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Statement at the hearing on costs and benefits of domestic offsets

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Disciplines

Agribusiness | Agricultural and Resource Economics | Agricultural Economics | Economics

**STATEMENT BEFORE THE SUBCOMMITTEE ON CONSERVATION,
CREDIT, ENERGY, AND RESEARCH
U.S. HOUSE COMMITTEE ON AGRICULTURE**

**Hearing on costs and benefits of domestic offsets
Thursday, December 3, 2009**

**Dermot James Hayes
Departments of Economics and Finance
Iowa State University**

Thank you, Mr. Chairman, for the opportunity to participate in today's hearing. I would like to describe some of our recent research on the impact of domestic offsets on agricultural land use and on crop prices and then finish with results of an informal survey on the subject where I have attempted to capture the opinions of farmers with whom I have recently interacted.

I first became interested in this subject of domestic offsets when I read a report produced by the Environmental Protection Agency suggesting that with a carbon price of \$30 per ton, as many as fifty million crop acres would be converted from crop to woodland nationwide. This early EPA report was followed by a report by a team from Duke and Texas A&M, led by Professors Baker and McCarl, that suggested this amount of acreage conversion would lead to significant price increases for agricultural commodities such as corn. This work caught my attention because a 50-million-acre conversion of crop land is greater than that associated with the Conservation Reserve Program or with the recent conversion of corn land used for feed into corn land used for biofuel production. Therefore, I decided to try to replicate these results especially as they pertain to the Corn Belt.

I am a co-director of FAPRI at Iowa State and I have access to the FAPRI modeling system. I believe that Pat Westhoff described this system yesterday in his remarks to this committee, so I will not describe the model in detail except to say that the model is well suited to this type of analysis. In addition, the group of individuals that I work with at the Center for Agricultural and Rural Development and in the Department of Economics at Iowa State University have an excellent understanding of how agricultural markets and agricultural policies interact. I was

able to draw on the expertise of a large group of experts as I prepared these remarks.

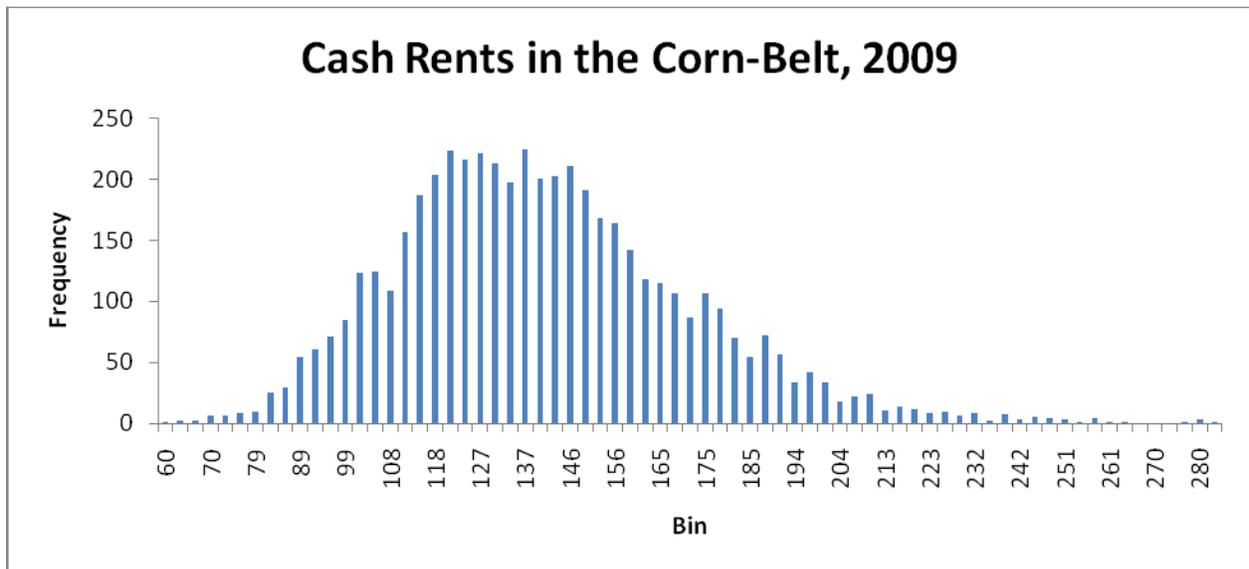
First, we decided to examine the EPA estimate of cropland conversion in the Corn Belt. To do this, we compared the offset value of trees grown for purposes of carbon sequestration against the current value of this land in agriculture. To estimate the carbon value of cropland in the Corn Belt, we used data from Lewandrowski on the sequestration rates in metric tons of CO₂-equivalent per acre for different tree types in different regions of the country. We converted these rates to an annual cash rent equivalent by multiplying the average annual sequestration amount in tons by \$30. I realize that there are other ways of examining this issue and we do plan to pursue other more sophisticated methods, but for now this method is as accurate as we can be. Our results suggest that Corn Belt land would have an annual offset value in the range of \$102 to \$132 per acre and that land in the Lake States would have a value of about \$146 per acre. These cropland conversion values are about 50% greater than for pasture in the same region because pasture land has more stored carbon to begin with.

Offset Values in US\$ per Acre at Carbon Price of \$30/metric ton

Region	Tree	Cropland to Forest	Pasture to Forest
Appalachia	Southern Pine	\$172.80 – \$189.30	\$102.90 – \$112.80
Corn Belt	White/Red Pine	\$102.90 – \$132.90	\$93.00 – \$122.70
Delta States	Southern Pine	\$189.00	\$112.80
Lake States	White/Red Pine	\$146.10	\$136.20
Northeast	White/Red Pine	\$132.90	\$122.70
Pacific States	Douglas Fir/Ponderosa	\$86.10 – \$89.70	\$79.80 – \$96.30
Southeast	Southern Pine	\$172.50	\$102.90

Next, we decided to compare the current cash rents in agriculture against the value of this land in an agricultural offset program. For purposes of this comparison, it is important to realize that cash rents vary widely in the Corn Belt because the suitability of the ground for corn and soybean production varies so much from farm to farm and from county to county. This is an important distinction because it seems likely that land owners will enroll the lowest quality ground in an offset program, much as was the case for the CRP program.

We were able to obtain survey data for cash rents on 3,000 Iowa farms for 2009 from Dr. William Edwards at Iowa State University and we used this as the basis for comparison. We also found 2009 cash rental data by county from the USDA National Agricultural Statistics Service. We used the coefficient of variation from the Iowa State University data as a measure of the dispersion of cash rents across farms, and we used the \$145 per acre mean of the Corn Belt county data as a measure of the current average farm rent. This distribution suggested that at an offset value of \$110 per acre, 20% or 22.5 million acres of Corn Belt land would be converted to trees. At \$118 per acre, the number of acres converted would be 25% of the total. These results are remarkably consistent with the EPA results for crop land conversion in the Corn Belt. We did not have adequate rental data for other regions of the country and we were therefore unable to verify the EPA results for those regions; however, these other results also make intuitive sense.



Next, we took the EPA estimates of regional cropland conversion and ran them through the FAPRI model to estimate the impact on crop prices. The FAPRI model is an annual model and it can be used for projections as far out as 2023. Therefore, we assumed that the \$30-per-ton carbon price would be reached by that date and that the rate of increase in carbon process prior to that date is linear.

Region	% of total	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Corn Belt	50%	-	2	4	5	7	9	11	13	14	16	18	20	21	23	25
Delta States	32%	-	1	2	3	5	6	7	8	9	10	11	13	14	15	16
Far West	2%	-	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Lake States	3%	-	0	0	0	0	1	1	1	1	1	1	1	1	1	2
Southeast	3%	-	0	0	0	0	1	1	1	1	1	1	1	1	1	2
South Plains	10%	-	0	1	1	1	2	2	3	3	3	4	4	4	5	5

The results suggest that by 2023, the price of corn would be about 28% higher than in our baseline and that the price of soybeans would be 20% higher. Our corn price results are slightly lower than in the Baker-McCarl study and our soybean results are slightly higher, but given the enormous difference in our approach, the results are remarkably consistent.

The FAPRI model did suggest that with higher crop prices, about 10 million acres of pasture and CRP would be converted into cropland so that the net price impact described here is for 40 million acres of conversion.

Commodity	McCarl (\$30/mt)	Our results (\$30/mt)
Cotton	+9.77%	+10.10%
Corn	+40.76%	+27.60%
Soybeans	+9.40%	+20.5%
Wheat	+14.23%	+14.60%
Sorghum	+5.50%	+23.40%
Rice	+1.25%	+28.40%

Finally, I would like to describe the reaction that I have had from about 250 farmers that have listened to earlier versions of this presentation. I conducted this survey by presenting the results and then asked the group if they were for or against the concept as described. About half the participants were livestock producers, and as I had expected, they were against the concept because of the increase in feed costs. The other half were specialized crop growers and, to my surprise, they were also against the concept. I had expected that this group would be in favor.

After some consideration, I was able to come up with a reason for the opposition from crop growers. The key is that the particular individuals I asked are actively involved in growing crops and, as such, they did not wish to reduce the size of their

own operation by converting land. Almost all participants also rent land from investors, or from landowners who have retired and/or who live out of state. Approximately 60% of the land farmed in Iowa is operated by someone other than the owner and about 80% of the land in Illinois is in this category. Because I conducted my survey among actively involved farmers in Iowa, I simply missed the group of people who own land but do not farm it themselves. I am sure that this second group would be more favorable towards the domestic offsets, because the program would offer them leverage when negotiating cash rents. I should acknowledge here that my wife and I own several hundred acres of crop land in Iowa.

However, the farm operators would see increases in the cost of renting land and this explains their opposition. Crop growers see a big difference between policies that increase crop prices because of demand pull (as was the case for ethanol) and policies that increase crop prices due to cost push as would be the case here.

I have not had a chance to present these results to agribusiness companies, but I would assume that those who provide machinery and seed genetics would prefer to see cropland remain in production, while those who provide equipment for conversion of land into trees would be supportive of the policy. People and businesses involved in the food industry and food security programs are also likely to be opposed to the domestic offsets because of the impact the program would have on food prices.

One last group worth considering is those who live in rural towns but who are not directly involved in production agriculture or land ownership. My sense is that this group would prefer to retain the economic activity associated with crop production, in part because of the negative impact that the CRP program had on some small towns.

I do see a way to make this program beneficial for almost all involved. The answer is to limit the conversion of crop land for domestic offsets and confine this activity to pasture, CRP, and publically owned lands. Alternatively, the U.S. could explore other opportunities to sequester carbon, such as that provided by using crop residues and other forms of cellulose to produce biochar and burying the biochar in the soil. Such a program might sequester similar amounts of carbon, while creating much smaller discontinuities for agriculture, industry, and rural communities.

Thank you for the opportunity to present this research and these remarks.

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