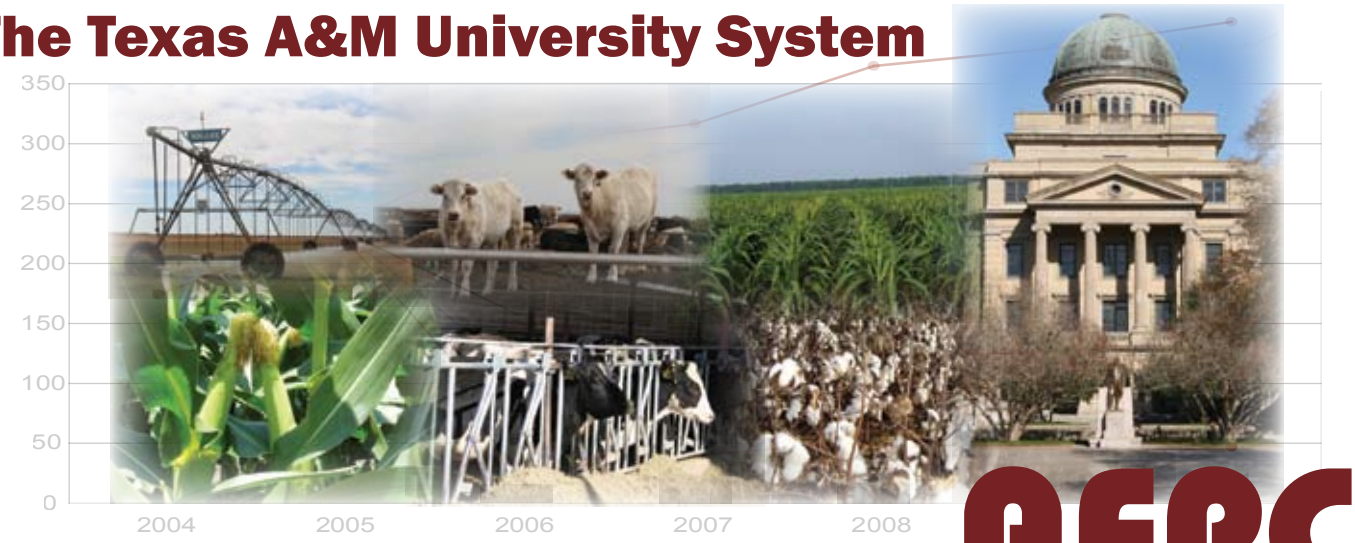
Analysis of the Administration's Proposed Formula for Loan Rates

AFPC Briefing Paper 07-4

March 2007

Agricultural and Food Policy Center

The Texas A&M University System



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The Secretary of Agriculture in the USDA report "2007 Farm Bill Proposals" proposed setting the loan rate each year based on a more market oriented formula. The loan rate for each crop would be determined annually by averaging the past five year's prices excluding the high and low as indicated in the following formula:

LR = Min [(Olympic 5 year Moving Average Price * 0.85), or Proposed Maximum]

The proposal also established a maximum loan rate for each crop. The proposed maximum loan rate for each crop is reported in Table 1 along with the current loan rates for the 2002 Farm Bill.

Crops that have an Olympic average price that is more than 18% greater than the maximum loan rate will have their loan rates set at the maximum each year. For crops experiencing Olympic average prices less than 118% of the proposed maximum loan rate, the formula will experience loan rates less than the maximum.

Table 2 contains the FAPRI January 2007 Baseline average price projections for the next 10 years. From Table 2 one can see that average annual prices for all of the crops are sufficiently greater than the maximum loan rate and that loan rates would not fall below the maximums. However, one must also consider the effects of price risk when making this determination.

The purpose of this report is to analyze the probable effect of the proposed loan rate formula if one considers the effects of price risk.

To analyze the effect of price risk on loan rates, the FAPRI Stochastic January Baseline which incorporates the effects of weather and market risks will be used. The Baseline analyzes 500 different possible yield and demand shocks based on historical variability and calculates equilibrium prices that would prevail. Using the 500 draws of annual prices in the Baseline and the historical prices for 2003-2006, 500 loan rates were calculated for 2008-2016 across seven program crops. The results of the simulation analysis on loan rates produces an optimistic projection of loan rates, to the extent that if prices are tending lower than current loan rates, FAPRI's price response equations may produce even lower equilibrium prices and thus lower loan rates.

The results of the analysis are summarized in Table 3 and Figures 1-7. As expected for wheat and corn, the proposed loan rate formula results in their loan rates equaling their respective maximums every year (Table 3 and Figures 1 and 2). The analysis shows there is a zero percent chance of wheat and corn loan rates being below their maximums.

Sorghum loan rates would average $1.887/bu in 2008 and will have a 6.8% chance of falling below the maximum that year. The chance of sorghum loan rates below the maximum is zero for 2010-2016. Soybeans have a 22.6% chance of having loan rates below the $4.92/bu maximum in 2008 and a 36.8% chance in 2009. The average projected loan rate for soybeans in

2009 is $4.894/bu. Figure 4 shows that the average soybean loan rate will be less than the maximum every year and reaches its harvest value in 2014.

Cotton, rice and peanuts have a 100% chance that the proposed formula would reduce their loan rates below their respective maximums (Table 3 and Figures 5-7) for most years. The average projected cotton loan rate ranges from a low of $0.4077 in 2009 to a high of $0.4895 in 2016 and its minimum reaches a low of $0.3511 in 2013 and 2014. The average projected rice loan rate remains close to the proposed maximum of $6.50 as it ranges between $6.46 and $6.49 over the 2009-2016 period. The minimum peanut loan rate falls below the $350/ton maximum loan rate six of the nine years analyzed.

In summary, the proposed formula for making the loan rate more market oriented will have very small impacts on crops with favorable price outlooks, namely wheat and feed grains. However, for cotton, rice and peanuts the proposed loan rate formula would result in lower loan rates than the proposed maximums in most all years.

Table 1. Current Loan Rates and Proposed Maximum Loan Rates for Major Program Crops.

	Wheat	Corn	Sorghum	Soybean	Cotton	Rice	Peanut
	($/bu)	($/bu)	($/bu)	($/bu)	($/lb)	($/cwt)	($/ton)
Current	2.75	1.95	1.95	5.00	0.5200	6.50	355.00
Maximum	2.58	1.89	1.89	4.92	0.5192	6.50	350.00

Table 2. FAPRI January 2007 Baseline Price Projections for Major Program Crops.

	Wheat	Corn	Sorghum	Soybean	Cotton	Rice	Peanut
	($/bu)	($/bu)	($/bu)	($/bu)	($/lb)	($/cwt)	($/ton)
2008	4.07	3.24	2.98	7.02	0.554	8.02	454.68
2009	4.11	3.25	3.01	7.01	0.567	8.30	450.26
2010	4.15	3.22	3.02	6.90	0.574	8.51	444.73
2011	4.17	3.19	3.02	6.83	0.578	8.54	445.56
2012	4.19	3.15	3.01	6.76	0.582	8.72	444.75
2013	4.18	3.10	2.99	6.66	0.584	8.84	444.02
2014	4.17	3.06	2.98	6.55	0.588	8.81	443.44
2015	4.18	3.03	2.98	6.47	0.595	8.86	443.36
2016	4.19	2.99	2.98	6.37	0.600	8.87	443.58

Table 3. Projected Average Annual Loan Rates, Minimum Loan Rates and Probability of Loan Rates Being Less than the Proposed Maximum Loan Rate.

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Wheat									
Average ($/bu.)	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58
Minimum ($/bu.)	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58
Prob(LR<Max LR)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Corn									
Average ($/bu.)	1.890	1.890	1.890	1.890	1.890	1.890	1.890	1.890	1.890
Minimum ($/bu.)	1.890	1.890	1.890	1.890	1.890	1.890	1.890	1.890	1.890
Prob(LR<Max LR)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sorghum									
Average ($/bu.)	1.887	1.889	1.890	1.890	1.890	1.890	1.890	1.890	1.890
Minimum ($/bu.)	1.768	1.766	1.890	1.890	1.890	1.890	1.890	1.890	1.872
Prob(LR<Max LR)	6.80%	3.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.20%
Soybeans									
Average ($/bu.)	4.905	4.894	4.913	4.917	4.919	4.918	4.915	4.912	4.905
Minimum ($/bu.)	4.834	4.740	4.624	4.757	4.610	4.429	3.977	4.085	4.085
Prob(LR<Max LR)	22.60%	36.80%	10.00%	3.20%	0.40%	1.80%	2.20%	5.40%	7.40%
Cotton									
Average ($/lb.)	0.4144	0.4077	0.4290	0.4481	0.4667	0.4759	0.4818	0.4859	0.4895
Minimum ($/lb.)	0.3855	0.3632	0.3693	0.3628	0.3628	0.3511	0.3511	0.3518	0.3639
Prob(LR<Max LR)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Rice									
Average ($/cwt.)	6.50	6.46	6.48	6.48	6.46	6.46	6.47	6.48	6.49
Minimum ($/cwt.)	6.50	5.97	5.69	5.73	5.54	5.54	5.78	5.80	5.78
Prob(LR<Max LR)	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Peanuts									
Average ($/ton)	316.41	324.32	337.37	346.39	348.84	348.97	348.76	348.88	348.69
Minimum ($/ton)	306.28	296.04	296.04	294.70	297.18	303.77	303.77	315.82	309.56
Prob(LR<Max LR)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

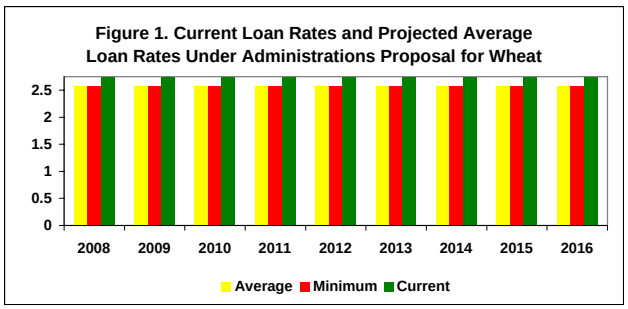
Figure 1. Current Loan Rates and Projected Average Loan Rates Under Administrations Proposal for Wheat
2.5
2
1.5
1
0.5
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Average
Minimum
Current

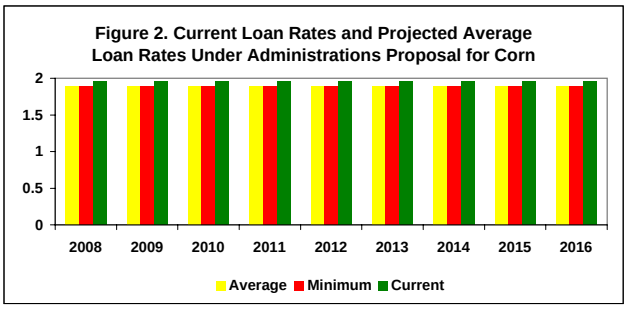
Figure 2. Current Loan Rates and Projected Average Loan Rates Under Administrations Proposal for Corn
2
1.5
1
0.5
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Average
Minimum
Current

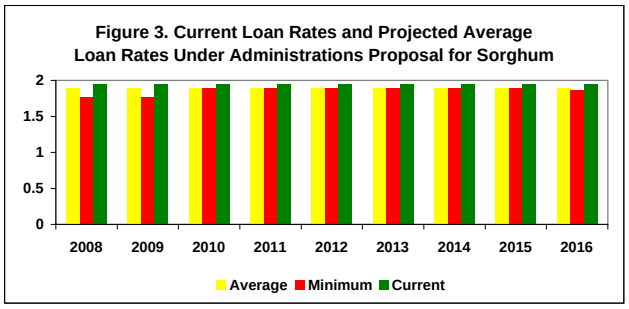
Figure 3. Current Loan Rates and Projected Average Loan Rates Under Administrations Proposal for Sorghum
2
1.5
1
0.5
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Average
Minimum
Current

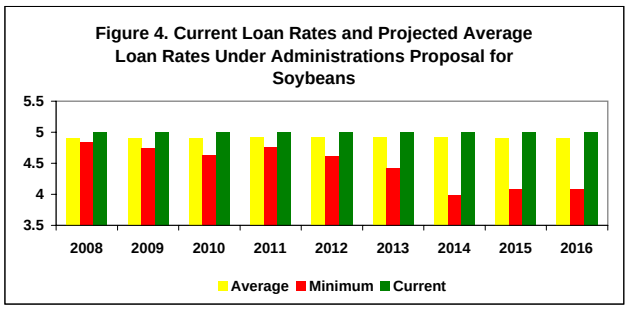
Figure 4. Current Loan Rates and Projected Average Loan Rates Under Administrations Proposal for Soybeans
5.5
5
4.5
4
3.5
2008
2009
2010
2011
2012
2013
2014
2015
2016
Average
Minimum
Current

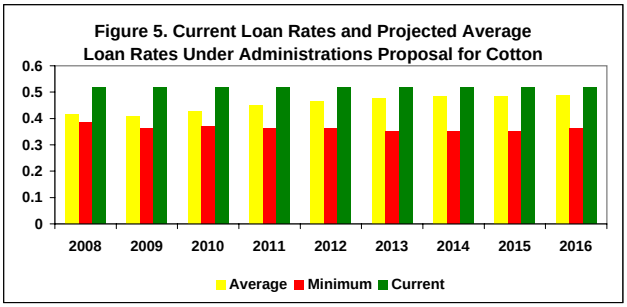
Figure 5. Current Loan Rates and Projected Average Loan Rates Under Administrations Proposal for Cotton
0.6
0.5
0.4
0.3
0.2
0.1
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Average
Minimum
Current

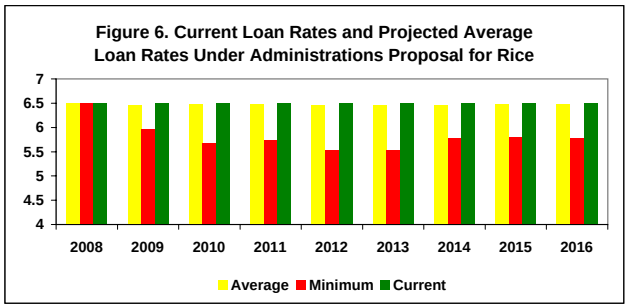
Figure 6. Current Loan Rates and Projected Average Loan Rates Under Administrations Proposal for Rice
7
6.5
6
5.5
5
4.5
4
2008
2009
2010
2011
2012
2013
2014
2015
2016
Average
Minimum
Current

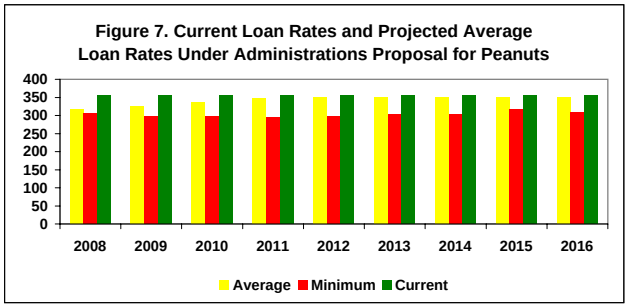
Figure 7. Current Loan Rates and Projected Average Loan Rates Under Administrations Proposal for Peanuts
400
350
300
250
200
150
100
50
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Average
Minimum
Current