AGRICULTURAL POLICY BRIEF

No. 15   August 2007

An Analysis of the U.S. House of Representative's 2007 Farm Bill

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The negotiations for a new farm bill began in 2006, but no major proposals were released until January 2007. The USDA released a proposal for the 2007 farm bill utilizing revenue-based counter cyclical payment instead of the current price-based counter cyclical payments. In July, the House of Representative's Agriculture Committee released a proposal similar to the 2002 farm bill but with higher marketing loan rates and target prices for some commodities. The objective of this study is to estimate the impact of the House of Representative's new farm bill on North Dakota agriculture compared to the current farm bill.

The bill would increase the level of governmental support for agriculture, although since current prices are above both the loan rate and the target price, there is no current benefit from higher marketing loans and target prices. Direct payments remain unchanged from the current farm bill.

SUMMARY OF THE HOUSE VERSION OF THE 2007 FARM BILL

The House version increases marketing loan rates and target prices for several commodities. Table 1 shows the current and new target prices and loan rates and current direct payments rates. The House Bill would increase per bushel target prices by $0.23 for wheat, $0.49 for barley, $0.30 for soybean and $0.014 per pound for sunflowers, canola and other minor oilseeds. The loan rates would increase $0.19 for wheat, $0.05 for barley, and $0.014 per pound for sunflowers, canola and other minor oilseeds. In addition, the loan rate for sugar beets and sugar cane would be raised $0.50 per cwt to $18.50 per cwt for cane sugar and $23.50 per cwt for beet sugar. Direct payments remain the same under the House bill. The House bill proposes the option to choose counter-cyclical payments based on either market price or revenue. The option, as proposed, would be a one-time choice for the life of the bill and would be by crop. Table 2 shows the national target revenue and yields. The revenues were calculated as 85% of the average cost of production for these crops. Producers would receive payments as the national average revenue dropped below the target levels.

Major changes in renewable energy programs are proposed under the assumption that additional costs of the programs can be offset by savings in other sections of the farm bill. The bill would provide loan guarantees for bio-refineries and bio-fuel production plants and enlarge the Biodiesel Fuel Education Program from the 2002 farm bill. The bill also increases funding for the Renewable Energy, Energy Efficiency Improvements, and Bio-energy Programs, and it creates a Bio-mass Energy Reserve Program to develop new and higher yielding bio-mass crops. Federal crop insurance would be amended to allow producers to purchase supplemental area-based policies in addition to individual yield or revenue policies.

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Table 1. Target Price, Direct Payment Rates, Loan Rates Used by the North Dakota Representative Farm Model

|	Target Price		Direct Payment	Loan Rates	
	Current	House	Current	Current	House
	----------------------dollars/bushel----------------------				
Wheat	3.92	4.15	0.52	2.75	2.94
Barley	2.24	2.73	0.24	1.85	1.90*
Corn	2.63	2.63	0.28	1.95	1.95
Soybeans	5.80	6.10	0.44	5.00	5.00
	-------------------------dollars/lb-------------------------				
Sunflowers	0.101	0.115	0.008	0.093	0.107
Canola	0.101	0.115	0.008	0.093	0.107

*Feed Barley

Table 2. National Target Per Acre Revenue, National Payment Yield, and Calculated per Bushel Payment

	$/ acre	bushels/acre	$/bushel
Wheat	149.92	36.1	4.15
Corn	344.12	114.4	3.01
Barley	153.30	48.6	3.15
Soybean	231.87	34.1	6.80
Minor oils	129.18	1167.6 (pounds/acre)	0.111 ($/pound)

METHODOLOGY

The North Dakota Representative Farm Model, which is operational at North Dakota State University, was used to analyze impacts of both the current and the new farm bills on the various sizes of representative farms. The model was updated using 2006 data from the North Dakota Farm and Ranch Business Management reports. The North Dakota Representative Farm Model divides the state into four regions (Figure 1) with three different farms in each region. Characteristics of the representative farms are summarized in Table 3. The high-profit farm in the sample has about 2,800 acres of crop land, while the average-profit farm has about 1,800 acres of crop land, and the low-profit farm has about 1,600 acres. Major crops produced by these farms are wheat, corn, soybeans, barley, sunflowers, and canola. The model is based on data obtained from the North Dakota Farm and Ranch Business Management Association and prices are linked to historical national prices adjusted to North Dakota basis. Expenses are assumed to increase by 3% per year.
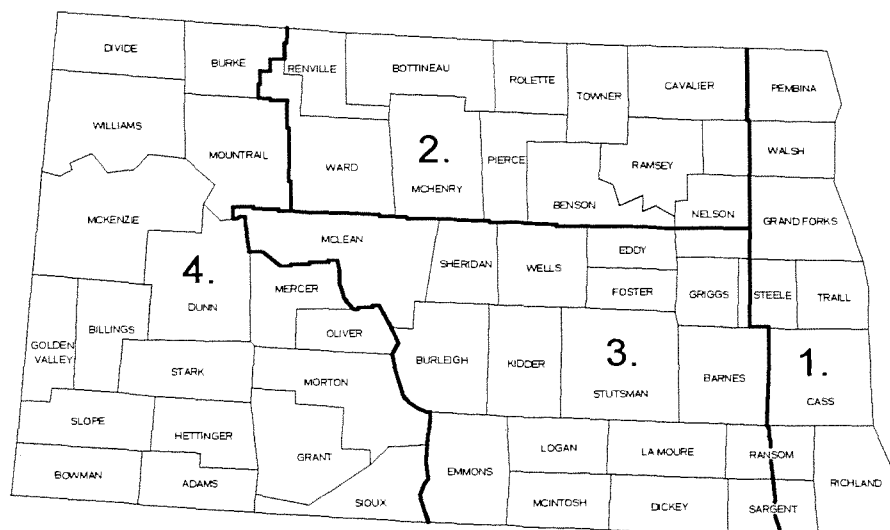
Region 1. Red River Valley (RRV)
Region 2. North Central (NC)
Region 3. South Central (SC)
Region 4. Western (West)

Figure 1. North Dakota Farm and Ranch Business Management Regions

A computer software program, "Risk" by Palisades, is used to determine the uncertainty associated with future prices and yields, which is calculated based on historical changes in prices and yields. Since future prices and yields are not know with certainty, distributions of possible net farm incomes are used to estimate the impact of the new farm bill on various farms. Thus, our analysis is based on historical prices, yields, and the variations within those prices and yields.

Table 4 shows the means and standard deviations of yields for North Dakota crops which are used in "Risk" to generate distributions of yields for each crop in each region. The distributions for each crop in each region were generated with 1000 iterations with the corresponding mean yields and standard deviations. To account for the relationships among crop yields, all other crop yields were related to spring wheat yields. It is assumed that individual crop yields were not correlated with the price level. Commodity prices were correlated, indicating that if the price was high for one crop, prices would tend to be high for other crops.

Table 5 shows the average commodity prices and standard deviations used in "Risk" to generate a price distribution for each crop. Current market prices are higher than the prices used for the study, but it was assumed that prices will return to normal levels by 2008. The prices are based on FAPRI prices from the 2007 Outlook. The prices were converted to North Dakota basis using historical relationships. If prices remain near the current levels, there will be no counter-cyclical payments made to producers.

Table 3. Characteristics of North Dakota Representative Farms.

	High Profit	Average Profit	Low Profit
Number of Farms	91	454	91
Total Cropland (ac)	2768	1762	1611
Spring Wheat (ac)	1,093	715	650
Durum Wheat (ac)	87	57	96
Barley (ac)	225	131	130
Corn (ac)	99	57	27
Sunflower (ac)	113	71	53
Soybeans (ac)	418	247	135

Table 4. Means and Standard Deviations of Crop Yields for North Dakota Farmers

	S.Wht	D.Wht	Barley	Corn	Soybeans	Sugarbeets	Sunflower	Canola
	------------------bushels-------------------					-tons-	-------pounds-------	
Mean Yields								
RRV	51.6		71.1	135.0	34.3	20.8	1662.0	
NC	38.0	32.9	58.2				1406.1	1534.5
SC	45.1	35.0	68.2	104.5	30.3		1485.6	
West	26.4	27.1	43.7					
Standard Deviations								
RRV	10.20		13.04	23.51	6.43	2.25	286.48	
NC	10.89	10.27	18.17				450.02	472.58
SC	11.37	8.24	17.82	29.29	9.20		381.28	
West	12.02	11.54	17.55					

Table 5. Prices Used for the Analysis

		Average 2008	Average 2012	Standard Deviation
S. Wht	$/bushel	4.00	4.06	0.56
D. Wht	$/bushel	4.33	4.42	0.96
Barley	$/bushel	2.56	2.53	0.45
Corn	$/bushel	2.37	2.35	0.38
Soybean	$/bushel	6.08	5.90	0.89
Sugarbeets	$/ton	39.15	39.95	3.80
Sunflower	$/cwt	12.06	11.75	1.95
Canola	$/cwt	11.22	10.92	1.64

RESULTS

Three scenarios plus a base scenario were developed to analyze the impact of the new farm bill. The base scenario uses the current target price, loan rate, direct payment rate, and counter-cyclical payment rate. Scenario 1 (house price) uses the new loan and direct payment rates and the counter-cyclical payment rates. Scenario 2 (house revenue) uses the revenue-based counter-cyclical program. Scenario 3 (none) removes all governmental support from agriculture. This scenario was analyzed to compare the impact of governmental support on North Dakota net farm income.

High-Profit Farms

Figure 2 shows the net farm income for high-profit farms under the four scenarios. Under the base scenario, net farm income for the high-profit representative farm averages $105,434 in 2008 and increases to $116,221 by 2012. Under scenario 1 (house price), net farm income for the high-profit farm is $117,285 in 2008, increasing to $129,329 in 2012. The average increase in net farm income in scenario 1 is 11% compared to the base scenario. The increase is mainly due to higher loan rates and target prices proposed in this scenario. The House proposal increases average net farm income by $11,851 in 2008 and $13,108 in 2012. Net farm income under the House revenue option (Scenario 3) is $116,427 in 2008, increasing to $129,123 by 2012. Income under the revenue option is slightly less than that under
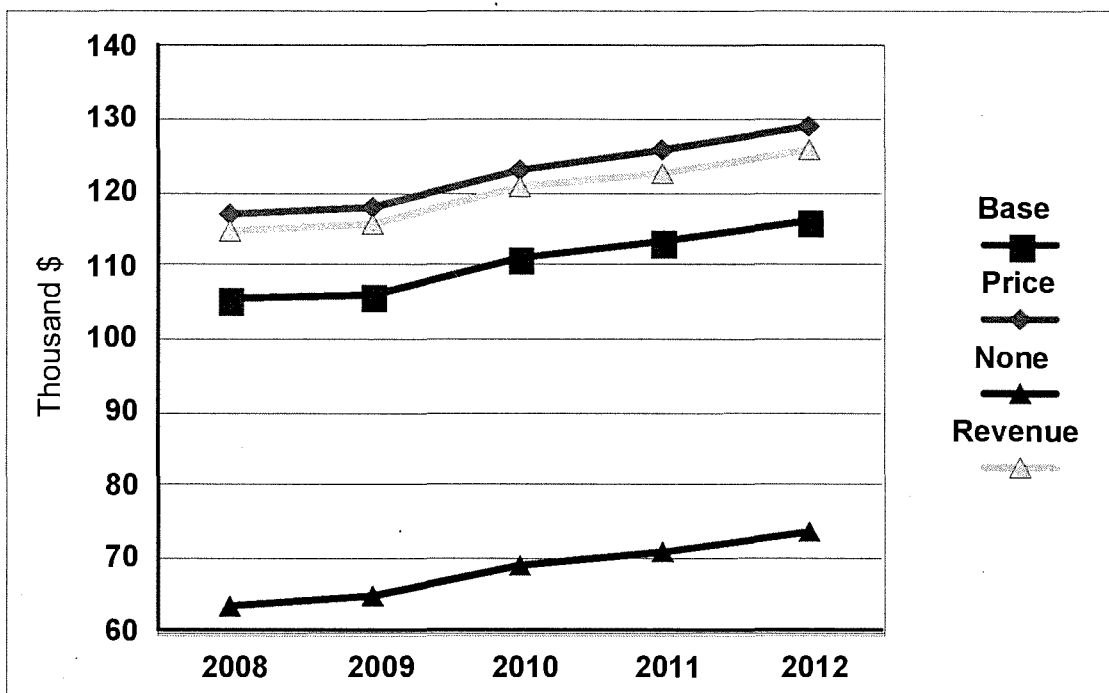
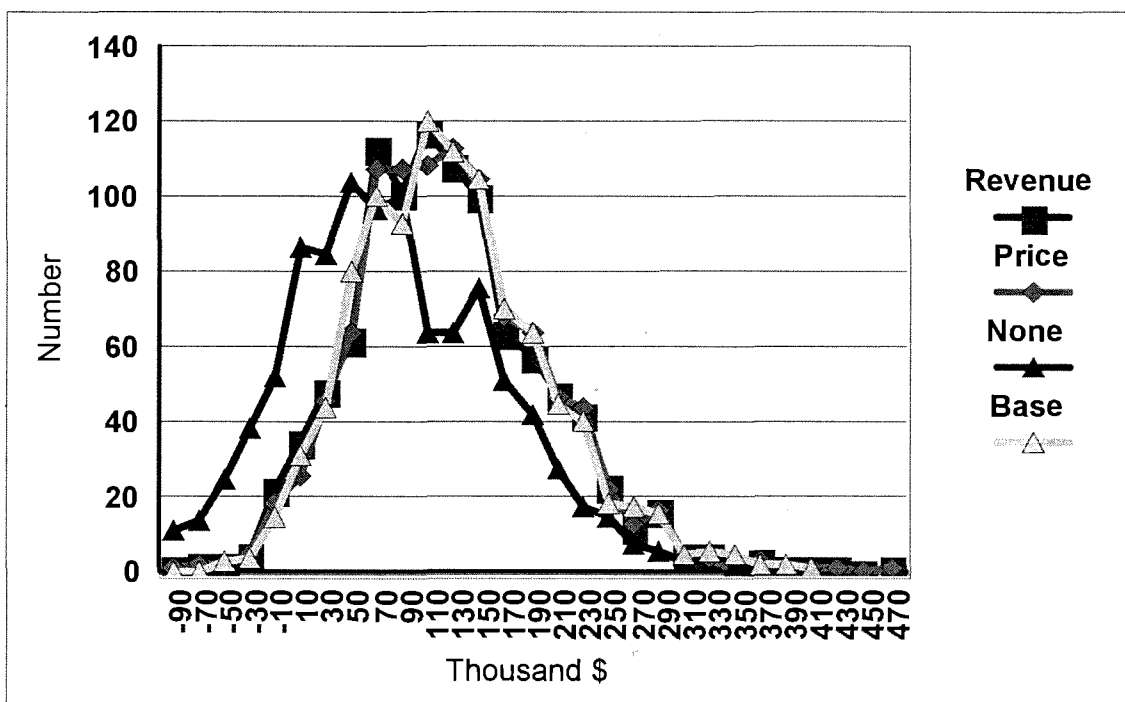**Figure 2. Net Farm Income for High-Profit Farms Under Various Scenarios**

Figure 3. Net Farm Income Distribution in 2008 for the High-Profit Farms Under Various Scenarios.

the price-based option for the high-profit farms. Under scenario 4 (none), net farm income for the high-profit farm averages $63,620 in 2008 and $73,871 in 2012. With no governmental support, net farm income is equal to about 60% of net farm income from the base scenario in 2008 and 64% of that in 2012. Without the farm bill, incomes, even for the high-profit farms, would decrease substantially.

Future yields and prices can not be know with certainty. Therefore, a distribution of yields and prices were developed with known means and estimated standard deviations. Each scenario was run 1000 times with the distribution of means and standard deviation to estimate distributions of net farm income instead of point estimates.

The House farm bill, under both options, shifts the income distribution to the right (Figure 3) because of higher loan rates, target prices and revenue payments. The probability for negative net farm income under the current farm bill is about 7%, while the House's bill decreases it to about 4%. The probability for the high-profit farm have negative net farm income is about 25% without governmental support. The income distribution for both the price and revenue options are very similar. The probability for high-profit farms to have net farm incomes higher than $30,000 is about 63% without governmental support, 83% under the current farm bill, and 89% under the House bill.

Average-Profit Farms

The average-profit farm has a net farm income of $47,156 in 2008 and $57,041 in 2012 under the base scenario and $54,330 in 2008 and $64,912 under scenario 1 (House price) in 2012, as shown in Figure 4. The average increase in net farm income under scenario 1 is about 15% compared to the base scenario. Net farm income under Scenario 2 is slightly less than that under Scenario 1. Without governmental support (Scenario 3), net farm income for the average-profit farm would be $20,748 in 2008 and $30,304 in 2012.
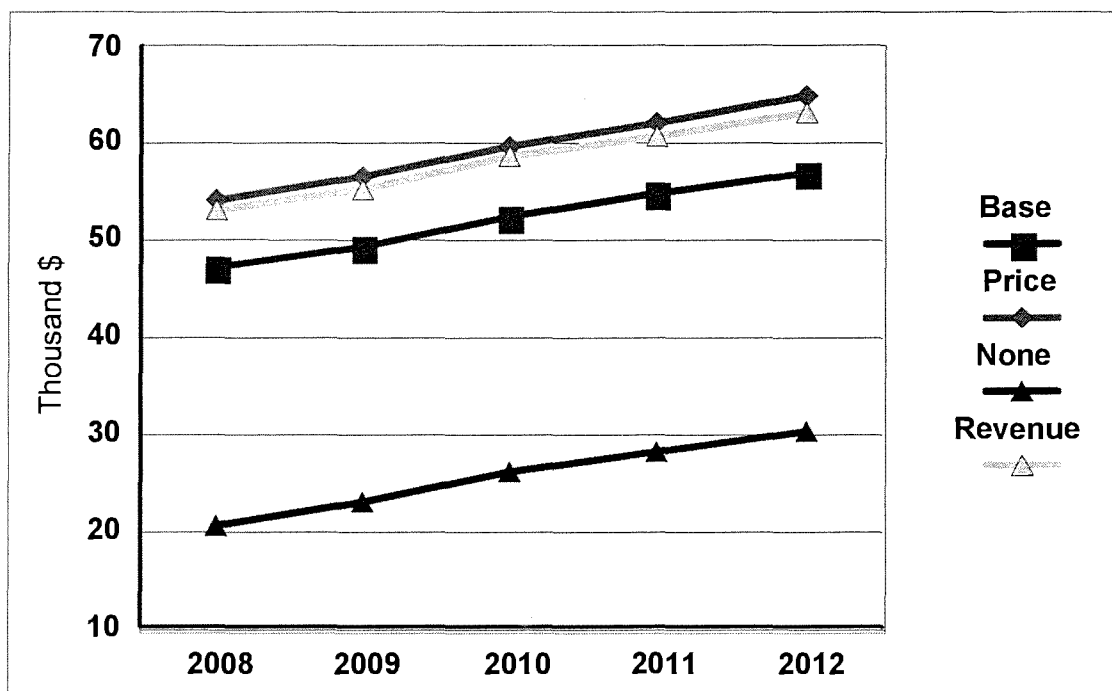

Figure 4 Net Farm Income for Average-Profit Farms Under Various Scenarios

The probability for the average-profit farm's net farm income to be negative is about 11% under the current farm bill and about 3% under the House's farm bill (Figure 5). With no governmental support, the probability for net farm income for the average-profit farm to be negative is about 32%. The probability for net farm income for the average-profit farms to be higher than $30,000 is about 44% without governmental support, 67% under the current farm bill, and 84% under the House bill. The income distributions for the two options in the House farm bill are very similar, indicating that for the average-profit farm in North Dakota, the choice is not important.
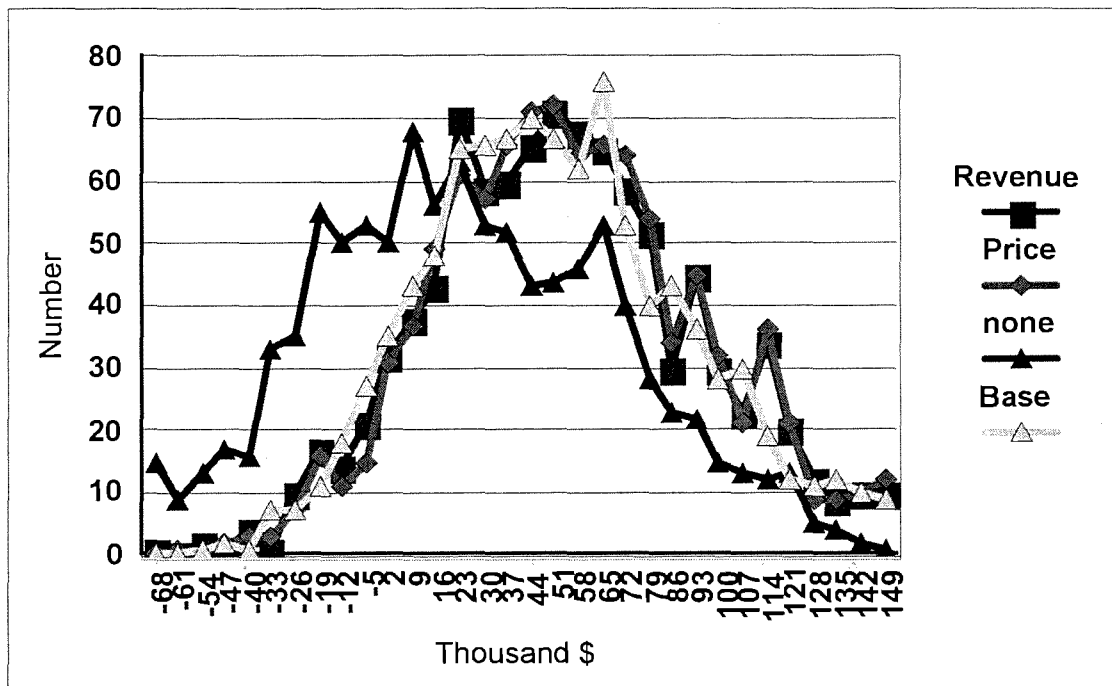

Figure 5. Net Farm Income Distribution in 2008 for the Average-Profit Farms Under Various scenarios.

Low-Profit Farms

The low-profit has a loss of $5,549 in 2008 and a profit of $7,935 in 2012 under the base scenario and a small positive net farm income under the house price option in 2008 which increases to $14,473 in 2012 (Figure 6). The net farm income under the price and revenue options is the same. Without governmental support, the low-profit farm loses $27,426 in 2008 and $14,012 in 2012.

The probability for the low-profit farm to have negative net farm income is about 53% under the current farm bill, compared to about 45% under the House bill (Figure 7). Without governmental support, the probability for the low-profit farm to lose money is 76%. The probability for the low-profit farm to have net farm income higher than $30,000 is about 8.5% without governmental support, 18% under the current farm bill, and 20% under the House bill. The price option appears to be slightly better for low-profit farms.
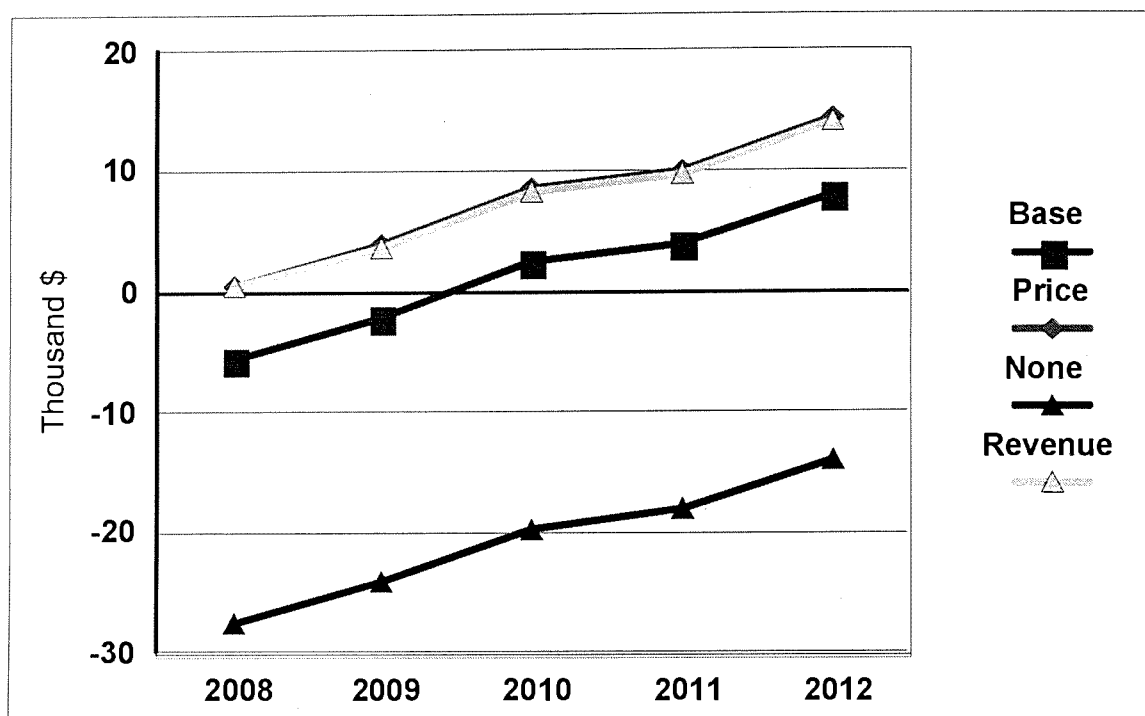
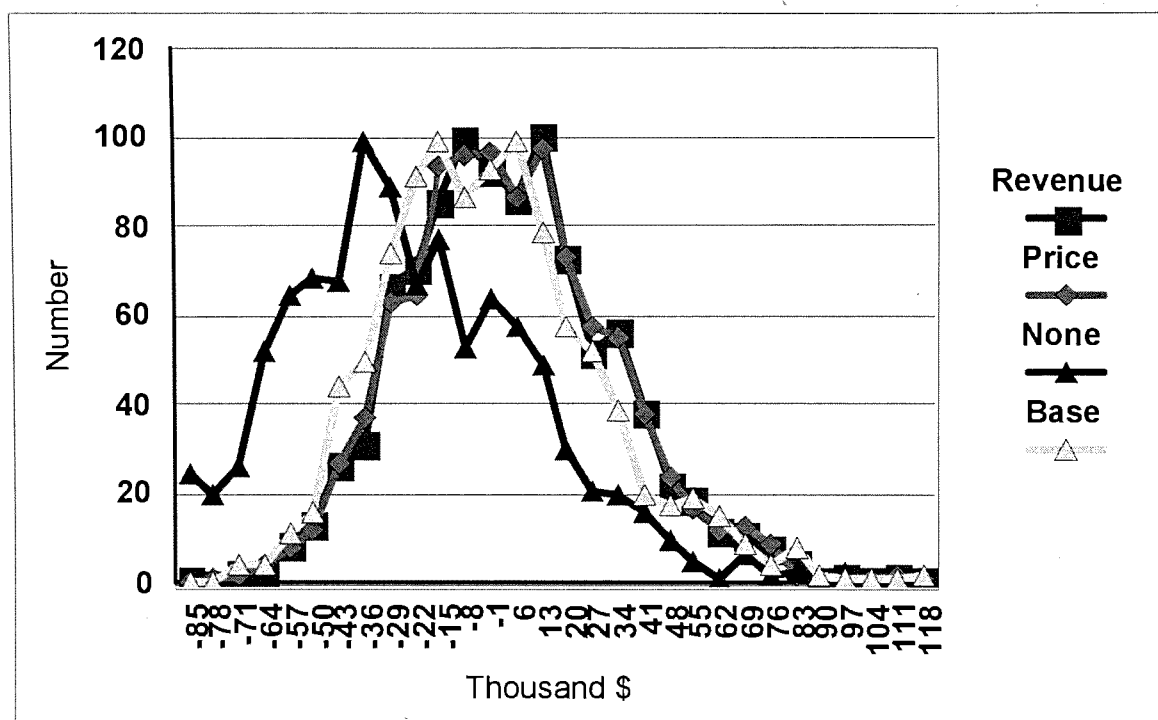Figure 6. Net Farm Income for Low-Profit Farms Under Various Scenarios

Figure 7. Net Farm Income Distribution in 2008 for the Low-Profit Farms Under Various Scenarios

Governmental Per Acre Spending

Table 6 shows the average governmental payments made to the representative farms between 2008 and 2012 under the four scenarios. The House bill price option provides $4.41 per acre more support than the current farm bill for the high-profit farm. Average- and low-profit farms will receive $4.07 and $3.79 per acre more, respectively, under the House bill. The revenue option provides slightly less support than the price option. State-wide, the House bill would provide about $70 million per year additional federal dollars to North Dakota's agriculture.

Table 6. Average Per Acre Governmental Payments

Scenario	High	Average	Low
	---------------$/acre---------------		
Base	19.77	14.99	13.58
House price	24.18	19.06	17.37
House revenue	23.25	18.53	17.15
None	0	0	0

Safety Net

All farm bills which provide an income safety net need to address two characteristics of agriculture, the variability of incomes and the level of those incomes. Table 7 shows the standard deviations of net farm income for the three representative farms under the various scenarios. Without governmental support, the standard deviation of income is $87,216 for the high-profit farm in 2008. The standard deviation is $77,800 under the current farm bill, and under the house bill it is $74,844 for the price option and $75,377 for the revenue option. The standard deviation is reduced about 4% from the current farm bill to the House bill, while standard deviation is reduced 14% between no farm bill and the House bill. The reductions are similar for the other farms in the study. The current farm bill increases net farm income by 57% compared to no governmental support, while the House bill increases net from income by 75% compared to no governmental support, indicating that the current farm bill and the House bill are more successful in raising net farm incomes rather than stabilizing them.

Table 7. Estimated Standard Deviations for Net Farm Incomes Under Various Scenarios

	2008	2009	2010	2011	2012
High			------$------		
Base	77,800	81,397	82,756	87,752	88,332
House price	74,844	76,797	79,311	82,472	84,309
House revenue	75,377	78,220	80,619	82,757	85,384
None	87,216	89,734	92,306	96,102	98,301
Avg					
Base	44,901	47,172	47,807	50,731	51,066
House price	43,062	44,221	45,673	47,570	48,903
House revenue	43,337	45,191	46,468	47,780	49,188
None	50,527	52,035	53,505	55,798	57,328
Low					
Base	31,455	33,208	33,4235	35,623	35,830
House price	29,880	30,569	31,826	33,129	34,647
House revenue	29,809	31,455	32,225	33,262	34.064
None	35,461	36,401	37,635	39,242	40,825

SUMMARY AND RECOMMENDATIONS

The U.S. House of Representatives passed a 2007 farm bill in July 2007. The bill is similar to the 2002 farm bill but with higher marketing loan rates and higher target prices for some commodities and a revenue-based counter-cyclical payment. The bill includes an option which allows the producer to choose between a price-based counter-cyclical program and a revenue-based counter-cyclical program. Supporters of the revenue-based program claim that it provides both price and yield protection. The program is based on national prices and yield in the determination of payments. The bill, either option, could increase governmental spending if commodity prices would return to historical levels. Currently, changes in the farm bill would have little impact since commodity prices are well above both the marketing loan rates and target prices. A permanent disaster provision is not included in the house proposal, so therefore it is not included in the analysis.

The North Dakota Representative Farm Model was used to analyze four scenarios developed for this study: the current farm bill, the House bill with the price-based counter-cyclical payment option, the House bill with the revenue-based counter-cyclical payment option, and one with no governmental support. Risk analysis was conducted since future prices and yields are not known with certainty.

The higher marketing loan rates and target prices for the House bill does increase net farm income during the period of the proposed farm bill, 2008-2012. The price-based and the revenue-based counter-cyclical programs provide similar net income levels. For 2008, net farm income is $11,851 higher for the high-profit farm under the house scenario than the base scenario, $7,174 higher for the average-profit farm, and $6,108 higher for the low-profit farm. Those increases remain relatively constant throughout the time period. If these additional payments were aggregated statewide, benefits to the state would be about $70 million per year if prices returned to historical levels.

All farm bills which provide an income safety net need to address two characteristics of agriculture, the variability of incomes and the level of those incomes. For the average-profit farm, the house proposal increases net farm income 15% over the current farm bill and 162% over no governmental support. The standard deviations for the revenue-based option are slightly greater than those for the price-based option. The standard deviation falls by 4% from the current farm bill to the house proposal and 14% from no governmental support. The current farm bill and the house proposal increase incomes much more than they reduce income variations, which means that most of the income variations remain, but at a higher level of income.

Three main concerns of the proposed farm bill are as follows. First, increases in target prices and loan rates for wheat and barley may be beneficial for protecting farm income when market prices of the crops move below the loan and target prices. However, these changes would increase the U.S. amber box payments under the World Trade Organization (WTO) and provide ammunition to other countries attacking U.S. farm subsidies. Increasing direct payments rather than increasing loan and target prices could be more desirable under the WTO, even though direct payments are more likely to be bid into land rents, thereby transferring the benefits to the land owner. Second, the house bill proposes counter-cyclical payments based on market price and a revenue-based counter-cyclical payments, similar to the administration's proposal. The revenue-based option is designed to protect producers from both low prices and yields, however the use of national yields eliminates most of the yield protection. Using local or state average yields for each crop could protect producers based on crop conditions in each region. Third, the new farm bill should include a more restrictive payment

limitation scheme which would address the small number of very large payments made to individuals. Our analysis on the administration's proposal indicates that a very small number of large farms would be impacted by stronger payment limitation legislation. Payment limitation would not decrease government spending substantially, but it would improve public relations.

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