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Research Report

Evaluation of alternative base periods for a National Rice Counter Cyclical Payment Program including added AMTA

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Evaluation of Alternative Base Periods for a National Rice Counter Cyclical Payment Program Including Added AMTA

Briefing Paper 01-2

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Executive Summary

The analysis was completed for one year, namely, 2001 using the FAPRI baseline rice price of \$6.29/cwt. as the mean price for 2001. Risk for price and yields was incorporated into the analysis to appropriately replicate the historical variability for these variables.

The counter cyclical payment (CCP) payments were calculated based on a national revenue. CCP payments were assumed to be triggered if total planted acre market receipts for rice (national planted acre yield times national season average price) was less than the average national planted acre receipts for a particular base period.

The U.S. rice leadership group narrowed the alternatives from the original 18 to 8. The current 8 alternatives include:

- Base – projected market receipts, loan deficiency payments, and \$2.10/bu. AMTA payments. No additional CCP payments are included.
- Avg 95-99 – Base revenue plus an additional CCP triggered when 2001 market receipts fall below the average market receipts on a planted acre basis for the 95-99 marketing year.
- Avg 94-98 – Base revenue plus an additional CCP triggered when 2001 market receipts fall below the average market receipts on a planted acre basis for the 95-99 marketing year.
- Olym Avg 95-99 – Same as Avg 95-99, except the high and low market year receipts are dropped and the remaining three years are averaged as the base.
- Olym Avg 94-98 – Same as Avg 94-98, except the high and low market year receipts are dropped and the remaining three years are averaged as the base.
- AMTA \$2.25 – Assumes producers receive an additional \$2.25 AMTA paid on planted acres.
- AMTA \$2.50 – Assumed producers receive an additional \$2.50 AMTA paid on planted acres.
- AMTA \$2.75 – Assumed producers receive an additional \$2.75 AMTA paid on planted acres.

Results of the analysis are summarized in terms of the probable impacts of the alternative programs on total receipts per yield cwt., CCP rate per cwt., and total government costs for rice. Average total receipts per yield unit (Table 1) is presented for each of the 8 alternatives. For the rice producers, total receipts per cwt. are largest for the two Olympic average alternatives (\$13.25). (It should be noted that total receipt per cwt. is defined here as market receipts plus LDPs plus a \$2.10/cwt. AMTA plus either a CCP or an Added AMTA.)

There is risk associated with total receipts, so probabilities of receipts being less than \$12/cwt. or greater than \$13/cwt. were calculated. The strategy with the lowest probability of having receipts per cwt. less than \$12 was the Added AMTA greater than \$2.50/cwt. The greatest probability of seeing total receipts per cwt. in excess of \$13/cwt. was achieved using the two Olympic averages.

Similar results are shown for cotton, corn, wheat, soybeans, and sorghum. With the exception of wheat, all commodities prefer the CCP calculated using the Olym Ave 94-98. Wheat producers would prefer the greatest added AMTA.

In a risk ranking the preferred strategy for U.S. rice producers is either of the two Olympic averages (Table 2). Producers on average would receive \$2.60/cwt. more than the current Base situation.

Results are shown for other crops in a similar fashion. All crops except wheat continue to prefer the Olym 94-98 alternative. Wheat producers continue to prefer the highest added AMTA at \$0.69/bushel.

The average CCP rates for the 4 options are summarized in Table 3. The highest average CCP occurs for the Olympic average 1995-99 and 1994-98 bases (\$2.61/cwt.). The minimum simulated CCP is \$0.72/cwt. while the maximum CCP is \$5.53 under each of these alternatives.

Total government payments to rice in 2001 for LDPs, AMTA and CCPs or Added AMTAs are reported in Table 4. Average government costs in 2001 is the greatest under the Olympic average scenarios at \$1.300 billion.

Method of Analysis

- Planted acre cash receipts, for the U.S., 1980-2000
 - National planted acre yield
 - National rice price
 - $\text{Planted acre receipts} = \text{Yield} * \text{National Price}$
- Base receipts calculated using selected 5 year periods
 - Simple average 1994-1998, 1995-1999
 - Olympic average 1994-1998, 1995-1999
- Monte Carlo Simulation Model
 - Stochastic national price for 2001 based on FAPRI price projection
 - Stochastic national receipts triggered CCPs when receipts less than base period trigger
 - AMTA for 2001 and LDP for 2001 calculated per farm bill specifications
- Results reported in risk context for each strategy
 - Average levels of total receipts/acre, where total receipts is defined as the sum of cash receipts, LDP's, AMTA in the 2001 farm program, and either CCP or Added AMTA
 - Probability of total receipts less than \$12/cwt. for rice
 - Probability of total receipts greater than \$13/cwt. for rice
 - Average level of CCP and Added AMTA/cwt.

Table 1. Total Receipts per Yield Unit in 2001 for Selected Crops Under Alternative Counter Cyclical and Added AMTA Programs, Assuming a 100% Trigger

	Mean	Min	Max	P(x=Min)	P(x<X)	P(x>Y)
Rice	\$/Cwt)				P(x<12)	P(x>13)
Base	10.64	9.84	11.31	1%	99%	1%
Avg 95-99	12.93	11.58	15.10	1%	4%	43%
Avg 94-98	13.10	11.75	15.27	1%	3%	53%
Olym Avg 95-99	13.25	11.91	15.43	1%	2%	60%
Olym Avg 94-98	13.25	11.91	15.43	1%	2%	60%
AMTA 2.25	12.62	11.82	13.29	1%	4%	15%
AMTA 2.5	12.83	12.04	13.51	1%	1%	35%
AMTA 2.75	13.05	12.26	13.73	1%	1%	55%
Cotton	\$/lb.				P(x<0.75)	P(x>0.8)
Base	0.635	0.476	0.960	1%	88%	6%
Avg 95-99	0.728	0.680	0.960	29%	74%	9%
Avg 94-98	0.803	0.770	0.984	44%	1%	41%
Olym Avg 95-99	0.746	0.703	0.960	34%	62%	11%
Olym Avg 94-98	0.811	0.779	0.993	46%	1%	44%
AMTA 0.067	0.696	0.537	1.021	1%	77%	14%
AMTA 0.074	0.702	0.544	1.027	1%	74%	15%
AMTA 0.081	0.709	0.551	1.034	1%	71%	16%
Corn	\$/bu				P(x<2.5)	P(x>3)
Base	2.39	1.76	3.08	1%	76%	3%
Avg 95-99	2.71	2.52	3.44	1%	1%	12%
Avg 94-98	2.80	2.63	3.55	37%	1%	22%
Olym Avg 95-99	2.71	2.52	3.43	28%	1%	12%
Olym Avg 94-98	2.83	2.66	3.58	1%	1%	23%
AMTA 0.295	2.62	1.99	3.31	1%	30%	9%
AMTA 0.328	2.64	2.01	3.33	1%	23%	9%
AMTA 0.361	2.67	2.04	3.36	1%	15%	9%
Wheat	\$/bu				P(x<3.75)	P(x>4.25)
Base	3.50	3.02	4.13	1%	84%	1%
Avg 95-99	4.00	3.85	4.77	45%	1%	10%
Avg 94-98	4.10	3.96	4.89	27%	1%	16%
Olym Avg 95-99	3.98	3.83	4.76	45%	1%	10%
Olym Avg 94-98	4.08	3.94	4.86	50%	1%	15%
AMTA 0.565	4.11	3.63	4.74	1%	8%	24%
AMTA 0.628	4.18	3.69	4.81	1%	5%	31%
AMTA 0.69	4.24	3.76	4.88	1%	1%	45%
Soybean	\$/bu				P(x<5.5)	P(x>6)
Base	5.55	4.50	7.05	1%	40%	14%
Avg 95-99	7.04	5.96	9.54	8%	1%	91%
Avg 94-98	7.30	6.25	9.83	13%	1%	99%
Olym Avg 95-99	7.06	5.98	9.56	8%	1%	91%
Olym Avg 94-98	7.36	6.30	9.88	14%	1%	99%
AMTA 0.061	5.64	4.59	7.14	1%	34%	15%
AMTA 0.067	5.65	4.60	7.15	1%	34%	15%
AMTA 0.074	5.66	4.61	7.16	1%	33%	15%
Sorghum	\$/bu				P(x<2.4)	P(x>2.85)
Base	2.34	1.92	3.43	1%	65%	3%
Avg 95-99	2.70	2.53	3.43	3%	1%	25%
Avg 94-98	2.82	2.66	3.43	3%	1%	33%
Olym Avg 95-99	2.73	2.56	3.43	3%	1%	27%
Olym Avg 94-98	2.94	2.79	3.43	58%	1%	40%
AMTA 0.248	2.64	2.22	3.73	1%	18%	13%
AMTA 0.275	2.67	2.25	3.76	1%	11%	16%
AMTA 0.303	2.71	2.29	3.80	1%	10%	19%

Total receipts includes: market receipts, LDPs, base AMTA for 2001 plus CCPs or Added AMTA.

Table 2. Rankings of Alternative Counter Cyclical and Added AMTA Options Relative to the Base and Dollars per Yield Unit Required to Equate Alternative to the Preferred Option, 100% Trigger

	Value of an Option Relative to the Preferred Option
Rice (\$/cwt.)	
Rice Olym Avg 95-99	Preferred Option
Rice Olym Avg 94-98	0.000
Rice Avg 94-98	0.156
Rice AMTA 2.75	0.185
Rice Avg 95-99	0.324
Rice AMTA 2.5	0.405
Rice AMTA 2.25	0.624
Rice Base	2.601
Cotton (cents/lb.)	
Cott Olym Avg 94-98	Preferred Option
Cott Avg 94-98	0.8208
Cott Olym Avg 95-99	6.4995
Cott Avg 95-99	8.2741
Cott AMTA 0.081	10.2082
Cott AMTA 0.074	10.8850
Cott AMTA 0.067	11.5618
Cott Base	17.6529
Corn (\$/bu.)	
Corn Olym Avg 94-98	Preferred Option
Corn Avg 94-98	0.027
Corn Avg 95-99	0.120
Corn Olym Avg 95-99	0.122
Corn AMTA 0.361	0.162
Corn AMTA 0.328	0.187
Corn AMTA 0.295	0.213
Corn Base	0.440
Wheat (\$/bu.)	
Wht AMTA 0.69	Preferred Option
Wht AMTA 0.628	0.068
Wht AMTA 0.565	0.136
Wht Avg 94-98	0.142
Wht Olym Avg 94-98	0.164
Wht Avg 95-99	0.246
Wht Olym Avg 95-99	0.259
Wht Base	0.746
Soybean (\$/bu.)	
Soy Olym Avg 94-98	Preferred Option
Soy Avg 94-98	0.054
Soy Olym Avg 95-99	0.300
Soy Avg 95-99	0.316
Soy AMTA 0.074	1.675
Soy AMTA 0.067	1.685
Soy AMTA 0.061	1.696
Soy Base	1.789
Sorghum (\$/bu.)	
GS Olym Avg 94-98	Preferred Option
GS Avg 94-98	0.117
GS Olym Avg 95-99	0.210
GS AMTA 0.303	0.231
GS Avg 95-99	0.238
GS AMTA 0.275	0.264
GS AMTA 0.248	0.297
GS Base	0.594

For example, the Olympic Average 95-99 benefits rice producers by \$0.624/cwt more than the Added AMTA 2.25 and \$2.601/cwt more than the Base of no CCP or Added AMTA.

Table 3. Counter Cyclical Payments per Yield Unit for Alternative Base Periods or Added AMTA Payments, 100% Trigger

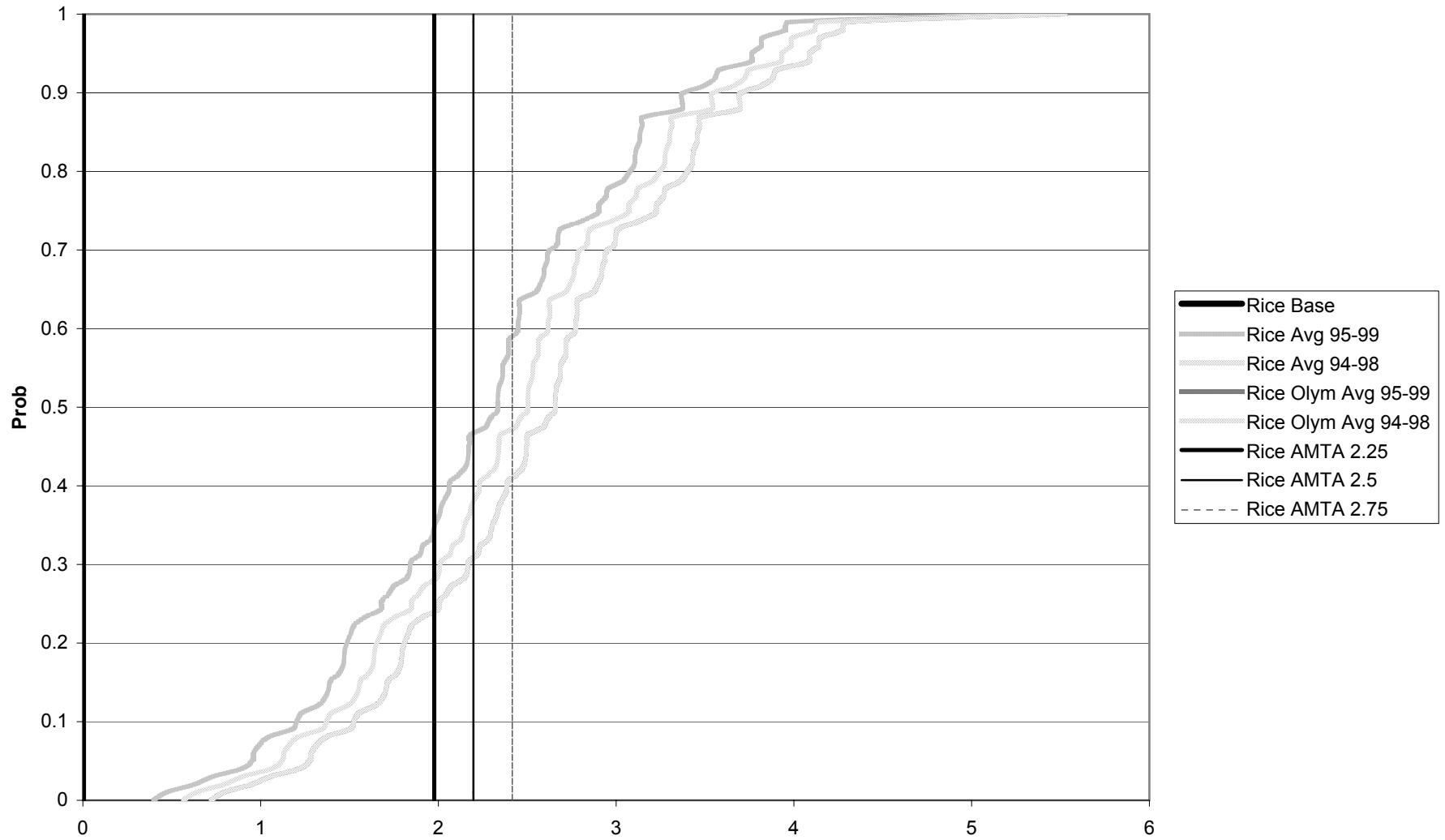
	Mean	Min	Max	P(x=Min)	P(x=0)
Rice (Cwt.)	(\$/Yield Unit)				
Base	0.000	0.000	0.000	100%	100%
Avg 95-99	2.289	0.397	5.205	1%	0%
Avg 94-98	2.457	0.565	5.373	1%	0%
Olym Avg 95-99	2.613	0.721	5.529	1%	0%
Olym Avg 94-98	2.613	0.721	5.529	1%	0%
AMTA 2.25	1.977	1.977	1.977	100%	0%
AMTA 2.5	2.197	2.197	2.197	100%	0%
AMTA 2.75	2.416	2.416	2.416	100%	0%
Cotton (lb.)					
Base	0.000	0.000	0.000	100%	100%
Avg 95-99	0.093	0.000	0.353	26%	26%
Avg 94-98	0.168	0.000	0.443	10%	10%
Olym Avg 95-99	0.111	0.000	0.376	20%	20%
Olym Avg 94-98	0.176	0.000	0.452	8%	8%
AMTA 0.067	0.061	0.061	0.061	100%	0%
AMTA 0.074	0.068	0.068	0.068	100%	0%
AMTA 0.081	0.074	0.074	0.074	100%	0%
Corn (bu.)					
Base	0.000	0.000	0.000	100%	100%
Avg 95-99	0.320	0.000	1.091	21%	21%
Avg 94-98	0.413	0.000	1.201	12%	12%
Olym Avg 95-99	0.318	0.000	1.088	21%	21%
Olym Avg 94-98	0.440	0.000	1.231	12%	12%
AMTA 0.295	0.228	0.228	0.228	100%	0%
AMTA 0.328	0.253	0.253	0.253	100%	0%
AMTA 0.361	0.278	0.278	0.278	100%	0%
Wheat (bu.)					
Base	0.000	0.000	0.000	100%	100%
Avg 95-99	0.499	0.000	1.495	13%	13%
Avg 94-98	0.603	0.000	1.611	7%	7%
Olym Avg 95-99	0.486	0.000	1.480	13%	13%
Olym Avg 94-98	0.581	0.000	1.587	8%	8%
AMTA 0.565	0.610	0.610	0.610	100%	0%
AMTA 0.628	0.678	0.678	0.678	100%	0%
AMTA 0.69	0.746	0.746	0.746	100%	0%
Soybean (bu.)					
Base	0.000	0.000	0.000	100%	100%
Avg 95-99	1.491	0.000	3.325	9%	9%
Avg 94-98	1.754	0.000	3.608	4%	4%
Olym Avg 95-99	1.506	0.000	3.342	9%	9%
Olym Avg 94-98	1.808	0.000	3.664	3%	3%
AMTA 0.061	0.093	0.093	0.093	100%	0%
AMTA 0.067	0.104	0.104	0.104	100%	0%
AMTA 0.074	0.114	0.114	0.114	100%	0%
Sorghum (bu.)					
Base	0.000	0.000	0.000	100%	100%
Avg 95-99	0.355	0.000	0.842	16%	16%
Avg 94-98	0.476	0.000	0.978	8%	8%
Olym Avg 95-99	0.384	0.000	0.876	13%	13%
Olym Avg 94-98	0.593	0.000	1.103	3%	3%
AMTA 0.248	0.297	0.297	0.297	100%	0%
AMTA 0.275	0.330	0.330	0.330	100%	0%
AMTA 0.303	0.363	0.363	0.363	100%	0%

Added AMTA payments are calculated using current national farm program yield, national base acres, and a payment fraction of 0.85 per base acre. Added AMTA payments were divided by average national planted acre yields for 1996-2000 to put them on a comparable basis to the CCPs. Counter Cyclical Payments were calculated on a planted acre yield basis.

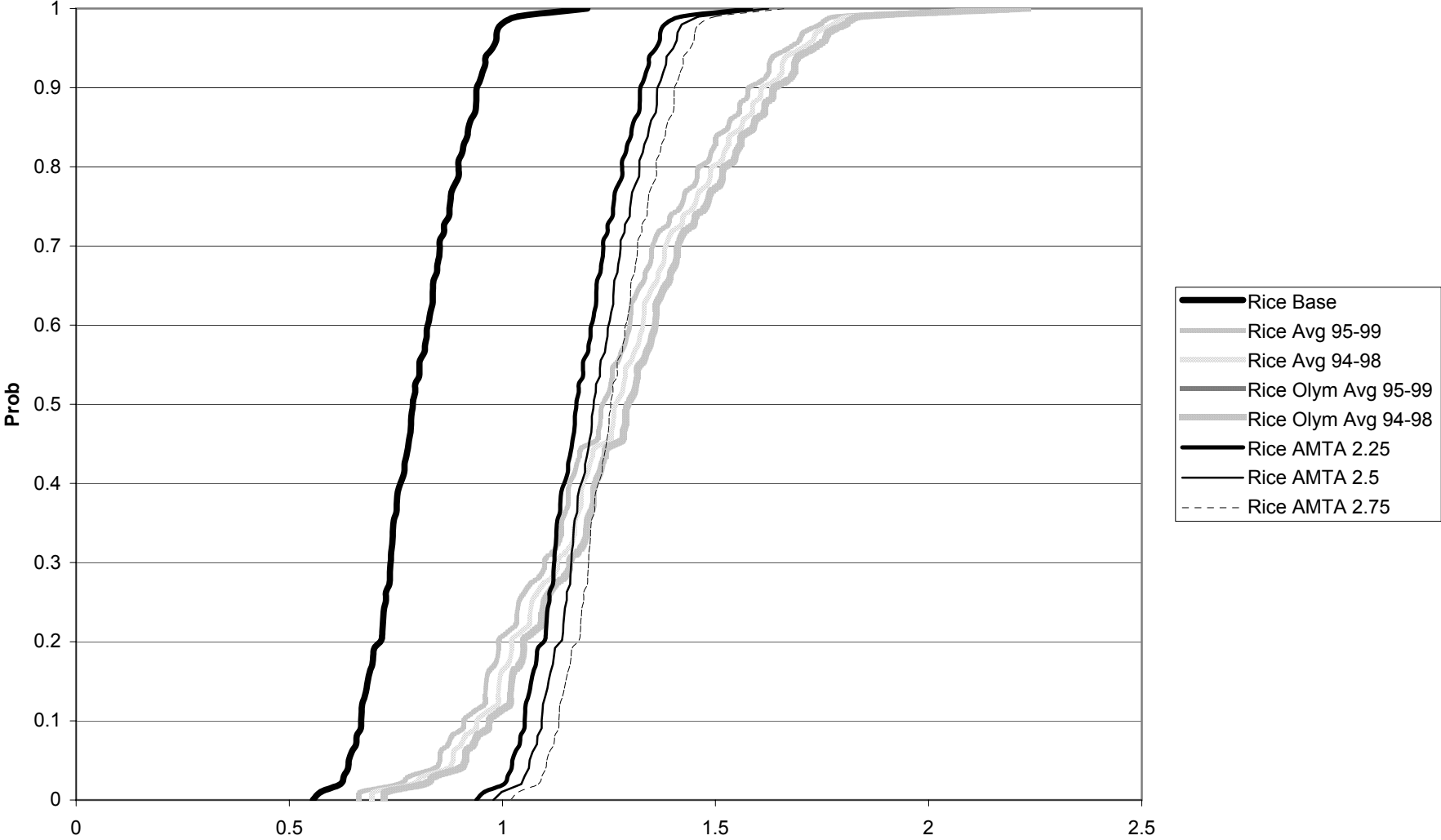
Table 4. Total Government Costs for Base AMTA, LDP, and Counter Cyclical Payments or Added AMTA in 2001, Assuming 100% Trigger

	Mean	Min	Max	P(x=Min)
(Billions \$)				
Rice				
Base	0.80	0.55	1.20	1%
Avg 95-99	1.24	0.66	2.17	1%
Avg 94-98	1.27	0.69	2.20	1%
Olym Avg 95-99	1.30	0.72	2.23	1%
Olym Avg 94-98	1.30	0.72	2.23	1%
AMTA 2.25	1.18	0.94	1.58	1%
AMTA 2.5	1.23	0.98	1.62	1%
AMTA 2.75	1.27	1.02	1.66	1%
Cotton				
Base	0.68	0.45	2.30	54%
Avg 95-99	1.48	0.45	5.32	25%
Avg 94-98	2.13	0.45	6.10	10%
Olym Avg 95-99	1.64	0.45	5.52	20%
Olym Avg 94-98	2.20	0.45	6.18	8%
AMTA 0.067	1.20	0.98	2.82	54%
AMTA 0.074	1.26	1.03	2.88	54%
AMTA 0.081	1.32	1.09	2.94	54%
Corn				
Base	3.26	1.92	10.36	49%
Avg 95-99	6.21	1.92	19.37	21%
Avg 94-98	7.06	1.92	20.38	12%
Olym Avg 95-99	6.19	1.92	19.35	21%
Olym Avg 94-98	7.31	1.92	20.67	12%
AMTA 0.295	5.36	4.02	12.46	49%
AMTA 0.328	5.59	4.25	12.69	49%
AMTA 0.361	5.82	4.49	12.93	49%
Wheat				
Base	1.36	1.08	3.05	58%
Avg 95-99	2.42	1.08	6.23	13%
Avg 94-98	2.65	1.08	6.48	7%
Olym Avg 95-99	2.40	1.08	6.20	13%
Olym Avg 94-98	2.60	1.08	6.43	8%
AMTA 0.565	2.66	2.38	4.35	58%
AMTA 0.628	2.80	2.53	4.49	58%
AMTA 0.69	2.95	2.67	4.64	58%
Soybean				
Base	3.00	0.00	10.25	17%
Avg 95-99	7.27	0.00	19.77	9%
Avg 94-98	8.02	0.00	20.58	4%
Olym Avg 95-99	7.31	0.00	19.82	9%
Olym Avg 94-98	8.17	0.00	20.74	3%
AMTA 0.061	3.27	0.27	10.52	17%
AMTA 0.067	3.29	0.30	10.55	17%
AMTA 0.074	3.32	0.33	10.58	17%
Sorghum				
Base	0.29	0.21	0.55	61%
Avg 95-99	0.48	0.21	0.95	16%
Avg 94-98	0.55	0.21	1.02	8%
Olym Avg 95-99	0.50	0.21	0.97	13%
Olym Avg 94-98	0.61	0.21	1.09	3%
AMTA 0.248	0.45	0.37	0.72	61%
AMTA 0.275	0.47	0.39	0.73	61%
AMTA 0.303	0.49	0.41	0.75	61%

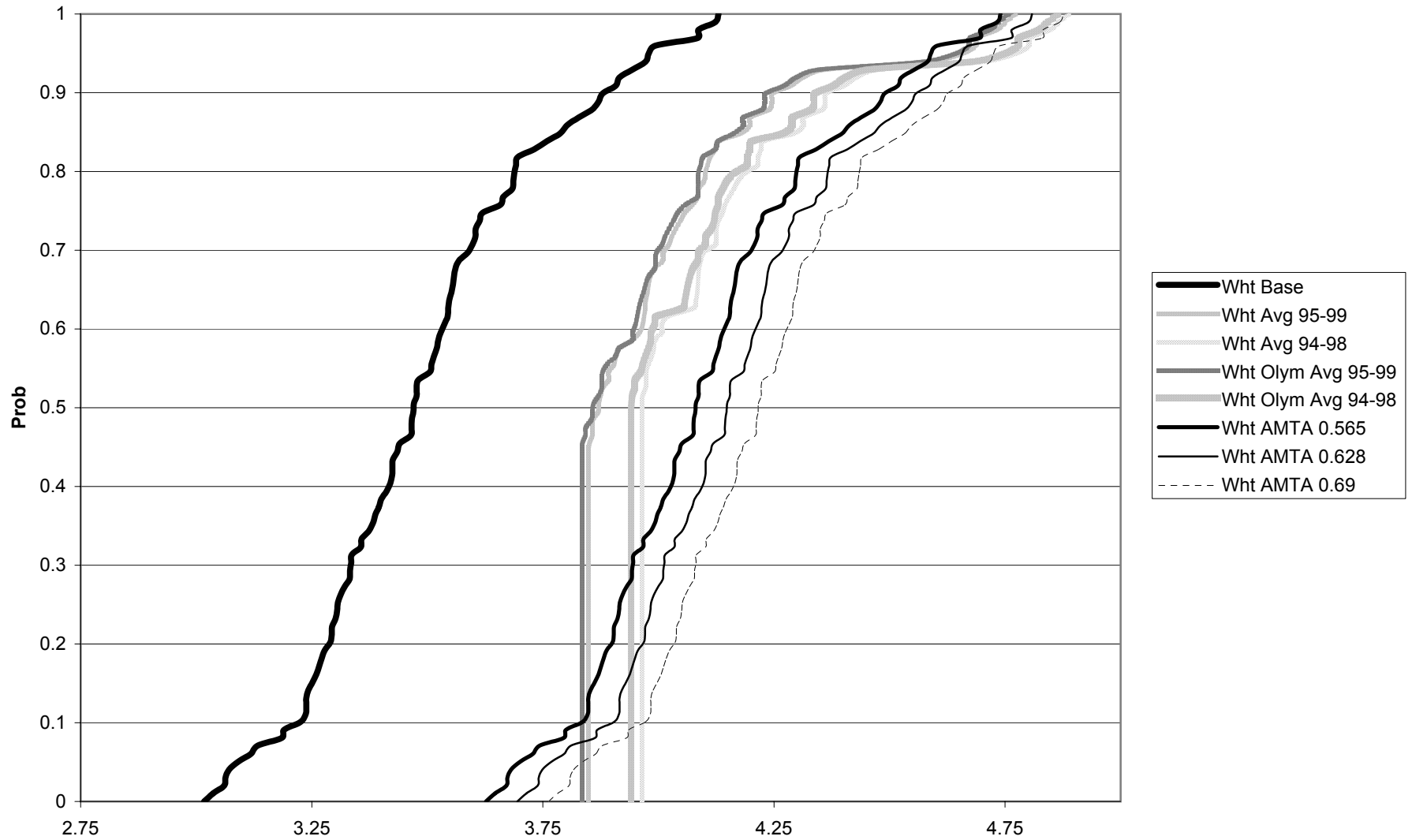
**Cumulative Distributions of Counter Cyclical or Added AMTA Payments per Cwt of Rice in 2001,
Assuming 100% Trigger**



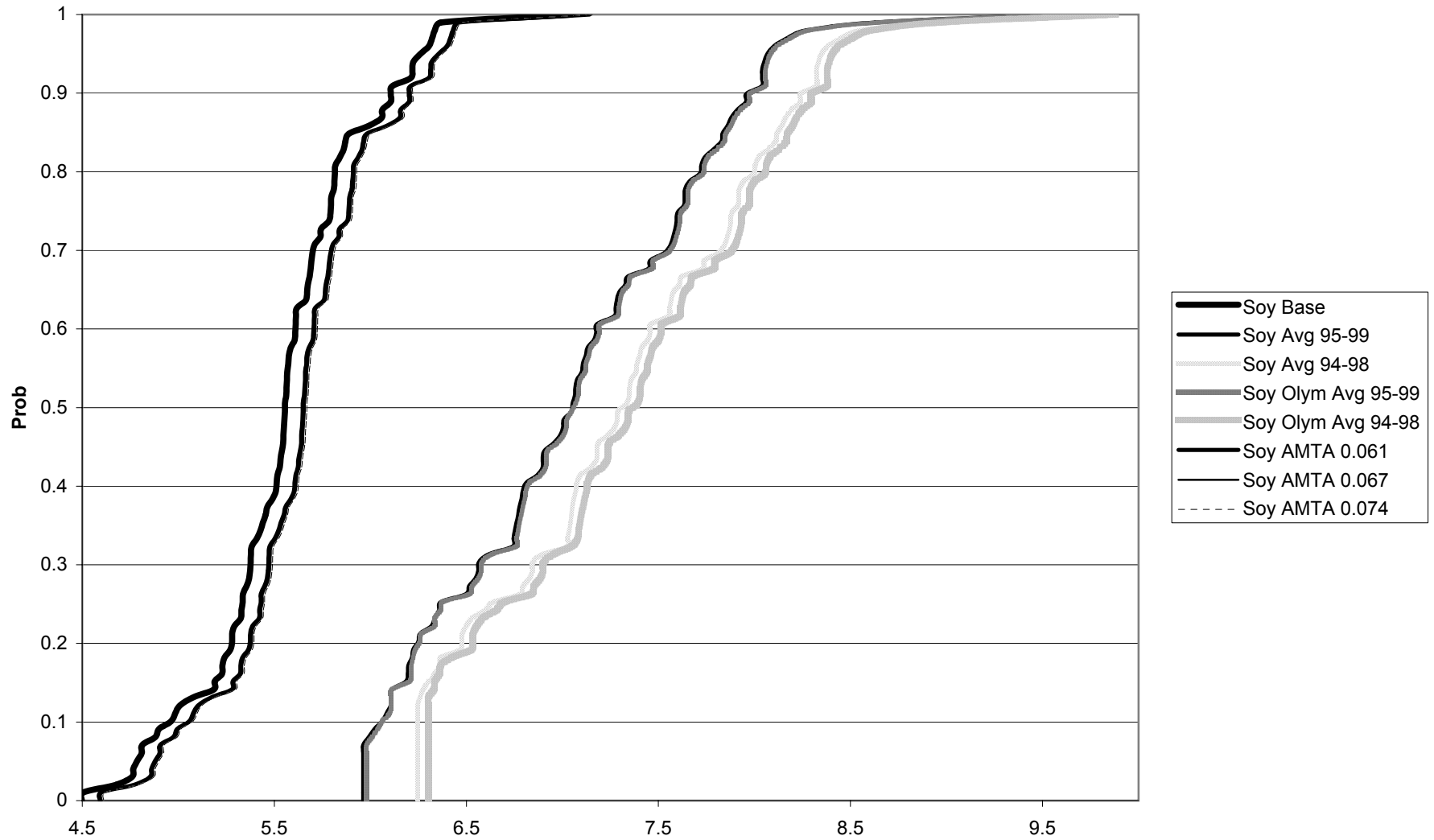
Cumulative Distributions of Total Government Costs for Rice in 2001 Under Alternative Counter Cyclical or Added AMTA Payments, Assuming 100% Trigger (Billions \$)



Cumulative Distributions of Total Receipts per Bushel in 2001 for Wheat, Assuming Alternative Base Periods for Counter Cyclical Program or Added AMTA Payments and 100% Trigger



Cumulative Distributions of Total Receipts per Bushel in 2001 for Soybeans, Assuming Alternative Base Periods for Counter Cyclical Program or Added AMTA Payments and 100% Trigger



Cumulative Distributions of Total Receipts per Bushel in 2001 for Sorghum, Assuming Alternative Base Periods for Counter Cyclical Program or Added AMTA Payments and 100% Trigger

