Stochastic Analysis of Margin Protection (MP) Crop Insurance in Arkansas Rice Production

Ranjitsinh Mane and Bradley Watkins
University of Arkansas
Rice Research and Extension Center,
2900 Hwy. 130 E., Stuttgart, AR 72160
Email: mane@uark.edu / kbwatki@uark.edu
Office: 870-673-2661 / Fax: 870-673-4315

Selected Paper prepared for presentation at the Southern Agricultural Economics Association's 2016 Annual Meeting, San Antonio, Texas, February, 6-9 2016

Area: Crop Insurance, Farm Profitability, Rice Production

Keywords: Margin Protection, Indemnity, Price Risk, Risk Management, Price Volatility

Abstract:

Rice is an irrigated crop, and irrigated crops are more insulated against yield risk than non-irrigated crops. However, rice is largely dependent on energy related inputs like fuel and fertilizer and suffers from systemic risks caused by increasing energy related input costs. The USDA Risk Management Agency (RMA) is making available a new insurance product to rice producers in 2016 called Margin Protection (MP). Margin Protection provides coverage against an unexpected decrease in operating margin resulting from increased input costs. Thls study used simulation to evaluate stochastic indemnities generated by MP at various coverage levels ranging from 70 to 90 percent for three major rice counties in Arkansas. Multivariate empirical distributions of county yields, margin rice prices and prices for allowed margin inputs were simulated. The likelihood of receiving indemnities under MP was small for 70 and 75 percent coverage levels based on our simulated results. Indemnity probabilities were 0.8, 5.2, and 18 percent for Arkansas County at MP coverage levels of 80, 85, and 95 percent, respectively. Indemnity probabilities for Poinsett and Desha Counties were higher at the 80, 85, and 90 percent MP coverage levels (6, 18.8, and 31.9 percent respectively for Poinsette; 6.6, 16.8, and 34.6 percent respectively for Desha). The higher probabilities of indemnities in Poinsett and Desha counties may be due to higher variability in yields for those counties.

JEL Code(s) Q11, Q13, Q14, Q16.

Introduction

Rice production is an expensive enterprise when compared to production of other row crops such as corn, soybean, grain sorghum and wheat. According to Arkansas Crop Enterprise Budgets reports (2011 – 2015) the net operating cost per acer[1] for rice is the highest ($641.08) when compared to other row crops like cotton ($523.90), corn ($571.80), sorghum ($317.12) and soybean ($313.74). However, rice is more profitable ($436.40) when we compare the per acre returns to operating expenses with other crops (cotton ($378.50), corn ($397.80), soybean ($376.66), and sorghum ($211.10)). A typical farm involved in rice production requires physical assets (equipment, irrigation infrastructure) worth $ 2.5 million whereas a soybean farm would require assets less than a $1 million dollars (Fahr, 2015). Therefore, it is important for the rice producers to be profitable or have certain margins over their production costs for their economic sustainability.

In May 2015, the Risk Management Agency (RMA) of the U.S Department of Agriculture (USDA) announced a new crop insurance product called Margin Protection (MP) would be available for selected crops in selected counties. In Arkansas, MP Policies are available for 26 rice growing counties[2] starting in the 2016 crop year (USDA, RMA, 2015b). Margin Protection is an area based product, using county-level estimates of average revenue and input costs to establish the amount of coverage and indemnity payments. The objective of the MP is to provide coverage against an unexpected decrease in operating margin (revenue less input costs). Margin Protection[3] can be purchased as a stand-alone product or in combination with other crop

[1] With Surface Irrigation
[2] Arkansas, Ashley, Chicot, Clay, Craighead, Crittenden, Desha, Cross, Drew, Greene, Independence, Jackson, Jefferson, Lawrence, Lee, Lincoln, Lonoke, Mississippi, Monroe, Phillips, Poinsett, Prairie, Randolph, Saint Francis, White, Woodruff.
[3] Margin Protection Policies do not provide prevented and replanting coverages

insurance products such as Revenue Protection (RP) and Yield Protection (YP). Coverage levels for MP range from 70 to 90 percent of expected margins and are purchased in 5 percent increments (USDA, FCIC, 2015).

In 2014, about 1.2 million rice acres in Arkansas were insured under different federal crop insurance programs with a total indemnity value of 28.8 million dollars (USDA, RMA 2014). However, crop insurance products like Yield Protection (YP) and Revenue Protection (RP) address either production risk (YP) or both production and price risk (RP). Crop insurance participation for rice in Arkansas is less than that for crops in other regions because rice is 100 percent irrigated (Anderson et al. 2013). Therefore, YP and RP products are not as appealing for rice as for other non-irrigated crops. Also, RP products address market price risk which operates on price discovery tools offered by the Chicago Board of Trade (CBOT). Rice futures are thinly traded on the CBOT due to a low level of participation in the rice futures market (McKenzie et al. 2002). Therefore, RP policies may be more limited at addressing market price risk in rice because of lack of convergence of rice futures with local cash prices resulting from thinly traded rice futures.

Both, YP and RP policies do not address risk related to cost of inputs such as diesel and fertilizers especially nitrogen used in rice production. About 58 percent of rice production costs were attributed to the costs of fertilizer and Irrigation fuel when compared to other inputs such as seed, herbicide, fungicide and insecticide based on data from the Arkansas Rice Research Verification Program (RRVP) for the period 2001 through 2012 (Hardke et al. 2012). The costs of nitrogen and diesel are based on crude oil prices. Therefore, any volatility in crude oil prices gets transferred to basic inputs used in rice production. Margin Protection seeks to address input price risk and represents an alternative crop insurance option for rice producers. The objective of this study is to determine the likelihood of indemnities for MP given alternative buy-up coverage levels. Margin Protection indemnities are simulated and indemnity summary statistics are presented with for select rice production counties in Arkansas. The results indicate that the likelihood of indemnities can vary by both county and coverage level.

Literature Review

Margin insurance is not a new concept. Various margin protection products are available in both the dairy and beef industries. Nicholson and Stephenson (2014) evaluated the dynamic impacts of the dairy Margin Protection Program (MPP) as an alternative to the Dairy Product Price Support Program (DPPSP). Under the dairy MPP, dairy farmers determine the level of margin they want to protect (milk prices less a specified feed cost value). If average margin for two consecutive months becomes lower than the level of covered margin, the producer receives an indemnity based on the difference between the observed margin and the protected margin. Nicholson and Stephenson found that weakened feedback processes are likely to result in persistent lower margins, lower farm incomes and larger government expenditures than the continuation of current policies if margins were to fall to levels activating indemnity payments. They also suggest that program participation decisions have a significant impact on the outcomes resulting from MPP, and an individual producer's decision to participate in MPP could depend on collective decisions made by other producers.

Burdine et al. (2014a) evaluated the risk-reducing effectiveness of the Livestock Gross Margin-Dairy (LGM-Dairy) insurance program. The LGM-Dairy program enables dairy producers to purchase insurance against decreases in gross margins (milk output prices less corresponding feed costs), with gross margins being constructed using Chicago Mercantile Exchange (CME) Class III milk, corn meal, and soybean meal futures prices. They found that use of the LGM-Dairy program during the period 2002 -2012 would have resulted in reductions in downsize margin risk (measured as downside semivariance of gross margins) in 13 US dairy production regions ranging from 24 to 41 percent. They also noted primary components responsible for triggering LGM-Dairy indemnity payments. The primary component of the payout was the result of the difference between the expected and ‘‘actual’’ milk price. The next largest component in terms of magnitude of the total indemnity was corn meal followed by soybean meal.

In a similar study, Burdine et al (2014b) found that if the LGM-Dairy had been widely available during the period 2001 through 2011, reductions in risk would have ranged from 28 to 39 percent in the 13 dairy-producing regions analyzed. They defined risk in this study as the root mean-squared downside deviations from the median gross margin. They conclude that the LGM-Dairy as a gross margin insurance program is more flexible in terms of coverage than other risk management tools, such as hedging in futures or options markets, which likely makes LGM-Dairy more attractive for small farms.

Finally, Williams et al. (2014) evaluated the effectiveness of the Adjusted Gross Revenue – Lite (AGR-Lite) program on the net farm income risk of beef farms. Unlike the two dairy margin protection programs discussed above, the AGR-Lite program insures whole farm adjusted gross revenue. Using panel data from 49 beef farms in southeast Kansas, the authors found that on average for the group (but not for each individual farm) the AGR-Lite program reduces mean and standard deviation of net farm income. The authors also found that out of 12 years of program participation for each farm, 34 farms (69 percent) received at least one indemnity and 19 farms (38 percent) received at least two indemnities. Fifteen of the 49 farms received no indemnities.

The present study differs from the other previous MP studies in that we do not focus on a multi-year framework. We simulate 500 iterations of rice MP indemnities for expected margin coverage levels ranging from 70 to 90 percent for three rice-producing counties in Arkansas. Similar to Williams et al. (2014), we evaluate the likelihood of receiving an indemnity across 500 simulated outcomes. Similar to Burdine et al. (2014a), we look at the role of inputs (prices) and outputs (county yields) contributing to indemnity payments.

Data and Methods

The procedure to estimate or calculate indemnities for rice MP is based on guidelines set forth by the USDA's Federal Crop Insurance Corporation (FCIC) available online as Margin Protection Plan of Insurance Standards Handbook[4].

Calculation of Rice Margin Protection Indemnity

The indemnity for rice MP (MPI) is calculated as follows:

$MPI = TM - HM$

where TM = the trigger margin and HM = the harvest margin. TM is calculated as follows:

$TM = EM*CL$

and EM is calculated as follows:

$\mathrm{EM} = ER - EC$,

where ER = Expected revenue (projected rice price * expected county rice yield) and EC = expected costs of variable inputs (allowable input quantities of diesel, urea, diammonium phosphate (DAP) and potash multiplied by their respective projected prices); fixed input costs

[4] http://www.rma.usda.gov/handbooks/20000/2016/20260u.pdf (FCIC 20260U (07-2015))

for maintenance, chemicals, and application; and projected interest applied to variable and fixed input costs for a 6 month period.

Harvest margin (*HM*) is calculated as follows:

$HM = HR - HE$

Where *HR* = harvest revenue and *HE* = harvest expense. Both *HR* and *HE* are calculated the same as *ER* and *EC* above with the exception that harvest prices are used in place of projected prices, a harvest interest rate is used instead of a projected interest rate, and final county yield is used in place of the expected county yield.

Allowable input quantities and fixed input costs for maintenance, chemicals, and application are obtained from Watts and Associates, Inc. on behalf of the RMA.[5] Final county yields and projected and harvest prices for rice, Urea, DAP, potash[6], and interest are simulated as empirical distributions using SIMETAR, and the expected county yield is obtained for each county (Arkansas, Poinsett, and Desha) from the MP price discovery prompt of the USDA, RMA "Margin Protection for Corn, Rice, Soybeans and Wheat" website[7].

Finally, net indemnities are calculated as follows:

$NMPI = MPI - PREMIUM$

where *PREMIUM* = the producer's MP subsidized premium for the coverage level purchased. Margin protection premiums by county and coverage level for this study were obtained from the "Margin Protection for Corn, Rice, Soybeans and Wheat" website.

[5] http://marginprotection.com/Content/Files/Rice%20MP%20Costs%20and%20Inputs.pdf

[6] The projected and harvest price for potash are the same, as the USDA RMA uses a cash price (FOB Distributor Illinois, January 15 through February 14) rather than a contracted price for potash price discovery

[7] http://www.rma.usda.gov/policies/mp/index.html

Simulated County Yields and Prices

Projected and harvest prices for long grain rice and variable inputs (diesel, urea, DAP, potash, and interest) were simulated as multivariate empirical distributions (MVEs) using SIMETAR (Simulation & Econometrics to Analyze Risk), developed by Richardson, James, Schumann, and Feldman (2008). An MVE simulates random values from a frequency distribution made up of actual historical data and has been shown to appropriately correlate random variables based on their historical correlation (Richardson et al. 2000). All prices were simulated based on ten years of data for the period 2006 – 2015. Each price MVE was composed of 500 simulated iterations.

Projected and harvested prices of long grain rice[8] were obtained from the USDA's Risk Management Agency (RMA) futures prices and are based on the Chicago Board of Trade (CBOT). Projected and harvest input prices for diesel are based on heating oil prices listed on the Chicago Mercantile Exchange (CME). Interest charged for rice production activity are based on 30-day Federal Funds from CME. Urea and DAP prices are derived from NOLA Granular FOB Barge spot price and US Gulf DAP FOB spot price respectively. Potash prices are based on USDA Agricultural Marketing Service (AMS) data. All prices listed above except price of Urea and DAP are as per RMAs' margin price provision for rice.[9] However, due to limited access to Freight Inventory Services (FIS) commodity exchange data for Urea and DAP prices, spot prices from other sources listed above were used as a proxy for futures prices.

Final county rice yields for Arkansas, Poinsett, and Desha counties were simulated as EMPs using SIMETAR. Final county rice yields were simulated based on ten years of county

[8] Contract month November, margin projected price discovery period January 15 to February 14 and margin harvested price discovery period September 1 to September 30.
[9] http://www.rma.usda.gov/policies/2016/16mpp_rice-1.pdf

yield data from each respective county for the period 2005 – 2014. As with prices, final county yield MVEs were composed of 500 simulated iterations. The stochastic yields, and prices are used to represent changes in the agro climatic conditions and economic conditions respectively which are different for every individual year and county. The stochastic analysis provides a range of values associated with risks and uncertainties in rice production, which is a fundamental element in farm risk management.

Results and Discussion

This section of the study is divided into three sections. The first section will discuss the coverage level and premium of MP for selected counties and coverage levels, the second section will discuss the likelihood of MP indemnities by county and coverage level using summary statistics and probabilities or achieving indemnities. The third section will discuss net indemnities (triggered indemnities less the producer premium) by county and coverage level. Finally, we will comment on individual input and output factors affecting the triggering of MP indemnities based on individual simulated iterations where indemnities were triggered.

Margin Protection Premium and Coverage level for Arkansas, Poinsett and Desha Counties in Arkansas

Rice MP premiums by county and coverage level are presented in Table 1. Arkansas County has the lowest premiums followed by Poinsett and Desha Counties. The premium data reported in Table 1 are total premiums and producer premiums (total premiums less producer subsidies). The amount of premium paid by the producer increases (and the producer subsidy decreases) as coverage levels increase. In general, premiums are based on yield performance of counties. Based on NASS historic data Arkansas County has the highest yield on average for the last 10 years when compared to Poinsett and Desha Counties. Likewise, Poinsett County has higher yields on average for 6 years when compared with Desha County. The premium difference is less between Poinsett and Desha Counties at different coverage levels when compared to Arkansas County. Based analysis by Makki and Somwaru (2001) of RMA data, it was concluded that producers' choice of an insurance product is based on cost of premium, subsidy associated with the premium, and level of coverage. We can assume the preference to purchase a MP policy will be based on the same parameters as listed above.

Simulated Rice MP Indemnity Stochastics for Arkansas, Poinsett and Desha Counties in Arkansas

Simulated rice MP indemnities are presented by county and coverage level in Table 2. Average simulated indemnities are largest for the higher coverage levels (80, 85, and 90 percent). However, median indemnities for all coverage levels and counties equal zero, implying the likelihood of receiving and indemnity for MP (as well as for other traditional insurance products such and YP and MP) is small for any given year. Probabilities of receiving and indemnity over 500 simulated outcomes are presented in the right column of Table 2. The probability of receiving and indemnity increases as coverage levels increase from 70 to 90 percent.

Probabilities of receiving and indemnity vary by county. Indemnity probabilities are lowest for Arkansas County. The probability of receiving an MP indemnity in Arkansas County at 80, 85, and 90 percent coverage level is 0.8, 5.2, and 18 percent respectively. There is no indemnity for MP at 70 and 75 percent coverage levels for Arkansas County. Poinsett and Desha counties have a probability of approximately 1 and 3 percent of receiving an indemnity at 70 and

75 the coverage level and have higher probabilities of receiving and indemnity than Arkansas County at the 80, 85, and 90 percent coverage levels. Based on the simulated results we can argue that MP indemnities are more likely to be triggered for higher coverage levels and are larger in magnitude for counties with relatively lower and more variable rice yields.

Simulated Rice MP Net Indemnity Stochastics Arkansas, Poinsett, Desha Counties in Arkansas

Simulated rice MP net indemnities are presented by county and coverage level in Table 3. The net indemnities on MP is the difference between total indemnity (as presented in Table 2) and the producer premium (presented in Table 1) at each coverage level. In most instances, net indemnities are negative on average, reflecting the fact that in most years producers will receive no indemnity and will incur a premium cost. However, average net indemnities are positive for Poinsett, and Desha Counties at the 90 percent coverage level, implying that positive net indemnities occur more frequently at the highest coverage level for these counties.

The likelihood of receiving net indemnities is greater at all coverage levels for Poinsett and Desha Counties relative to Arkansas County. Higher net positive indemnities in Poinsett and Desha Counties reflects higher yield variability and lower yields in these counties which are most likely to trigger an indemnity. On the contrary, Arkansas County has lower relative rice yield variability and higher rice yields and is less likely to trigger an indemnity.

Input and Output Factors Affecting the Likelihood of Triggering Rice MP Indemnities

This section describes some insight obtained by looking at individual simulated iterations with triggered positive indemnities. We found in most instances that escalating fertilizer prices (urea, DAP, and Potash) coupled with low yields and low harvested prices increased the likelihood of an triggering and indemnity for MP, particularly at the 85 and 90 percent coverage levels for all selected counties. It would be difficult to rank which of the following factors; price of Urea, DAP, Potash, Yield of rice or Harvest Price of rice is the most important factor contributing to indemnity payment for margin protection policy. It is interesting to note that the price of diesel as an input by itself or in combination with other inputs like Urea, DAP or Potash would least likely trigger an indemnity payment. Almost all indemnity payments on the input side were associated with higher input prices for Urea, DAP and Potash. Likewise, lower yields and lower harvest prices can equally contribute to trigger an indemnity.

Conclusions

Margin Protection is an insurance product instituted to protect against unexpected decreases in operating margin resulting from unexpected increases in input prices, reductions in output prices, and lower yields. Based on our simulated results, MP is more effective in addressing risk at higher coverage levels (80, 85, and 90 percent) when prices of Urea, DAP and Potash are higher and yield and harvest prices are lower. We also found that the likelihood of indemnities increases for counties with relatively more yield variability and/or lower yields.

A couple of things need to be noted about MP in rice and our stochastic analysis of the product. First, MP is an area insurance product. As such, a farmer in a particular county may experience rice yields much lower than the county average and may not receive an indemnity from MP. Second, unlike other studies evaluating margin protection products, we did not investigate if MP reduces overall return variability for producers. Given the low likelihood of generating indemnities for all three counties evaluated, and particularly at the lower buy-up coverage levels, it is likely that MP would have minimal impacts on overall rice return variability and may result in lower average returns overall due to premium costs. This however needs to be validated and represents an area of further study.

References

Anderson J., R. Young, and T.D. Davis. 2013. Institutional barriers to an insurance-based farm safety net. Paper presented at Agricultural and Applied Economics Associations 2013 Crop Insurance and the Farm Bill Symposium, Louisville, KY.

Burdine, K. H., Kusunose, Y., Maynard, L. J., Blayney, D. P., & Mosheim, R. (2014a). Livestock Gross Margin-Dairy: An Assessment of Its Effectiveness as a Risk. *Journal of Agricultural and Applied Economics*.

Burdine, K., Mosheim, R., Blayney, D., & Maynard, L. J. (2014b). Livestock Gross Margin-Dairy Insurance: An Assessment of Risk Management and Potential Supply Impacts. *USDA-ERS Economic Research Report*, (163).

Farh. R. (2015). "More Rice, Fewer Farms" Arkansas Ag Business, Vol 2, No. 1, March 2015.

Hardke J., Watkins, B.,Mazzanti, R., and L. Schmidt. (2012). "Rice Research Verification Program" Chapter 17, Arkansas Rice Production Handbook. MP192, University of Arkansas Division of Agriculture Cooperative Extension Service, Littlerock, AR 72204.

Makki, S. S., & Somwaru, A. (2001). Evidence of adverse selection in crop insurance markets. *Journal of Risk and Insurance,* 685-708.

McKenzie, A. M., Bingrong, J., Djunaidi, H., Hoffman, L. A., & Wailes, E. J. (2002). Unbiasedness and market efficiency tests of the U.S. rice futures market. Review Of Agricultural Economics, 24(2), 474-493. doi:10.1111/1467-9353.00032

Nicholson, C. F., & Stephenson, M. W. (2014). Dynamic market impacts of the dairy margin protection program of the Agricultural Act of 2014. *Program on Dairy Markets and Policy Working Paper Series*.

Richardson, J.W., S. L. Klose, and A.W. Gray. (2000). An applied procedure for estimating and simulating multivariate empirical (MVE) probability distributions in farm-level risk assessment and policy analysis. Journal of Agricultural and Applied Economics 32(2):299-315

Richardson, J.W., K. D. Schumann, & P. A. Feldman. (2008). SIMETAR.Simulation & Econometrics to Analyze Risk.Simetar, Inc. College Station, TX. (Manual)

U.S Department of Agriculture, Federal Crop Insurance Corporation. 2015a. Margin Protection Plan of Insurance Standards Handbook, FCIC 20260U (July 2015). http://www.rma.usda.gov/handbooks/20000/2016/20260u.pdf (Accessed as of on Aug 27th 2015)

U.S Department of Agriculture, Risk Management Agency. 2015b. Crop Year 2016 Margin Protection for Corn, Rice, Soybeans and Wheat County Availability.

http://www.rma.usda.gov/policies/2016/16mpcountiestext.pdf (Accessed as of on Aug 8th 2015)

U.S Department of Agriculture, Risk Management Agency. 2014. Federal Crop Insurance Corporation, Summary of Business Statistics. http://www.rma.usda.gov/data/cause.html (Accessed as of on March 9th 2015)

Valvekar M., Cabrera V.E., and B. W Gould. 2010. "Identifying Cost Minimising Strategies for Guaranteeting target dairy *Journal of Dairy Science*,

Williams, J. R., Saffert, A. T., Barnaby, G., Llewelyn, R. V., & Langemeier, M. R. (2014). A Risk Analysis of Adjusted Gross Revenue-Lite on Beef Farms. *Journal of Agricultural and Applied Economics*, *46*(02).

Table 1. Rice Margin Protection Premium at Different Coverage Levels for Selected Counties in Arkansas.

Counties	Coverage Levels				
	70%	75%	80%	85%	90%
Arkansas					
Total Premium	$2.16	$4.58	$8.77	$15.37	$25.22
Producer Premium	$0.89	$2.06	$3.95	$7.84	$14.12
Poinsett					
Total Premium	$2.92	$5.69	$10.07	$16.82	$26.21
Producer Premium	$1.20	$2.56	$4.53	$8.58	$14.68
Desha					
Total Premium	$3.51	$6.67	$11.61	$18.90	$28.90
Producer Premium	$1.44	$3.00	$5.22	$9.64	$16.18
Source: Risk Management Agency (RMA) MP Actuarial Data as of on 12/8/2015					

Table 2. Simulated Indemnities by Coverage Level Summary Statistics, for Arkansas, Poinsett, and Desha Counties in Arkansas.

Coverage Level	Mean[1]	SD	CV	Min	Median	Max	Indemnity Percent
Arkansas County							
70	0.00	0.00	---	0.00	0.00	0.00	0.00%
75	0.00	0.00	---	0.00	0.00	0.00	0.00%
80	0.10	1.28	13.16	0.00	0.00	23.96	0.80%
85	0.79	4.55	5.79	0.00	0.00	57.44	5.20%
90	3.86	11.14	2.88	0.00	0.00	90.92	18.00%
Poinsett County							
Coverage Level	Mean	SD	CV	Min	Median	Max	Indemnity Percent
70	0.16	2.33	14.43	0.00	0.00	41.38	0.80%
75	0.54	3.97	7.41	0.00	0.00	55.88	3.00%
80	1.58	7.54	4.76	0.00	0.00	70.38	6.00%
85	4.39	13.20	3.00	0.00	0.00	84.88	18.80%
90	10.85	21.40	1.97	0.00	0.00	115.81	31.60%
Desha County							
Coverage Level	Mean	SD	CV	Min	Median	Max	Indemnity Percent
70	0.09	1.22	14.32	0.00	0.00	23.22	0.60%
75	0.44	3.14	7.12	0.00	0.00	37.86	3.20%
80	1.45	6.90	4.76	0.00	0.00	67.59	6.60%
85	4.37	12.91	2.96	0.00	0.00	98.17	16.80%
90	11.46	21.79	1.90	0.00	0.00	128.75	34.60%

[1]Indemnity statistics are based on 500 simulated iterations.

Table 3. Simulated Net Indemnities by Coverage Level Summary Statistics, Arkansas, Poinsett, and Desha Counties in Arkansas.							
Arkansas County							
Coverage Level	Mean[1]	SD	CV	Min	Median	Max	Positive Net Indemnity Percent
70	-0.89	0.00	0.00	-0.89	-0.89	-0.89	0.00%
75	-2.06	0.00	0.00	-2.06	-2.06	-2.06	0.00%
80	-3.85	1.28	-0.33	-3.95	-3.95	20.01	0.60%
85	-7.05	4.55	-0.65	-7.84	-7.84	49.60	3.20%
90	-10.26	11.14	-1.09	-14.12	-14.12	76.80	9.40%
Poinsett County							
Coverage Level	Mean	SD	CV	Min	Median	Max	Positive Net Indemnity Percent
70	-1.04	2.33	-2.25	-1.20	-1.20	40.18	0.80%
75	-1.98	4.16	-2.10	-2.56	-2.56	54.68	3.00%
80	-2.75	8.21	-2.99	-4.53	-4.53	69.18	6.00%
85	-2.80	15.34	-5.48	-8.58	-8.58	83.68	17.80%
90	0.46	26.41	57.28	-14.68	-14.68	114.61	31.20%
Desha County							
Coverage Level	Mean	SD	CV	Min	Median	Max	Positive Net Indemnity Percent
70	-1.35	1.22	-0.90	-1.44	-1.44	21.78	0.60%
75	-2.51	3.36	-1.34	-3.00	-3.00	36.42	3.00%
80	-3.52	7.67	-2.18	-5.22	-5.22	66.15	6.40%
85	-3.89	15.36	-3.94	-9.64	-9.64	96.73	16.20%
90	0.38	27.30	71.76	-16.18	-16.18	127.31	33.20%
[1]Indemnity statistics are based on 500 simulated iterations.							