The Farm Level Impacts of Operating the Current Farm Bill at Reduced Federal Budget Spending Levels

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Introduction

Reduced federal spending on farm programs is a reality that U.S. producers will likely face in the near future as the debate over the next farm bill looms. Less money will likely be available in the federal budget for farm program spending under the next farm bill. Also, additional players will potentially be involved as issues such as WTO compliance of farm programs come to the forefront of the debate. In essence, more players will be competing for a shrinking pool of funds allotted for federal farm program spending.

One response to the current budget reality is to allow the current farm program structure to remain in place while reducing support to producers. Westhoff and Brown (2006) found that this type of reduction has only slight impacts on commodity markets at the sector level; however, the manner in which government spending is reduced will likely have very different impacts on different types of farms across the United States.

The purpose of this study is to quantify the probable economic impacts of a $5 billion reduction in direct payments, countercyclical payments, or marketing loan benefits on representative crop farms. The result will suggest which program reduction would be better for different commodities, or if they will all agree on which program to use for saving $5 billion.

Data and Methods

A two step approach was utilized to quantify and compare the impacts of alternative methods of saving $5 billion over the 2008 to 2017 budget period by reducing direct payments, countercyclical payments, and marketing loan benefits. In the first step, a model for projecting annual farm program payments to nine major crops is used to determine the reductions necessary to save $5 billion over the 10 year projection period. The second step in the methodology calls for simulating representative crop farms with the reduced payments identified in the first step for each policy alternative in order to determine the farm level impact of these potential changes.

Stochastic Optimal Control Model

The March 2007 Congressional Budget Office (CBO) Baseline for CCC and FCIC Outlays (Hull, Langley and Hitz 2007) provides a projection of annual CCP, DP, and LDP program payments for feedgrains, wheat, rice, upland cotton, soybeans, and peanuts. The CBO Baseline was used to develop a stochastic simulation model that calculates annual payments for these

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program crops over 2008-2017. The model uses the same stochastic framework as CBO to calculate program payments over the complete range of possible crop prices and weights these costs by the probability of price falling in the associated range. The model includes a production response to changes in target prices, DP rates, and loan rates through own supply elasticities.

Extensions in the model beyond the model used to develop the CBO Baseline include an update of the probability distributions for prices based on the January 2007 FAPRI Stochastic Baseline and the inclusion of minor feed grains (sorghum, barley, and oats). These minor feed grains were added to the model using the January 2007 FAPRI Baseline projections of prices, acres, yields, DPs, CCPs, and LDPs for these crops. The CBO Baseline reports total payments to the three minor feed grains. The proportion of payments in FAPRI's Baseline paid annually to each crop was used to apportion CBO's projected payments to the minor feed grains. The mix of payments (CCP, DP, and LDP) to the minor feed grains was estimated using the fraction of payments for these programs in the FAPRI Baseline.

An optimal control mechanism (Solver in Microsoft® Excel) was used to estimate program participation fractions implicit in the CBO Baseline. After calibrating the model to the March 2007 CBO Baseline, the difference in total payments (error) for the nine program crops over the 2008 to 2017 period between the two models was less than five tenths of one percent on a $74 billion budget forecast.

Total government expenditures for 2008-2017 in the CBO Baseline assume continuation of the 2002 farm bill through 2017. Three alternative policy scenarios were analyzed assuming the government saved $5 billion over 10 years, relative to the Baseline, for each policy. Savings were achieved by withholding a percentage of direct payments, countercyclical payments, and marketing loan benefits. It is important to note that direct payment rates, target prices, and loan rates remained at 2002 farm bill levels to calculate initial payment levels. These initial payment levels were then reduced by the specified percentages across all program crops to reduce government program spending by $5 billion. These scenarios analyzed and compared to the **Base** situation are:

- **Base** – Current farm bill legislation (2002 farm bill) remains in effect with no alterations throughout 2017, the end of the study period.
- **Reduce DP** – Spending on direct payments over the 2008-2017 is reduced from $52.1 billion to $47.1 billion, a 9.6% cut for each program crop.
- **Reduce CCP** – Spending on countercyclical payments is reduced from $11 billion to $6 billion, a 45.5% reduction for each program crop.
- **Reduce MLB** – Spending on marketing loan benefits (including loan deficiency payments and marketing loan gains) is reduced from $7.1 billion to $2.1 billion, 70.5% reduction for each program crop.

Representative Farm Analysis

The farm level analysis uses primary representative farm data in a whole farm simulation model to project the economic impacts of reduced federal spending at the farm level. The Agricultural and Food Policy Center (AFPC) at Texas A&M University maintains a set of sixty-four representative crop farms located in nineteen states that are developed using a focus group interview process. Information relevant to these farms is updated through follow-up meetings every two to three years. The representative farms are located in critical agricultural production

centers of the country and include nineteen feedgrain and oilseed farms, eleven wheat farms, twenty cotton farms, and fourteen rice farms. Characteristics of the representative farms analyzed are available in AFPC Working Paper 2007-1 (Outlaw et al. 2007). The first two letters for the name of each representative farm indicate the state where it is located, while the numbers in the name indicate size of the farm (in acres). Farm classification by commodity type is determined by the commodity or commodities comprising the majority of receipts for the farm.

The impact of alternative farm policies on these farms is analyzed utilizing the whole farm simulation model (FLIPSIM) developed by Richardson and Nixon (1986). The model incorporates price and yield risk by utilizing a multivariate empirical (MVE) distribution. Random crop yields and commodity prices are drawn from a MVE distribution to apply the effects of risk to the analysis, thus allowing a range of outcomes for analysis rather than a single point estimate. The description for this random value simulation procedure is available in Richardson, Klose and Gray (2000).

Following are three key assumptions made in this study: (1) long-term and intermediate-term debt beginning the study period in 2004 is 20% of the beginning market value of assets for the representative farms, (2) the framework and provisions of the 2002 farm bill are assumed to remain constant through the end of the study period (2012), and (3) crop mixes, payment yields, and program crop base acreages are assumed to remain constant throughout the study period (2008-2012). The alternative policy scenarios were analyzed for the representative farms by simply reducing the direct, countercyclical, or loan deficiency payments by their respective fractions defined above.

Changes in CCPs and DPs are not expected to result in modifications to crop mixes on the representative farms, as these payments are decoupled. Reductions in MLBs are expected to result in modest changes in crop mixes on farms that grow crops heavily dependent on MLBs. The methodology used assumed no crop mix change over the planning horizon, so the net cash farm income (NCFI) projections reflect lower bounds for farms growing cotton and rice.

Results

Preferences for each alternative are ranked based on 2008-2012 average projected NCFI. The 2008-2012 period was chosen because this would be the first five years of the next farm bill. NCFI is equal to total cash receipts minus total cash expenses. It is important to note that NCFI does not include all cash outflows, as family living, principal payments on loans, cash difference required for machinery trade-ins, and income and employment taxes must be paid from NCFI. Table 1 provides the average projected NCFI (2008-2012) for the base situation and the three policy alternatives for all sixty-four representative crop farms. As expected, the **Base** situation is clearly the preferred scenario for all of the representative farms since each alternative involves a different way to reduce government payments. Following is a detailed description of the probable impacts of reduced government spending on the representative farms by commodity type.

Feedgrain/Oilseed Farms

The majority (thirteen of nineteen) of the representative feedgrain and oilseed farms prefer the **Reduce CCP** scenario over the **Reduce MLB** and **Reduce DP** scenarios, indicating that most of the farms are more willing to give up 45.5% of countercyclical payments than 70.5% of marketing loan benefits or 9.6% of direct payments. Strong projected grain prices result in low

expected countercyclical payments over the 2008-2012 projection period, thus most representative feedgrain and oilseed farms are more willing to give up the specified percentage of those payments than the specified portions of direct payments or marketing loan benefits. The remaining six farms prefer the **Reduce DP** scenario over the **Reduce CCP** and **Reduce MLB** scenarios. The common link among these six farms is they all either produce cotton or have cotton base acreage, thus they receive government payments associated with cotton. As cotton is expected to experience relatively weak prices over the study horizon, it is not surprising that grain producers growing cotton would prefer to forfeit fixed direct payments for potentially higher payments that depend on uncertain market conditions. The **Reduce MLB** scenario is the least preferred option for eighteen of the nineteen feedgrain and oilseed farms because a $5 billion savings using only the marketing loan benefits would require reducing these payments 70.5%. In addition, when market conditions trigger a marketing loan benefit, the payment is on 100% of actual production rather than 85% of a historical payment yield used to calculate direct and countercyclical payments.

Wheat Farms

All eleven representative wheat farms prefer the **Reduce CCP** scenario over the **Reduce DP** and Reduce **MLB** scenarios, indicating they are all more willing to give up a portion of countercyclical payments before giving up marketing loan benefits than direct payments. For the wheat farms, giving up 45.5% of countercyclical payments results in a very small reduction in average NCFI because high price projections will not result in significant countercyclical payments over the next five years. All representative wheat farms prefer the **Reduce DP** scenario over the **Reduce MLB** scenario.

Cotton Farms

All representative cotton farms, with the exception of the two Texas northern high plains farms (TXNP3000 and TXNP7000) prefer the **Reduce DP** scenario, indicating they are more willing to give up 9.6% of their direct payments rather than 45.5% of their countercyclical payments or 70.5% of their marketing loan benefits. The two Texas northern high plains farms have no cotton base acres (the practice of growing cotton in this part of Texas is a relatively recent trend, and base acreage was only able to be updated based on planted acres from 1998-2001 under the last farm bill) and are unable to receive countercyclical payments on cotton, so they would prefer to preserve their marketing loan benefits. Cotton producers are more willing to give up direct payments than countercyclical payments or marketing loan benefits in an environment of low projected prices. Thirteen of the representative cotton farms would least prefer giving up a portion of their countercyclical payments, the **Reduce CCP** scenario. The **Reduce MLB** scenario ranks second in preference for thirteen of the twenty representative cotton farms.

Rice Farms

Thirteen of fourteen representative rice farms in this study prefer the **Reduce CCP** over the **Reduce DP** and **Reduce MLB** scenarios, indicating they would rather forfeit a portion of their countercyclical payments than give up direct payments. The northern Louisiana rice farm (LANR2500) has 325 acres of cotton base, thus making it somewhat less willing to give up a portion of its countercyclical payment. The **Reduce MLB** scenario is the least favorable alternative for all fourteen representative farms, while giving up a portion of direct payments (**Reduce DP** scenario) ranks as the second preferred alternative for thirteen of fourteen representative rice farms analyzed.

Conclusions

As expected, producers of different commodities clearly have different preferences concerning how they would prefer the government reduce spending, if necessary. The current grain price outlook suggests that countercyclical payments will be less critical for grain producers, thus strengthening their preference to accomplish savings through reducing this program. In contrast, for cotton producers, the MLB and CCP programs are likely to remain a critical market safety net, meaning they are generally more willing to give up a portion of their smaller direct payment. This will likely lead to interesting debates as well as the formation of some previously unexpected alliances as the next farm bill debate gets underway. For example, wheat and rice share almost identical preferences in methods for the government saving money over the 2008-2017 period. Cotton and rice, two crops traditionally considered southern crops, display considerably different preferences regarding direct payments and countercyclical payments. These results highlight the challenges that exist in making potential reductions in federal spending equitable across all commodities.

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Table 1. Average Net Cash Farm Income for Representative Feedgrain/Oilseed, Wheat, Cotton, and Rice Farms Under Current Policy Situation and Three Alternative Policy Options, 2008-2012.

	Base[1]	Reduce DP[2]	Reduce CCP[3]	Reduce MLB[4]
	--$1,000--	--$1,000--	--$1,000--	--$1,000--
Feedgrain/Oilseed				
IAG1350	205.8	203.0	204.6	185.9
IAG3400	578.9	571.9	576.2	529.0
NEG1960	425.4	420.5	423.6	392.5
NEG4300	846.4	836.5	843.1	780.2
NDG2180	229.9	227.6	229.3	219.1
NDG7500	1190.7	1181.6	1188.9	1122.6
MOCG2050	434.0	430.9	432.7	413.2
MOCG3630	778.2	773.5	776.3	744.0
MONG1850	320.0	317.0	318.8	300.2
TXHG2000	51.4	48.4	45.0	39.4
TNG900	59.6	58.4	59.1	49.5
TNG2750	387.3	383.6	386.0	354.9
SCG1500	223.6	218.1	190.7	206.8
SCG3500	508.6	498.9	484.6	474.2
ING1000	120.2	118.1	119.5	106.0
ING2200	356.8	352.5	355.4	326.3
TXWG1400	38.6	36.2	29.2	29.2
TXUG1200	9.2	5.9	-3.2	-11.3
TXPG3760	132.2	123.0	98.1	64.0
Average	**363.0**	**358.2**	**355.7**	**332.9**
Std. Dev.	**313.1**	**311.2**	**315.8**	**299.5**
Wheat				
WAW1725	79.4	75.8	78.9	69.6
WAW5000	181.1	171.3	179.9	151.5
WAAW3500	80.3	77.7	79.9	75.9
KSCW1600	59.4	57.3	59.1	53.8
KSCW4000	231.3	226.6	230.7	214.0
KSNW2800	82.2	79.2	81.6	74.7
KSNW5000	268.8	263.6	267.7	247.9
COW3000	168.7	167.2	168.4	163.3
COW5640	218.2	214.9	217.8	208.1
MTW4500	199.1	194.7	198.6	192.9
ORW4000	115.5	112.7	115.1	110.3
Average	**153.1**	**149.2**	**152.5**	**142.0**
Std. Dev.	**72.7**	**71.7**	**72.5**	**68.4**

Table 1. (Continued)

	Base[1]	Reduce DP[2]	Reduce CCP[3]	Reduce MLB[4]
	--$1,000--	--$1,000--	--$1,000--	--$1,000--
Cotton				
CAC4000	391.2	385.0	351.7	365.6
TXNP3000	-70.9	-76.3	-72.1	-102.8
TXNP7000	96.4	84.5	93.3	25.5
TXSP2239	-16.4	-20.4	-41.3	-29.8
TXSP3745	-34.8	-41.7	-76.3	-57.1
TXRP2500	61.6	59.0	48.8	52.4
TXCB2250	71.5	66.5	48.7	50.2
TXCB5500	38.3	27.5	-10.5	-11.5
TXVC4500	322.7	312.4	277.2	277.7
TXPC2500	177.4	169.8	151.2	148.5
TXMC1800	109.9	105.2	94.1	90.3
TXEC5000	230.1	221.6	168.3	193.0
GAC2300	271.2	260.1	205.8	230.1
TNC1900	322.3	318.2	300.9	299.9
TNC4050	-111.3	-121.7	-178.3	-173.3
LAC2640	159.5	148.8	115.4	122.3
ARC6000	-240.1	-263.1	-311.6	-327.1
ARNC5000	-67.1	-78.2	-171.6	-139.6
ALC3000	22.7	13.6	-30.7	-6.6
NCC1100	-56.3	-59.4	-78.0	-71.2
Average	**83.9**	**75.6**	**44.3**	**46.8**
Std. Dev.	**165.5**	**166.9**	**171.6**	**173.9**
Rice				
CAR550	-156.3	-163.3	-161.3	-163.5
CAR2365	1150.4	-1182.0	-1175.8	-1185.3
CABR1100	-506.3	-520.0	-516.3	-520.7
CACR715	-390.5	-400.0	-397.5	-401.1
TXR1350	-85.4	-91.3	-89.6	-92.3
TXR2400	-165.0	-175.5	-172.6	-180.1
TXBR1800	-113.4	-122.2	-119.6	-125.3
TXER3200	-339.8	-355.4	-350.7	-359.4
LASR1200	-191.0	-195.9	-195.1	-199.5
LANR2500	-148.6	-161.2	-167.4	-180.1
ARSR3640	113.6	100.1	103.7	81.7
ARWR1200	-286.6	-293.6	-291.4	-303.3
ARHR3000	-422.7	-440.0	-437.3	-463.2
MOWR4000	285.9	265.4	269.2	231.7
Average	**-89.7**	**-266.8**	**-264.4**	**-275.7**
Std. Dev.	**413.3**	**335.4**	**334.5**	**331.0**

[1] Base: Current (2002) farm bill legislation remains in effect through 2012.
[2] Reduce DP: Direct payments are reduced by 22.2% for all government program crops to save $5 billion over the 2008-2012 projection period.
[3] Reduce CCP: Countercyclical payments are reduced by 47.1% for all government program crops to save $5 billion over the 2008-2012 projection period.
[4] Reduce MLB: Marketing loan benefits are reduced by 38.0% for all government program crops to save $5 billion over the 2008-2012 projection period.