

Title: “JAAE Appendix for Mitigating Price and Yield Risk Using Revenue Protection and Agriculture Risk Coverage”

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Note: The material contained herein is supplementary to the article named in the title and published in the Journal of Agricultural and Applied Economics (JAAE).

Supplementary Material

This document contains supplementary material that is referenced in the main text. It contains 7 sections:

Section S1. Rank Correlation Matrices Used in Stochastic Simulation

Section S2. Summary Statistics of Raw Data Used in Stochastic Simulation

Section S3. ARC Program and Farm Parameters

Section S4. Simulated Base Premium Rates

Section S5. Results for Soybeans

Section S6. Simulated Base Premium Rates Under Alternative Sampling Methods

Section S7. Results Under Copula Sampling Method

Section S1. Rank Correlation Matrices Used in Stochastic Simulation

Table S1. McLean Co., IL Corn Rank Correlation Matrix

	Y_c	Y_i	p^{Cash}	F^f	p^{MYA}
Y_c	1	0.14	-0.05	-0.23	-0.10
Y_i		1	-0.00	-0.04	-0.01
p^{Cash}			1	-0.54	0.98
F^f				1	-0.50
p^{MYA}					1

Table S2. Bolivar Co., MS Corn Rank Correlation Matrix

	Y_c	Y_i	p^{Cash}	F^f	p^{MYA}
Y_c	1	0.18	-0.00	-0.41	0.38
Y_i		1	-0.00	-0.07	0.05
p^{Cash}			1	0.32	0.04
F^f				1	-0.50
p^{MYA}					1

Table S3. McLean Co., IL Soybean Rank Correlation Matrix

	Y_c	Y_i	p^{Cash}	F^f	p^{MYA}
Y_c	1	0.34	0.11	-0.22	0.14
Y_i		1	0.04	-0.07	0.05
p^{Cash}			1	-0.51	0.98
F^f				1	-0.58
p^{MYA}					1

Table S4. Bolivar Co., MS Soybean Rank Correlation Matrix

	Y_c	Y_i	p^{Cash}	F^f	p^{MYA}
Y_c	1	0.18	-0.03	0.16	0.14
Y_i		1	0.01	0.02	0.03
p^{Cash}			1	-0.60	0.50
F^f				1	-0.58
p^{MYA}					1

Section S2. Summary Statistics of Raw Data Used in Stochastic Simulation

Table S5. Summary Statistics of the Data Used for Simulation of Prices and Yields

Region and Crop		McLean Co., IL Corn	Bolivar Co., MS Corn	McLean Co., IL Soybeans	Bolivar Co., MS Soybeans
County Yield	Mean (s.d.)	224.65 (14.93)	178.05 (13.71)	63.68 (4.40)	54.59 (4.15)
	[Min., Max.]	[188.98, 255.44]	[151.04, 214.01]	[47.12, 68.66]	[46.60, 63.06]
Farm Yield	Mean (s.d.)	224.65 (49.47)	178.05 (81.15)	63.68 (12.87)	54.59 (23.36)
	[Min., Max.]	[36.69, 385.81]	[0.27, 356.05]	[13.53, 102.29]	[0.27, 102.81]
Δ Cash Price	Mean (s.d.)	-0.03 (0.20)	-0.11 (0.65)	0.18 (0.45)	0.00 (0.64)
	[Min., Max.]	[-0.63, 0.51]	[-1.27, 1.82]	[-1.33, 0.98]	[-1.43, 1.35]
Δ Harvest Price	Mean (s.d.)	-0.18 (0.71)	-0.18 (0.71)	0.12 (1.45)	0.12 (1.45)
	[Min., Max.]	[-1.27, 1.82]	[-1.27, 1.82]	[-4.14, 3.38]	[-4.14, 3.38]
Δ MYA Price	Mean (s.d.)	-0.08 (0.22)	0.08 (0.22)	0.01 (0.44)	0.01 (0.44)
	[Min., Max.]	[-0.61, 0.62]	[-0.61, 0.62]	[-1.53, 0.75]	[-1.53, 0.75]

Section S3. ARC Program and Farm Parameters

Table S6. ARC Program and Farm Parameters

	<u>McLean Co., IL</u>	<u>Bolivar Co., MS</u>
<u>ARC (Corn)</u>		
Olympic Average Yield	231.00	179.00
Olympic Average Price	\$3.70	\$3.70
Loan Rate	\$1.95	\$1.95
Base Acres/Planted Acres	1.00	1.00
<u>ARC (Soybeans)</u>		
Olympic Average Yield	66.00	55.00
Olympic Average Price	\$8.40	\$8.40
Loan Rate	\$5.00	\$5.00
Base Acres/Planted Acres	1.00	1.00
<u>Futures Plant Price</u>		
Corn (December)	\$3.96	\$3.91
Soybeans (November)	\$10.16	\$10.04
<u>On-Farm Costs per Acre</u>		
Corn	\$692.48	\$570.00
Soybeans	\$472.35	\$345.00

Source: Olympic Average Yields were calculated using USDA RMA data from 2013-2017, and Olympic Average Prices were calculated using cash prices received from USDA NASS data from 2013-2017.

Section S4. Simulated Base Premium Rates

Table S7. Simulated RP Base Premium Rates by Coverage Level

	50 percent	55 percent	60 percent	65 percent	70 percent	75 percent	80 percent	85 percent
McLean Co., IL Corn	0.0038	0.0072	0.0125	0.0200	0.0303	0.0436	0.0600	0.0792
Bolivar Co., MS Corn	0.0744	0.0882	0.1028	0.1182	0.1341	0.1505	0.1675	0.1848
McLean Co., IL Soybeans	0.0018	0.0038	0.0070	0.0119	0.0190	0.0285	0.0409	0.0563
Bolivar Co., MS Soybeans	0.0533	0.0650	0.0777	0.0913	0.1057	0.1210	0.1371	0.1539

Section S5. Results for Soybeans

Figure S1. McLean Co., IL Soybeans Plotted Certainty Equivalents

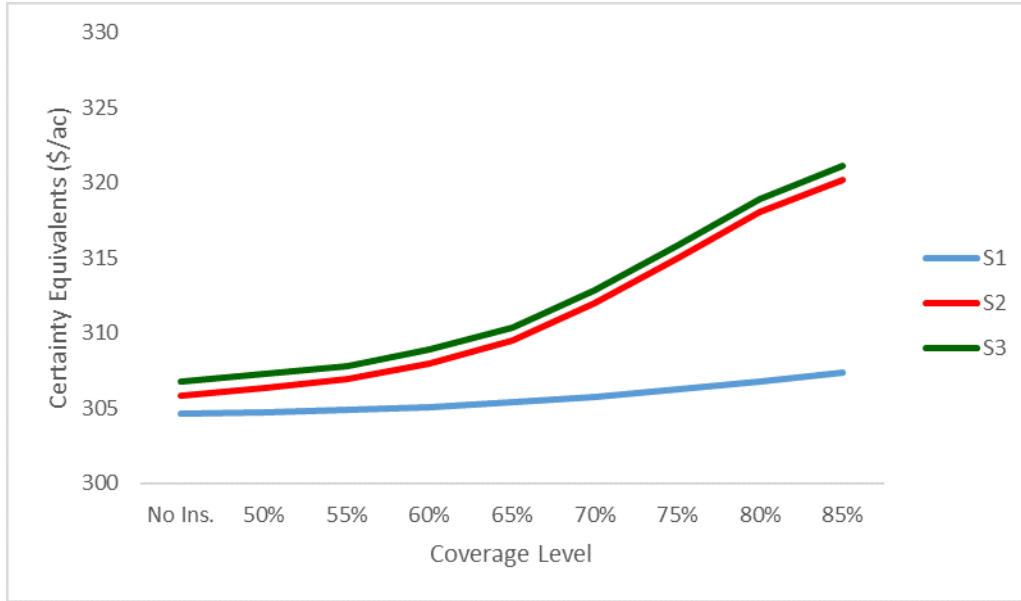
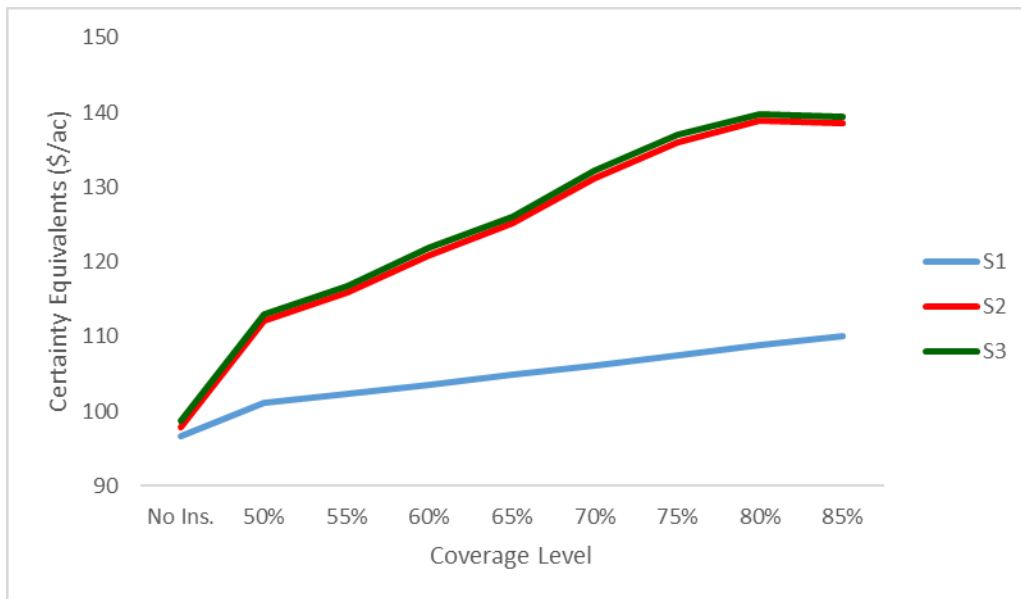


Figure S2. Bolivar Co., MS Soybeans Plotted Certainty Equivalents



Section S6. Simulated Base Premium Rates Under Alternative Sampling Methods

Table S8. RP Corn Base Premium Rates Under Alternative Sampling Methods

Location	RMA Rate	PQH Rate	Copula Rate
Adams County, IL	0.0622	0.0928	0.1665
Iroquois County, IL	0.0377	0.0695	0.1165
Jefferson County, IL	0.1743	0.1704	0.3293
McLean County, IL	0.0203	0.0436	0.0436
Piatt County, IL	0.0241	0.0584	0.0662
Sangamon County, IL	0.0402	0.0778	0.0841
Wayne County, IL	0.1766	0.1757	0.3056
Humboldt County, IA	0.0271	0.0532	0.0732
Rush County, IN	0.0442	0.0599	0.1165
Stoddard County, MO	0.0927	0.1170	0.1745
Obion County, TN	0.0786	0.1081	0.1746
Craighead County, AR	0.1592	0.1627	0.1910
Bolivar County, MS	0.1224	0.1505	0.1627
Hinds County, MS	0.0403	0.0484	0.0628
Leflore County, MS	0.1017	0.1081	0.1016
Madison County, MS	0.0382	0.0478	0.0474
Washington County, MS	0.1112	0.1204	0.1111
Yazoo County, MS	0.0747	0.0838	0.0966
Franklin County, LA	0.0692	0.0896	0.1911

Table S9. RP Soybean Base Premium Rates Under Alternative Sampling Methods

Location	RMA Rate	PQH Rate	Copula Rate
Adams County, IL	0.0622	0.0735	0.0235
Iroquois County, IL	0.0377	0.0311	0.0577
Jefferson County, IL	0.1743	0.1075	0.2572
McLean County, IL	0.0203	0.0285	0.0215
Piatt County, IL	0.0241	0.0292	0.0193
Sangamon County, IL	0.0402	0.0313	0.0252
Wayne County, IL	0.1766	0.1000	0.2175
Humboldt County, IA	0.0271	0.0324	0.0616
Rush County, IN	0.0442	0.0421	0.0632
Stoddard County, MO	0.0927	0.0854	0.1276
Obion County, TN	0.0786	0.0762	0.1604
Craighead County, AR	0.1592	0.0908	0.1437
Bolivar County, MS	0.1224	0.1210	0.1125
Hinds County, MS	0.0403	0.1048	0.0889
Leflore County, MS	0.1017	0.0962	0.0667
Madison County, MS	0.0382	0.1522	0.1136
Washington County, MS	0.1112	0.0911	0.0567
Yazoo County, MS	0.0747	0.1181	0.0988
Franklin County, LA	0.0692	0.1345	0.1524

Section S7. Results Under Copula Sampling Method

Figure S3. McLean Co., IL Corn Plotted Certainty Equivalents (Empirical Copula)

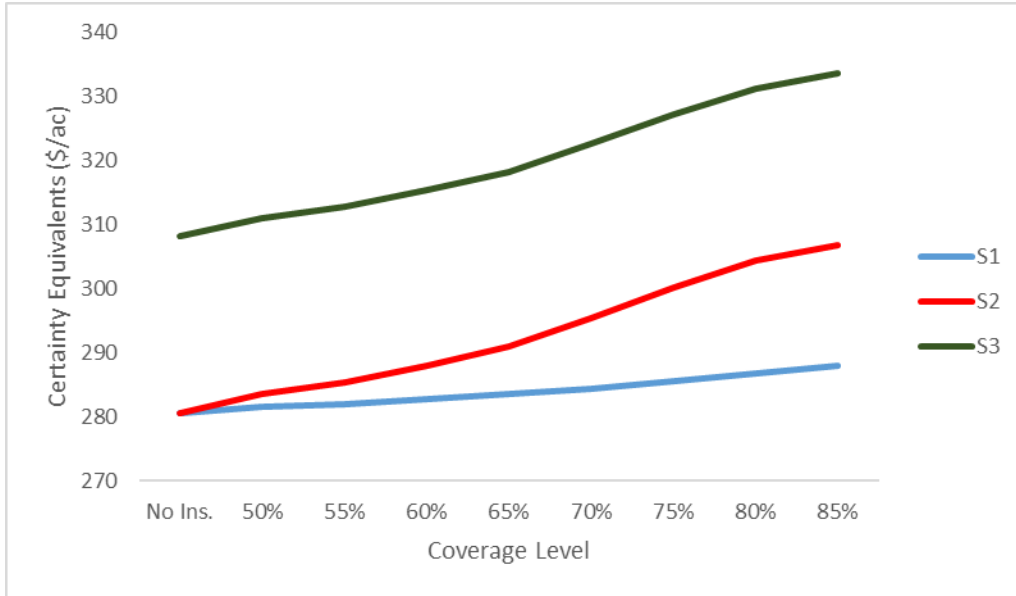


Figure S4. Bolivar Co., MS Corn Plotted Certainty Equivalents (Empirical Copula)

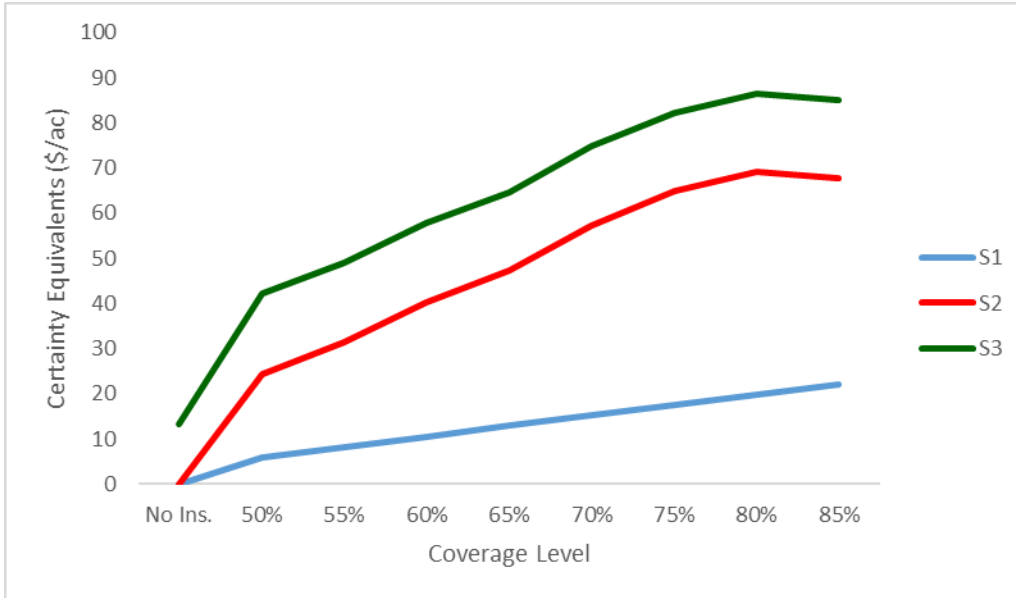


Figure S5. McLean Co., IL Soybeans Plotted Certainty Equivalents (Empirical Copula)

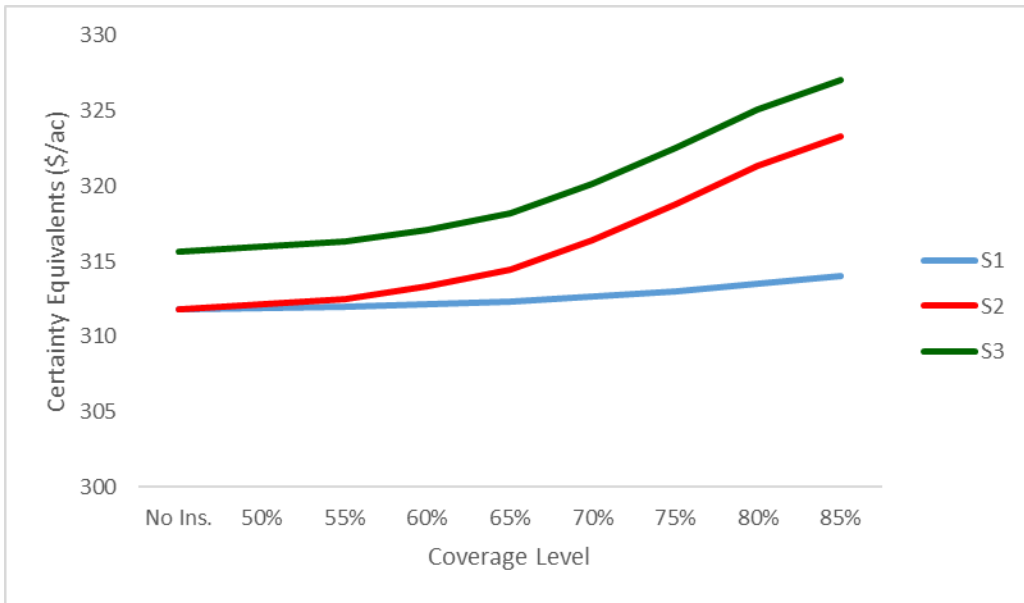


Figure S6. Bolivar Co., MS Soybeans Plotted Certainty Equivalents (Empirical Copula)

