



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

# Measures & Issues

## Estimating Crop Insurance Industry Profitability

By Thomas P. Zacharias, Frank Schnapp, Keith Collins, NCIS; David Hazels and David Wharton, Grant Thornton LLP



On behalf of its member companies, NCIS has, over the past several years, sponsored a series of industry-level reports of crop insurance profitability. The purpose of these reports has been to provide a consistent and transparent measure of the profitability of the crop insurance industry. In addition to providing industry profitability measures, these reports have also addressed the risk profile of the industry and issues related to the cost efficiency of the industry delivery system. This article is a summary of the most recent 2009 Grant Thornton (GT) report.<sup>1</sup> The article is organized as follows. First, a background section describing the MPCI program along with role of the private crop insurance industry is provided. This is followed by a summary of the methodology and results of the 2009 GT report. The article concludes with a brief assessment of the GT analysis in relation to alternative perspectives for measuring the profitability and effectiveness of private sector participation in the federal crop insurance program.

### Background of the Federal Crop Insurance Program

*The Business Relationship:* The Federal crop insurance program (hereafter referred to as the Multiple Peril Crop Insurance Program or MPCI) is a public-private partnership between the United States Department of Agriculture's (USDA) Federal Crop Insurance Corporation (FCIC) and private sector crop insurance companies,

referred to as Approved Insurance Providers (AIPs). The FCIC is managed by the USDA's Risk Management Agency (RMA). The formal business relationship between FCIC and the AIPs is contractually defined by the terms of the Standard Reinsurance Agreement (SRA) signed by FCIC and each individual AIP. The SRA establishes the financial and oversight arrangements between the FCIC and the industry. This business relationship has been in place since the early 1980s.

**The Program Itself:** The MPCPI program is available throughout the U.S., but the bulk of the insurance protection is concentrated in the Corn Belt and the Plains states. Corn, soybeans and wheat account for about 80 percent of the premium. For crop year 2008, the MPCPI program provided coverage on 272 million acres (approximately 80 percent of all eligible acreage for major crops) for an insured liability of \$89.9 billion. In 2008, more than 80 percent of total program premium was insured under revenue policies and about 70 percent of premium was on policies with coverage levels of 70 percent or more. In addition to traditional agricultural and horticultural crops, clam and livestock price insurance policies are available, but participation is limited. Beginning with 2007, program acreage has increased primarily due to the introduction of a pasture, rangeland, and forage program.

The overall MPCPI program loss ratio (indemnities divided by total premiums) has been favorable since the mid 1990s, and below 1.0 in most years. Total premium for 2008 was \$9.9 billion with approximately \$8.7 billion in indemnity payments for a loss ratio of 0.88. Prior to the Federal Crop Insurance Reform Act of 1994 and most of the 1980s, the MPCPI program loss ratio averaged well over 1.0.

**RMA's Role:** In its role as regulator, RMA is responsible for oversight of the industry's financial condition, and RMA is charged with ensuring that industry is in compliance with agency regulations and procedures. RMA also negotiates the Standard Reinsurance Agreement on behalf of USDA. In its administrative role, RMA establishes policy language, formulates premium rates, develops underwriting requirements for the program, shares in underwriting gains and losses with the AIPs, makes a delivery expense payment

to AIPs and provides premium subsidies to farmers so that premiums are affordable.

**Industry's Role:** The role of the AIP is to market insurance to farmers, determine farmer eligibility, collect premiums, determine crop loss, and make indemnity payments. AIPs are also responsible for agent and adjuster training, comprehensive reporting of crop insurance program data, program compliance and quality control. Corporate headquarters for most of the AIPs are located primarily throughout the Midwest and Texas. Most AIPs have regional offices across the U.S. Total direct industry employment including agents, adjusters, and company staff is approximately 18,000.

With regard to the financial relationship between FCIC and the AIPs, AIPs are paid an administrative and operating (A&O) payment for the costs incurred in delivering crop insurance to farmers. A&O payments are made by FCIC on behalf of farmers to keep premium more affordable. In conventional lines of insurance, company operating expenses would otherwise be included in the premium. Program delivery expenses include wages and salaries, agent commission, loss adjustment expense, and other operating and overhead expenses such as information technology systems and rental of office space.

Perhaps the most interesting aspect of the financial relationship between FCIC and the AIPs is the sharing of underwriting gains and losses between FCIC and the AIPs. The specifics of the relationship are found in the risk sharing formulas of the SRA. AIPs' underwriting gains and losses represent the difference between the AIPs share of retained premium and retained losses. Retention levels can vary by AIP based on the size of the company, its preference for risk, and its regional distribution of policies. At the national level, the AIPs retain over 80% of program premium. When program loss ratios exceed predetermined thresholds specified in the SRA, FCIC reinsures a portion of these excess losses.

## 2009 Grant Thornton Report

**Methodology:** Because of the unique nature of the MPCPI program, the estimation and comparisons of crop insurance industry profitability must be placed in proper con-

text. The GT report addresses this issue by comparing AIP results for the MPCPI program to the U.S. Property & Casualty (P&C) industry as a whole. In effect, the P&C industry is used as the benchmark for evaluating MPCPI financial performance. Before proceeding, it is important to understand that the two industries have fundamental operational differences that need to be considered in any comparison of their relative financial performance. The most significant

The GT report addresses this issue by comparing AIP results for the MPCPI program to the U.S. Property & Casualty (P&C) industry as a whole.

issue is the limitation placed on crop insurance companies from engaging in business management practices common to P&C insurers. Unlike P&C insurers, crop insurers have no control over the rates they charge their policyholders. Instead, AIPs are required to charge farmers the rates published by RMA. In comparison, most large P&C insurers are able to issue policies through a number of different programs, such as for superior, standard, and substandard risks, each with its own rate level. From an underwriting perspective, crop insurers are required under the SRA to issue policies to any eligible farmer regardless of the risk profile of that individual. With rare exceptions, P&C insurers are allowed to underwrite their risks, that is, to choose whether or not to accept each risk or to modify the coverage being provided in order to improve the acceptability of the exposure. Since these restrictions on the ability to engage in normal rating and underwriting practices increase the financial risk of crop insurers as compared to P&C insurers, the financial incentives and opportunities for participating in the crop insurance industry are somewhat different and need to be addressed in the development of profitability comparisons for the two industries. In addition, P&C insurers have the ability to recoup losses in prior years

through rate increases and schedule rating modifications. Moreover, P&C insurers may modify their premium rate structure depending upon the expectation or realization of investment income.

With their greater ability to select or modify risks, control rates, maintain a variety of programs each with its own rate level, recoup past losses, adjust rates to account for investment income gains or losses, and select the markets in which they operate, P&C insurers have much greater flexibility in their operations in comparison to insurers participating in the MPCCI program. These operational differences have major implications for the specification and definitions of net income which will be discussed shortly.

Another important difference between the crop insurance industry and the P&C industry is the relative size of the two programs. The P&C industry wrote almost \$440 billion in net earned premium in 2008 versus \$8 billion of retained premium for the crop insurance industry. The size difference between the two industries makes it essential to develop income and expense measures as ratios to premium rather than absolute dollar terms.

The initial step in the computation of income and expense ratios is to ensure that premiums for the two industries are stated on a comparable basis. For the P&C industry, premiums are intended to cover the insurer's expected indemnity payments as well as commissions, loss adjustment expenses, and other overhead costs of running the company. For crop insurance, RMA-developed premiums are intended to cover only expected indemnities and do not include company delivery expenses. As stated earlier, RMA provides a separate A&O payment to compensate companies for their costs of program delivery, which may or may not be sufficient to cover an AIP's actual expenses. Restating the premium for the two programs on a consistent basis could be done in either of two ways. One approach would be to include A&O as part of the MPCCI premium, while the alternative would be to exclude expenses from the P&C premium. The first approach distorts the comparison because P&C expenses are a much larger portion of the premi-

um than are MPCCI industry expenses.<sup>2</sup> Comparisons made on this basis could show the MPCCI industry as being more profitable than the P&C industry simply due to the fact that the MPCCI industry is much more cost effective in delivering insurance to its policyholders. The second approach avoids this distortion and has the further advantage that profitability and expenses are measured in relation to the benefits received by policyholders, that is, to the indemnities paid under each program. The GT report adopted the second approach in that this method is both more meaningful and more reliable. More specifically, the GT report places the premiums for the two industries on a consistent basis by removing the expense load portion of P&C industry premiums. With this adjustment, the restated P&C and MPCCI premiums can be considered to represent the expected indemnities for each program. As noted above, the use of these premiums in the denominators of the income and expense ratios measures the financial performance of both industries in dollars of insurance benefits delivered to policyholders.

Next, net income measures for the two industries need to be defined. For the P&C industry, net income is defined as underwriting gains, net of expenses and after reinsurance, plus any investment income. For MPCCI, net income consists of net underwriting gains, following the application of the reinsurance and quota share provisions of the SRA, plus the net difference between A&O reimbursements and industry expenses. This difference between industry expenses and A&O reimbursement is a real cost to the MPCCI industry, just as net expenses are to the P&C industry. The GT report includes the entire amount of the industry's operating expenses, not just those defined as "allowable expenses" by RMA. Since the A&O payments are generally less than the industry's actual expenses, net income for the industry is often substantially less than the net underwriting gains.

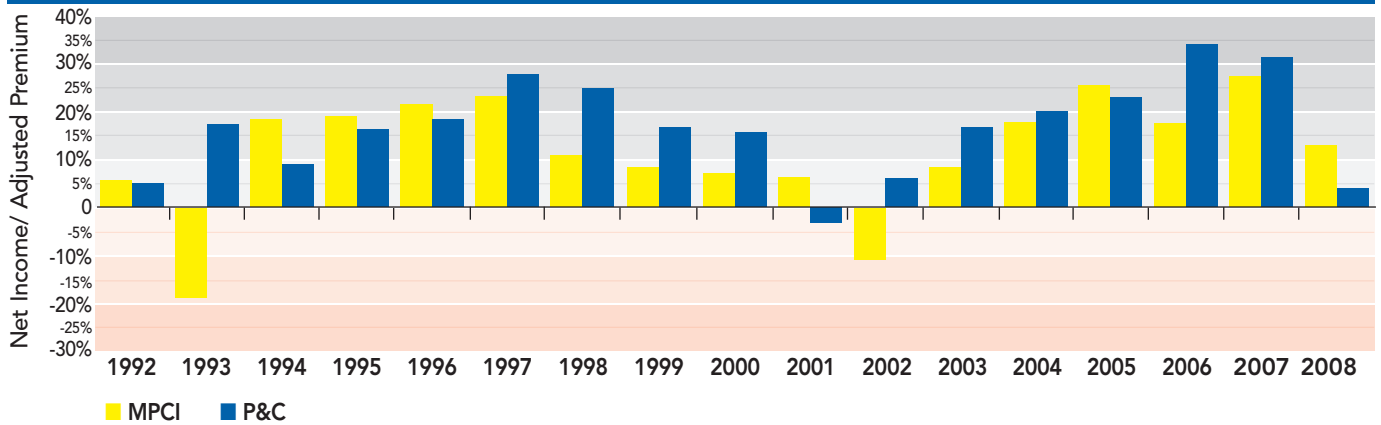
A final consideration in comparing net income between the two industries is the treatment of investment income and commercial reinsurance. P&C industry results shown in the GT report include investment income and are net of all reinsurance. In

contrast, investment income is not included in MPCCI industry net income. The primary reason for this is that the timing of the cash flows for MPCCI premiums and indemnities provides no opportunity for crop insurers to earn investment income on the funds. P&C insurers collect premiums at the time policies are issued and pay claims much later, whereas crop insurance premiums are collected at harvest, essentially at the same time that claims are paid. Although MPCCI carriers have the opportunity to earn investment income, it is not a significant source of profitability associated with being involved in the crop insurance program. The fundamental sources of profitability for AIPs are underwriting gains earned through the SRA and, to a much lesser extent, any potential cost savings in relation to the A&O reimbursement. Investment income is minimal in comparison. Given the diverse structure of companies writing crop insurance, any measure of investment income would be an imputed rather than an actual documented amount and would be based on a number of arbitrary financial assumptions. Consequently, an accurate estimate of investment income for the MPCCI program is neither reliable nor readily available. Conversely, P&C insurers view underwriting gains and investment income as equally important sources of profitability, and structure their business plans accordingly. For P&C insurers, inadequate investment gains can be offset by increases to their rates or a transfer of business to their higher rated programs, which is not the case for MPCCI insurers. While it could be argued that the inclusion of investment income would slightly increase the net income of the MPCCI program, an adjustment for commercial reinsurance would have the opposite effect. Commercial reinsurance is a significant cost item for AIPs, and including commercial reinsurance would reduce the net income of the MPCCI program. In combination, these two adjustments would be expected to reduce MPCCI net income from the level indicated in the GT report.

**Data Sources:** To the maximum extent possible, the GT report uses data that is publicly available. While individual company results are not publicly available due to confidentiality concerns, industry-level data

## MPCI vs. P&C Pre-tax Net Income

Table 1.



for both the P&C industry and the MPCI program is, for the most part, publicly available. Use of data from public sources provides transparency in order that the results can be easily verified by third parties.

Financial results for the P&C industry were obtained directly from *Aggregates and Averages* published by A.M. Best. Although MPCI results are also available in A.M. Best, this information is incomplete and is not considered to be reliable due to accounting adjustments and reinsurance considerations which have no direct bearing on the performance on the MPCI program, nor can it be easily reconciled to MPCI program data available from RMA.

For MPCI, industry-level underwriting gains or losses and A&O reimbursements are also released publicly but not on a regular schedule. Gross and retained premiums for all years were obtained from RMA reports. A&O reimbursements and net underwriting gains for 2008 were based on the survey of AIPs, while prior years were available from RMA. Actual expenses incurred, including expenses not allowed by RMA, were obtained from the survey or from industrywide results published in earlier years.

**Results:** The ratio of MPCI's Pretax Net Income as a percent of Adjusted Retained Premium<sup>3</sup> averaged 14.2% during the period 1992 - 2008. For the same period, the P&C industry's ratio of Pretax Net Income as a percent of Adjusted Net Earned Premium<sup>4</sup> averaged 17.5%. These results are presented on an annual basis in Table 1.

For ten of the 17 years, the P&C industry was more profitable on this basis than the MPCI industry. The P&C industry realized an annual net loss in only one year, 2001, primarily due to the extraordinary losses associated with September 11. The MPCI program lost money in two years between 1992 and 2008 (1993 and 2002). In terms of risk, the volatility of the MPCI industry's historical pre-tax net income ratio (as measured by the standard deviation) was 12.3%, while volatility for the P&C industry was only 10.1%. In other words, the MPCI industry is less profitable than the P&C industry despite being riskier than P&C.

The GT report also analyzes adequacy of A&O reimbursements in relation to AIP expense outlays to deliver the program. A&O is paid as a percentage of gross premiums using payment rates specified in the SRA. Actual delivery expenses are computed as a percent of gross premiums, consistent with the conventional approach used by the P&C insurance industry and supported by the language of the Federal Crop Insurance Act. As shown in Table 2, the government has imposed dramatic reductions in A&O reimbursements over time, from about 35% of premium in the early 1990's to roughly 20% in 2008. Further reductions imposed by the 2008 Farm Bill came into force during 2009 but are not included in the chart. In response to the rapid growth of the program and cutbacks in A&O, the industry has become much more cost effective over time. Actual delivery expenses reported by the AIPs show the

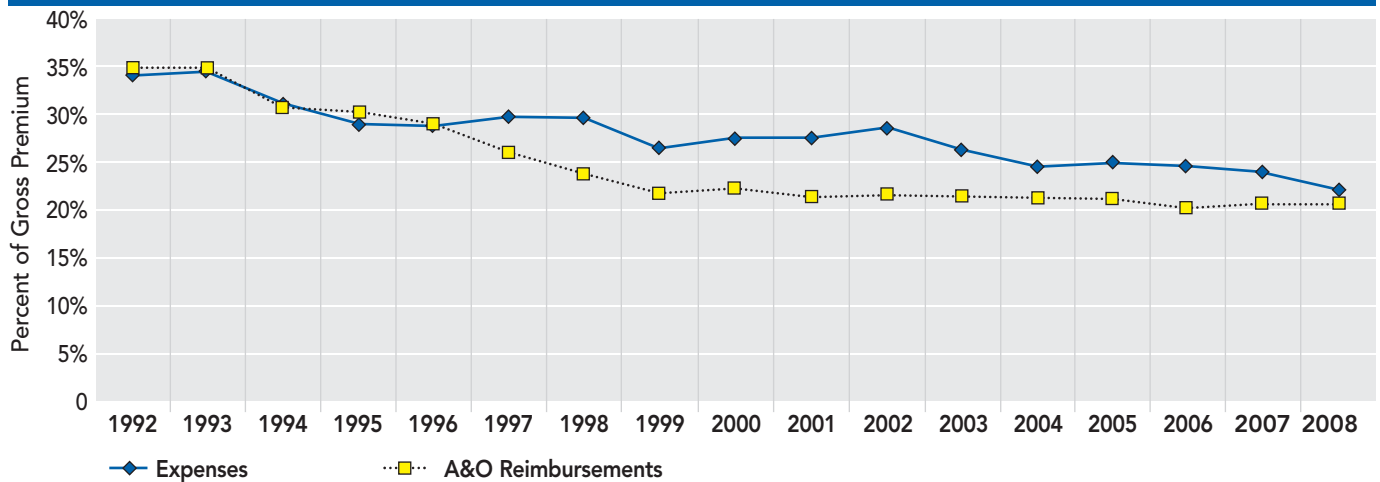
same downward trend as a percent of gross premiums as A&O, yet they remained higher than the average A&O reimbursement rate in every year from 1997 through 2008. The shortfall of A&O reimbursements to cover industry expenses reached a maximum in 2002 of 6.9% of premium but shrank to 1.6% of premium by 2008. Since net income is the sum of the industry's pure underwriting gains or losses and the gain or loss on expense reimbursements, any A&O shortfall is a direct penalty to the profitability of the industry.

### Comparison to the recent Milliman studies

One issue not addressed in the GT report is an evaluation of the relative merits of the selected approach to measuring profitability as compared to alternative methods, such as the approach employed in the two recent Milliman studies prepared on behalf of RMA.<sup>5</sup> Milliman adopts return on equity as its profitability measure, computed as the industry's pure underwriting gains plus investment income, with the total divided by industry surplus.<sup>6</sup> The Milliman analysis has a number of easily identifiable shortcomings,<sup>7</sup> including the failure to recognize that A&O reimbursements have been insufficient to cover all of the industry's expenses, as well as the exclusion of commercial reinsurance from the industry's net income. The comparison of historical results to a "reasonable rate of return" in the Milliman reports can also be misleading in that it creates the impression that the indus-

# MPCI Expenses vs. A&O Reimbursements

Table 2.



try earns excessive profits. In reality, the reports cannot be used to evaluate the current and expected profitability of the program in that the report fails to account for recent reductions in A&O imposed by the 2008 Farm Bill as well as changes to the program itself over time. The use of an experience period including only a single catastrophic weather event also raises doubts regarding the usefulness of the Milliman result as an estimate of the historical performance of the program. The Milliman report itself cautions “against drawing any strong conclusions on the adequacy or excessiveness of the historical returns,” noting that the inclusion of a second catastrophic year similar in magnitude to 1993 would reduce the industry’s return on equity from 17.1% to 15.6%.<sup>8</sup>

Perhaps the most questionable aspect of the Milliman study is its evaluation of equity capital for the MPC I industry. Since equity is the denominator of the Return on Equity ratio, any error in this figure can grossly misstate the industry’s profitability. In addition, since equity is the basis on which the investment income in the numerator of the Return on Equity ratio is calculated, any error in determining equity can distort the Return on Equity through this means as well. Rather than obtaining the actual equity for individual AIPs or using the minimum capital requirement imposed by Federal regulations for participation in the program, Milliman develops an estimate of the equity for the MPC I

industry as a whole by allocating the equity of the P&C industry to the MPC I industry. The allocation formula is essentially a crude measure of the volume of each line of insurance. In theory, the objective of the procedure is to allocate equity to each line of insurance in proportion to its risk. In practice, the method assumes that the risk for a line of insurance is measured by the sum of its premiums and unpaid loss and premium reserves. Not only is this method without theoretical support, the concept is seriously flawed, particularly for MPC I and other high risk types of catastrophic property insurance which carry minimal loss reserves due to the rapid settlement of claims. In addition, the assumption that capital can be allocated across the P&C industry is unrealistic from a real-world perspective. While allocation of capital can be used internally by an individual insurer to judge the relative performance of its individual market segments, the idea that capital can be reallocated to other insurers to meet the objectives of a computational method is clearly not legitimate. The GT method avoids the shortcomings of the Milliman approach by focusing on measurable and verifiable results without reliance on allocation methods or arbitrary assumptions.

## Summary and Conclusions

Results of the 2009 GT update continue to indicate that the MPC I program does not

possess any profitability or risk-return advantages relative to the P&C industry. Instead, the MPC I industry is less profitable as well as being more risky than the P&C industry. Furthermore, the MPC I program is delivered on a much more cost effective basis than the P&C industry. These results are consistent with industry studies in previous years. It is hoped that these results along with the discussion on methodological issues involved in measuring industry performance will improve our understanding of the crop insurance program.

## Footnotes

- 1 Grant Thornton LLP was engaged by NCIS to update the “Federal Crop Insurance Program Profitability and Effectiveness Analysis 2008 Update” with 2008 results. The 2009 Update is available at [http://www.ag-risk.org/NCIS-PUBS/SpecRPTS/GrantThornton/Grant\\_Thornt\\_on\\_Report-2009\\_FINAL.pdf](http://www.ag-risk.org/NCIS-PUBS/SpecRPTS/GrantThornton/Grant_Thornt_on_Report-2009_FINAL.pdf).
- 2 60.2% vs. 27.7% of adjusted premium over the 1992-2008 period, per GT Exhibit 5.
- 3 Adjusted for the 5% Quota Share provision in effect from 2005 through 2008.
- 4 Adjusted to remove expenses, as discussed above.
- 5 The Milliman reports can be found at [http://www.rma.usda.gov/pubs/2009/milliman\\_reasonablerate.pdf](http://www.rma.usda.gov/pubs/2009/milliman_reasonablerate.pdf) and <http://www.rma.usda.gov/pubs/2009/millimanhistoricalrate.pdf>, with a corrected version of Table 8 at <http://www.rma.usda.gov/pubs/2009/millimanhistoricalratetable8.pdf>.
- 6 Surplus represents the book value of an insurer under Statutory Accounting Principles and corresponds closely to GAAP book value. Surplus is used interchangeably with capital and equity in this discussion.
- 7 See “Industry Response to Milliman Reports” National Crop Insurance Services, Inc., October 5, 2009.
- 8 Milliman Historical Rate of Return Analysis, p. 28.