talk a bit about some of these things in the next session

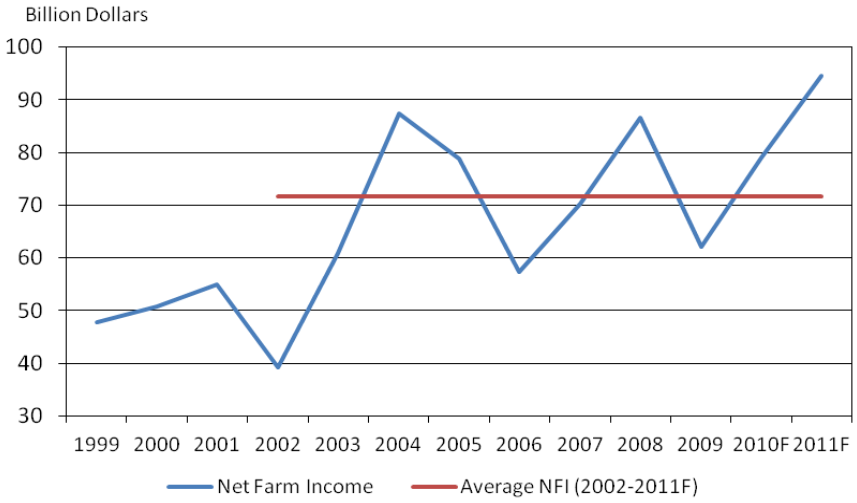
A nice way to frame this is, to compare to the 1980s. Do we have the same kind of risks? The whole risk pie is bigger, but is it shared similarly as we did in the past? I don't have the answer to that, but this is something to consider as we move forward.

The general consensus when I talk to most folks is they believe more risk is being pushed back to the farmer. When we look at risks – interest rate risk, contract risk, supplier risk, and cash rents – some of that is being pushed back. Another good example, of course I'm a bit biased toward my home base of Illinois, I had a farmer come in the other day and ask, "How do I manage? I just had to pay $500 per year for cash rent for the next three years – all up front."

So is more risk being pushed back to the producer and, if it is, then are we managing it well? We will talk more about financial statements and balance sheets here today, but there are other pieces to the puzzle.

This chart is similar to what Jason [Henderson] said before. The red line is the average farm income level in the United States. [Chart 1] The blue line is the volatility we've seen in national aggregate farm income.

Chart 1: U.S. Net Farm Income 1999 – 2011F

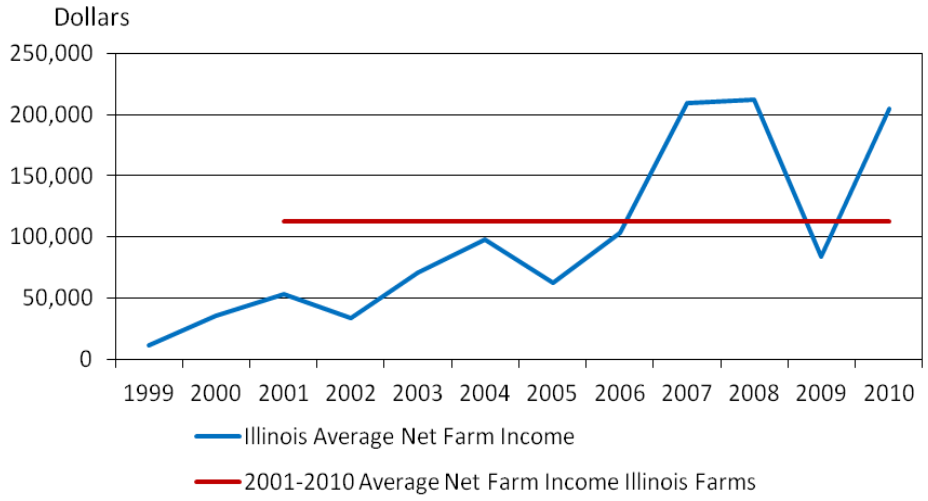


Source: Economic Research Service.

We have access to farm level data for Illinois producers, primarily grain and hog farms. Three of the last four years, on average, Illinois producers have had income levels over $200,000. [Chart 2] These farmers would be primarily full-time operators. From a weathering or cash-flow standpoint, economic conditions are pretty good. But, in 2009,

our average livestock producers' net farm income was a negative $50,000. So, we obviously have some distributions around that line and, when we see these aggregate numbers, sometimes we don't get the whole picture. I put these aggregate measures up here, not because I think they are great signals of strength, but because they are ones we have typically used when we talk about the health of the agricultural sector.

Chart 2: Average Income on Illinois Farms 1999 - 2010



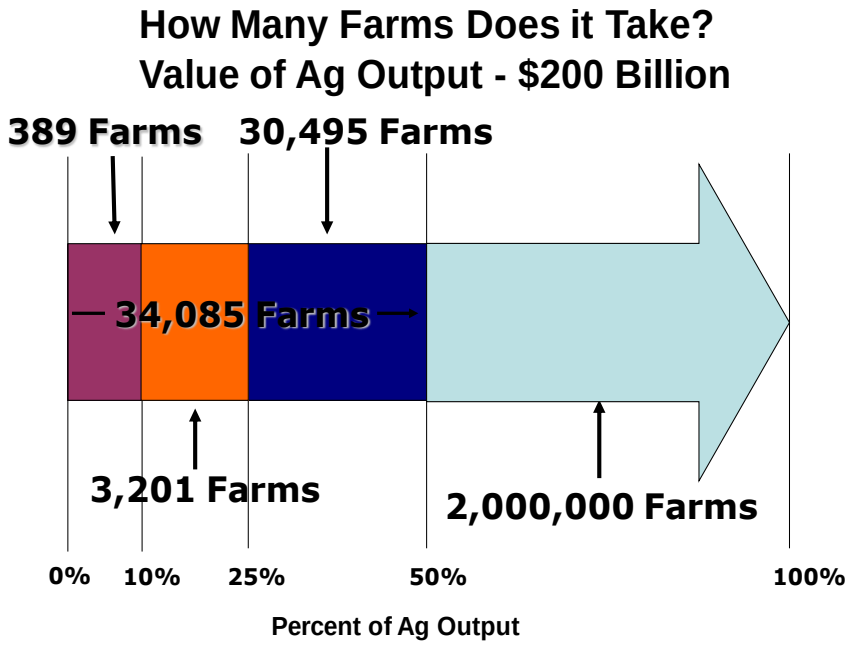
Source: Illinois Farm Business Farm Management

We often talk about leverage or debt-to-asset ratio being low in agriculture. When we went through the recent crisis, this is the measure referenced as much any. "Agriculture is fine, because we have 10 percent leverage in agriculture." To some degree, that is informative. This number is calculated is by including all farm assets, including all farmland. This includes farmland investors, as well as actual producers.

Is this a good characterization of leverage? We probably get more out of the trend or the first derivative of this in terms of change and in terms of signals. I am not sure we get a lot of value from these aggregate numbers to say the agricultural economy in general is healthy. Again, to look at the debt-to-asset ratio number and the USDA values, about 84 to 90 percent of the asset value is farmland. Depending on what happens to farmland prices is what will happen to that ratio, as well. We need to drill down a bit more to evaluate the true health of producers.

The aggregate debt to asset level does provide signals about how agriculture compares to the different times in the past. Some might argue, if you look at the poor times in the 1980s, 22 percent isn't an alarming debt to asset ratio from a leverage standpoint.

Figure 2: Distribution of Ag Output by Farm Numbers



I bring up this next chart to illustrate the structural changes happening in agriculture. [Figure 2] When we discuss whether we can weather a storm, who are we talking about? Are we talking about the 389 farms that produce 10 percent of what we have? Are we talking about the 34,000 farms that produce half, or the other 2 million farms that produce the other half? As we look at the risk management ability and risk management tools, the strategies are different in each one of these pools. There will be a lot more ripple effects from stressed events that happen with the largest 389 farms. My point of emphasis here and throughout is we can't look through this large lens. We have to be more careful about evaluating the different risks among the different farms. Getting back to evaluating some of the farm financial conditions and trying to get some distributional aspects of this, Brian Briggeman – former economist here at the Kansas City Fed – used USDA data to illustrate how much debt farms were carrying, compared

with what they could carry. What he did, and it was very well-done – was to determine how much debt could a farm support, given the level of income and how much is that compared with what they actually are borrowing. Results indicate that farms, in general, had adequate repayment capacity. Livestock farms, young farms, and large farms were the most vulnerable to changes.

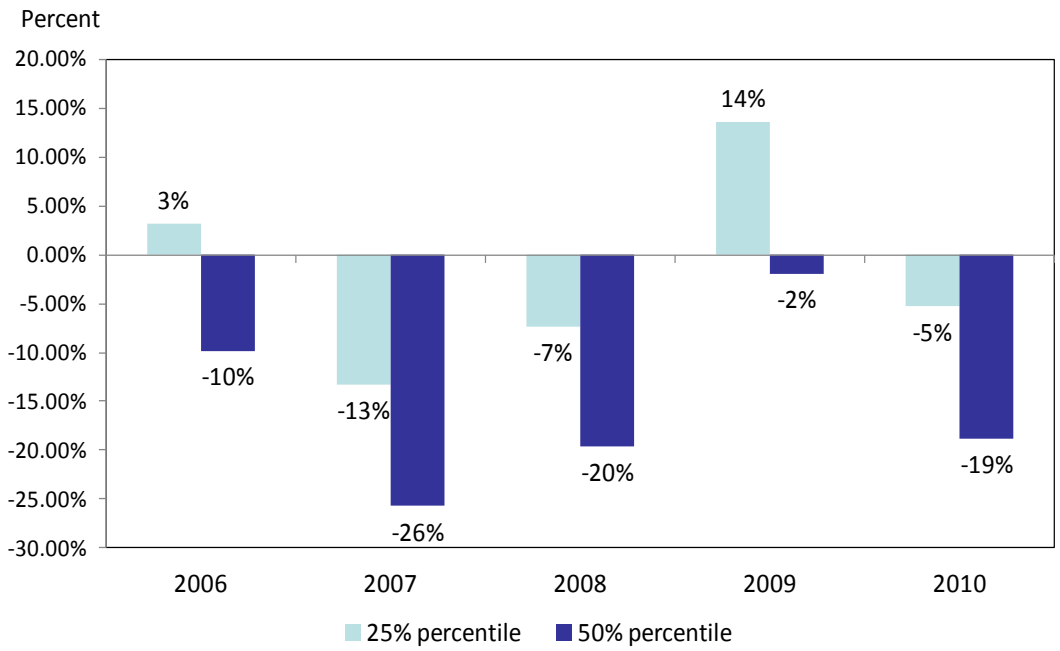
The downside of the research is the data he did not have. Lenders in this room would agree that cash flow pays loans. Liquidity is a backstop. The Briggeman study did not differentiate between term loans and operating debt in the calculation of the level of debt a farm could support. Cash flow measures are needed to evaluate repayment capacity.

I've done an extension of this analysis. The data will be for Illinois producers. Illinois data provide additional distributional aspects of producers and use cash flow measures that lenders use to determine whether a borrower can weather a storm.

What is the first thing you look at? It is likely earnings and cash flow. The second thing you look at is liquidity. Finally, you look at whether there is some equity capital. As we weather the storm, that is probably the same sequence we have to look at things. We have cash flow, with liquidity as our first backstop, and equity as our last backstop. Again, these are Illinois data, but they allow us to get some distributional aspects of farm producers.

This graph goes back over multiple years. I took the data and asked, what if we were to reduce gross revenue to a level where lenders typically lend(a repayment capacity benchmark of 1.25)? How much would we reduce gross revenue to derive that level? Basically, how much cushion do we have across the farms, including all cash flow, all nonfarm income, all family living, and everything else – items most lenders will look at?

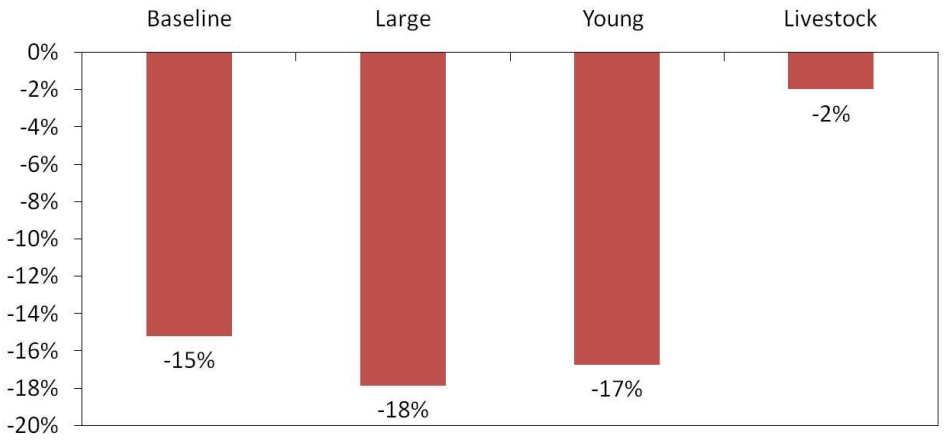
Chart 3: Percent Farm Revenue Drop Needed to Reduce Repayment Capacity to 1.25 Benchmark for Illinois Farms.



There are two values represented in the graph -- 25th percentile and the 50th percentile of the farms. Using the 2008 number, a 7 percent drop in gross revenue would result in 25 percent of the farms not meeting the benchmark debt-repayment capacity of 1.25. If we had a revenue decline of 20 percent, one-half the farms in Illinois would not meet the benchmark debt-repayment capacity. Mike [Swanson] will talk about the likelihood of that or how we can protect these kinds of things [downturns] in the next session. This chart shows the magnitude of the vulnerability to revenue changes.

We can separate the measures among the same types of farms that Brian did. The baseline was about 15 percent over the last four years: For large farms – 18 percent, young farms – 17 percent, but livestock -- only 2 percent [Chart 4]. Small margins are not news to anybody in here. And, sensitivity to changes in revenue is much more variable among livestock farms than it is among other operations.

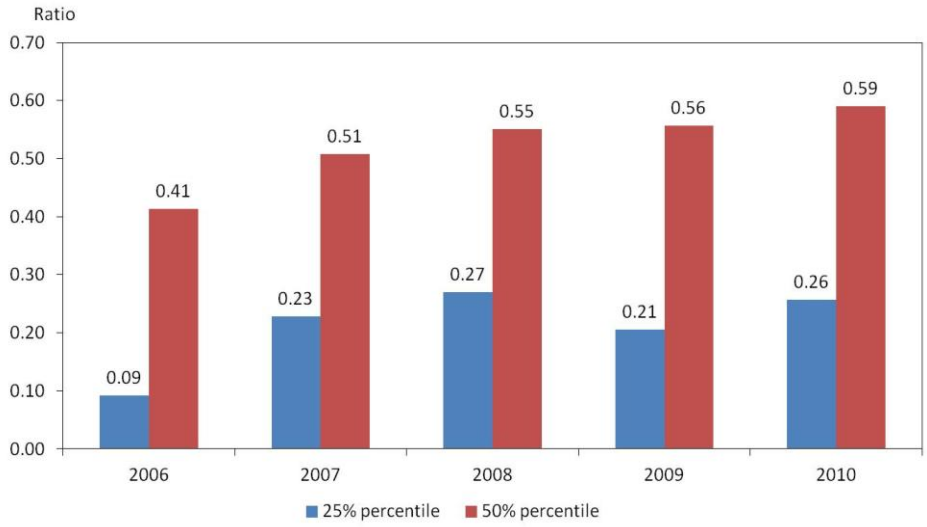
Chart 4: Revenue Decline if 50% of Farms are Below Repayment Capacity Benchmark (average of 2006-2010)



The next question that gets asked is, has liquidity kept up with increases in costs and revenues? Since we had high earnings on farms, were those earnings invested back in farmland, fixed assets, or did farms actually improve their liquidity positions in this process?

Instead of a standard liquidity measure like the current ratio, a better measure is working capital relative to revenue [Chart 5]. You can see from 2006 to 2010, the average measure has increased, showing some improvements in liquidity at the same time we had increases in revenues and costs. The lower number is 25 percent of the farms. Values ranging from 25 to 30 percent is the benchmark where we like to see most farm operations. The bottom line here is it looks like there have been some investments in working capital and cash, in addition to investments in capital items.

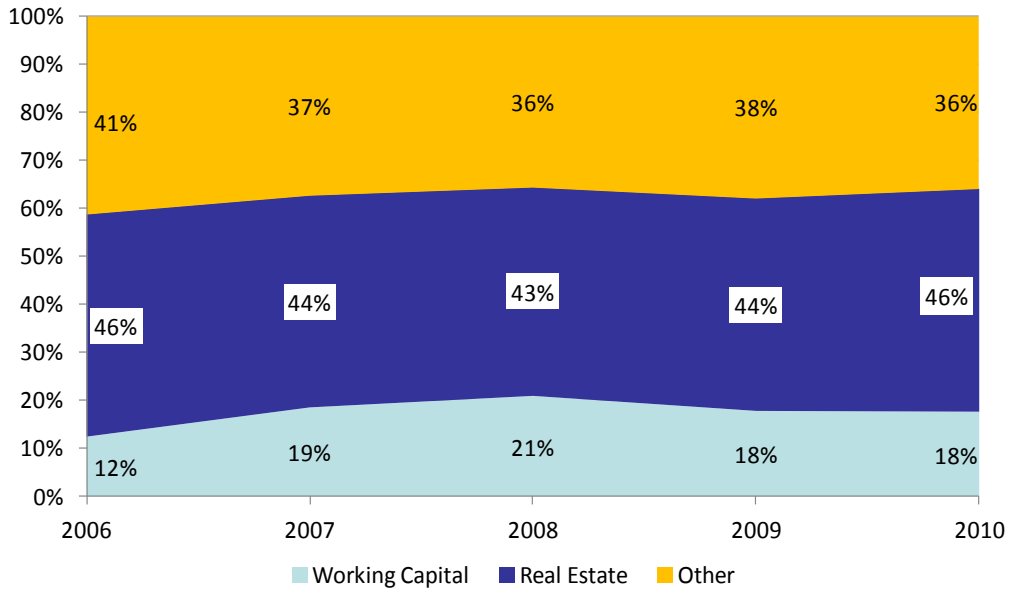
Chart 5: Liquidity – Working Capital to Sales



This table probably surprised me more than anything else. A very common housing measure that you see coming out of the housing literature reports the proportion of house equity to total personal wealth. The level has fallen off to almost 10% now, whereas before it was up in the 20 to 25 percent range earlier in the decade.

We can do the same thing in agriculture and calculate how much of the wealth position on a farm is farmland equity? Has it grown rapidly with increasing land prices? If we have a decline in land prices, that obviously will affect equity more. I was surprised that shares of equity have been relatively flat [Chart 6]. The bottom line indicates working capital as a percent of equity. The next line shows farm real estate as a percent of equity. The final line is machinery equity and everything else. In general, what we have seen is there have been almost uniform changes resulting in relatively constant shares over time.

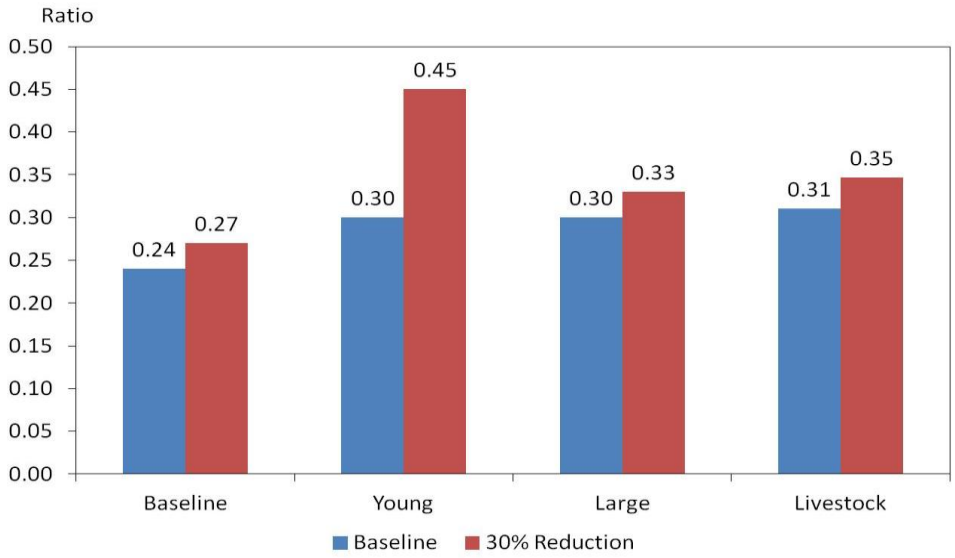
Chart 6: Components of Farm Equity



One caveat is the method land is valued in the FBFM data; it is probably similar to most of the lenders in this room. It is not the $13,000 an acre we just observed last week in Champaign County, Illinois. It's a bit more conservative measure. Brian [Briggeman] did a similar analysis with the Kansas City Fed. I said, "What happens if we reduce land prices? What would it do to leverage ratios?"

For our 3,000 farms or so we have in here [data set], the leverage ratio would increase from 24 to 27 percent with a 30 percent decline in land values. Young farmers take a bit bigger jump, because their balance sheets aren't as large and changes in land values increase their leverage [Chart 7]. And livestock farms, not so much. If you look at these from an aggregate measure, it doesn't appear there would be substantial changes. The 30 percent decline is equivalent to the increase in Illinois land values from 2006 to 2010.

Chart 7: Effect of a Decline in Farmland Values on Leverage Ratios

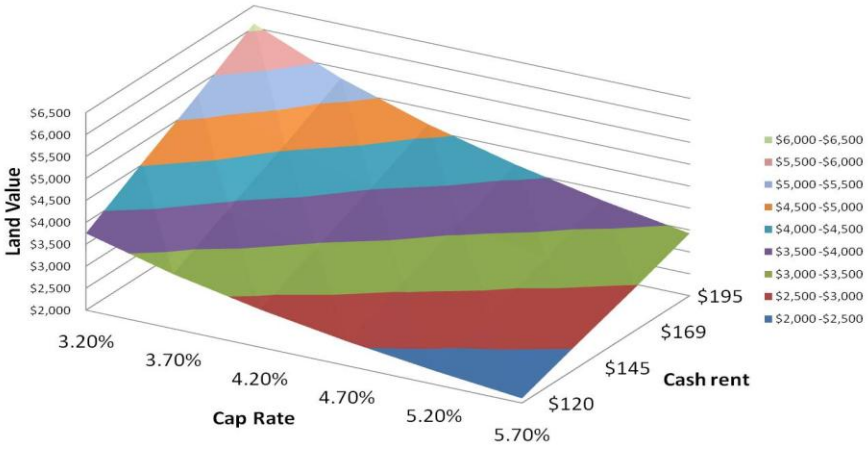


I was asked to talk a little about interest rate risk. The big interest rate risk for Illinois farmers relates to land values rather than cash flows.

A couple of colleagues of mine at Illinois did an analysis of farmland, both of actual prices and capitalized values. It tracked pretty well, except for the first part of 1980s. Then, it was partially due to interest rates being substantially higher than what was expected. What they also looked at was, if we get a bump in interest rates or a bump in inflation, what would happen to land values?

This chart is relatively hard to interpret, but look at the cap rates across the bottom from 3 percent up to 5 percent and cash rent or returns to land on the other side [Chart 8]. Actual land values are on the vertical axis. As you can see, increases in cap rates could result in 40 percent declines in land values. The real risk and vulnerability in the Midwest, at least, are not interest rates from a cash flow standpoint, but interest rates from a land-value standpoint.

Chart 8: Land Price, Cap Rates and Cash Rents

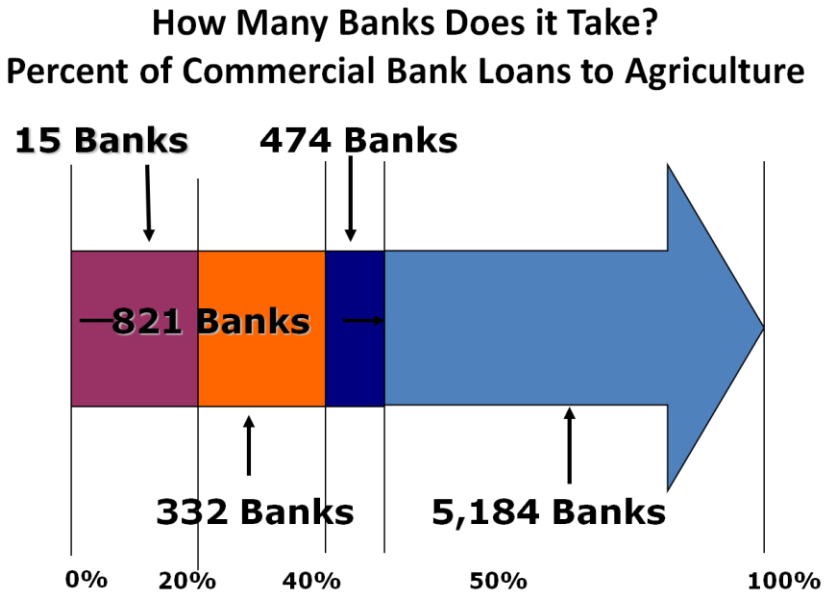


Source: Schnitkey and Sherrick

Jason [Henderson] also asked me to talk about what is happening on the lender side. In terms of who holds the shares, the share data on this chart aren't new to anyone here. We have some panelists, who are on the ground that will talk about the farm lending situation in more detail after me.

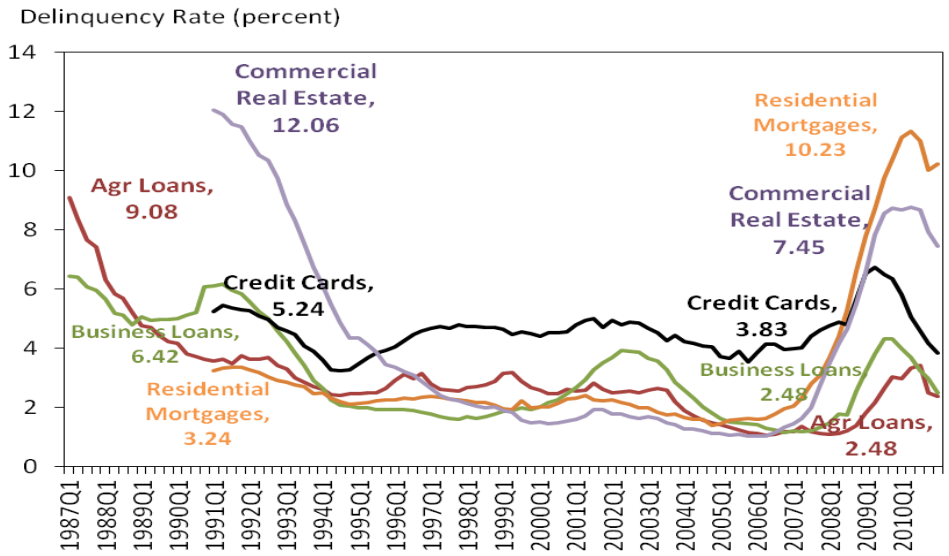
For this next slide, I included every bank that is lending to agriculture and calculated distributions of the agricultural debt by bank size. The largest 15 banks hold about 20 percent of that portfolio [Figure 3]. Another 800 larger and regional banks control 30 percent. That leaves the other 5,000 banks for everybody else. Who are we talking about when we say whether we can weather the storm? Where are some of the vulnerabilities right now within this sector?

Figure 3: Distribution of Commercial Bank Loans to Agriculture



I did some analysis about what we are seeing in delinquency rates at banks. Agricultural loans are the green number. [Chart 9] Back in 1980s, we were a little north of 9 percent; Currently, agricultural loan delinquency rates are down to 2.5 percent. Compared with the other sectors, agriculture is still much stronger.

Chart 9: Commercial Bank Delinquency Rates



There is one caveat I would add. As we look at these numbers and try to use this as a measure of health, we have to be cautious of delinquency rates on operating loans. When are they delinquent? One time a year. Even then, we may roll it over to the next year.

Now for a brief summary of what is happening on the banking side. Profitability, as measured by ROA, even if it is an uptick for people who are lending to agriculture, are not quite 1 percent. When looking at all failed banks from 2010 through June of this year, the amount of agricultural loans that have been affected by the failed banks is about $1.2 billion, which is 1 percent of all bank-held agricultural loans. So, there hasn't been tremendous disruption on the agricultural banking side, in terms of the bank failures we have observed.

Problem loan data are reported through call reports. From this data it is hard to identify the sectors within agriculture that are incurring stress. Since we have extensive branching, it is hard to say where the hot points are from available data.

I calculated problem loans to equity for all banks lending to agriculture. Typically measures of stress use problem loans to total loans. If you are looking at vulnerability of banks, problem loans to equity is a stronger measure. Vulnerabilities occur when banks have low equity and high problem loans.

There are 68 banks out of 6,000 banks that lend to agriculture with ratios greater than 20 percent. Most of those banks are headquartered in Georgia, Florida, Oklahoma, and Nebraska. There is only a handful beyond those areas. The number of banks increase to 230 banks, if you look at that ratio being greater than 10 percent. This encompasses only about 5 percent of the agricultural loans at commercial banks. In general, we have relatively strong equity positions at banks and strong performance of loans at banks.

Let me interpret these final two tables quickly, as well. I evaluate the distribution of agricultural loans by equity to asset ratio and not necessarily by agricultural banks or non-agricultural banks [Table 1]. I simply report large banks, those with assets greater than $10 billion and all other banks. And, then I evaluated how much equity they have relative to assets. It illustrates the vulnerability of banks that hold high shares of agricultural loans.

Table 1: Distribution of Agricultural Loans at Commercial Banks by Equity/Asset Ratio

December 2010	Large Banks [1]		Other Banks	
Equity to Assets	Share	Number	Share	Number
less than 4%	0	0	0.6%	86
4-8%	1.2%	8	7.0%	714
8-12%	16.5%	33	56.0%	3605
> 12%	6.0%	22	12.7%	1235

[1] Banks with assets exceeding $10 billion.

The left-hand side of the table is a standard equity-to-asset ratio, less than 4, 4-8, and 8-12. Next, the data are separated between "large banks" and "other banks." The 1.2 value can be interpreted that there were eight banks with assets greater than 10 billion with equity-asset ratios between 4 and 8% and they hold 1.2 percent of the agricultural loans.

On the right-hand side, we have smaller banks at less than 4 percent that have some exposure to low equity positions and problematic loans, as well. You can see the distribution of the shares of agricultural loans by bank size and solvency level.

A very simply analysis is represented in Table 2. Let's shock 10 percent of agricultural loans and call them losses. The 10 percent value is larger than previous crises. I simply took 10 percent of agricultural loans and reduced equity by that same amount. What would that distribution look like? On the large banks, the distribution does not change much because their percentage of agricultural loans compared with equity is very, very small. But, if you look over on the other bank side, we see the numbers sliding to lower capital to asset levels -- over 100 banks below 4 percent, 1,600 banks in 4-8 percent, and so forth.

Table 2: Distribution of Agricultural Loans at Commercial Banks by Equity/Asset Ratio with a 10% Drop in Farm Production Loans

December 2010	Large Banks [1]		Other Banks	
Equity to Assets	Share	Number	Share	Number
less than 4%	0	0	4.2%	182
4-8%	1.2%	8	32.6%	1644
8-12%	16.6%	34	32.7%	2902
> 12%	5.9%	21	6.9%	912

[1] Banks with assets exceeding $10 billion.

The Farm Credit System's return on assets has been a bit higher than community banks and banks in general. Stepping back a little bit, it is more difficult for the community-size banks to take advantage of these current low interest rates. The yield curve doesn't benefit community banks as much as it does the larger banks or Farm Credit System. Community banks have a floor on their cost of funds, which is probably why their spreads are a little bit lower.

Return on assets has been strong for Farm Credit. Capital-to-asset ratios are also strong at 17 percent, with nonperforming loans at 2 percent. I sorted all the associations from highest nonaccrual loans to total loans to lowest and identified geographic locations of the associations.

At the end of the fourth quarter of 2010, 16 associations had nonaccrual loans to total loans greater than 5 percent. Those were primarily located in Florida, Texas,

Georgia, Tennessee, and South Carolina. They are very regionalized in terms of where the problem loans are located.

As noted by Lee Strom at the Farm Credit Association, problem loans in the Farm Credit System are primarily in ethanol, hogs, forestry, dairy, and poultry – the portfolio segments experiencing the largest degree of stress – which is about 20 percent of our total portfolio. We'll stop here then come back to talk about the implications and listen to the other panelists first.

Industry Panelist

Transcript

Ejnar Knudsen
Passport Capital

A little background, with a name like Ejnar you would think I am a foreigner – I am. I am from the Republic of California, [laughter] but I am not from San Francisco. I still reside at the feed mill in the central valley of California. When I go to San Francisco and they tell me about how we should have an organic food production system, I tell them we would have to go to an alternate eating-day process. If your Social Security number is odd, you get to eat today and tomorrow if it's even. I am not received very well in San Francisco. [laughter]

The firm I do work for is there. They manage about $5 billion. What I do is manage a portfolio for them made up of investors that might be 500,000 investors or banks and universities. It adds up to about $120 million I manage in this one fund. It is a job I've wanted for a long time, because previously I'd been with Rabobank in New York for 10 years and I was lending to the agricultural sector around the world. I enjoy being in the equity position of choosing which sectors. What we do is we break down all the agricultural sectors into 43 subsectors. There are about 500 public companies in the world. I have the pleasure to travel around the world to figure out which countries and which sectors are at what stage in the cycle and where I want to place the capital in advance. It's a dream job to do that.

With that, what I thought I would spend some time that might be valuable for you is to give you some perspectives of risk and how we view it in some of the sectors. Maybe it will lead to some Q&A. When I was asked to think about things that would be valuable in risk management, there are a couple things. How many of you have read the book *The Big Short*? It's a great book, and Passport Capital, the firm I am with, was one of the people who bet on the subprime mortgage meltdown and they made $1.5 billion in that process. It was before my arrival, so I never saw that bonus check.

What I learned from that was, what they look for is slow-moving trends that are not really appreciated; that are not priced. When I think about what is the biggest slow-

moving trend we've seen in our lifetime, what is it? Slow-moving trend, how do you boil a frog? You boil him slowly. If you took your grandfather, removed him from his age, and dropped him right here, the biggest observation he'd probably have as a shock effect is that there was a billion people on earth when he was living and now there are 7 billion people. That's a monstrous change that we don't see. It is imperceptible on a daily basis.

Just like the subprime mortgage thing was imperceptible on a daily basis. But, then, one day people woke up to it and it all happened very quickly. I think about in investing other imperceptible changes on a daily basis and how do we invest? One thing, for example, is people's consumption of high-fructose corn syrup versus sugar. Investing in sugar refiners has been a very rewarding business recently, and we found that to be the case, but it is imperceptible on a daily basis.

Or another slow-moving trend is investing in fish meal and fish oil. The consumption of fish meal and fish oil has been very significant, and the margins in that business have been fantastic. So those companies are doing very well.

There are two things. One is slow-moving trends and one is things people can't imagine. When I think about that, one of the things we take for granted here is the population going from 7 billion to 9 billion people. We start every conference by taking that for granted, then we build our businesses and our sectors based on that assumption.

There is a book that is worth reading. How many of you have read the book *The Black Swan*? Actually quite a few. It is well worth reading, because if you took Professor Babcock's research yesterday, and the corn price could be $5.30, and you built your whole business or your lending portfolio based on $5.30 corn and a what-if scenario. What *The Black Swan* is about is the highly improbable events, but ones that could be fatal or extremely rewarding, like the $1.5 billion that Passport made. It is figuring out how fat are the tails on his models, because if we have $4 corn and $12 corn all within a 12-month period, can your portfolios and businesses handle that kind of volatility?

We've heard the previous speaker say there is likely more volatility, and I would agree with that, because if you know of a person who is addicted to something and the addiction is debt and consumption and 100 percent of their salary is now debt, are they going to be more predictable going forward or more unpredictable? More unpredictable. There is probably a lot more volatility ahead of us than behind us. So the volatility that is

in Professor Babcock's model – and is outlined in this book – is important to appreciate as far as risk.

One of the other things I've learned at Passport is saying "what if." What if – and I am going to play a game here and the question is – first I'll do a quiz. I am a dairy guy, so I am used to cycles: Milk prices always come back to the same old price and corn comes back to the same old price. I mention that, and I'll come to why I looked into this.

Write this down or think about it. Out of the last 20 centuries, or 2,000 years, how many centuries has China been the number one economy? I was thinking China is mean-reverting. In my entire life, China has been nowhere and they will probably go back to nowhere. But then, when I spent a lot of time in China, somebody said, "Well we are just trying to get back to where we were."

I said, "What do you mean?"

So I had to go into the history books. And I didn't spend a lot of time studying history. I was milking cows. What I figured out was, 18 out of the last 20 centuries, China was the number one GDP of the world! That gave me a different perspective. A lot of people say, "What if China breaks?"

There is this whole housing market. It's a speculative bubble. Then, if you go to China and figure out what the housing market is driven by, you realize it is not much different than in southern California. Why do people have fancy cars? When you are young, you have fancy cars because that is how you get a date. In China, you need several apartments to be able to get married, because the mother-in-law won't let their daughter – who is a hot commodity because there are more men there than women – actually be the chosen one. Do you have three apartments or four apartments? And a lot of those apartments are bought with cash or 75 percent cash. When you figure out that market and you figure out they have over a $1 trillion of reserves, you realize that country is maybe a little more stable than we think.

The growth in the dairy industry is growing so fast in China they need the equivalent of one new California's milk production every year. In five years, they will need the entire U.S. milk production for consumption. The only reason Nestle is not growing faster than 26 percent a year is they can't get enough milk. That is the kind of force we see, and it's a slow-moving trend, and it's a black swan.

Back to this image on risk management. We have a just-in-time food supply, but we now have seven billion people. What happens if there is a shock to the system? When there is a billion people, we have more ability to handle that shock. At seven billion people, we probably have less. Another "what if" I heard yesterday – and I think about the black swans – what if there is no mandate for ethanol in five years? How are businesses structured and values, what could that do? What if the European banking systems failed and everybody went to the dollar very quickly and the dollar appreciated 30 percent? What happens to corn prices if that happens? What is the financial flexibility of the businesses we are in?

It causes me, when I think about all these risks, to want [to discuss quantitative easing and agriculture]. Thirty-eight years ago we did quantitative easing in a massive way. And 38 years before that, we did quantitative easing, also in a massive way. The first time was when we went off the gold standard in 1933. We went off the gold standard, printed a lot of money, and changed the whole dynamics of asset pricing in our debt, so we deflated the value of our debt.

In 1971, 38 years later, we went off the gold standard, we had a cheaper dollar, and agriculture had a boom. We may be around 1975 in that boom. We don't have a lot of debt yet. We probably have a whole other wave of buyers, but of course something may happen like a meltdown here or there along the way. But the volatility in the 1970s was tremendous and eventually we had debt in the system, which today we don't have.

I look at that cycle, and I also look at the weather cycle when I consider things we expect to be normal. We don't realize the fat tails. Another one is the weather cycle, where we expect normalcy based on our lifetimes. If we look back 200 years ago and 200 years prior to that, we had very low sunspot activity. Sunspot activity actually does result in weather impacts on earth.

I am not an expert in it, but I have studied it enough to appreciate that we've had the same low sunspot activities as we had 200 years ago that led to massive crop issues around the world. That is when Malthus wrote the population principle that the population is going to surpass the carrying capacity of the earth. It is interesting he wrote that whole principle when we were having crop failures because of weather issues – droughts, record droughts, and a lot of things that seem to rhyme with today. I mention

that because we have a just-in-time food supply system, we have seven billion people, our country and other countries have a lot of debt, and instant information, where people can hit a button and liquidate their whole portfolios to initiate massive liquidity shocks. It's a really interesting time to be in. I mentioned that because my encouragement is to read this book, think about it, and don't make plans based on the averages – make plans based on the extremes.

In closing, I thought about the impact of having the speech here at the Federal Reserve and the dollar has on it "In God We Trust." It is one of those things we just assume -- that everybody trusts that dollar. Boy, when that was first created, the Founding Fathers sure had to hope and pray for people's trust in that dollar. I sure hope the politicians can be careful when they are haggling, because people trust the dollar right now, but maybe we are taking that for granted, because people will until one day, what happens if they don't? And then what? My question is, what will you have wanted to be in yesterday or before that trust breaks in the dollar? So where are you going to preserve your purchasing power? What I say is, "Thank God we are in agriculture, because the farmland and the private and public companies are where I believe we can place our trust." Thank you. [applause]

Industry Panelist

Transcript

Douglas Hofbauer
Frontier Farm Credit

I appreciate this symposium. I have always been entertained here, so I'll try to not disappoint. Here are a couple of revelations: First of all, there are a lot of smart people who serve on these panels and I'm a farmboy from Iowa, so keep that in perspective. Ejnar, thank you for eliminating all vestiges of sleep I once had. With that, though, I would like to share a bit of experience in the Farm Credit System and a perspective of what we look at in our association, for sure.

Considering all the growth and volatility we see in our industry, it is certainly a topic the Farm Credit System is seriously considering, considering our mandate and mission to serve agriculture and rural America. The financial health of our institutions, of course, is directly tied to the financial health of our borrower-owners.

Let me share a little about the financial health of both of the Farm Credit System and the farmers and ranchers and customers we serve. I have been in the System for 31 years. I have experienced both good times and bad times – sometimes in the same year, sometimes in the same week. I am very pleased to report the Farm Credit System is financially strong. At year-end 2010, the System held a loan portfolio of about $175 billion, which is an increase of 6.4 percent over 2009. Combined net income was $3.5 billion, a 23 percent increase over 2009; and the System held a combined capital of $33.3 billion, or nearly 15 percent of total assets. By any financial institution measure, that is a strong balance sheet and income statement.

It is because of that financial strength, as a System we weathered the disruption and turmoil of the financial meltdowns in 2008 and 2009 and met the daily and seasonal financing needs of every one of our creditworthy customers. We also provided forbearance and support to those experiencing industry downturns, especially in the pork and dairy sector.

The association I lead, Frontier Farm Credit, serves the eastern 41 counties of Kansas. We provide approximately 11,000 loans, totaling nearly $1.3 billion to 6,000 member customers. We serve customers of all sizes and complexity, and hold approximately 34½ percent of the agriculture credit market in our territory. By number, 72 percent of our loans are less than $100,000 in size and compose 22 percent of our volume. Conversely, then, 28 percent of our loans by number compose 78 percent of association volume.

In today's agriculture, it certainly doesn't take very long for a farmer-ranch operation or agribusiness to need more than a million dollar loan. Our financial results would mirror those of the rest of the system as a whole. In 2010, we grew about 6.1 percent in loan volume. Our net income was $19.6 million. Our permanent cap ratio is nearly 16 percent. We also have an active loan participation group, and we mitigate risk from larger loans by participating amounts above our internal hold limits.

Typically, in our situation, that means we hold credits below 5 percent of permanent capital and commonly as low as 1 percent to 3 percent of permanent capital and risk funds. As a cooperative, we pay cash patronage. We distributed $4.75 million last year and have distributed $25.65 million in cash patronage, money we think returns to our local communities. Nationally, the Farm Credit System distributed $730 million in patronage to its customers last year.

How are our customers doing? In our real estate portfolio, the average loan-to-value on land is 44.9 percent. Their current ratio is 1.53 to 1, net worth is $1.7 million, owner equity is 68.7 percent, and the debt-coverage ratio – the most important ratio – is 164 percent. In 2010, the average real estate loan value went up to about 54 percent on all the new real estate loans we made last year. All the other ratios improved, as well.

To mitigate risk, 68 percent of the volume in our real estate portfolio is in longer-term fixed rates. Our average operating-loan customer has a similar ratio of about 1.68 to 1 in terms of current ratio, net worth of about $1.6 million, owner equity is 70 percent, and, again, the capital repayment capacity of 149 percent. Of the volume in our operating-loan customer portfolio, 35 percent is in short and intermediate-term fixed rates.

Many of our customers are employed off-farm. Off-farm income is very diverse in our territory, with no one sector of employment more than 15 percent of the total. Delinquency rates are at reasonably low levels. We are at a less than 0.5 percent delinquency rate and we have been there for the last five to six years.

Of course, nationally of great interest in local coffee shops, increasingly from the media, and from financial regulators are the recent price increases in agricultural real estate. The most notable increases certainly have been in the upper Midwest – the major grain-producing areas of the country. Because we in the Farm Credit System hold virtually all of our loans on own balance sheet, we have a strong interest in seeing that customers are successful by remaining focused on using sound underwriting principles.

Given the volatility and risk in agricultural real estate values, we have adjusted underwriting standards by setting lower loan-to-value limits, stress testing the borrower's repayment capacity, shortening loan terms, or cross-collateralizing loans with property that has limited debt encumbrance. The most important thing we do, though, is make our credit decision based on the repayment capacity of the borrower, not just collateral.

Regardless of the System's financial strength and the general strength of our customer base, we know it is not the time to become complacent. There are many long-term, tenured management teams in the Farm Credit System, and we know industry downturns occur in the tails of the curve, not at the average. The operations most affected tend to be those that are growing rapidly in specialized and concentrated industries and young, beginning operators. Those that are late to the game and use leverage are certainly at most risk.

The successful businesses, including farms and agribusinesses, that grow also grow their intellectual capacity to manage a larger, more complex operation. Many use advisers and consultants for their production, marketing, and risk-management programs. That correctly positions us as a lender to accurately assess their plans and strategies, determine if they fully understand the implications to their business, and then structure the financing appropriately. We found our most successful customers embrace the concept of growing intellectual capacity, and add the appropriate accounting and risk management discipline to their business.

We've had significant downturns in the last several years that I've been at Frontier. I always am amazed and underestimate the ability of our customers to make adjustments on their own. It is our credit philosophy that when a customer begins to significantly increase loan size, leverage, and risk, we increase our expectations for quality information and frequency of reporting. We set loan covenants with expectations for minimum financial ratios before and after any new business venture and capital expansion project. We support and fund growth and expansion certainly, but we also feel it is our responsibility to provide counsel on managing growth and leverage appropriately.

As an industry, agriculture has been very profitable the past several years. Considering the amount of cash in the market right now, a marketing and financial adviser friend of mine who gives good counsel to his customers said, "We're in a profitable time, folks. And, if you aren't financially healthy, get healthy. If you are already healthy, get strong. Nobody ever said building equity was a sin."

Volatility certainly takes more liquidity and equity on producer balance sheets to manage risk. We know that. Grain producers, for instance, might fund portions of three years of production – last year's until it's marketed; this year's until it's grown and harvested; and before this year's is harvested, they are doing prepaids and marketing this year's production in the next year.

Livestock and grain producers alike are increasingly sophisticated marketers in using options and hedging strategies. And it takes more expertise and knowledge by lenders to serve their risk management needs. Today, I think customers have better financial and risk management tools available to them than they did 25 and 30 years ago. More importantly, they seem to be taking advantage of them.

I have been at this business of lending for more than a few years and I ask myself the question, why? Why do customers seem to have stronger financial skills and financial ratios today and seem to display more savvy financial management skill? Have we as lenders played any part at all in that change with demands for more information and evidence of management? Likely, it is a combination of factors, because frankly customers and lenders alike have no choice. You have to get better at what you do, if you expect to stay in the industry.

At our association, therefore, we've structured staff into specialized roles to make certain we have the right staff with the right tools with the right products and services for our customers. We know the future of agriculture is in the young, beginning operators. And, for that reason, every Farm Credit Association, including ours, has programs in place. At our association, we offer AgStart, a program for young, beginning operators, where we combine specialized loan programs with assistance on business and financial planning. Our loan officers work hard to understand the agriculture operations these new farmers engage in. Last year, the Farm Credit System made $7.3 billion in loans to young farmers and $10.3 billion in loans to beginning farmers.

So, in answer to the question of the day, are we ready, both as lenders and as customers, for unexpected downturns in agriculture? My answer is a cautiously optimistic "yes," especially for those customers and lenders with strong balance sheets and liquidity. Not all will be ready. Not all will survive. But then that is always the case.

Will we see the 1980s repeated? I don't think so, and certainly not for the same reasons. In the 1980s, economic and fiscal policy changed to bring inflation under control and severely penalized capital-intensive businesses like agriculture. We planted fence row to fence row and didn't build the demand to sell the product. We didn't have seven billion people in the world.

Today, inflation is in check ….so far. Worldwide demand exceeds supply. Even so, with those positive elements, we can't control the uncontrollable and liquidity, equity, and , risk management is an absolute. Volatility increases risk; it also increases opportunity for those who are well-positioned. There are more opportunities in agriculture today than ever before.

The Farm Credit System and our association are financially strong in serving our mission for agricultural America. Our association motto is "Side by Side, Season by Season." Those words were chosen carefully years ago, because they reflect an expectation by us and by our customers to be dependable and consistent. Today, that means being prudent in underwriting, knowledgeable about customer operations, conservative in good times, and courageous in bad times. I look forward to your questions.

Industry Panelist

Transcript

Jeffrey Gerhart
Bank of Newman Grove

Well, good morning. Yes, I am from Nebraska and, yes, we are looking forward to the Big 10. I can do that in a mixed group like this. What I will miss is looking across the way to the University of Kansas and knowing that once a year they come to Nebraska to play basketball. So I have to be confined to watch that on television, because those tickets are way, way too high.

What I am going to do is give you a little bit of a banker's perspective on the farm customers we have. The Bank of Newman Grove was founded or established in 1891, so we have been financing farmers for an awfully long time. Since that time, farmers have gone from the plow behind the horse to the farm machinery of today.

I was sitting out on my back patio having a cup of coffee the other day and the machinery that goes by looks more and more like it came out of a *Transformers* movie or a *Star Wars* movie. They were heading out the other day to do some spraying and all the end guns that protrude out, cars or trucks could be driven underneath those things, since they sit up so high.

We are a $36 million agricultural bank in northeast Nebraska. We are about 120 miles north and west of Omaha or Lincoln, Nebraska. Our customers raise corn and beans – most of it under center-pivot irrigation. We have several cattle feeders and a couple of cow-calf operators. Hogs went by the wayside in our area many years ago, although several of our customers raise hogs on a contract basis.

There is a saying, "The more things change, the more things stay the same." My invitation to this event from Mr. Hoenig stated, "As you know surging commodity prices have ushered in a new era of prosperity for agriculture. Yet, agriculture profits are often fleeting and there are certainly many questions about what the future may hold." Again, "the more things change, the more they stay the same."

We've been down this road before. They are many differences and there are many similarities. Agricultural bankers, like their customers, are pretty resilient and will weather, as best we can, those unexpected downturns.

The 1980s agricultural crisis was our toughest time since the Great Depression. It was also the toughest time for our borrowers. Together we worked through those challenges. Our bank was fortunate not to lose any farmers through bankruptcy or foreclosure during those years. Many banks were not so fortunate.

I still remember the day that one of the first agricultural banks in Nebraska failed and was closed. Because I knew the family, I looked in the mirror and reminded myself that, if we weren't careful, this could happen to us. Between the bankers and farmers, there were many sleepless nights – and also for the local agribusinessmen. In the end, working together, we worked through the challenges that surrounded us.

So will we today, as we prepare to weather the downturns in agriculture – expected or unexpected. I believe that and I agree with Doug. Overall, we are much better prepared. I asked and received input from a variety of agricultural bankers from across the country. I asked them to take a look at their farm customers and give me some insight to their agricultural customers' financial health.

There were nine questions that Jason gave me and I added one. We'll get to that, so I can poke him a little bit. One of the questions was, would you comment on how strong the farm financial sector is financially? Most of the agricultural bankers said the farm sector is financially as sound as they've seen it in the past 30 years. We have record commodity prices, land prices, and low interest rates.

So how much debt do farmers actually have? A majority of the farmers are less leveraged than in recent past. Most bank deposits are up from a year ago and most bank loans are lower from a year ago. Is the debt rising or holding steady? The response from bankers is mixed on that. Most debt is declining. Within the past couple of years, farmers are now paying down that debt with profits. Farmers will borrow more to plant and harvest this year's crop, but overall farmers have been working to reduce their debt.

What types of farm debt are farmers accumulating -- real estate or non-real estate? Again, there was a mixture of answers, depending on whether you were in Montana, Minnesota, Texas, Nebraska, or Kansas. Of real estate, machinery, grain bins, and

irrigation pivots, there is probably more machinery and equipment debt. Several bankers mentioned the farmers have been updating their equipment over the past couple years and we've experienced that, too. When the sun shines, you have to make hay, so there are good opportunities for the farmers to update machinery.

I remember in 1980s guys would come in to look at a new combine and their cash flow just didn't handle that. So we would turn them down. But, they were paying a lot for machinery repairs every year, so when the farmer had a good year and could buy that new piece of machinery, that took him down the road quite a ways.

Would farmers be able to handle a correction in commodity prices and farmland values? Boy, I wish I knew the real answer. What I found out from a lot of bankers was they felt farm customers could handle a modest correction in both commodity prices and farmland values. Most bankers felt land values on their financial statements are conservative. We'll find out as we go down the road and see if that worm does turn in a couple years.

At what price would corn have to fall before farmers started showing signs of stress? The consensus from the various agricultural bankers was that it would stress the farmers' cash flow if the price of corn was between $3.50 and $5 a bushel. Beans down into the $8 range would cause problems in most portfolios. That is a good range on the corn price, but then if you have bankers from Iowa, Montana, Texas, Nebraska, and Minnesota, you will receive different answers, depending on their particular situation.

How far would farmland values have to fall before the farmers would face serious challenges? Again, this response is all over the board too. Some said 30 percent and some said 50 percent. This also depends on what land value the farmer has on his balance sheet or how much land he's bought recently. Many of our borrowers have met very conservative land values.

We just had some irrigated ground in northeast Nebraska go for around $6,300 an acre. But some of my customers, who have just as good or better irrigated ground, they have land at $2,000 an acre on their financial statements and they don't want you to raise that amount. Again, it depends on the situation. Each year we also stress test our customers' land values. I'll give you some insight to that in a little bit.

Another question was, how would bankers respond to smaller profits in agriculture? Well, I run an agricultural bank, so I have to get up each day and loan to that farmer to get him through the good times and get him through the bad times. The consensus was we would continue to work with farmers just like we have in the past. We'd rewrite loans and repayment loans, if needed, as we've done in the past. By the way, that really works. Agriculture, as we all know, is cyclical in nature and we understand that in the good times and not-so-good times, that will come and go.

Now, the one question that Jason *didn't* ask me to address that every banker had some fun with this one. Remember the question was, how would banks respond to smaller profits in agriculture? Jason didn't ask the follow-up question which was, how would regulators respond to smaller profits in agriculture? That is the tail that really wags the dog. The banker's ability to work with his customer is influenced – and heavily at times – by the examiner's position on this.

In the 1980s agricultural crisis, we were able to restructure debt for farmers, if they needed help. The banking examiners at that time were willing to work along with the banker who was working along with the farmer. And the worm will turn at some point in time, but the regulators – and I know the Kansas City Fed's District and we are a state member bank – so the Fed comes in, as does the Nebraska Department of Banking and Finance -- they understand this. We hope that will be across the sector, because when the downturn comes, we'll need that consideration, and not just because a guy had his debt restructured. Will that loan be classified? Because that will do the most damage the quickest. It will be key for the regulatory environment to acknowledge this and allow agricultural bankers to work with their borrowers to see them through the tough times.

Would funding dry up? The consensus was no, but probably new purchases of land and machinery would certainly slow. Farmers are pretty good at making hay when the sun shines. They are updating machinery. They are adding irrigation. In fact, in our area, there has been a lot of conversion from dry land to irrigated land and also from propane and diesel wells to electrical wells. There is good upgrading going on that down the road will benefit the farmer.

How should agribusinesses prepare themselves if the farm boom ends? Any business needs to be prepared to work through the good times and the bad. As one agricultural banker said, "Be as prepared as you can."

Doug and I were talking at lunch yesterday and one of the issues in the 1980s agricultural crisis, for the folks out here that have implement dealerships and finance purchases, a farmer would come into me wanting to buy a new combine. We would sit down and do a cash flow and it just wasn't going to work. So we would turn him down. But then he would go down the road to the machinery dealer – whether it was Case IH or John Deere – I don't care what color – and whoever was financing, he would get that financing and come in 6, 8, or 10 months later, had a short crop, was not able to pay that down, so we had to figure out how to help him make that payment so that combine wouldn't be picked up.

We learned from that. Doug and I were talking and felt we were smarter than that. But there is a marked change today in how bank regulators look at my loan customers. They look at the global payments. It took me about six months to understand what the word "global" was, because I would just use the word "all." When an examiner comes in, if the customer is not making their payment to Case IH, I stand a really good chance of having that loan classified, or that customer classified. So we all need to be aware of that – that what the implement dealer makes or the pivot guy, whether it's Farm Credit or community bank, this all fits together. At the end of the day, we want to see that farmer out there year after year, because that is our bread and butter. That's something we want to keep in mind.

Most of the agricultural bankers I know and most of the banks have been in banking long enough to have lived through and remember the 1980s agricultural crisis. Many of us cut our teeth at that time. That is when we learned to make loans and collect loans. We learned also that we made some mistakes and we are trying hard, hopefully, to not do that again.

Our farmers also learn from their mistakes. We hope at the end of the day we work to be better prepared. We do a stress test on our real estate land values. We just did this the other day and our current loan-to-value ratio for farm real estate is at 20 percent. If land values drop by 25 percent, our loan-to-value ratio would rise to 26 percent. If

land values drop by 50 percent, the loan-to-value ratio would rise to 40 percent. If land values drop by 75 percent, our loan-to-value ratio would rise to 79 percent. Now that's collectively. That's everything.

If you break that down into individual customers, which is where all these numbers come from (we have a software program that lets us put a lot of information in it and extract this information), you will see individual customers differently. But we've run a stress test on our portfolio for quite a long time. I was surprised that most agricultural bankers I asked do not stress their farm real estate loans. Sometime soon, as per request from the regulator, they will do that.

In closing, let me thank Jason Henderson and the Federal Reserve Bank of Kansas City for allowing me to give a community banker's perspective as it relates to the financial strength of our farm customers. As a fourth-generation banker, we work hard every day to make prudent lending decisions for our customers. Many of these customers are second, third, and fourth generation farmers. We would like to keep that ball rolling.

As sure as it will rain, someone is going to get hail and sure as the sun shines, some farmer will dry out. Over the years, agricultural bankers have done a good job of managing risk, along with their customers in good times and in bad. As an agricultural banker in Colorado told me when I put these questions out (he was in the middle of a wheat harvest in the western part of Kansas and I don't know exactly where, but maybe south of I-70, because that is where the dry weather is, I believe), he said his wheat crop was very poor and he was going to keep his day job as a banker. He does banking on the side. He's a Kansas farm boy.

My parting word is that agricultural bankers are prepared for the next downturn, whenever that might come. And we are also working to prepare our customers for that downturn. Thank you very much.

General Discussion

Transcript

Moderator: Jason Henderson
Vice President and Omaha Branch Executive
Federal Reserve Bank of Kansas City

Mr. Jason Henderson: Now it's time for some discussion and questions and answers, again, similar to yesterday. I want to start off with some questions. When I go out, people say they're afraid of the 1980s returning. But I heard today that we are at 1975. Does that mean we are on the verge of an investment and leverage boom in agriculture in terms of that timing? What types of investments are going to be made? Is it going to be in U.S. agriculture or overseas?

Mr. Ejnar Knudsen: I've learned to *not* say, "I think it's exactly 1975." It's "maybe", "probably", and words like those, because it won't be exactly the same. But it sure seems to rhyme with that.

To me it seems, when I travel to the Middle East as an example, they have a major issue. We've transferred a lot of our wealth to the Middle East, but they have fossil water, they have aquifers that are not replenished, they are phasing out their wheat production, they have food security issues, and countries are destabilizing with these high food prices in the Middle East. China, over 2,000 years, they've lost the ability to govern their people 13 times. Seven of those times have been about food issues. So these countries have our money, and they're worried about their ability to continue to govern. They need to deal with food issues and have tried to invest in places like Egypt, just to find that the whole country destabilizes.

I expect a significant amount of money to come here to buy our resources. They've tried to buy in Australia, New Zealand, and South American, but they are being blocked in a lot of countries like Madagascar. I expect a lot of money to come to buy our resources in some form or fashion. I don't invest in farmland, but it's probably likely we will see many more buyers coming, and some of those buyers might use leverage. Because, with the instability in the dollar, would you rather own farmland? When asked

about gold, Warren Buffett, at the Berkshire-Hathaway Conference in May, said, "Buying gold today is betting on people's insecurity being greater in the future than it is today. I am not about to bet that people are going to be more insecure in the future. But I would take all the gold, that's $8 trillion, and take that $8 trillion – which would be all the gold in the world – and buy all the U.S. farmland for $2 trillion and I'd buy 10 energy companies for $6 trillion, because you are going to get something from them every year, since they produce something." He continued, "The government doesn't get upset at him. Every government produces fiat currency."

The answer is "yes," I would expect a lot more money coming from places that have our money. I would expect to see it well-supported. There might be cracks and crises along the way, as there were in the 1970s. But we are in the first third or the first half of the game.

Mr. Paul Quinn, Harvest Moon Capital: I'm Paul Quinn. I'm with Harvest Moon Capital. My question is for Ejnar. You mentioned fat-tail risk. How do we hedge or, more importantly, make money from fat-tail risk.

I also had a second question for the bankers. Given the health of your borrowers, why do you think there hasn't been more of a competitive response from the money center banks in the agriculture arena?

Mr. Knudsen: Hedging fat-tail risk is pretty hard because you don't know the time it's going to come. You don't know if it's this year or not, so the easiest thing is the financial flexibility. But you don't want to have too much cash because the cash might become worth a lot less, as the government is printing so much of it. It's the balance of having that financial flexibility and not a lot of leverage. Also what I value is liquidity. I invest in public securities, so I have the option to sell one company's stock to redeploy it. But, of course, it could be depressed to buy something that is even more depressed -- liquidity less leverage.

With this volatility, options probably are underpriced at some times. I noticed it in the milk market, where banks are forcing their customers to be more sophisticated and have risk-management strategies. So, then, the dairymen are actively selling call options to be able to buy put options.

They are unfortunately not realizing we have a much wider distribution tail. We could have $24 milk, and we see that happening right now, whereas eight months ago that was unimaginable for the dairy industry where we were at $22 milk. Buying options and being careful when you sell options, because we have so many extreme scenarios with the devaluation of the dollar and the potential for liquidity shocks. Hopefully that answers your question.

Mr. Jeffrey Gerhart: The question on the competitive side is, Why aren't the very large banks in our markets? …They are, they just don't pay taxes. We have the Farm Credit System we compete against every day, along with other community banks. A lot of it is the farmers that Doug is financing, I am financing, and some of the bankers around the table are financing, they are just too small.

In the 1980s agricultural crisis, one of the big providers for real estate debt – we weren't doing it [lending on real estate] in the 1970s and 1980s, because you had the Federal Land Bank and the insurance companies – when times got tough, they got out of it. I don't know if that mentality is out there, but our borrowers aren't that big, and I'd be interested in Doug's perspective on that. We do have the Bank of the West around. We have Wells Fargo and U.S. Bank, and they are active in the area. I also think – a little bit tongue-in-cheek – come Thursday, the 111 largest banks and credit unions in the country are going to be invaded by the Consumer Financial Protection Bureau. They will have their hands full. There is a smallness to it that community banks can certainly fill. Maybe we are not large enough, but I'd be interested in Doug's perspective.

Mr. Doug Hofbauer: I would agree with everything Jeff has said here, other than we do pay taxes, by the way. [laughter] We have a pretty diverse portfolio and the 72 percent of our portfolio I said that was smaller than $100,000, that is not a target market for a money center or international bank. But, when you get up into our larger customer base, we certainly compete. They are in those markets. If you look at the percentage of volume in our system that is in the large-customer base, we certainly compete with that market every day. We also compete with the local community banks on the local level. We see them in the market all the time, they are good competitors, and we do business with one another.

Mr. Kenneth McCauley, National Corn Growers: Ken McCauley, a northeast Kansas farmer. There is a hazard of sitting too close to the microphone. I swore I wouldn't get up today.

But there is something we've missed, in talking about the price of grain going down. The yield and volume a farmer has to sell are really, really important. When you look at this 2010 crop, I would put some money on the fact the average selling price of corn was $4 or a little higher. And 2010 is going to go down in the books as a very profitable year for agriculture. It tells me $4 is a pretty good breakeven point for farmers to sell corn and soybeans at the same percentage. It is really important we not just talk about the prices falling, but we look at the whole growth side of a farmer's portfolio.

The question I have is, if a farmer who buys land today and finances it at 50 percent of the value, which would be financing about $4,000 an acre, is subjected to some of the things that happened in the housing market, will we need to reappraise that land if the values drop 50 percent? And, if that is the case, that is a totally different situation for my son who doesn't have a lot more to go back on or myself, if I buy 160 acres today for $1 million and have to refinance three I've already paid for, just to stay current, when you are current with your payments. I'd be interested in that. Thanks.

Mr. Hofbauer: I might answer that. As long as your payments are current, we don't care what the value of that property is. Agriculture is one of the few industries that celebrates the increase in the cost of the factory. Did you ever think about that? Everybody else wants to cheap factories and we celebrate the increase in cost of our factory.

As long as they are current, we are certainly not going to reappraise and expect additional security to support that loan. When there is trouble that occurs in the account, then we are going to look for additional security or something to try to restructure the debt.

Mr. Gerhart: The situation today is also with the low interest rates. This gives a great opportunity for the farmer, existing operator, or new young farmer to lock in for very long times and very low interest rates. I know I'll get the question, "Well, if I pay this off early, is there a penalty?"

But I say, "No, but at these low rates, I don't think you are going to pay this off early."

If they do, I still have some cheap money to utilize for something else. Yes, that it is a tough question. In our bank, we typically loan 50 cents on the dollar and take some additional ag land, if we feel it's prudent. Plus, in most financial statements, the long-time farmer has some pretty good values built up.

I am not actively out soliciting $6,300 an acre land. In fact, that particular piece of property was too large for us, which was a nice way not to have to work with our customer. He didn't get it, but I wondered where in the world, and how in the world, is he going to pay that off. We are in some pretty high times. We are going to get through this thing, but properly structuring that loan is important, so they don't have to come back and redo it.

Mr. Ken Keegan, Farm Credit Services of America: Paul, I'm interested in your slide that is showing the current distribution of farms. What can we expect in farm structure changes for our agricultural producers as we look forward, particularly in light of some of the world food security issues.

Mr. Paul Ellinger: That's a very good question. When we go to meetings like this, what we tend to see is bigger tails, with more of a barbell where the larger farm size is more consolidated, as well as more hobby-size farmers. So we might see them move toward the tails of those distributions.

What we see in Illinois is clearly consolidation on that side. We've gone at a faster pace than maybe other parts of the country. But we have a lot more farmers that are doing 7,000 to 10,000 acres when we get to meetings. It used to be we'd only have a handful of those, but now we can get a room almost this size of the farmers that are at that edge. One of the biggest changes I've seen since I came back to the University of Illinois in 1996, and we asked what the bigger changes are when we go out to the farmers, they said, "We compete with each other now."

You get the sense that farmers help everybody else in their farming operations. Now land rent and land access have become so valuable that they're competing for land rent. Good friends are taking land away from somebody else, so there is a tremendous amount of competition for renting land. We're seeing a higher percentage of land being

rented that is being farmed in our state. From that standpoint, we are going to see larger farms, but we are still going to maintain more of the hobby size as well.

If you look at the slide I had at the beginning about farm profitability, the one area that didn't have high correlation with that is agriculture. What generates a lot of interest in farmland, both domestically and internationally in some of the research we've done, is it does look good in a portfolio.

An interesting anecdote is we receive a lot of calls from institutional investors about – for those of you who don't know much about farming – asking where they can get the price? Where is it listed? Well, it's not.

The very interesting one – and one he wouldn't mind me sharing – is I received a call from Peter Lynch, just wanting an hour primer on agriculture. There are people who are interested in that industry, both domestically and internationally, who haven't been interested before.

Mr. Henderson: We have an investment fund that shorted the housing market. Now you are investing in agriculture. What draws you in and, the other people who come in, what is the risk they leave at a future date?

Mr. Knudsen: The reason why a firm like Passport Capital would be interested in launching a fund is it's a long-term commitment for them to have a fund that is dedicated versus just having a part of the main fund. The reason is they view persistent resource scarcity – this seven billion people and better economics and all the new consumers in the world. But Passport's view is that we are going to have liquidity and crises shocks of high magnitude happen very quickly, so we should be prepared for more of what happened a few years ago. They value having liquidity in those crises, because other things can become even more distorted. That's why 1) they are interested in agriculture and 2) interested in some liquidity in that strategy. But it's a long-term view and, not something that's three years; it's a decade plus.

Marc Faber of "Gloom, Boom, and Doom Report" did an excellent presentation recently in Indianapolis that I attended. He took the Mexican crisis and -- if you were in the peso or in Mexican bonds at the beginning of the Mexican crisis, you lost more than 90 percent of the purchasing power of your peso, because of the devaluation that

happened --but, if you were in equities or if you were in commodities, you maintained your purchasing power through that decade.

Even though the public equity market might be down 20 percent intra-period, through that decade you maintained your purchasing power. That is an example of why we and our clients, who are giving us money, look at it as they will have money in farmland and in hard assets and they will have money in equities. If you look at the U.S. equity market, farmland, and rents, they are very cheap relative to most parts of the world, so a lot of money is probably going to come to the United States to buy even more public equities and farmland.

Mr. Gerhart: Jason, I have a question for the panel. With regard to slow-moving trends, there might be a slow-moving trend from the standpoint that in our area – I'd be curious to see if Paul saw this in his research and Doug with his customer base – we are seeing more farm families continue to work more together on buying machinery, land, and other types of equipment than we saw maybe 20 years ago. It's brothers and spouses having off-farm income, but that might be something under the radar screen. I don't know what kind of research is out there, but I've been seeing that more in our area. I am curious what you folks are seeing. Maybe there is an underlying current that it will add some stability, if these guys are not *each* buying a $300,000 or $500,000 combine, but they are sharing the load a bit.

Mr. Ellinger: It goes back to the last question that was asked, where are we getting larger firms? It depends upon how you count the farms. In many cases, these farm families have two sons and a nephew and a farmer who are all sharing. Is that counted as one farm in this versus individual farmers? I guess we are seeing a lot more of that by necessity and the capacity to be able to do that. We are trying to conduct seminars to assist in how to do machinery sharing, even outside of a family operation. Lawyers get involved, then bankers – who has the security? – but we are seeing more opportunities with people trying to investigate that.

Mr. Hofbauer: We've seen more growth in some of the larger operations where a neighbor decides to discontinue farming and sells her machinery or rolls her machinery assets into another neighbor. It used to be adding 80 acres or a quarter section. Now we are adding 500, 1,000, or 2,000 acres at a time. Part of that is to create more efficiency in

the resource allocation, so you can put that same piece of equipment over more acres. I don't know if we have any research which shows the trend you seeing, though.

Mr. Henderson: How does that structural change affect the structural change of the financing industry? If your farming is consolidating, what's the agricultural lending landscape going to look like five years from now?

Mr. Ellinger: If you go back to his question, why aren't the large people getting involved, if you look at my graph, the large people are involved since 20 percent of lending is involved in that capacity. Some of the community banks are going to be challenged, as we become larger. I am on the board of directors of a $100 million bank and our maximum loan is $2 million. This consolidation is going to force you to partner with Farm Credit or Farm _____ or with somebody else. The shift in the data would support some of that is going to larger operations.

Mr. Hofbauer: I would agree. We are in the process of restructuring our company, so we have specialists assigned to larger customers. They have to have fewer accounts. They can't be everything to everybody. At the same time, we have more farms in Kansas this year than we had in past years. That is a specialized market to serve, too. So we try to assign and allocate staff appropriately.

We work with money center banks. We've worked with community banks recently on some participation activity. That trend is going to continue.

Mr. Ellinger: Getting back to openness, I see more partnering now. We have this little dialogue between banks and Farm Credit. The conversation is occurring more, where people are seriously thinking about partnering. Our two local associations in Illinois said they need and want that partnership with the bankers. That conversation, at least, is occurring, whether or not a lot of transactions are resulting.

Paul Quinn, Harvest Moon: If we were to see a stress scenario develop – $4 corn and land values down 30 percent – how would you expect cash rents to behave?

Mr. Hofbauer: With a severe lag. [laughter] Landlords don't like to reduce rent. They are very sticky. That is where some of the risk is and hopefully our next speaker will talk to this. Within a year, at least our own corn producers are fine, we have crop producers and other types of things. From year to year is where you see the drop with our guaranty insurance rates and land values stay at that level for another year, if they are

sticky for that year. That is where some of the real risk occurs and also with fixed rents at $500 for three years out. That happens. Those are hard to protect against but maybe Michael [Swanson] will tell us how to protect from that, as well. That is where the real challenge is and, in my opinion, those will be sticky. We tend to not see those rents come down at least in the Midwest. We are seeing a lot higher proportion of cash rents versus shares or some combo of that.

_____: It seems there is always somebody willing to pay it too. We are talking about that competitiveness between neighbors, because we are seeing more cash rental auctions occurring.

Mr. Gerhart: The last time cash rents went up, before more recent times, I had an older customer and former farmer who was cash renting his farm out. All of a sudden grain prices jumped up – he was a good depositor too – and he came into the bank one day and he was upset because his renter was making so much money. He thought he really should have an opportunity to raise the cash rent during the year. It was an interesting conversation, because I was trying to calm him down a little bit. I said, "Listen, you are getting a guaranteed amount out there. Next year you could do that or you could go to a crop share, if you wanted to take on that risk."

It has always surprised me there is more cash rent going on versus crop share, because most of the farms are going from one generation to the next. But sometimes even Dad wants a cash-rent check versus the crop share. The crop share would help that son do a little better job and give him less risk. It is another slow trend. Maybe it's _____, but it is an interesting change that has gone on.

Mr. Ellinger: But, the more institutional investment you have, the more cash rents and more stickiness you will see in that as well, because they want a return on the $10,000 an acre they have and a certain percent would be my opinion.

Mr. Knudsen: A lot of farmland in the world is based on bags of whatever the crop is, not on this fixed priced. So it is surprising to me that the U.S. is still in this "We're going to set it and it is going to be the right price for however long," and then there is the relationship damage that occurs when you want to change that.

Mr. James Andrew, Andrew Farms, Inc.: Jim Andrew from Iowa. My question is directed to Jeff. In my community, there are three community banks. My old

system of telling how well they were doing was how full the parking lot was. I realize that no longer holds with electronic banking. Are you seeing it more difficult to maintain customer relations when I can sit at my computer at midnight, transfer my funds around, make my payments, and don't have to come in to physically see you – other than maybe socially on the street – your ability to press me as to an opportunity or whatever being limited? Are you noting that?

Mr. Gerhart: In our shop, no. We'll sit down before harvest is done with our customers and work their cash flows and set up the next year's crop over the winter months. So we have a pretty good flow of traffic. We will set up a line of credit, as many do. They can call in or they can come in, but there are times when it is not as busy. Certainly online banking allows people to move money and to check their balances. We are taking fewer phone calls from the customers inquiring whether checks have come through, their daily balance, or whatever.

Technology has been a boon to us. We use the services of Web Equity out of Iowa and are able to put in all the tax information and the year's financial statement, which gives us some nice trends. When we first started asking for tax information, believe it or not we did not always ask for that, there was a certain of reluctance from customers, but when they see the results and trends and we can go over those with them and show them the different ratios where they are either improving or not improving, then the discussion becomes, "What do I do to improve?"

They are appreciative of that. There is no way on God's green earth we could do all those ratios for all of our customers with this being a small bank having a limited staff. Technology is helping us a lot. Yes, there are fears they would go someplace else, but for the most part, it is a people-related business and it's person to person. If we are competitive in the market with interest rates and providing them with the funding they need, they return generation after generation.

Mr. Ellinger: I want to pick up on that. A more interesting question from a banking perspective is, back in the beginning of the decade, we thought we'd see with Internet banking a lot fewer branches. There is not a lot of evidence of that, at least in the Midwest. Branch expansion has not slowed down. We are still investing in bricks and mortar. We anticipated having only an Internet banking service, but there is no evidence

of that. We have a research report that asks why we are still expanding and why do we need bricks and mortar and people on the corners, but it is happening. It is still happening at a rate that is a bit puzzling of that investment.

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Session 4:
Managing Agricultural Risk

Managing Agricultural Risk

Michael Swanson
Vice President and Consultant
Wells Fargo

Farmers and agribusinesses have sought ways to deal with risk since the very first farmer put some of their precious grain back into the ground instead of their stomachs. The calculated risk of exchanging a sure thing for a possible better (or worse) thing in the future is still at the heart of agriculture. All the possible strategies no matter how elaborate revolve around this primal and unchanging risk. Farmers and agribusinesses are still taking grain and other resources with a certain value today and putting it in the ground or the stomachs of animals for an uncertain but hopefully better value tomorrow. So why, after literally thousands of years, hasn't the market come to the optimal and permanent solution for this risk taking? In 1473 in Sienna Italy, the Monte dei Paschi bank was established to help farmers and merchants manage grain price risk.[1] Surely, 600 plus years of business transactions and government regulation should have produced a universal and effective method for farmers and agribusinesses to mitigate their risk.

In reality, the U.S. and international markets are seeing rapid and dramatic change in risk management in agriculture and agribusiness. Technological and social change drive risk management and adoption evolution. Technologically, telecommunications and the Internet have increased both availability of information and the illusion of information. Socially, while human nature seems to change extremely slowly if at all, the growth of corporations and cooperatives has changed the nature of participants in the agricultural markets. Quite simply, corporations behave distinctly from individuals under the pressure of agricultural risk. Corporations as a collection of individuals with long-term capital structures that insulate decision makers from the day-to-day pressures of the market behave differently. As corporations and cooperatives become ever larger shares of the agricultural markets, they change the risk and reward structure to better suit their needs.

[1] Against The Gods: The Remarkable Story of Risk, Peter L. Bernstein 1996

Historically, the first risk mitigation technique for farmers was to hold back enough seed that if the crop failed they could still eat and plant again. This was the first example of "living within your means" and leverage, and it was a brutal teacher. Not surprisingly, this principle still forms the basis of risk management. While farmers might not save the seed themselves, they need to hold enough working capital that if their crop fails or prices plunge they can live for another year (or two) and plant again. Both banks and governments directly influence this most basic of risk management techniques through their policies. Almost universally, banks require a minimum working capital ratio to ensure solvency and ability to mitigate income volatility. Between banks and their regulators the definition and targeted minimum can vary dramatically, and their policies respond to the change in price and production volatility.

Once again, after so many decades of managing agricultural risk, it would seem that the "market" would have settled on a commonly accepted ratio for working capital. After all, farmers and agribusinesses incur a financial penalty from holding excessive amounts of working capital, and they face a severe risk from holding too little. If farmers and agribusinesses are too conservative in retaining working capital they face competitors that can expand faster by using more leverage and bid higher for available assets. This type of risk hardly seems important in the short-term, but many farm operations and agribusinesses are multi-generational. Only those that expanded fast enough to compete remain in business. While it might not seem like a business failure, many farm operations and agribusinesses are forced to sell when they can no longer compete. They do not fail in the strict financial sense, but they do not succeed either on a long-term basis. Almost exclusively, banks and regulators are concerned with the short-term and dramatic risk of illiquidity from holding too little working capital. These are the types of "financial" failures that show up in the statistics. Bankruptcies are counted, but firms that self-liquidate because they cannot compete are not.

One reason why banks and regulators do not have a universal target involving working capital ratios is because they cannot agree on the real risk of price and production volatility. The old jibe about "lies, damned lies and statistics" still holds sway in the world of risk management. What is the "true" price and production volatility? It all depends on the data used to compute it and the assumptions. And, unlike a physical

phenomenon, socioeconomic market systems can change based on large number of factors. What would cause banks and the regulators to agree that price volatility has changed? And, what does that mean to the amount of working capital a farmer or agribusiness should hold? Lastly, a bank's risk standards are a crucial competitive decision. Loose standards attract business, but they invite a financial disaster of their own. Banks and the banking system go through cycles of risk aversion just like all industries. And, the cycles are always backwards looking. So what is the current environment for price and production risk?

The following statistics measure the premier market for agricultural risk throughout the world – the U.S. corn market. The U.S. is the world's predominant grain producer, and corn is the cornerstone of the U.S. agricultural system. The following charts illustrate the U.S.'s unique position in the world of grain. The U.S. consistently produces about a quarter of the world's grain (including rice), and its corn markets are the price setter for traded feed grains around the globe (Chart 1). The U.S. alone sits in the upper right quadrant of grain production versus grain per capita (Chart 2). Other countries produce as much grain (China), and other countries produce as much grain per capita (Australia). However, no one produces both as much grain and as much grain per capita. All grain markets are linked through substitution and opportunity costs.

Chart 1: U.S. Share of Global Grain Production

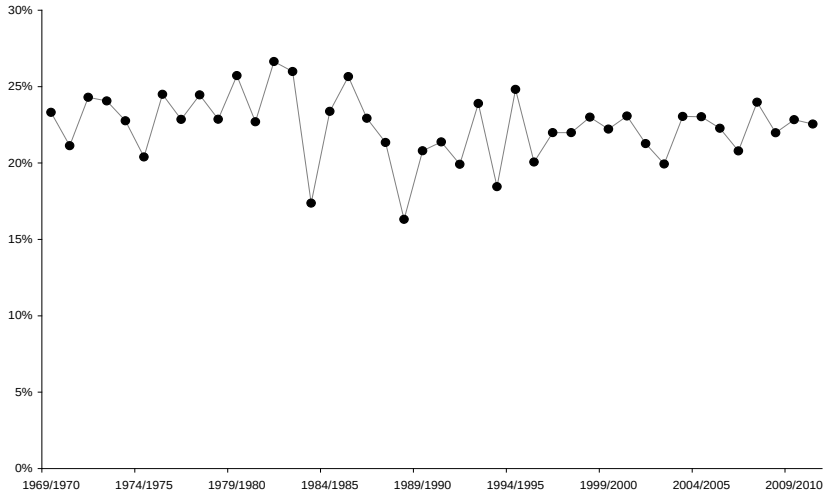
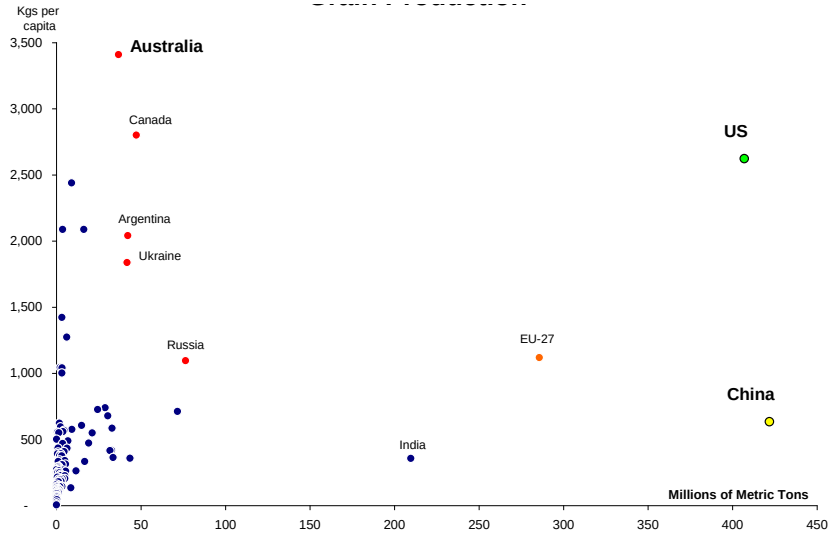
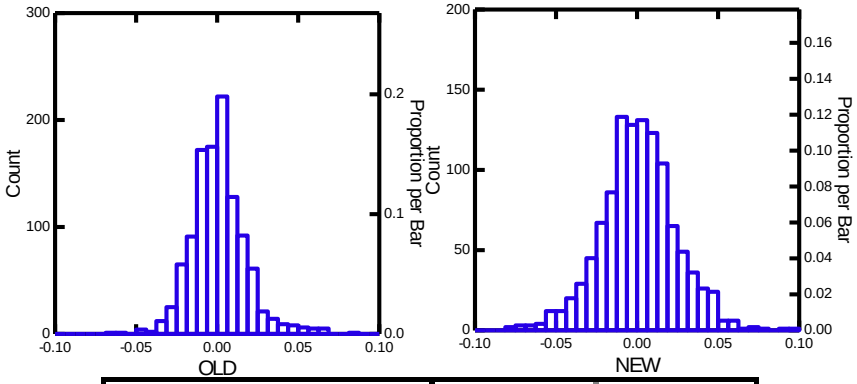


Chart 2: World Grain Production



Something has changed in these key price setting markets. They have become statistically more volatile, and this should be forcing farmers and agribusinesses to retain more working capital and employ additional risk management techniques. The following statistics compare the day-to-day percentage price change in the nearby (the contract closest to the current date) corn contract on the Chicago Mercantile Exchange (CME). Both samples contain 1,120 observations expressed as a percentage change to make comparison more applicable. Both periods are clearly normal bell shaped distributions centered on zero (Chart 3). In both distributions, the median and the mode are 0 percent, and the mean is 0.1 percent. However, the standard deviation has increased 35 percent in the later period. The range of observed values in the most recent period is wider and the volatility more pronounced.

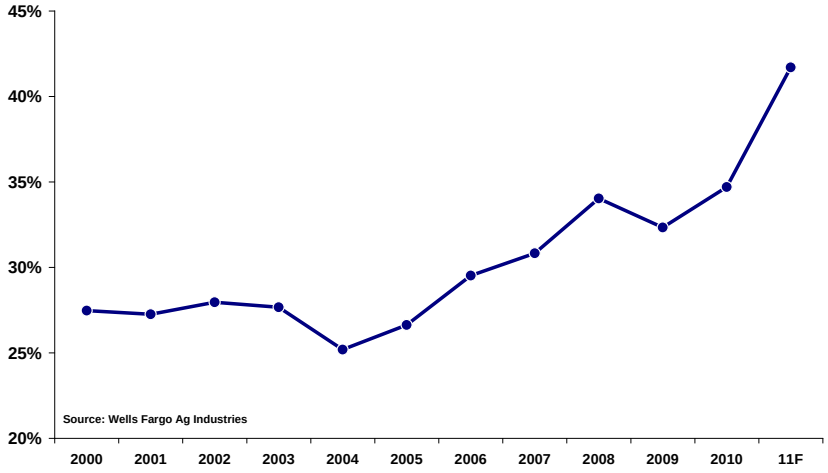
Chart 3: Descriptive Statistics on Corn Futures Contract



Daily Percentage Change in CME nearby corn contract	2007 to June 2011	2002 to 2006
N of Cases	1,120	1,120
Minimum	-7.8%	-6.5%
Maximum	9.8%	8.4%
Range	17.6%	14.9%
Median	0.0%	0.0%
Arithmetic Mean	0.1%	0.1%
Mode	0.0%	0.0%
Standard Deviation	2.3%	1.7%
Skewness (G1)	0.01	0.70
Kurtosis (G2)	0.81	2.38

A similar increase in price volatility can be measured in all of the commonly traded agricultural futures contracts. Even crops and products that are not directly traded via futures are being influenced by this volatility. For example, there is no futures market for dry beans, but they compete with corn, wheat and soybeans for planting acreage based on returns per acre. As the price for the "big three" fluctuates wildly, dry beans and other specialty crops fluctuate to match the expected returns. Additionally, the U.S. agricultural market has progressively become more dependent on the global markets as a larger percentage of its sales are going to foreign markets both as a percentage and in absolute dollar terms. Many specialty crop markets such as dry beans and almonds are particularly influenced by the global economy with its greater growth and volatility. In reality, no agricultural market has escaped the increased price volatility. It is simply easier to measure it in the well-documented futures markets.

Chart 4: The Value of Agricultural Exports Relative to Farm Gate Revenue



Besides the immediate and obvious response of increasing working capital, what other risk management practices are being emphasized or created to deal with the greater price volatility? There has been a significant amount of innovation in risk management over the last decade. Some of it has been promoted by governments. In the case of the U.S., the USDA RMA (Risk Management Agency) has created hundreds of crop and livestock insurance programs that combine production and price risk policies. These policies have been subsidized by the federal government to promote their usage and reduce the need for disaster assistance. They have also been touted as being trade policy neutral since they do not "appear" to favor planting one crop over another. However, by reducing the risk of farming, they help promote crop production in general. In the early 2000s, this seemed to be a bigger problem when overproduction was keeping grain prices depressed. In 2011, the biggest problem appears to be a lack of sufficient production to keep grain prices from rising.

These "revenue assurance" programs have had a number of significant ripple effects in risk management. Since farmers can be assured of a minimum level of revenue established early in the crop cycle with an upside potential if prices rise, they can forward sell a larger portion of their crop. Previously, the concern was that if they pre-sold a number of bushels at a set price and suffered a crop loss they might need to buy back bushels at a higher price and lose the difference. In reality, most farmers exaggerated the risk of this type of transaction. With the exception of some the most extremely variable

districts, most farmers never have yields that drop too much. The risk most feared by the farmers was missing out on a rising crop price without having crop to sell. These revenue crop insurance programs have come to dominate the crop insurance sector. And, most agricultural bankers would be very skeptical of farming operations that do not participate in crop insurance. Many agricultural banks have policy governing how much forward marketing an operation can do with and without crop insurance. Additionally, agricultural bankers have become licensed crop insurance agents to strengthen their relationships with their customers and to earn additional premium income.

With the widespread adoption of "revenue assurance" crop insurance, a crucial number of producers have become more willing to pre-sell crops. The two drivers of pre-selling grain is that it allows farmers to manage margin by pairing up input and output prices, and in most years there is a substantial risk premium for selling early before the industry is assured of an good crop. Farmers are naturally long on grain or crops that they produce, and they are naturally short of crop inputs such as cash rent for ground, seed and fertilizer. When they make a decision to purchase an input, they can pre-sell the crop to set the relative price ratio establishing a margin for an expected yield. This form of margin management is rapidly becoming the preferred method of handling risk on input purchases.

It also splits farmers and ranchers in to two distinct groups. The first group is the more traditional group that relies on maintaining large reserves of working capital to deal with price and production volatility. This group believes that farmers earn a better financial return by taking the risk rather than trading away the risk. The second group focuses on the returns from operations more than the possible returns from marketing gain. They can operate more acres on the same amount of working capital. If the strategy is well executed, given the crop insurance and matching of input and output prices, they have reduced the range of possible outcomes both bad and good. Agricultural lenders who understand the risk management technique will be willing to lend with less working capital because the farm operators have truncated the worst case scenarios, limiting the need for the working capital.

The second group has been more successful in expanding over that last five year phase. Given the dramatic rise in crop prices in general, access to additional acres to

operate over has been the key to producing greater income and higher returns. This is a good example of how changing volatility prevents a single strategy from dominating agricultural risk management. For a prolonged stretch from the 1990s to 2006, the grain markets saw limited price volatility. Typically, the only price events were weather events that would temporarily spike prices until a new crop could reestablish sufficient supplies. This lack of volatility reduced the need for working capital, and working capital was not typically a binding factor for expansion. Additionally, farmers who traded away price risk for set margins lost out on the occasional sharp price increase that could boost returns. These weather driven run-ups in prices boosted the returns to capital compensating farmers for the additional liquidity that held in the working capital.

So what tools is the second group of farmers using to pre-sell grain to establish their margins?

Table 1: Tools to Sell Grain

Risk Tool	Pro	Con
Hedge To Arrive	• No margin funding required • Cost established upfront • Delivery point established at sale • Local connection	• Locked into single delivery point • Limits ability to negotiate better basis • "Rolling" risks • Hard to evaluate counter-party risk • Typically more expensive
Futures Accounts	• Liquidity • Transparency • Options trading possible • No counter-party risk • Open on basis and delivery	• Margining required • Harder to manage emotionally due to constant repricing • Can become speculative instead risk managing • Open on basis and delivery
Over the Counter	• No margin funding required • Cost established upfront • Known counter-party risk • Counter parties typically stronger financial institutions • Open on basis and delivery	• Open on basis and delivery • Dodd-Frank act reduces number of parties willing to enter swap

There are three well established techniques; hedge to arrives (HTAs), futures sales and "over the counter" (OTC) swaps (Table 1). HTAs are typically established between a farmer and a grain operator (elevator, feed mill or ethanol plant). It is swap

arrangement that typically references a CME specific contract. The farmer takes fixed futures price for a set delivery period, and the grain operator takes the floating price risk. In an HTA, the farmer and grain operator can establish the basis (cash difference to the future price) or leave it "open" to be determined at a future date. The grain operator almost universally then offsets their floating risk by taking a fixed futures position or selling back-to-back positions. The farmer typically pays the grain operator a set fee for HTA that depends on the length of the swap and the recent volatility and interest rates. The farmer gets a fixed futures or cash price without having to maintain funds for possible margin calls.

Farmers typically overestimate the real interest expense of maintaining a futures position. However, they face a legitimate concern that if they can't maintain the margin position due to lack of liquidity or support from their lender, they could be forced out of their hedge. Grain operators offer HTAs as a source of fee income from the hedges, but most importantly it allows them to encourage and program additional delivery volumes to their facilities. Grain elevators face the risk of non-delivery on these HTA arrangements. When local yields are substantially below average or prices change rapidly, grain farmers might seek "to roll" their HTAs with the grain elevators. The following excerpt is from an Iowa Supreme Court Ruling that discusses the risk involved with HTAs and rolling.[2]

> The second element of risk in HTA contracts is introduced when the farmer is allowed to postpone delivery to a later date. This practice is known as rolling. When the price of grain rises by or near the time set for delivery, the farmer may prefer to sell his grain on the current cash market for a higher price rather than deliver the grain to the elevator for the contract price. Under these circumstances, the parties may agree to modify the contract by delaying, or rolling, the delivery date to a date in the future. To preserve its hedged position, the elevator buys back, at the current price, the futures contract it had previously sold on the CBOT and enters into another futures contract to sell grain on the new delivery date.
>
> The complicating factor in rolling is that the price of corn for the new date of delivery generally is not the same as the current price for the old delivery date. This difference is called the spread. If the new price is higher, the spread is positive and will result in a gain or carry. If the new price is lower, however, it will result in a loss or inverse. This gain or loss is fixed at the time of the roll and is added to or deducted from the new

[2] TOP OF IOWA COOPERATIVE, an Iowa Corporation, Appellee, v. SIME FARMS, INC., Appellant. No. 98-1166. -- March 22, 2000 Iowa Supreme Court

> contract price under the rolled HTA contract. Thus, when the farmer decides to roll, he can determine at that time whether he will incur a gain or loss. The problematic risk arises when the farmer rolls to a month when he will not have grain on hand to deliver. He has then exposed himself to an additional, unknown risk because he will have to roll again before he will be able to make the agreed-upon delivery. If the market deteriorates and the price of corn falls, the farmer may ultimately be required to deliver grain at a significant loss.

Clearly, any common practice that has been argued to the state Supreme Court level represents a significant risk. If HTAs cannot be "rolled" to a different delivery date, they behave almost exactly as standard futures accounts. They would need to be settled by delivering the grain or cash settlement.

The Dodd-Frank Act represents a major change in agricultural risk management. It represents the belief that HTAs and "over the counter" swap arrangements create a bigger risk through their counterparty and complexity risk. The argument is that everything a farmer can do with a HTA or OTC arrangement can be done better and with less risk with a futures account. Additionally, the transparent and cash-backed nature of futures accounts managed by a regulated board eliminates many problems. Theoretically, it is true that future contracts offer the best risk management technique. However, human nature trumps financial logic. Many farmers will simply stop forward selling grain to manage risk if they are forced to maintain margined accounts. Psychologically, they feel that every margin call when prices rise is a reminder that they failed to sell at the top of the market. They fear being unable to meet the margin calls and being forced out of their positions at exactly the wrong time. Additionally, farmers often create speculative positions in their futures accounts that add to their risk rather than limit it. Too many operators feel they have superior information because they work in the sector. In fact, many operators are the worst speculators because they have an implicit bias in their expectations. All these factors and more make the theoretical superiority of margined futures accounts over swaps a hollow argument.

What about the livestock sector? For the most part, the livestock sector uses risk management tools more extensively than the crop sector. The amounts of capital at risk have been elevated for a longer period of time. The sizes of operations in livestock have been growing rapidly for more than two decades. Now, with increased feed cost

volatility and livestock price volatility, the need for working capital is forcing livestock operations to increase their hedging strategies. Each livestock segment has its own unique approaches. A number of factors dictate the prevalent approach in the different livestock segments. Table 1 lists some of the factors and the associated characteristics. Often, the prevalent risk management technique in a segment is dictated by the combination of these factors.

Table 1: Key Livestock Risk Factors

Feed	• Self supplied	• Purchased
Replacement animals	• Self supplied	• Purchased
Output price	• Open bid	• Contracted
Technology	• Open market	• Proprietary
Land base	• Significant	• Minor
Permitting	• Minor	• Significant

For example, a smaller farrow-to-finish hog producer with a large land base might do little price risk management. They can estimate their feed cost based on production costs and yields. This allows them to vertically integrate the cost of feed into their operations. They can supply their own sows, barrows and gilts at a known replacement cost based on feed costs, breeding and mortality rates. They can often take spot delivery contracts with processors based variable but competitive cash or futures markets to be established at the time of delivery. In a situation like this, many producers feel that hedging simply adds complexity and cost without improving the average margin. If they have sufficient working capital to manage the up and down cycles, the unhedged approach represents a very sound risk management technique.

On the other hand, a large feeder pig operation with little or no self-supplied feed would need to practice extensive risk management. They are exposed to the weekly feed price risk, as well as feeder hog price risk. They would not have the offset from the farming operation to vertically integrate the feed price risk. Likewise, barrow and gilt prices are highly correlated to feed prices which would reinforce the feed price risk. Hog operators like these often completely hedge every hog produced. When they purchase feeder pigs, they sell lean hog contracts and buy the corn and soybean meal either physically or by futures. This sets the margin on every pen of hogs raised at the time of

purchase. They often have established hog contract basis with large processors to eliminate that risk as well. The basis established is often an average of a rolling period to assure that they do not suffer a major variation from the market. Without this type of hedging structure, large operators with a small land base would need to maintain an extreme amount of working capital, which would dilute the returns to assets. Likewise, without an extensive hedging program, most financial institutions would not be willing to supply financing given the variability of returns.

As noted before, each livestock sector has its own unique situation. In contrast to the hog and cattle sector, the poultry sector does not have a well established futures market. This creates a major difficulty in trying to establish margin hedges. The broiler producers can actively manage their input costs through hedges. They know to the fraction of the penny per pound of chicken produced what the cost would be given the current futures market for corn and soybean meal, but they cannot layoff the risk on a futures market for broiler meat. They often face a diverse market of sales options. In some cases, they offer a "tolling" arrangement with restaurants and food service companies. They simply take a formula for input costs and mark them up for a pre-established margin per pound. This puts the risk of price on the final buyer. This limits their risk and their reward.

In the case of sales to supermarkets, they may offer short-term pricing based on current market conditions. They can reset prices respectively as cost rise or fall respectively. This does not offer as much margin protection as tolling. If a broiler producer has better or worse costs than its competitors it can change market share to help offset margins. Unfortunately, broiler producers have large fixed expenses in terms of laying flocks and broilers being fed out to finish. On top of the broiler production, they have large slaughter and packing operations that are designed to operate at maximum efficiency with complete utilization. If current and short-term prices do not offer break-evens, they can reduce production, but their other fixed costs will not decline as quickly as the variable costs. This gives the industry a perverse incentive to continue operations at negative contribution rates for extended periods of times. This is leading to more companies looking for additional tolling options to pass the real risk along to the final consumer.

The last livestock sector to discuss is the dairy producers. Dairy resembles the hog and cattle sector more than the poultry sector. It has a functioning (if thinly traded) futures market to help producers manage future revenues. It differs somewhat from the hog, cattle and broiler sector in that much of its feed inputs cannot be directly hedged. For example, important parts of a California dairymen's ration would be alfalfa, distiller's dry grain/cotton hulls and corn silage. In a typical ration, these inputs might account for 87 percent of the feed content and 76 percent of the feed cost. While corn silage and distiller's dry grain do not have their own futures, they can be traded relative to corn contracts with a high degree (but far from perfect) of correlation. This mismatch between the milk revenue and the feed cost in hedging has kept the vast majority of dairymen from becoming effective hedge managers.

The last four years have seen significant income volatility in the dairy sector from excellent to disastrous, often in back-to-back years. This increased volatility and lack of predictability are slowly forcing dairymen to reconsider their reluctance to margin management. They find the alternative need to increase working capital very difficult in the current environment of limited returns. The current generation of dairymen is turning to more and more outside financial advisors to help them manage their risk. This will be a major development in the sector going forward.

Conclusion

Agricultural producers have faced catastrophic risk from the very first farmer. They have spent centuries developing ways to manage that risk. However, the last decade's incredible change in globalization, technology and communications has led to dramatic change that appears to be accelerating. Producers have two effective but contrasting methods for managing risk. They can increase the working capital on a per unit basis to weather the downturns to get to the spectacular upturns, or they can increase their use of hedging per unit to limit income volatility. Both methods have their advantages and disadvantages. Regulators and bankers often want producers to do both to protect the value of the loan, but the costs to the producer are not trivial. Producers and bankers who understand the real trade-offs and risk can thrive in the current environment, and conversely, the ones that do not will fail spectacularly.

Managing Agricultural Risk Presentation (Transcript)

Michael Swanson:
Wells Fargo

Well thank you very much. It is a pleasure to be here today. My motto when I give a talk is "You've listened to the best, now you'll just have to suffer with the rest." [Laughter]

I am going to live up to that motto today. One thing I really do hope is that you understand my favorite two answers when I give a speech or do my work at the bank is, "I don't know" and "I was wrong." How's that? And I still have a job. If that wasn't a reason to sell your Wells Fargo stock, I don't know what is.

It was very nice of Allison [Felix] to talk about forecasting. I always remind farmers, "The only difference between my forecast and their forecast is this: I am professionally wrong and they are amateurishly wrong. But we are wrong together."

I'd like to thank Jason [Henderson]. Thank you, Jason, for giving a speaker a very *narrow* topic to talk about, managing agricultural risk. It is always nice to hand one of those defined types of questions. Managing agricultural risks – oh my goodness. We are going to focus a bit here. First off, I want to talk about this – if you don't remember anything else I say today, you won't probably remember even this – I want you to remember one thing. We are now telling agricultural operators, "We want you to do more risk management?"

Who in this room has had a conversation with their banker or as a banker about managing risk? Anybody have a conversation – show of hands? Show of hands, who has spoken with an account about risk management? Okay, now what did you ask them to do? Help me out. What did you do when you asked them to manage risk? Did you give them a specific plan? No, we talk in platitudes when it comes to risk management. We say, *"You need to manage risk."*

That's what we say. Imagine yourself as a row-crop farmer or as a dairyman in California. What do they hear you say? *"You need to sell for high prices."*

Isn't that what they hear you say, when you say, "You have to manage risk?" That's really what they do. Here is the point: Easy to confuse, dangerous when confused. I think we have to be very, very careful as agricultural bankers and as the agriculture sector when we ask people to move into risk management, because they can kill themselves as much as they can help themselves with agricultural risk management. The problem we get is too many farmers don't know what hedging really means. They just don't.

So we are going to say to them, "We want you to manage risk. Go ahead and manage risk."

And then we will be surprised when we find out they've sold all their corn at $3.75 a bushel at the bottom of the market when they panicked and bought all their fertilizer at $1,500 a ton at the top of the market when they panicked. That is not risk management. But we don't say clearly to them what it is. I want to make a very clear point. We need to be very careful when we say to our agricultural accounts and our agricultural relationships, "Manage risk."

It is so easy to confuse what they're doing and if they do it wrong, it could be worse than doing nothing. Let's ask a couple of questions. I think we can get some resounding answers to these. Is agricultural risk rising? Yes, we've heard everybody talk about that so far today. It is rising quantitatively. I am going to show you another couple of slides. It is rising qualitatively. I really don't know what qualitative risk means. But, I can guarantee you it is rising emotionally.

Who has had a relationship with a banker or with an agricultural account and you see the stress because of all the opportunity? It is there; it is in their eyes. What stresses farmers more than anything else? Missing out on the top of the market. They are more stressed about missing high prices than losing money sometimes.

What else? What are the drivers? I am not going to spend a lot of time on this, because we've already talked quite a bit about it. The drivers are there, but it is very important to really understand what is driving risk, if you want to manage risk. Finally, what are the implications for that?

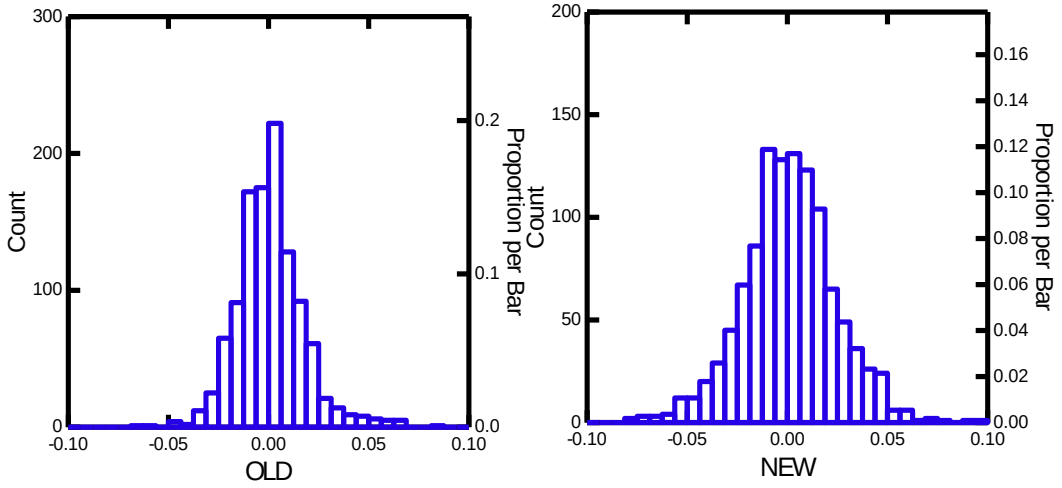
I promise you this is my one and only statistical chart [Chart 1]. Typically, agricultural economists love statistical charts. But I want to show quantitatively that risk

is really rising. What is here? I went back to look at the corn market. It is a big market and a proxy for a lot of agricultural things. I looked at the Chicago Board of Trade "nearby corn contract." I love it in agricultural risk management, because you have so many confusing terms – nearby, prompt, lead, first on that, frontend, whatever. But this is the most current contract. I said to myself, "Did it become more volatile?"

The answer is, yes, it did. I compared two different periods of time, from 2002 to 2006 and 2007 to June 2011. I compared the same number of days – 1,120 days. So I took two different datasets over the same length of time. Then I said to myself, "How much did that frontend contract, or the prompt, or the nearby change on a daily basis?"

I wanted to look at it as a percent. Why a percent? Think about it. We had $2 corn and we had a 4 cent move, it is as big a deal as when you have $6 corn and you have a 12 cent move, because it has the same impact on a percentage basis. So I converted all the daily price changes over that period of time into a percentage change one day to the next. Then I compared the two distributions.

Chart 1: Daily Percent Price Volatility for CME Corn



Who remembers Statistics 101? Anyone in this room ever take Statistics 101? But, if you remember your statistics class, remember your *normal* distribution? What we

have up here are two normal distributions. Both are centered on zero. The most likely occurrence in any day of the market is for nothing to happen in the corn market. It doesn't *feel* that way, but statistically that is where the mode, the mean, and the average are. Around that mode and mean, which haven't changed and are still centered on zero, you have your standard deviations – your spread.

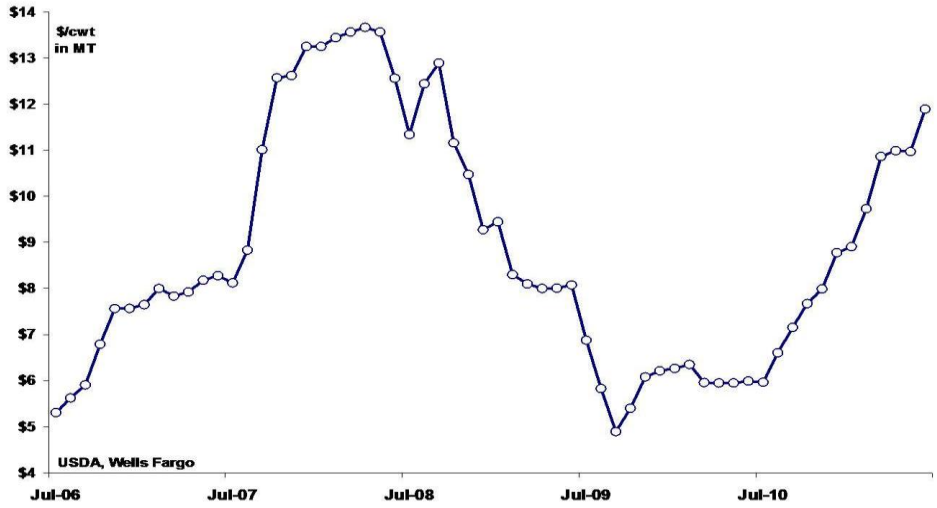
Look at the old distribution on the left-hand side there. See how it is much more narrow and much more pointed going up. Look at the new distribution – much flatter, with big, fatter tails. The tails have statistically gotten fatter. The range has expanded, the standard deviation has expanded. So, yes, quantitatively we have seen more risk come into agriculture. It is easier than ever to be wrong. Right there you can see that we are dealing with something.

Now, is this just the corn market? No, it's not the corn market. Everything is connected. That is the problem we have in agriculture. Everything is connected, but we just don't know how it is connected.

Why would I show malting barley on a chart [Chart 2]? Think about that. Why should malting barley respond to corn pricing. They are not the same crops, right? Malting barley goes into beer, with very predictable demand, not changing around a lot and not a new dynamic market. Look at the price volatility in malting barley. We know why they are connected. It is because ground that can grow malting barley can grow wheat as well. Wheat competes with corn. They are all connected via the pricing mechanism for the opportunity cost.

Look at the volatility in malting barley over the last four or five years. It tripled, dropped, and almost tripled again, showing amazing volatility [Chart 2]. What we are seeing is that corn volatility has come into even specialty crop markets. If you are a cattle or broiler feeder, you are feeling it. Even markets that should have no connection with ethanol have a connection. Why? Because ground that can grow dry beans in North Dakota can grow soybeans and corn, as well. Everybody is looking at the opportunity costs. So the volatility in the corn market has come into specialty crop markets. Hence, nobody is immune.

Chart 2: Malting Barley Price



Here is a question. How do you manage risk in malting barley? There is no futures market. You have a contract, but we all know about contracts for malting barley. They are not worth the paper they are written on. They just change their acceptance rates or their criteria. They can either accept all of it or throw all of it out the door. Think about what is happened. You have this volatility in malting barley. The farmer is seeing it, but what about the beer brewer? They are seeing it, as well. What about the malter? They are going to more tolling contracts. Everybody is responding. No segment of the agricultural economy has escaped this increasing volatility.

What else? Let's talk about emotions. Who in this room has ever made a credit decision as a banker or on the other side? It's interesting. As you get into credit, you know what I mean. If you have been into credit's process, you understand. There are two emotions that break out – the probable and the possible. You know a credit is really in trouble when you start talking about the possible, when things *might* be able to happen. Probable is when it will happen. You know prices will go and prices will go down. But, when people in the credit industry talk about it could happen – we could have a tsunami on top of an earthquake on top of a whatever – then you know the credit process is broken down, because you are no longer talking about the probable, you are talking about

the possible. Right now, there is a lot more talk in agricultural risk management about the possible and less about the probable.

What else? Our two favorite emotions are fear and greed. Who has ever heard the expression that the only two emotions in trading are fear and greed? You guys have all heard that. It is not really true. People are fearfully greedy. That is where they are.

Who remembers the book – *The Third Emotion – Hope* – that came out about ten years ago? That is never going to happen. But fear and greed are a big part of managing risk.

Last, let's talk about integrating these emotions. This is a key point, because we have a huge spectrum in this audience. I know we do, because I know people in this audience. We have people who are individual owner-operators of their businesses. They have to make the decisions and live with them. What we are seeing in agriculture is a very, very big expansion of different operations – whether they are row crop, feeding operations, or specialty crops.

We are seeing a lot of people who are bringing in people, specifically to manage risk in their businesses. It is a real luxury. You are going to hire somebody in, who will come in to be your risk manager. Great. Are you going to have them as a consultant? What is the problem there with the emotions? How do you integrate the risk and reward that are in the business to ensure they are doing the right things?

For example, look at grain elevators. You guys have all financed or worked with grain elevators. How many times has a grain elevator failed because the board brought in somebody and they really didn't want them to manage the grain elevator, they wanted them to outguess the market – make money for them speculating. That's the problem. We are seeing a lot of this risk is changing people's attitudes. People are trying to find a new structure for managing it, but how do you integrate the risk and reward?

Let's talk about what is changing in agriculture and who is changing. There are cohorts. I am going to call them "old school."

I was in North Dakota a number of years ago and I was talking with these old wheat guys. He says, 'Geez, the wheat has been in the bin for five years. I either have to send it to kindergarten or sell it! I don't know what to do." [laughter]

We are not going to change "old school." They will finish out their farming careers never changing. However, and this is important to people in this room who are going to finance the current crop – the new operators, they have started to selectively manage financial risk and they will do more so going forward. These are the people who are very, very important to us, because they are in the process of discovering how they want to manage financial risk.

The last group is the new groups – the "next ups." I was in California last week talking with a dairy guy. He was telling me, "I sent my kid to school for one reason only – learn how to do financial management. I know how to milk cows, but I told my son that when he goes to school, the point of him coming back home is I want you to know how to do finances and risk management."

Those are the "next ups." These guys will do it from the start and will do it for the rest of their lives. We are going to see this evolution as the old school falls away, the current crop changes, and as the "next" school takes over.

Let's talk about the quality of the risk we have. Why now? What are the drivers? I am not going to spend a lot of time on these, because we've talked about them so much. There is an intersection of things – global economic growth, biofuels policy, and speculative tools and fools. Everybody loves speculators. Show of hands: Who loves speculators? You will not get rid of them. I always love it when people say we need to change regulation to get rid of speculation. Never going to happen. These are things we've talked about quite a bit already. They are the drivers.

Look at China. This is a horrible forecast, by the way. Just horrible! We're going to talk about why it is so bad [Chart 3]. You look at that number and it's very, very compelling. If you look at the impact it has had, it has been amazing already. Look at the oil seeds. This has been the driver. China was deficit in oil seed production on a per capita basis. When they got the money, the first thing they turned to was more oil seeds [Chart 4].

Chart 3: Real per Capita Income in China

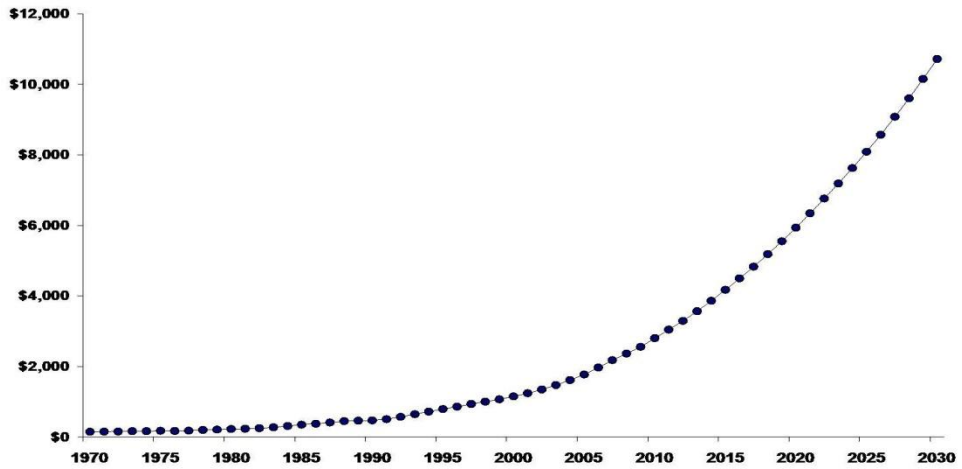
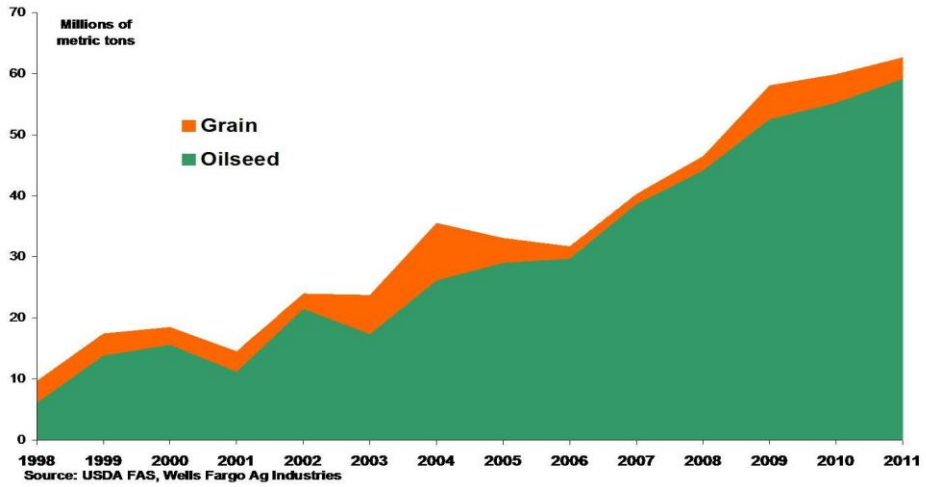


Chart 4: Global Agricultural Exports to China



What about grains? This is my grand forecast. Going forward, you are going to see the grain side swell and add on top of the future growth of the oil seeds. That is an amazingly good outlook for agriculture. They have the money, as Ejnar [Knudsen] said, and they want to spend it. This is going to be great.

But here is the problem. That is a forecast of 41 degrees in Fargo, North Dakota. Show of hands: Who has ever been to Fargo, North Dakota? Did you know the average annual temperature in Fargo, North Dakota, is 41 degrees? If you dress for 41 degrees in Fargo, North Dakota, you will be uncomfortable three months of the year and dead the

other nine. [laughter] So, my forecast is going to be perfect, but it is going to be really, really dead.

Let's talk about meat. There are a lot of numbers on here, but they show a couple of things. First off, this is the USDA's estimate of meat consumption per capita [Table 1]. Look at where China ranks on the countries they put on their database – way down there, about 25th down at 50.6 kilograms per person. They are behind, Jamaica, that superpower, and look what they eat – primarily pork. They want variety like anybody else. They are going to want to eat more meat.

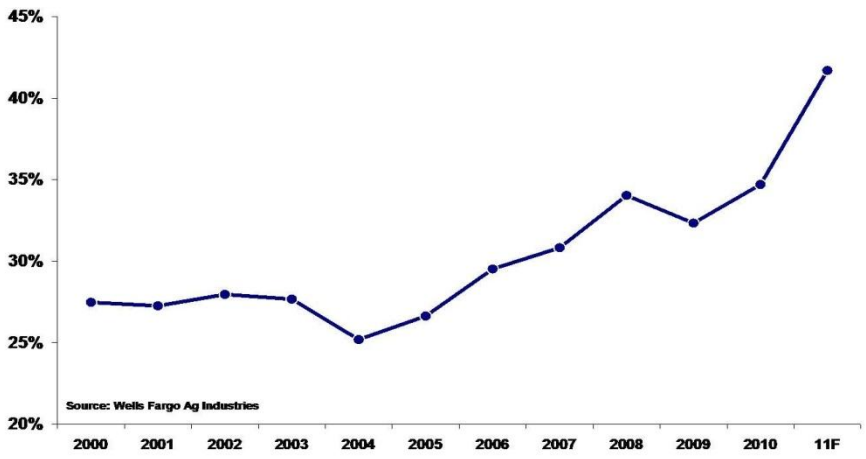
Table 1: Meat Consumption per Capita

Kgs.	Commodity			
Country	Meat, Beef and Veal	Meat, Swine (KG)	Poultry, Meat, Broiler	Grand Total
Hong Kong	23.9	67.3	40.1	131.3
United States	39.3	28.6	42.8	110.7
Argentina	61.3	6.5	33.1	100.8
Kuwait	26.6		67.7	94.3
Brazil	37.5	12.5	42.9	92.8
Australia	35.2	22.3	35.2	92.6
Qatar			88.4	88.4
Canada	30.0	24.7	29.7	84.4
United Arab Emirates	16.8		61.1	77.9
EU-27	16.7	43.0	17.8	77.5
Chile	23.1	22.6	30.1	75.7
Belarus	29.6	44.8		74.4
Uruguay	60.3	10.9		71.1
Singapore	6.4	26.9	36.1	69.4
Taiwan	5.6	36.4	26.6	68.5
Mexico	17.4	15.9	29.5	62.8
Korea, South	11.9	31.1	14.7	57.6
Russia	16.7	19.6	21.1	57.4
Kazakhstan	26.8	14.6	13.8	55.1
Switzerland	20.7	33.2		53.9
Venezuela	18.5	4.9	29.9	53.3
Jamaica	5.1	3.3	44.6	53.1
Bahrain			52.5	52.5
China	4.2	37.2	9.2	50.6

Going back to the last slide, to produce that meat, it's going to take more grain. The forecast is very, very optimistic. Here's the problem. Depending on trade is a very dangerous two-edged sword. Look at the incredible jump in the amount of revenue that is coming from exports. This number compares the value of our exports, which are mixed, bulk, intermediate, and consumer-oriented, to the value of crops at the farm gate,

including livestock [Chart 5]. You can see in the first part of the decade it was about 25 percent on a valuation basis. Year to date, it is going to be over 40 percent. This is great. This is the reason why we can support record-high meat prices, record-high oil seed prices, and great dairy prices. The money is out there.

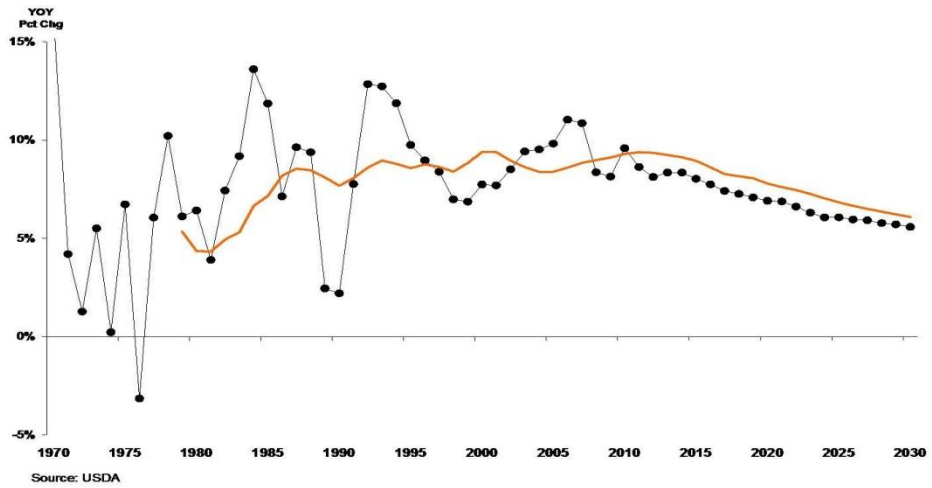
Chart 5: Value of Agricultural Exports Relative to Farm Gate Revenue



The kick side for risk management is, if it goes away for just a year on a trade issue, we could have a complete reversal of attitudes and prices.

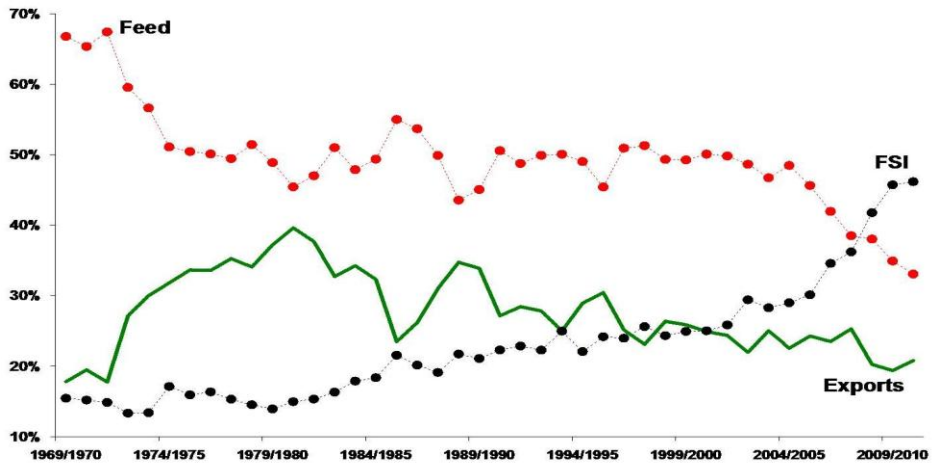
Why do I say that forecast from China is really, really bad? Because we don't take volatility into consideration. On average, China is going to be a monster. We can count on them having monstrous growth. But look at the history, going back into the 1970s and 1980s [Chart 6]. They can stumble. If they stumble for a couple of years, that would be the scenario. It's not a couple of months of bad prices that will kill people in this business, it is a couple of years of bad Chinese economic growth, which changes the mentality of what farmland is worth and what commodities are worth around the world. That would be the real risk. The key question is how do you manage that risk?

Chart 6: Real per Capita Income in China



I won't spend much time on biofuels, because we've already talked about it. How do we get off the tiger? If we kill biofuels policy, what replaces it? There are just way too many things out there to not be concerned about the possible. It has an amazing impact on our system.

Chart 7: U.S. Domestic Grain Usage

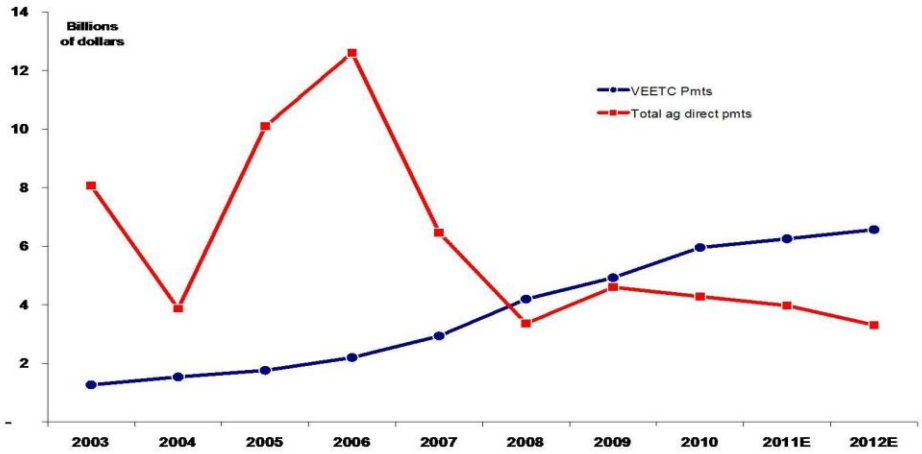


What we have here are the three major uses of U.S. grain [Chart 7]. The red line is, of course, feed for animals – the black line is food seed and industrial, which of course

is ethanol. And the green is exports. We made a conscious policy decision to change how we use our grain in this country.

By putting it into feed seed and industrial, we had a couple of benefits. One, we exposed the real value of what grain was worth around the world. Countries like China would pay more for oil seeds and grain, but they didn't have to. Now we made them, because we have an alternative use for it domestically. The problem is that we know there are a lot of issues around ethanol that aren't sustainable. Here is the payment structure. Another smart move is we took those direct payments in agriculture and switched them to indirect payments via the ethanol tax credit [Chart 8].

Chart 8: Government Payments



There are a lot of things at play here; things we shouldn't count on. Let's talk about the implications of hedging versus marketing. Row crops are a very different world. I guarantee you every farmer you talk to says, "I hedge. I sell grain ahead. I hedge to arrive. I sell contracts. I do this and that."

No, you market. Nothing is wrong with marketing, but marketing is not to be confused with hedging. I always use the example of a grain elevator operator. I say to a farmer, "Look, do you think those guys are so smart? No, they're not that smart. I know those guys. So how can they afford to buy grain from you 12 months in the future, when they don't know the real price of grain?"

He replied, "Oh, that's easy. They buy it from me and they sell the futures. They put it in a hedge and establish a basis."

I answered, "Yes, that's real hedge management. What are you doing? You go out there to buy your fertilizer, spend $300,000 on fertilizer, what do you do?"

"Nothing."

"Why did you buy it?"

"I thought it was a good price."

"No, that's speculative. That is not marketing, that's speculation. When you sell your grain, what do you do?"

"What do you mean? I sell my grain."

"Well, what did you do on a counterpart?"

"Nothing."

The problem we have is we need to have a fundamental discussion with our row-crop operators and our agricultural operators of what hedging really means. It is not marketing. It is two simultaneous matched pieces of activity that will lock in a profit. What is the problem with that? Farmers hate it.

It is really easy to talk about things like this, but why don't farmers like to hedge? Because they are terrified of missing a home run. They don't want to be the guy who goes into the coffee shop and says, "Shhh, I sold my corn for $4.75."

Yes, but he bought all his cash rents and all his fertilizer for half the price of everybody else. He made more money per bushel, right? He's not going to explain that.

They are afraid, because they can see the income earned but they can't see the risk they've avoided. Do they need new tools or do they need a new attitude? Primarily, they need a new attitude. So what are the tools that are out there? You guys can look at these at your own leisure.

I want to make one point. When you talk about Dodd-Frank as a new regulatory environment, there seems to be an interesting attitude within that legislation. The attitude is, swaps are bad. Swaps and futures are bad; they get people to do bad things. Wait a minute. If they have to do them, then Dodd-Frank says to let them do them on a cash-based exchange basis, so we know who has them and we can count them up.

Here is my challenge back to the regulators who are going to do Dodd-Frank. If you force farmers to do primarily their hedging on the futures market, they simply won't do it. Why? Because they hate margin calls. Why do farmers hate margin calls? Because it reminds them they didn't pick the top of the market every time they sold a piece of grain.

Hedge-to-arrives or over-the-counter swaps with their bank – which we did, but we are not doing as much anymore. Now we say they need $10 million of investable wealth to be a good swap partner. Oh, come on. These guys are long on grain and we take the grain and we do the business for them and $10 million of investible wealth is a necessary criterion for managing grain risk? That's crazy. The idea is we are going to force them all on to the futures markets, because we can see it all. It's all regulated. Well, good for you. Farmers aren't going to do it. They simply aren't going to do it and you are going to find they do less of it.

What else? How about livestock? Wow, livestock is a whole kettle of fish all to itself. It depends on who you are. There are a lot of different factors – feed, land, and what kind of contractual arrangements you have, and who you are.

Look at the broiler industry. It's a good example of an industry that went down this path. People who do broiler raising typically don't have any skin in the game. What are they doing to get paid for? Efficiencies: managing the farm, turning the lights on, getting the chickens fed. They are not in financial management anymore. All that has been shifted back to the owners of the broilers.

Cattle feeders are still out there and still managing on their own. Curt [Covington] is hopefully going to enlighten us quite a bit more on the California dairy market and their hedging. I think it is the wild west of financial hedging out there on the dairy side.

Let me finish here. I believe agricultural risk is rising. I can quantitatively measure it. I can look at the linkages into markets you wouldn't suspect would be connected to it. I know it's rising. The opportunity we are seeing also creates the risk. So we need to talk to farmers and agricultural operators and convince them, "You need to do more margin management."

Margin management is not fun. Margin management is about reducing volatility; it's not about increasing profitability. If that doesn't hurt a farmer's mentality, I don't know what does.

What is the role of policymakers? I am a market economist, so I think they have a very limited role in this business. They are not the ones who can change attitudes. They are the ones who look at the unintended consequences.

They had some opportunities. Crop insurance is a wonderful opportunity. Crop insurance is probably the single best development for risk management that farmers have seen in the last 15 to 20 years. They still don't like it. They pay their premiums and they don't always get a payoff. For them, that is a disaster. We need to encourage more neutral policies like that that encourage people to manage their risk. With that, I am going to stop. Thank you.

Industry Panelist

Transcript

Curt Covington
Senior Vice President
Bank of the West

Thank you very much. I always appreciate coming back to the Midwest. I love the weather. We are going to wallow a little bit in the weeds, if that's okay with you. I was asked to talk about what goes on in California and I sometimes say to myself, "I wish I could tell you."

I gave you some slides that are a bit helpful. The first thing that comes to mind that I always am asked is, "How in the world do you manage in a portfolio what goes on out there?"

The answer is that it's not an easy process. I gave you some statistics about California. They have about $42 billion in sales and that was output in 2009, according to California Park, Food, and Agriculture, which far exceeds many of the other states as you can see. There are 37 different crop segments and 350 identifiable crops more or less. We lead in about 70 different commodities. We produce 100 percent of some of the things you probably find in your natural foods and snacks. We produce about 98 percent of almonds. Interestingly enough about almonds, and it ties in with what I've heard today and yesterday, is 80 percent of the almond crop leaves this country – 80 percent! So 8 out of every 10 pounds is shipped out in a container to somebody other than someone in the U.S.

And you look at some of these other products. What kind of value added is there in raisins? What kind of value added is there in walnuts? What kind of value added is there in pomegranates? What kind of value added is there in pistachios?

Today, you will probably eat one of those commodities. It will probably be at the airport in a snack food. The reality of the matter is, very high-value crops are virtually impossible to grow in other areas of this country or even the world.

The last comment on that page is interesting. It says, "California production of fruits, nuts (and that's exclusive of politicians), and vegetables account for nearly 55 percent of U.S. production. If you turn the page, I assert this by saying, "What are the real weaknesses in California?"

Here is my comment about that, "If you think California is a bell-weather state, you are probably right." Which means the problems I will talk about here – or the weaknesses I will talk about here – will probably end up in your state sooner or later. Maybe not all of them, but certainly some of them.

The first one I mentioned is that virtually all of the crops we grow at risk. We have no subsidy programs, and even the crop insurance programs we have, in some cases, are woefully weak given the risk. Some of those crops aren't mature enough – and I mean in terms of age – to actually have a sustainable crop insurance program. There are no subsidy programs, with the exception of cotton and some for dairy. Other than that, wheat has a little bit. Otherwise, all our crops are at risk. If the crop goes down, so does the income, so does the borrower, and so does the bank.

Most of our crops are retail-driven. I will talk a little bit about this, because it is important everybody understands this. The farmer in California no longer drives how that crop is produced, packaged, or sold anymore. If you are packaging tree fruit, as an example, 99 percent of all tree fruit in the United States comes from California and is grown on less than 12,000 acres. But 100 percent of that, in terms of what is produced, what is grown, what is taken out, what is replaced, how it is packaged, and where it ends up is driven by the retailers, by Costco, by Kroger, by Wal-Mart, and to a lesser extent by some of the regional chain stores.

I don't even want to talk about number three, and that is the political and special interest groups. It's coming your way, but Tom Stenson [Farmer Mac] said to me yesterday, "Water is going to be an issue everywhere, no matter where you live."

The battlefield for water and the issues surrounding water started in California. And I am not necessarily proud of it. With the growth in the population, and it is important to understand this, California is a big state. Two areas – Los Angeles and San Francisco – are where 60 percent of the population lives. They dominate the politics. They determine what is going to happen in the state, who is going to get elected and,

more importantly, what is going to happen to the resources in that state. They decide what the farmer is going to do with those natural resources. California has not built a new dam in virtually 30 years. It is a crumbling infrastructure.

The state's population has outgrown its ability to store water. I was telling some of my banker friends yesterday, we had 25 feet of snow in the Sierra Nevada Mountains. I live 45 minutes from Yosemite National Park. I've never been there, but I hear it's great. This year California farmers are going to get a 60 percent water allocation of the snow that comes out of that mountain range and the balance of it flows right past Nancy Pelosi's home and goes out into the Pacific Ocean.

You say, "Why is that?"

It is pretty simple. Special interest groups and politics drive what goes on in California. And it affects other things as well. The Endangered Species Act determines what ground can be farmed and what you can do with that ground. There are certain parts of California where you can't level your ground until an environmental and biological opinion has been derived on that piece of property you've owned for four generations.

Water sales are a big deal. You think, "Water sales. You mean I can sell something that comes out of my tap?"

No, but you can sell water that is being delivered through the system. And it's a very unpopular thing these days. Farmers get in trouble. Their water allocation is worth more than their land. We had a water sale about a year ago. It was consummated for $72 million. That is three times the value of the operation on a book-value basis. They sold the water to the City of Mojave. If you know where Mojave is, they need the water.

Politicians don't like it; environmentalists hate it. But it also works the exact opposite way. I can buy your water and you can buy mine. A lot of people in that state think the water – even the ground water – underneath your feet on that property you own belongs to them. They are going to decide what you do with your water.

I was asked to talk a little bit about the at-risk nature of what goes on in California. So I divided this between the banker and their tendencies in California and the farmer and their tendencies. How did they look at things? (This is through my eyes, of course, not theirs, because they will completely disagree with everything I say.) But I

am also speaking for a lot of bankers I know. They would also disagree probably with what I am about to say.

Here is the deal. Because of the at-risk nature, I want to take some of the four basic components of what our bank looks at in terms of managing risk. First of all, our goal is to drive working capital levels to at least 20 percent of gross disbursements for a year. Dr. Ellinger, you made a comment and I thought it was interesting. You said, "Current ratio is kind of for the birds."

I couldn't agree with you more. Current ratio distorts, particularly in California. If you have a lot of risk in a crop, the most important thing is maintaining certain levels of working capital, absolute dollars in working capital. Not a percentage of assets to liabilities. That distorts the situation. I can have $1 in assets and 50 cents in liability. I can meet your covenant, but you have no liquidity. He made a comment I thought was interesting. He said, "I think it is more important to look at the Farm Financial Standards Council use of 'working capital to sales' or 'sales to working capital.'"

That was directly derived from the corporate world – very interesting about that. If you are financing a Fortune 500 company, and the company has any working capital at all, management is fired. And the reason is, they say, "Hey, look we can find working capital. We'll just issue another round of stock. Let's go issue some more debt. Let's put it on the back of somebody else."

Farmers, on the other hand, believe the exact opposite. What is a good level of working capital relative to the growth in sales in that particular sector? And I can't give you a good number. It depends. I would tell you this: If you want a minimum level of working capital to total disbursements off that farm in a given year of 20 percent, you probably want a working capital to sales of roughly 15 percent.

The other thing we do – and this is important – I hear a lot in banking about "What is the break-even of that business?" What is the break-even price on dairy? The break-even price on this? The break-even price on that? That is important, but one of the things we've instituted after the dairy crisis was something known as the sustainability quotient. It is not where their break-even point is. It is, if this happens again what percentage of our portfolio will be in trouble? So arbitrarily you're picking some loss per cow per month or some level of loss that could be generated in another volatile industry.

Look, we are a pretty simple bank for a $75 billion bank. We are living on 20-year-old technology in our bank, but it works really well --- the sustainability quotient. We can talk more about that.

The other thing we do that's a little bit different. In California, if you are not managing budgets on a monthly basis, reviewing those budgets, and making sure that borrower is not in variance of more than 10 percent outside of their budget, you will have problems.

A lot of the time in the Midwest, if you get a budget, it is an annual budget. It says it is so much this, so much for that. We allocate so much for fertilizer, we allocate so much for seed, and we allocate so much for this.

In California, it's a little bit different. How much is allocated for the month for that particular crop? We manage that monthly. Every budget we have on our farmers is reviewed on a monthly basis with a variance report. We look at that stuff, because if goes down on an at-risk crop, it is going to go down fast. You can't wait until the end of the year.

We encourage hedging or "taker paid contracts" if it is a not hedgible crop. We covenant the living daylights out of deals. A couple of examples is minimum line clean-downs and maximum cap X distributions. On the other hand, you can see what the borrower thinks. Their view of managing risk, a lot of times, is to vertically integrate to capture a greater share of the profits. I don't disagree with that, but there is more risk with it.

Seek higher margin crops, even if it implies higher risk. Seek a minority partner, who has less to lose than you do, and usually makes all the decisions. You see it all the time. The farmer loses control of his costs. He decides to partner up with a packer or marketer, who has nothing to lose in this deal and eventually takes control of the decision-making process. There is nothing worse than having a minority partner making decisions for you. For a farmer, that's called your bank.

I can't tell you how the world has changed in California, especially in retailer-driven markets. I use the term down below here as the "dumb bell effect." Okay "barbell" would have been better, but then I'm dealing with California bankers, so "dumb bell" just sounded better. There is that cartoon where the borrower is sitting across the

desk in front of his banker. Farmer has a toothpick in his mouth and he says, "You know what? I don't know who is dumber – me for borrowing the money or you for lending it."

That is how it is in California in a lot of respects. This retailer-driven market deal is a real, real issue in California. It goes something like this. If we are Costco or if we are Wal-Mart, we are not only going to tell you the varieties we want you to grow – and some of those might take three or four years to get in production, we want a specific size, a specific color, a specific hardness to that fruit, so that when it gets to East Coast it is not a pile of mush, and we want it packaged in a specific package.

Our bank represents the largest tree fruit and table-grape packer in the U.S. During the tree fruit season, he packs 227 different styles of boxes. It's the same piece of fruit. Wal-Mart wants their box to look different than Costco's. You've been there and have seen it. You go, "Wow! This looks pretty cool."

They've gone from the volume-filled boxes down to these petite, cute-looking things you can take home. The bottom line is in the manufacturing world we call that retooling. We have to stop, everyone has to take a break, we put a new set of boxes on the line, we resize the fruit, and we start over again.

On this retailer business, from a bank's perspective, we like to see limitations on those sales concentrations. Borrowers are saying, "Why would you limit my ability to do business with Wal-Mart? They are not going broke."

I am not worried about Wal-Mart going broke; I am worried about Wal-Mart sending you letters, saying we don't like you anymore. Now you go broke.

We look for a deeper analysis on that counterparty risk. Sure, everybody knows Wal-Mart is good for it. Everybody knows Costco is good for it; Kroger is good for it, but I want our bankers to know they are good for it. It's easy to do. It's called the Internet.

The farmer says, "I'd rather do business with the devil I know, rather than the devil I don't."

Typically, as a banker one of the things we look to do out there is, if they do have a contract or they do have a sales arrangement with a large, large retailer, we look for an extended termination period. In other words, if they want to terminate that contract, it

can't happen today or in 30 days. It might be a 13-, 14-, or 15-month exit relationship, where the borrower can retool his marketing plan.

As far as political risk, again I don't want to spend a lot of time here. But I will tell you I made a comment about water and biological opinions out in California. Do you guys know what a "biological opinion" is? It's worse than getting a shot in your rear end.

Here is what biological opinion is. A biological opinion is when a special interest group pays someone from a university to give them *the biological opinion they want*. Farmer gets his or her biological opinion from somebody he or she wants. That opinion goes in front of a judge, who doesn't know a thing about either of them and is asked to make a decision as it relates to the Endangered Species Act and the Environmental Protection Agency. That judge decides where the water goes, what ground can be farmed, what chemicals potentially can be used, and the list goes on.

Immigration is a whole other thing. Here is what I have to say about immigration. I know how it is in the Midwest. The easiest solution is to close the borders. If you live in a border state, you know it's not that easy. There won't be any produce, because 55 percent of it comes from California. It is not harvested by machine; it is harvested by hand. "Wow," the argument goes. "You have a lot of unemployed people standing on the streets asking for money. Get them to work."

If they wanted to, we would. If we had the political willpower, we would. The bottom line is, we rely on immigrant labor. So it is a double-edged sword.

Who lives near a meat-packing plant? A lot of you do, right? Tell me there is not going to be or currently isn't an immigration issue there. Same thing.

I just want to finish on a couple of things. The dumb bell risk, barbell risk, I heard it today. This barbell risk is never more evident than in California. You have what are known as "the institutional farmers" and you have the "cult farmers." Cult farmers are growing specialty crops for Whole Foods and Trader Joe's. Do you think that is a small business? Whole Foods last year had $18 billion in sales. It's not Kroger's and it's not Costco, but it will do. The institutional farmers have found they can no longer provide the supplies and supply these large retailers. Because here is what the retailers are saying, "I want it now, I want this quality, and I want it year around."

So institutional farmers are forming alliances. The great part about that is, like the lead bank or an agent bank, there is an agent farmer in the relationship. And that agent farmer is telling the other farmers how the deal will be done. You grow it to our specifications and our timing, and you'll have a chance to share in the profits or the losses. Here is what happens. The farmers are pretty smart. Since they can't grow it all themselves, they are transferring some of the risk to the other farmers. They don't have the relationship with Kroger's, they don't have the relationship with Costco, they don't have the relationship with these other large national retailers. How do they get it? They go to the guy who has it and say, "We'll grow for you under your name, as long as we receive a piece of the profits."

"Sure, if there are any."

Remember this, institutional buyers are finding out Whole Foods is not a fad, but a fabric of this country. Anybody who thinks Whole Foods is a fad, you had better wake up. Anybody here live in Omaha? Have you been to the Whole Foods Market in Omaha? It's a nice place, huh? It's nicer than most of your regular grocery stores. They are garnering a piece of that market.

As a last comment, there is this huge knowing-doing gap. I think a better way of looking at this is the "knowing-deciding-doing" gap. It's true for the banker and it's true for the farmer, particularly in the dairy business.

We suffered through a $1.5 billion portfolio of dairy credits in this last two years. It was a very difficult time for the bank. We managed conservatively, we managed consistently, and we were pragmatic about how we dealt with things. There comes a time when the banker has to be educated on ways to hedge and to manage the downside risk of their investment. But he [Michael Swanson] said it, you can preach all you want, but until you give them the tools and explain to them why it is so important, it's like sending somebody up to be a project manager who has never built anything in his life. This knowing-deciding-doing gap is a big problem with bankers and it's a big problem with farmers. We can't expect the farmers to go out – they know they have to do it. But how can we tell them to do it, if we don't know enough about it ourselves?

Finally, I would ask a couple of questions. I heard this and I don't know if it is true. Only 2 percent of farmers who have the ability to hedge in this country actually do

hedge. Is that a good number? Can anybody tell me? Only 2 percent? Let's say it is 20 percent. That's not a good number.

So I appreciate your time. I'll be available before I am kicked off the stage. I really appreciate this opportunity. It is always valuable for me, because I listen to people and one of my favorite words when I come back here is "benchmarking." If we could benchmark what our farmers in California are doing, we would have a much better time managing that portfolio.

By the way, I put a picture on the back. It is a pretty lousy picture. That's a map of California squeezed down. And those old boxes show you where some of the dams are in California. The number to the left, under those bars, is at percentage of capacity in those dams. The number to the right is the percentage over average. You will notice the number on the left is close to 100 percent. That means the dams are full. The number to the right is percent of average. It means it is anywhere between 15 to 20 percent higher. And the farmers are getting a 65 percent allocation of water – not 100 percent, but 65 percent.

Thank you. [applause]

Industry Panelist

Transcript

Richard Bowman
Bank of New Zealand

Thank you. There are just a couple of things I want to cover today. I want to talk a little bit about the paper in the handout you have, about agricultural banking system and some of the characteristics we have, and also about the risks we face and some of the characteristics we have in managing it.

First, at the Bank of New Zealand, we have an Agri Portfolio of $9.50b which is managed by 90 agri-managers that are proactive. This means they are mobile and interact with farmers on their farms discussing their business and viewing farm farms. These managers are spread over 24 separate locations around New Zealand.

The New Zealand agricultural lending sector is vastly different from here. In fact, there are only five major banks lending to the agricultural sector in New Zealand. In the last 15 years, we have seen enormous consolidation in that space. The All State Advances, which was New Zealand's government lending agency to farmers, was purchased and privatized in the very early 1990s. Now that is part of a larger private bank, so it is a very different business. In the 1990's we also had a number of stock firms, solicitor nominees etc who lent to agriculture. All this debt is now consolidated largely intro the 5 main bank lenders.

Our businesses are split up into tiers.

We have corporate agri-managers, who manage a line from $20 million and greater. We have a tier one manager who manages lines from $5 million to $20 million. The tier two managers manage from $1 million to $5 million. Then we have a telephone-based unit, and they manage anything that is very straightforward, and generally around the $0.1 million to $1.0m. It's a bit different type of business to what you guys have here, but is something that is working well for us. Our losses are very modest when you consider the size of the book.

One thing that has dominated the New Zealand rural landscape over the last two decades has been our deregulation in the 1980s, 26 years ago. New Zealand farmers benefited from state minimum prices, tariff subsidies, etc., (similar to what you have here in the US) and basically got to a point where the government could no longer afford to do this. Bearing in mind – excuse the pun – but agriculture is the sacred cow in New Zealand. About 56 percent of our total foreign cash receipts of $40 billion come from agriculture. Somewhere between $23 billion or $26 billion comes from agriculture. So it was a big call for the government to make (finishing subsidies). If you are a cynic, a very small number of voters, of course, comes from that sector, so that had a mighty impact on our economy. What we did see, when you do remove subsidies and expose an industry to the free market, you have casualties and you also have a very efficient allocation of resources from poor performing business and sectors to sectors and businesses that can utilize those resources much more efficiently and extract a greater economic benefit. It's a very core, fundamental design in agriculture in New Zealand. We expose ourselves to a free market, we operate in a global marketplace, we have to be efficient to survive. We are a population of 4.3 or 4.4 million people, and we produce enough food for nearly 50 million people. So obviously, we export. To compete with economies which are subsidized and protected we have to be efficient.

We produce 2.7 percent of the world's milk and we constitute 35 percent of total global dairy trade. So whether you like it or not, we operate in a free market. It's a very important part of New Zealand agriculture.

If you are exporting agricultural commodities, (or any commodity for that matter) which we are, then you have to be big and you have to be cheap. In New Zealand, we have a pasture-based system. This system is based on our unique mix of natural resources. For example we have 90,000 cubic meters of rainfall per capita. If you compare to a country like China or India, they get 2,000 to 2,500 cubic meters of rainfall. So it's very much environmentally conducive to growing pasture and grass. We grow pasture grass for about 9 cents a kilogram of dry matter. As a substitute for feeding grain, which costs about 40 cents per kilogram of dry matter. So you can see where the cornerstone of our low cost production system comes from. It is a pasture-based agricultural system where its feed cost is about 25% of the similar feed costs of its

competitors in subsidized and protected economies. **This is our competitive advantage.** We can produce commodities very, very cheaply, compared with the rest of the world. Even though we are stuck out in the middle of nowhere, we can still produce it more cheaply than a lot of other parts of the world.

If you look at that, you can get a picture about our industry. It's not a big industry by your standards, by any stretch, but if you think about the impact we have from an export and global perspective, we clearly are a major exporter of dairy products.

When you talk about a deregulated industry, the regulation and subsidies imposed by our competitors has a direct impact on us. One of the things we talk about constantly in New Zealand, and you discussed at length yesterday, was the ethanol policy and the subsidies around that. It is a major concern for us. Because, if that were to go, then we suspect we would see a large influx of grain and other resources into other agricultural sectors, potentially dairy, which would bring a wash of milk on the market creating a supply/demand imbalance resulting in lower prices. One stroke of a pen in the US can materially change our milk price in NZ. So it is a major concern for us. So while we are part of a deregulated environment, we can't control what other regulations and risks the world places upon themselves, indirectly affects us. It's something we have to deal with.

The key risk mitigant we have in regards to this is we are the cheapest producer. We know that for example if milk volumes rise in the US and it pushes prices down to a point where we are not making any money in NZ, then the US producer must be losing a lot of money and hence supply will reduce in the US and prices will rise.

Looking at deregulation in one of the slides, look at what happened with livestock numbers, especially the sheep numbers in New Zealand. We subsidized every sheep we had running around in our farms prior to deregulation. What an absolute laugh that was. Productive resources were being put into an uneconomic sector of our economy. This resulted in sheep numbers raising of over 70 million sheep in our country.

The moment subsidies were reduced, everybody started to look for a more intense or profitable use for their agricultural assets. Isn't that just a perfect free market? And it's something we really, really cherish in New Zealand. So we saw our assets shifting. We saw people going into receivership, and we saw more profitable businesses buying those assets and changing land use.

The key change of land use in New Zealand is dairy. We now have over 4 million dairy cows in New Zealand and about 33 million sheep. So sheep numbers have halved. That was because it wasn't profitable; it was being propped up by subsidies. So we have over 4 million cows and about 2 million beef cattle, so it's a key change in our business.

The other thing we've seen is an enormous amount of consolidation. I am off a family farm in Canterbury, South Island, New Zealand. We ran about 2,000 sheep and produced about 20 hectares of variable cropping – a very, very small farm. All of those farms are being purchased by and consolidated into larger businesses now. The banking industry has funded a large part of this consolidation. From 1990 to 1995, the banking industry in New Zealand was $10 billion. It now has $46 billion lent to New Zealand farmers. So a lot of the consolidation in the industry has been funded by debt, provided by the five major trading banks in our country.

The challenge we have around consolidation of industry is that we have mom-and-dad farmers, who have been very successful running their farms, and now they own three farms. They are still running it like they were when they had one farm – bills being paid around the kitchen table, speaking to the accountant once a year, and if the bank leaves me alone, that is a fantastic outcome. This is how these businesses have been run.

Some of those mom-and-dad farms may now own 10 farms, so this might be a $60 million business now. So the biggest risk we see in our industry is how these consolidated businesses are using a small business approach to running their business.

One of the things we've discussed as a bank is governance. How are these people managing and governing their businesses. This is something that is of enormous concern to us. In New Zealand, the consistency of all the major receiverships in agriculture has been massive recent expansion and terribly woeful and inadequate governance of their business. So, when we talk about managing risk, we can define exactly what the risks are and get a big long list of all the risks out there. However which of these risks is going to impact your business? Which ones create the greatest negative impact? Which ones are relevant now? Or next year? Who is responsible for reviewing and assessing this? Business owners are but they are spending all their time running the business. This is the role of good governance. We need to think more about what form we are going to use to manage that risk.

How are we going to go, as a business, managing risk when we think about the people who run that business? Their core competency is looking at livestock to understand how they are performing, looking at the crop to know when it needs spraying, fertilizing, planting, or whatever. Is it appropriate that we expect these two individuals to adequately manage the risk of their business? We would all have to agree that is an unrealistic expectation. As banks in New Zealand and other parts of the world, we have lost money on the back of that. We need to think how we go about this differently to ensure this is not replicated. Governance is different from management. Most businesses have management, very few have governance.

At the Bank of New Zealand we used comment on the poor governance of some large NZ agri businesses.

In New Zealand, if you look at what's happened in the rapid expansion of the industry, there is no one that provides an off-the-shelf introduction to governance. So we began a governance workshop ourselves. We got independent people in, use some of our internal people, and built a governance workshop. Put our largest clients in this workshop and explain to them the difference between management and governance. If our clients have well governed businesses they will manage their risk better which in turn manages our risk better as a bank.

We know people have varying degrees of expertise, and things farmers enjoy doing and things they don't enjoy doing. Things they don't enjoy doing, they are generally bad at. Farmers are generally practical outdoors people. These interests and skills don't align well with effective governance. So we need to make people aware that if they want to adequately run a business and manage all the risks associated with it – grow it, expand it, they need to look at introducing other people into their business to help them do the things they have limited skills and interest in, and governance so often one of those things.

In New Zealand, we feel we are fighting a battle on that one, but we feel like we are winning. We made it quite clear to all the large businesses in New Zealand that if they want to borrow money from us, that your prospects of success will be greatly enhanced if you can prove to us you have adequate an management and governance structure, and an ability to manage the risks and ongoing demands of your business. That

is something we feel is making traction over there now, and the people making deals with us are people who have a proven level of governance and management in their business.

When we think about the risks discussed, even over my time here this morning, an unbelievably diverse range of risks have been mentioned. How can we expect mom-and-dad farmers to manage that risk adequately on their own? In our opinion, and someone might have mentioned it earlier, farmers in New Zealand are no different than here. They *hate* parting with cash. And they *hate* paying for advice. The one consistent thing that is coming through in New Zealand is the large successful corporate style farmers realize they have to pay for good advice.

The big focus for us in managing risk in New Zealand is about getting the governance piece right. We feel if we can get that right, that will get us a long way to adequately managing risk in an environment that will make us more comfortable to be the lender.

To touch very briefly on some of the risks we face, we have all the environmental challenges, as you do here. Water is a big thing for us. We have a lot of water in New Zealand, but managing this resource sustainably is crucial. That is a big and ongoing challenge for us all.

One of our political parties in New Zealand. They want New Zealand to be CO^2 carbon-neutral. Agriculture in New Zealand produces half the carbon emissions of our economy, so that makes it a huge disadvantage for us if we pay a carbon tax on agri output. Bear in mind we work in a global marketplace and we are disadvantaging ourselves, because no one else in the world is going to charge emissions on their agricultural products apart from New Zealand.

We face political risk, which is not only on-shore in New Zealand but also globally, because we are very much a free market. Any decisions you make here in agriculture impact us very, very directly.

Capital gains tax is being muted by a political party in New Zealand. There is no capital gains tax on agriculture land in New Zealand, which has almost been a detriment, because there have been a focus on farming for capital gains rather than cash generation. In New Zealand, cash is king. It is now; it never was for the last decade.

Just more introductory words: I look forward to all questions and thank Jason [Henderson] very much for the invitation to be here with you all today. Those are some of the challenges we face. [Applause]

General Discussion

Transcript

Moderator: Ms. Alison Felix
Senior Economist
Federal Reserve Bank of Kansas City

Ms. Alison Felix: Well, I'll start it off with a question. What risks are we missing? So in other words, what risks are we *not* managing?

Mr. Michael Swanson: Wow! All of the above – weather, currency. It depends on who you are. Say you have more of a currency exposure. A lot of the companies – agribusinesses are being more global in nature. We didn't talk about currency risk management. In weather, futures are coming into play. The amount of risk I've missed in my presentation is almost endless.

Mr. Curt Covington: The one risk we didn't talk about that bankers really need to be concerned about is transition risk, succession management. We talk about going from old school to new school and – I am speaking generally for California – are very poor at recognizing that risk. Your comments please.

Mr. Swanson: I would agree. Farmers are allergic to taxes and cash, right? [laughter] And they don't like fees either. Good risk management when it comes to transition and estate planning is crucial, but they will not spend $5,000 to establish the right type of trust situation with the right type of documentation. Then they will leave $2 million or $4 million at risk for estate purposes. Shame on us for not showing the dollars saved for the dollars invested, because it is a great investment. You are right, Curt.

Mr. Larry Dreiling, High Plains Journal: I'm Larry Dreiling from *High Plains Journal*. I have a question on your last slide, which was about the issue of government involvement and policymakers having a limited role. We are getting ready for a farm bill. What kind of farm bill do you think we ought to have with a Title 1 that would be best for everybody, especially concerning the fact that you do have down here the aide to the Father of Freedom to Farm over here and the guy who developed the idea of direct payments. Where are you standing on that?

Mr. Swanson: This is my opinion. So it is professionally wrong now. I think we should get out of it. The only thing I see as justifiable is more crop insurance, because I see it as neutral to decision making. It doesn't favor acres, one over the other. Let me put a hand up and say, "Wells Fargo owns Rural Community Insurance Services – the largest crop insurer in the country – so that somewhat colors my opinion of crop insurance." But the unintended consequences are so huge when we tried to find a mechanism. People are looking for income security. When you try to give people income security, you guarantee yourself some type of bad problem to come out of it. That's my opinion, liked or not.

Ms. Felix: We've heard how important global trade is to farmers both in the U.S. and in New Zealand. We've also heard there are risks involved with that, that may be unique to a global trade setting. What do you think the best strategy is for managing that type of risk?

Mr. Swanson: I'll give you a cynical answer. You have to have an equal and opposite pain to inflict upon your trade partner, if they decide to give you trouble. Anybody who is involved in the broiler industry understands Russia comes in, Russia goes out. And it's always interesting because they say, "Well, we're not meeting their phyto-sanitary standards in our chicken-processing facilities."

Our answer is always, "We didn't know you had any standards!"

The U.S. is a very naïve trader at the end of the day. We think everything is done above board and for a real reason. Often times, there is very special interest on the other side that have their unique dollars that are in play. If you don't identify those dollars and push back on those dollars, you won't have a successful trading policy. You can't do it, thinking it is all done through sunshine and happiness. So that is a very cynical answer.

Mr. Richard Bowman: In New Zealand, we've been trading on a global marketplace for 2½ decades now, so you have to be efficient, as you see, we're trading commodities here.

You are either big or you are cheap in commodities. If you are neither of those things, then you are not a long-term player. From our perspective, like for example the dairy industry, we have a rough rule of thumb that in the U.S., if you are getting $3,000 U.S. a ton for your product over here, then you are hurting big time, whereas we are

making a bit of money at that price in New Zealand. So we can grow on out of that time until production falls over here and then we get back to a position where we will make quite healthy profits. Once again, that is the whole thing about commodities. You need to be cheap; we need to be big.

Mr. Covington: I would just add. I am going to get down again in the weeds a little bit. If I were a banker, we have a lot of these problems that face us out in California. One of the things we make sure is that there is a limitation on the amount of exports that can leave that business without some type of guarantee. There are several ways of guaranteeing repayment, through a foreign exchange facility or letters of credit with foreign banks. The bottom line is many of these smaller growers aren't large enough to take advantage of that or they are not sophisticated enough to know how that works. Typically what we do is make sure they are working with a U.S. trading company, they are trading in U.S. dollars, and that money is coming from a U.S. bank.

We may give some slack there, if we know the borrower, we know their history of not getting out too far over their skis. I want to add something to this later on about us seeing more and more of California farmers' money end up in Mexico, where they are funding their new partners, which are Mexican growers. And that is a *major* issue.

Mr. Bruce Gonyea, Harvest Moon: Richard, thank you for the insight into how New Zealand has coped with globalization and also being weaned off government support.

For the panel, I'd be interested to hear your views on the outlook for corporate-anticorporate ownership deregulation of farmland in the U.S. Also, New Zealand and Australia have been in the news recently with regard to foreign land ownership. Maybe the panelists can give their thoughts on that, as well.

Mr. Swanson: You notice I didn't use the words "corporate farmer"; I used the word "institutional farmer." That's my new buzzword. Because I think corporate farmer has a bad connotation, particularly in California, and 90 percent of our family-owned farming operations are either LLCs or limited partnerships but, at one point, converted from the family corporation.

The last thing I'll say about this: With all these foreclosures – and you see a lot of empty lots – people are growing these little neighborhood farms on these properties and think they are adding value to their lifestyle. It is a big problem in California.

Mr. James Andrew, Andrew Farms, Inc. The first one goes to Michael. The comment I heard in Washington last week is, direct payments are dead. They are going out the window. The *Time* magazine article, "Want to Live Like a Banker? Be a Farmer," didn't do us any good. However, it bothers me when we start talking about putting everything into crop insurance.

My basic understanding of WTO regulations' direct payments are green box, which means they are perfectly open to be paid. Crop insurance is considered a subsidy and is not. How are we going to resolve that difference? The legislators who are talking about it are smart enough to realize we may be bringing about a Brazil cotton-type lawsuit against the U.S. government later.

Mr. Swanson: Red box, green box, and amber box, don't we love the colors? I understand crop insurance is seen as an amber box, not a direct subsidy violation. Given how much money we are cut out of supporting farmers, I don't think the amount of money we will put into crop insurance will get us over the box limits. We will shrink our way to compliance with WTO.

Finally, I think we shouldn't give a damn what WTO thinks at the end of the day. We should always find a better way to push back. We are too naïve when it comes to WTO.

Mr. Andrew: The second question was for Curt. Having recently traveled in Europe, I just do not like socialism and government regulation. I think you hit the nail on the head; California is probably the leading example of bureaucracy and regulation.

How are we in agriculture going to mount the effort to change the mindset of the average urban resident and turn this thing around? I am more concerned about that than I am about some of the price volatility that confronts us in the future. I appreciate your comments.

Mr.Covington: Man, you raise a great question! We talk about California agricultural leadership. Every state has its own leadership program. The city dwellers think milk comes from a refrigerator or comes from the grocery store. Here is the

problem I see, and I would add that I retired from Fresno State after 30 years of teaching there. From that perspective, when these kids are coming out and being told that your first accountability and responsibility are to the social and economic well-being of others, not to maximizing the wealth on your farm.

I'm talking about the students who come out of Fresno State, not any other university since I can't speak to that. One of the reasons I retired is because when a third of your curriculum deals with things that are "off the farm" and you are trying to teach these kids that, "If you want to come out of here as a strong financial manager, if you really want to manage this business, you are going to have to spend 60 percent of your time making sound decisions – and they have to be sound decisions for your farming operation or your business."

But that is not what they are being taught. They are still taught agricultural economics in the social implications of every decision you make. Again, I am not against social implications; I am not against environmentalism. I'm against extremism.

In California, it's a dead proposition to turn around. It is turning a battleship around in a bathtub in California. Los Angeles thinks the farmers are wasting their water and the people in northern California think we abuse animals – everything from our pet dog to cows. And that is the bottom line.

That is just the best question. I don't know how!

Mr. Larry Dreiling, High Plains Journal: Thank you. Larry Dreiling, *High Plains Journal*. Mr. Bowman, I've been to New Zealand and love your country a lot. It's wonderful. I met with your farmers at the National Farmers Union there.

They have an interesting scenario with their discussion group program. Do you as a banker attach some credence to what they are trying to do with discussion groups? You can probably explain it a better than I could, but I was fascinated. They let me come in on one of them. I spent the entire day on one of these discussion groups, and it was really interesting. However, I thought it would be different. I thought it was going to be a bunch of guys sitting around in a coffee shop complaining and it absolutely wasn't.

Mr. Bowman: There will be a group of farms in a geographic location on an industry like dairy farming in a province or a region. They will discuss the challenges they have at certain times of the year. They came from old dairy board, which was a

government-funded organization and now it is privatized and each farmer pays a levy. The dairy discussion groups still run and also run in sheep and beef industry.

Basically what happens is there might be 20 farmers in a discussion group. They will go around every one of their farms. It may take two years to get around. They meet once a month to discuss all the challenges hitting on that exact farm. Generally, if that farm has challenges in that location and on that farming type, then everyone else has exactly the same challenges, as well.

I'm always quite proud to be part of a New Zealand farming community that actually does that. They have very open, honest, and frank communications. Nobody has any real secrets, because they are all in the same boat, and they are looking to help out each other. Approximately 70 to 80 percent of the meeting is commercial and 20 percent is social, which is also very healthy for a community. It has a huge benefit for the New Zealand economy in the farming community as a whole. It is very strong in particular in dairy. Dairy is a very simple business, so you can analyze it pretty quickly and can get some good conclusions in a day on a farm.

Ms. Felix: I want to ask just one more question before we wrap it up. Do farmers have the appropriate skills to utilize risk management strategies? If not, where can they get them? And who is a good risk-management partner for farmers?

Mr. Bowman: I'll start off. Most farmers generally have a reasonably similar range of skills. They are all a little bit different, but they have a complete skill set to run a business. If we think our businesses are getting bigger, more consolidated, more institutionalized, then they need more and more skills to start running the business.

Where do those skills come from? That is a great question. In New Zealand, what's happening here is pioneering. We have an industry that is consolidating. We have people who are asked to function in a very commercial and institutionalized capacity in a farming business, and there are not a lot of those people out there. We wish there were more and more people gaining the skills in that capacity, which will only further enhance the business, create opportunity, mitigate risk, and other things, but there is still a long way to go, in New Zealand in particular.

Mr. Covington: This goes back to what I was saying earlier. They know they have to do it. They maybe have made the decision to do it, but they have to get off the

tractor, get out of the milking barn, and get it done. That banker is accountable for half of that education. What I mean by this is, I couldn't count on my hands, toes, and all of yours how many meetings we've set up with commodity brokers and traders. So they get the PowerPoint presentation, which tells them what a hedge is, what a short is, what a long is, how to do this, it goes over their head, and they walk out and say, "Okay, but my neighbor did this five years ago and lost a bunch."

That is what they know about the business. That is what it comes down to. There are probably two or three firms – I don't want to name them here per se – but this is the thing about getting down to the weeds. That is, the banker sits down with the borrower, one on one, somewhere outside of the home or around the kitchen table and get outside the bank, and sit down and hear the questions: "Here is my dairy. How big of a hedge line do I need? Banker, would you be willing to provide a hedge line of that size? And how is it going to get collateralized?"

And the commodity broker or the trader –whoever they are using – will have to walk through how it gets done. Here is the practice and here is the thing they have to understand. *This is not a test model.* If you are going to do this, you have to commit to it over the long haul. This isn't something you do this year and say, "Well, my neighbor received $2 more a hundredweight, so this stinks."

Reality of the matter will come when there is a time when you are making a $1 more than they are making. It is all going to come out in the wash. What we know about our dairymen today, and Mike [Swanson] was telling me this earlier and I can't disagree at all, is they want to make up those $5 a hundredweight losses this year. And it is NOT going to happen. This is the deal of getting into the weeds and getting in front of that client, and the banker and whoever their representative is doing the trading need to sit down and knock out the plan.

Mr. Swanson: I would concur. It is not a question of aptitude or skills. It is a question of attitude and you are not going to save them from themselves. That's the harsh truth unfortunately. It will be a great winnowing as we go forward with this volatility.

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Closing Panel

Recognizing Risk in Global Agriculture

Moderator: Alan Barkema
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Panelists: Bruce Babcock
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Paul Ellinger,
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Michael Swanson
Chief Agricultural Economist
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Mr. Barkema: Over the last two days, our distinguished speakers and panelists have shared their perspectives about global agribusiness and financing. There is much to process and consider, but we've asked our closing panel give us the 10,000 foot view. Starting with Dr. Babcock, what are your takeaways from the symposium?

Mr. Babcock: … interest rate shocks. It would be interesting if agriculture could see if the high interest rates were inevitable or would they remain low and increase asset values over time and get more leveraged. I haven't worked that out, but that is a key question if inflation pressures do come along. That was a big one.

Mr. Barkema: Bruce [Babcock], a quick follow-up on that, though. With the policy we have in place now – unusually low interest rates and high liquidity – has that process begun in your mind?

Mr. Babcock: Very low interest rates clearly have contributed to higher land values. Just look at the capitalization rate. Paul [Ellinger] put up a nice chart about the major impact low interest rates have on land values. So that has helped. Clearly, a looser monetary policy has not kept the dollar strong. The dollar is weak and would be even weaker against the euro, if the euro wasn't under attack because of the problems they have, too. Yes, in some sense, what's happening now could be the first third of a decade-long trend. I am not making that prediction, but that is a risk factor to me.

Another big risk factor, not so recognized but mentioned by Ejnar [Knudsen], is the European Central Bank (ECB) and what happens to the Eurozone. That could have worldwide consequences in terms of world growth, so that should be resolved – I hope – in the next year or two.

My takeaway point is we are running a just-in-time food production system worldwide. Luckily we have diversity of production across the globe. So far, we have avoided major supply disruptions affecting two or three major producers at one time. Maybe we've been lucky. If we had a very large supply disruption, are we in a position to have any kind of buffer stock at all? The only buffer stock I can see in the United States is we are processing four to five billion bushels of corn a year into ethanol. If the world did suffer an unexpectedly large disruption, either in the U.S. Corn Belt or in multiple places around the world, feeding your car or feeding your animals and world livestock might be a decision we come up with. Then the question becomes, do we have a flexible enough biofuels policy to allow that tradeoff to be made? I don't know the answer to that question.

Another important insight before I wrap up here is what Bob McNally talked about in terms of biofuels. He didn't see any major risk of losing the mandate on biofuels for at least a year or two or three, because he didn't think the mandate would have a target on it because he didn't think it would be binding – that is, you are trying to force the consumption of ethanol into the marketplace. It doesn't want it to such a degree that the cost-minus-price gap would result in the *Wall Street Journal* being able to say, "That's a big tax on fuel consumers!"

In two or three years, unless the corn growers are successful in busting through the blend wall, it's going to have a big target on it. Maybe we should think about a more flexible mandate policy, if we want to keep that stabilizing force in the feed grain markets there in case crude oil prices fall. That was a very insightful political comment with regard to the ethanol debate.

Mr. Barkema: Thanks, Bruce. Paul, what are your takeaways?

Mr. Ellinger: I will try to not repeat what Bruce talked about, but I would pick up on some supply shocks, as it relates to what we just observed in Japan and what it did

with the automobile industry. Weren't they the investors of just-in-time processing? What happens if we don't respond to something like that?

On a really big limb, one of the big takeaways is, China matters. Everybody knows that. There wasn't a presentation made that we didn't talk about either the trade issues in China, the economy in China, what linkages it has back to us in agricultural demand for products, or what would happen with hiccups in China.

One of the things that came up in a private conversation is an individual from Monsanto was saying at what point in time will China adopt some of the biotechnology in their country in terms of expanding their production as well. It is very evident China matters, but was quantified more during the sessions we had here.

Even though I've heard Bruce a lot, it's always insightful to do this. I think maybe I'll short corn and sell my biodiesel-ethanol plant stock. It did illustrate what the real issues are, especially on the biodiesel side and what could happen. That was very well-illustrated and probably not articulated as well as I've seen in here and it helped us understand that area much better.

Bruce will laugh at this one a little bit, but they also asked us to look at what are the biggest risks out there. I like the concept of the big-tail risk. By definition that is risk. But how do we manage the big-tail risk? If you talk about weathering a crisis, the crisis really was what was in the tails and what happened in the tails.

What can we do? There are option contracts. There are not a lot of things we can do, except maybe CDS[Credit Default Swap] spreads in the agribusiness arena. We can manage some of this on the Greece issue, but we don't have some of the instruments to be able to go out to where the real risks are.

When I look at our presentation and some of the conversations I had with lenders – there will be winners and losers – but, if we can weather farmers' and lenders' financial balance sheets, on average we are doing pretty well. We have different tools in place. We always like to compare with the 1980s, but we weren't doing some of the stress testing back then.

John Moore is here and I knew him from Farm Credit Administration. They were being very aggressive about shocking the Farm Credit System to certain events. That wasn't done in the past.

Community banks were talking about shocking land values. Those tools were not in place. Our underwriting standards have certainly improved. Our data going into making these decisions, even though it's maybe still subject, are better quality and provide some opportunities. More and more cash is being invested in farmland. In general, even though the risk pie is bigger, we have better tools to helping manage that to some degree. That is within the tails. But I am not sure we have what it takes to be out there.

The other side we didn't talk a lot about, probably because of lack of time, is regulation risk and what surrounds that. Why we don't see more development in small business is all the uncertainty we have regarding environmental policy, tax policy, the cost of debt, and water issues. With all this uncertainty, we have more hesitancy to invest. Regulatory risk certainly is one of the factors that may be an impediment and a headwind.

Mr. Barkema: This is a follow-up question ,for both Paul and Bruce. You mentioned a just-in-time food system. We heard about that.

The thought occurs to me, is our just-in-time food system by design or is that by default? Are we simply in a place now where productivity growth in agriculture can no longer keep pace with consumption growth? Or will we see a point again where productivity, either gradually or by a continuous jump, will rebuild stocks some day? Is this by design or by default?

Mr. Babcock: I would say more by design in some cases.

Mr. Ellinger: No one likes old stocks. If you look at manufacturing throughout the world, we are moving more to a just-in-time system, because of investments in IT [information technology] and investments in logistics. An ability to do this is enhanced. It's a matter of increased productivity and an ability to do it. There are consequences of it on the food production system. What if you have a major supply disruption on feed grains? This year, for example, let's say the temperature in the Cornbelt never stays at 100 degrees. We could have a 25 to 30 percent decline in feed grain production at a time when we don't have any stocks to carry over. That would really test our ability to feed all the animals that rely on that, particularly if we see supply disruptions around the world.

It is by design, but we don't know how resilient the consequences are. I heard your colleague Scott Irwin saying, "Oh, that's the consequence that leads to $10 corn."

But $10 corn is the last thing the world needs right now.

Mr. Babcock: He would follow that up with that exact statement. If somebody asked him what would happen if we have a supply shock, we could see $10 corn. He is not necessarily forecasting that. And, his follow-up statement is, "That would be the worst thing for agriculture if we did have something like that, because of the volatility that would cause and people changing investment decisions based on that."

Mr. Barkema: Mike, what are your major takeaways?

Mr. Swanson: I alluded to an old quote from Mark Twain. It was, "History doesn't repeat itself, but it often rhymes." [laughter]

It is interesting, because let's give credit where credit is due: Jason [Henderson], Tom [Hoenig], and everybody who invited us here to have this conference. Why won't we repeat what we had in the 1980s? It is exactly because we are sitting in this room today talking about it and anticipating it.

I don't remember seeing a conference like this in 1978. I wasn't around working a lot of agriculture in 1978, but I don't think they had the same level [of conference]. We've *learned* something. Having this seminar is raising the risk awareness of what is happening. To a large degree, if you are around, nothing that was said during the conference was completely new. It was new for other people, because they hadn't heard it before. In totality, though, there has been nothing new said here. The real achievement is to bring it all together at one place at one time, so people can hear it in a consistent fashion.

I am more optimistic now than before to think there are enough people with their eyes open with the regulatory environment being aware of what is happening. This conference is a great way to prove it is a concrete step toward saying, "We won't make the same mistakes."

Now, we will make more mistakes. They will be a little more original this time. [laughter] The tools are new. We have crop insurance that wasn't there in the 1980s, just-in-time, transportation systems are different, and computerization is different. There will be issues. But I don't think we are going to have a crisis like we did back in the

1980s, because we are already asking questions. Is it a bubble? If you get to that question and you have the regulatory people involved, you are not going to be at the point we did in the 1980s where it is too far gone.

Is that a prediction? Yes. What did I tell you about my predictions? They are not very good, right? But my takeaway is that, when you look at this conference and the issues raised, it is already doing what it is supposed to do. It has already put people on guard for the problems we have.

Can we be caught blindsided by something? Absolutely, but hopefully to a smaller degree and a more manageable degree than we would have if we weren't doing this today.

Mr. Barkema: Good comment. Let me open this to the audience. Does anyone out there care to share your major takeaways with us or probe what our panelists just put on the table?

Jim, it's good to hear from you. [laughter]

Mr. James Andrew, Andrew Farms, Inc.: I feel like I am a jack-in-the-box.

Mr. Barkema: We'll put your chair closer to the microphone next time.

Mr. Andrew: One of the questions of the risks that are my black-swan nightmare is the current situation in the Eurozone. It's hard for me to get my mind around that whole situation. I pick up the *Wall Street Journal* every day and there is another country in bad shape. Do you have ideas on that, is it a potential black swan, and what can I as an agricultural producer do to protect myself from getting into that situation?

Mr. Swanson: It's a great question. If you were my hedge fund and we are having this conversation about what's the risk and how we'd handle it, I'd say, "What happens then?"

Let's say, given your scenario the European Union suddenly has a crisis of faith in their currency, they want to split apart, and debt starts being defaulted upon. What then? The most important question in any economic analysis is, what happens then? The story doesn't end there. The Europeans are still relatively wealthy. They are not going to eat less food. They might buy fewer cars, buy fewer electronics, and take fewer vacations. That is the long-term consequence.

The food would stay there. But, in the three years while people are figuring that out, food will still be purchased and eaten. There will be an absolute panic in the world's financial markets when that happens. If you don't have the wherewithal to be hedged off to start with or have the cash to get through that three- to six-month period before they decide food is still valuable, you will be the one who goes bankrupt. They teach you in banking that cash flow is like oxygen. You need it all the time. If you don't have it for five minutes, you are dead. It doesn't matter how much you get afterward, you are still a rosy corpse.

I can see that scenario, but before you panic, it is like any other of the 100 scenarios that could happen. The question is, what would I do in any one of these? What is my blitz? How would I pick up that blitz? Have more cash on hand and have hedges in places to start with. Yes, it is a real concern, but you have to deal with 100 just like it, so it is not that unique. I am not concerned about it, as long as I have a plan in place to deal with a six-month disruption of the markets.

Mr. Ellinger: I agree. The only addition to that would be in comparison with what happened with Lehman Brothers in that Lehman happened very fast. We didn't have that six months to prepare, and we are going through this with eyes relatively wide open. There have been problems, people have been talking about and dealing with these issues, so we have a bit more of a head start. We don't know what will happen in the markets. We can't predict what is going to happen in the financial markets, but have had a little longer run to lead up to what that crisis would be. So we might have some of these things in better line than if this crisis had happened almost immediately and then we responded.

Mr. Kyle Bauer, KFRM: I am doing this totally from memory, but as I recall someone showed a chart of the EU being a major exporter of red meat about 20 years ago and today their role is fairly insignificant. My preconceived notion on that was their production had dropped. But, on the other hand, maybe their consumption is absorbing that. My concern – again from my preconceived notion – is a lot of Europe has its social license to produce especially animal protein. Do we have any of that risk or is that a significant risk in our society?

Mr. Babcock: I can give some factual evidence. Twenty-five years ago the largest pork producers were the Dutch pork producers in the northeast part of Europe, so they were natural exporters. They couldn't eat it all there. As environmental regulations took over, they didn't have any place to use the manure. The soil was saturated in urine, and then phosphorus and nitrogen were showing up in water supplies.

As they tightened up environmental regulations, that pork production moved and they haven't ramped up to meet the world demand. I am not sure it is a social thing; it is environmental regulations that did in a lot of the production. Europeans are big meat eaters plus they have changed the common agricultural policy to give less supply-distorting price signals. So they are not guaranteeing their meat producers such a big price. That was another reason why they were exporters. They have rationed their production, because of environmental regulations and reform of the common agriculture policy. There is no social stigma to eating meat in Europe.

Mr. Kyle Bauer, KFRM: I just want to make sure you understand. My question was about a social license to produce meat in this country. Will our society continue to allow us to raise meat? We have animal rights groups, environmental groups, and a constant barrage of people who appear to be anti-animal agriculture. Is that a significant reason to be concerned or is it my perception only?

Mr. Babcock: I'm sure someone else can chime in. As Costco and Wal-Mart go, so does the way we produce our meat. What surprised me about the hidden camera we saw in Iowa was the big chains said they were not buying from Iowa Select Farms anymore until they take care of the animal cruelty allegations. The animal welfare standards – we had the California vote on caged chickens – are going to be negotiated between the big retailers and the livestock producers. The institutional producers in California will be the model for animal agriculture in the U.S., at least for domestic consumption. For export, they have their own way of producing. There will be a social license, but it might be a new contract, if you will.

Ejnar Knudsen, Passport Capital: I had a couple things to share with the group and then two questions for the panel. It is interesting to watch how we feel the effects of the Japanese tsunami, where they had only a 3 percent GDP hit. In the mid-century last year, Japan had an earthquake that knocked out a third of their GDP. That is a black

swan, but it doesn't happen often, and it probably won't happen again. If it did, are we prepared for something like that?

As I was preparing, I was gathering information. About a month ago, the sun gave off a solar flare that was so large it was equivalent to what happened in 1930 or the mid-1860s, which wiped out all electricity on earth. Fortunately for us, it is a coin toss that happened on the other side of the sun, so it went the other way. We don't think about that, but it would have knocked out all of our telecommunications, all of our grid, and just-in-time transformers would have been toast. What is the impact on society? What would happen to our GDP and oil prices? It was only a month ago that happened and you can look it up. It is really a coin toss that it happened on *that* side of the sun versus *this* side of the sun. I am constantly trying to think of how to deal with that. It's interesting to reflect on it.

I have two questions for the panel. Are there any books we can read that will help us understand the risks and unpredictability of things that happened in the 1970s? It wasn't a stable period when I looked at prices. It was up 300 percent on wheat. It was almost retraced completely. It was up. There were regulatory things enacted, such as price controls.

I look at governments around the world now trying to do price controls, releasing the strategic oil reserves, trying to reduce speculators in the markets, and releasing the strategic pork reserves in China. These are all signs the governments are freaking out and they are trying to do it in nice ways. What else can they do? Maybe some of you know what else they did. Alan, you might know of some of these you can share with us. Hopefully, they won't happen, but it is nice to know what *could* happen. What are some examples? And what books, case studies, professors, or resources can we seek out to learn more about the 1970s?

Mr. Barkema: Gentlemen? Who wants to tackle a look at the 1970s?

Mr. Ellinger: In terms of specific research in the agriculture sector, there are not a lot of good technical analysis like what you are asking for. Even though there are a lot of people here, there will be a lot of books about the housing sector and its financial crisis, because it is so large and so comprehensive. We learned a lot in the agriculture side, but not a lot has been written about it. There has not been a big demand. There are

scattered pieces, but not as good as the technical analysis you are interested in, at least not that I am aware of.

Mr. Swanson: It's a good question. I'll compare it with econometrics. If you are not familiar with econometrics, it is applied statistics where you try to model things. It's a big part of economics. The problem with econometrics is twofold. One is you need to go far enough back to have enough data to fill a model. The problem is, the further you go back, the less data apply to the reality you are in today.

There was a famous economist, Wassily Leontief, who said you are on the horns of a dilemma, because either you take current data that are very applicable to the situation you find yourself in and you don't have enough statistical power to validate a model; or as you go further back into history every additional observation becomes less and less relevant to what you are looking at today.

The reason I bring that up as an analogy is because what you are asking is, is there something in 1970s to look at? Sure, you could probably find articles in *The Economist* or whatever. But the question is, is it still relevant or are there some factors that were implied that would be no longer binding in that analysis? So it is a very difficult answer. So the answer is, no, there isn't a good answer and you will have the same horns of a dilemma you have in econometrics that you do in that type of analysis. At least that is my takeaway.

Mr. Babcock: I will give you one lesson I hope we learned, but I don't think we have. I had a discussion last night with some farmers who led me to think we haven't learned very much. What happened in the late 1970s is crop prices were finding a new plateau. Throughout the 1970s, the level of support given to farmers through the Farm Bill policies ratcheted up. It kept ratcheting up and ratcheting up. The excuse for farmers was the breakeven price has gone up, because the costs are going up, therefore more support is needed. As the support followed the prices up, that led to the early 1980s where we had the PIK [Payment-In-Kind] Program and government trying to undo what they had done with the ratcheting up of support.

I hope we learned that lesson, but I don't think we have. We have a farm program now called ACRE [Average Crop Revenue Election]. What it does, as the price goes up, it ratchets up support also. There are limits on how fast it can ratchet down. That is an

example where we have adopted a policy that has ratcheted up support. We haven't learned from that.

The other big risk management policy we have is crop insurance. What it does is rebalance the price every year before planting to reflect current market conditions. That, at most, has a one-year effect. If markets fall, the level of support from crop insurance will fall too. It is a superior risk management problem. I am not sure we've learned that lesson about how support from crop insurance follows market prices higher, which is common sense to do, leads to unintended consequences down the road when the markets are trying to adjust but the government isn't allowing it to.

Mr. Barkema: Are there any other questions or comments? I'd like to ask one more question of you.

I recently heard an individual who serves as chief risk officer for a Fortune 100 company. He described his job as thinking through risks that are very unlikely, for example, things that couldn't possibly happen. Then he answered with the question, "But what if they did?"

One of my takeaways from this conference – in fact, the whole conference is built around the idea that downside shocks to agriculture is not so much a question of "if" but rather "when." With the thought that forewarned is forearmed, chances are we won't see the next shock coming. What should we be watching for in agriculture today as the next shock? What do you think is the most likely downside risk to hit this industry next?

Bruce, what do you say?

Mr. Babcock: I am going to return to what Paul [Ellinger] said – China. It's easy and kind of a copout. But there is both upside and downside risk. We think we know China's income and food consumption are going to keep growing and their demand for meat will keep growing. But are they going to try to be self-sufficient in meat or self-sufficient in grain? That is, are they going to import grain or are they going to import meat? They have to do one or the other. If they build up and we start getting the supply chain going into China and gearing up for production, and they have some calamity that strikes their economy – because I don't trust the Chinese government to be able to manage everything, even though they are trying to do so – that has a severe downside potential. If China enters our feed grain market when we have almost no supply, that will

shoot up prices. Or are they going to enter long-term contracts to have meat produced in the U.S. by Smithfield, say, then Smithfield becomes a major exporter of meat? I think China has a lot of surprises left for us, both on the up- and the downside.

Mr. Barkema: Paul [Ellinger], what are you looking for?

Mr. Ellinger: You already stole my answer. [laughter] Maybe that is the event that happens, but one of the bigger and more likely risks is going back to what President Hoenig said last night on what inflation and interest rates do in the farm sector, both on the lending side and on the farming side. It goes back to what effect it has on land prices. We don't see a lot of evidence – but very low interest rates. We may become overleveraged.

In Illinois that is not the case. When you can borrow at low cost, are we borrowing at a level that is there? Community banks in Illinois are not set up to do nor have we done a lot of interest rate risk management in the past. Interest rates have been pretty flat. If we had large spikes in interest rates, there would be some potential hiccups in interest rate risk management at smaller institutions as well.

So inflation and interest rates would be an outcome if something happened in China, but those would have a major impact on agriculture in both sectors, on the lending side and on the borrowing side.

Mr. Barkema: Thanks, Paul [Ellinger]. Mike [Swanson]?

Mr. Swanson: They got China, inflation, and interest rates. What's left? [laughter] I will just throw in bad government. We could very well have a shock where we do have some kind of political game of chicken being played and they don't successfully pull off the pass at the end of the day. It is a possibility. Politics are another one of those major risk factors you can't discount any time.

Mr. Barkema: Thank you very much. That was the last word.

Ladies and Gentlemen, please join me in thanking our panelists. [applause]

Mr. Barkema: Well, Ladies and Gentlemen, that brings us to the close of our symposium this year. I deeply appreciate your participation. It is often difficult to get a conversation going among 200 of our closest friends, but I think that happened in this room and we are all better for it. I hope you gained as much from this experience as I did.

We would welcome your feedback on this conference. There is a card in each of your packets that has an electronic link to our website. Also, everyone in the room will receive an email tomorrow morning with the link to the feedback site, so you can tell us what you thought of the conference but also the conference papers will be there for you.

This kind of activity – part of what you said, Mike [Babcock] – we seek not only to accomplish our charges in monetary policy, supervision, and the payments system, but informing the public and education is another important mission of the Fed. We gain so much from your comments as we seek to understand what's happening in this industry and what its prospects are going forward.

That brings us to a close, Ladies and Gentlemen. I wish you safe travel. We are adjourned.