Whose Line is it Anyway?
Federal Crop Insurance Ratemaking and Profitability Projections

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Richard Bill, FCAS, MAAA
R. A. Bill Consulting
Bill.consulting@frontier.com

Overview

- Coverage
- Perils Insured
- Federal/Private Partnership
- Ratemaking Considerations
- Profitability Considerations
- Standard Reinsurance Contract (SRA)
- Projected Profitability

Coverage Provided

- The policy Guarantees the yield of the crop or the revenue from the crop
- Loss is not one event but is based on crop production (and price for Revenue Insurance) at the end of the season

Perils Insured

- Too Dry (Large Area)
- Too Wet
- Hail
- Insects
- Prevented Planting
- All other Risks except poor farming practices
- Price (Revenue products only)

Seven Prerequisites of Insurable Risk

#7-"Unlikely to produce loss to a great many insured units at the same time"

Mehr & Cammack; Principles of Insurance; 1972

Federal/Private Partnership

- Began strictly as a Govt Program in 30's
- Small program until Private Industry began participating in the early 80's
- Private Companies took over all delivery in the 90's
- Safety Net for Nation's Farmers
- Intended to replace Free Ad Hoc Disaster Payments

Growth of Crop Program

	1981	2009
Acres Insured	~ 50 M	265 M
Premium	377 M	8.9 B
Average Premium Subsidy	<30%	61%
Expense Reimbursement	32%	~18%
# Private Companies	30	16

Note: Includes Business Produced by Govt Agents

Federal Government Role

- Programs and Policy language
- Rates (All companies charge same rates)
- A&O Expense reimbursement to the companies (Expenses are not built into the rate)
- Pays a portion of the Farmer's premium (about 60% in addition to the expense reimbursement)
- Oversight
- Provides Reinsurance to Private Companies
- Program administered thru the Risk Management Agency (RMA) which is part of the United States Dept. of Ag (www.rma.usda.gov)

Private Industry Role

- Provides distribution system through their agents
- Issues policies on their paper
- Adjusts Claims
- Retains risk after Government Reinsurance

Two Types of Plans

- Individual Farmer Plan
  - Guarantee based on Farmer's actual production
  - Up to 10 years of individual farmer yield history used to establish the guarantee
- Group Plan
  - Guarantee based on yield history of a larger area or an index
  - Basis Risk

Individual Farmer Guarantee

Yield Product Guarantee

- Yield Guarantee=Actual Production History (APH) X Coverage Level

- Example - 100 Bushels per acre X 75% Coverage Level = 75 Bushels per acre

Revenue product Guarantee

- Revenue Guarantee=APH X Anticipated Price Per Bushel X Coverage Level
- Example - 100 Bushels per acre X $2 per Bushel X 75% = $150 per acre

Coverage Level

- Generally from 50% to 85%
- Acts like a deductible
- Example – 75% coverage level is really a 25% Deductible.
- A 25% loss is needed before any payment is made

Unique Ratemaking Considerations

- Paper in the Winter 2000 Forum by Schnapp, Driscoll, Zacharias, and Josephson which describes ratemaking in detail
- Long Experience Period Needed (> 30 Yrs)
  - Variability of Loss Ratio
  - Cyclical Weather patterns
- Revenue Coverage – Every Farmer could have a Loss the same year

Recent Paper on Ratemaking

Search RMA Website-www.rma.usda.gov

"A Comprehensive Review of RMA APH and COMBO Rating"

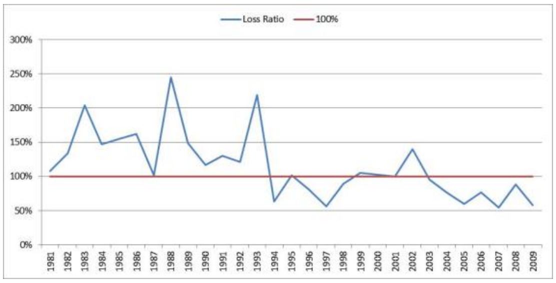
March 15, 2010

Profitability Considerations

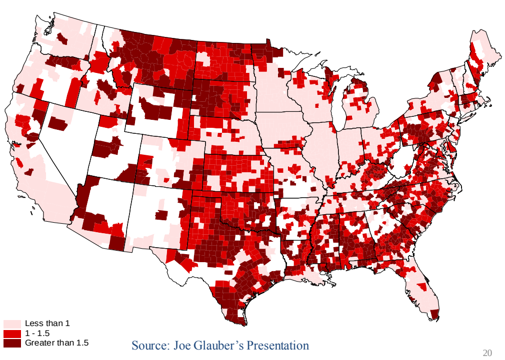
Standard Reinsurance Contract (SRA)

- Standard Contract for all of the Private Companies that specifies all the Terms of the Govt/Private Sector Partnership
- New Contact Just negotiated that went into effect July 1, 2010 for 2011 Crop Year
- Savings to Govt of $6 B over 10 years

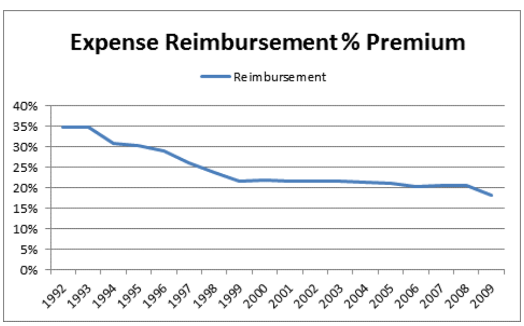
Federal Crop Loss Ratios



Aggregate Loss Ratio, 1981 - 2002



Source: Joe Glauber's Presentation



Projected Profitability

- 1981-2009 Average Loss Ratio was 115%
- Much better recently (improvement in experience or weather cycle?)
- Little or no investment income
- Highly catastrophe line requiring higher risk charge
- Low expense reimbursement (A&O)
- Can Companies make Money???

Standard Reinsurance Contract (SRA)

- Combination of Stop Loss and Quota Share
- Each State stands on its own
- Company places each risk into one of two categories (funds) based on their perception of profitability of the risk
- Each of the two funds have different reinsurance terms for Stop Loss and Quota Share

Categories of Funds

Assigned Risk		Commerical Fund
Policies that are significantly under priced with the risk being primarily born by the Federal Govt		Policies that the companies chose to take the maximum amount of risk

Quota Share Terms

- No Ceding or profit sharing Commission
- Up to 65% of the Commercial Fund can be ceded (usually 100% is retained by the company)
- 80% of the Assigned Risk fund is automatically ceded to the Govt.

Stop Loss Terms-Commercial Fund SRA Differences by State

- Stop Loss terms are applied to each state separately
- States with favorable past loss ratios have different Reinsurance terms than all other States i.e., IL, IN, IA, MN, NE (State group #1 representing 34% of the 2009 Premium
- State Group 3 States are underserved States
- All remaining States are Group 2
- Stop loss Terms for Groups 2 & 3 are the same and are much more favorable than Group 1
- Companies retain minimal risk for Assigned Risk policies

Commercial Fund Stop Loss Coverage State Group 2 – 51.5% Max Loss Retained

Retention:	100% LR		
	Layer	Ceded to Govt	Points Retained
1st Layer	60 Pts	57.5%	25.5 Pts
2nd Layer	60 Pts	80.0%	12 Pts
3rd Layer	280 Pts	95.0%	14 Pts
4th Layer	Above 500%	100.0%	0 Pts
Total			51.5 Pts

Commercial Fund Stop Loss Premium
State Group 2- 42.63% Max Gain Retained

Below 100% Loss Ratio	Layer	Charge	Pts Retained
1st Layer	35 Pts	2.5%	34.13 Pts
2nd Layer	15 Pts	60.0%	6.00 Pts
3rd Layer	50 Pts	95.0%	2.50 Pts
Total			42.63 Pts

2010 Final SRA Commercial Fund Gain or (Loss)
Applies to each State Separately

LOSS RATIO	State Group 1 Profit (Loss)	State Groups 2&3 Profit (Loss)
550%	-94.0%	-51.5%
500%	-94.0%	-51.5%
400%	-84.0%	-46.5%
250%	-69.0%	-39.0%
200%	-57.0%	-33.5%
160%	-39.0%	-25.5%
145%	-29.3%	-19.1%
130%	-19.5%	-12.8%
110%	-6.5%	-4.3%
100%	0.0%	0.0%
90%	7.5%	9.8%
80%	15.0%	19.5%
70%	22.5%	29.3%
50%	32.3%	40.1%
0%	34.8%	42.6%

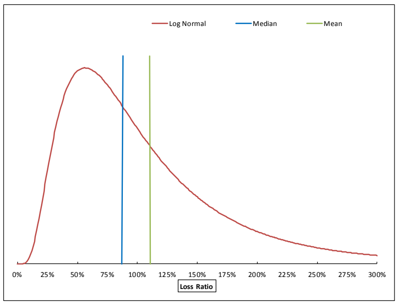
Mandatory Quota Share

- 6.5% of all net Premium and Losses are then Ceded to the Govt.
- This effectively reduces the expected dollars of underwriting gain by 6.5%

Modeling Profitability

- Most states appear to have Lognormal Distribution with Original Coefficient of Variation of between 50% and 125%
- I used Lognormal Distribution for illustration purposes

State XYZ-Commercial Fund
Lognormal Loss Ratio Distribution
Mean = 110%; Median = 88%
Coefficient Of Variation = 75%



Calculation of Expected Profitibility

State XYZ-Commerical Fund-State Group 2
Expected Loss Ratio = 110%; COV = 75%

(1) Loss Ratio From	(1) Loss Ratio To	(2) Cumulative Distribution F(X)	(3) Incremental Area	(4) Avg Loss Ratio	(5) Company Retained Gain (Loss)*
0%	50%	19.9%	19.9%	36.0%	40.8%
50%	65%	32.5%	12.6%	57.5%	37.1%
65%	100%	57.6%	25.1%	81.5%	18.1%
100%	160%	81.5%	23.9%	125.8%	-11.0%
160%	220%	91.5%	10.0%	185.7%	-30.6%
220%	500%	99.5%	8.0%	292.9%	-41.1%
500%	Plus	100.0%	0.5%	629.9%	-51.5%

Weighted Average of Col (3) and Col (5) = Expected Gain = 8.1%

*Based on 2011 Crop Year Reinsurance Contract (SRA)

Long Term Expected Underwriting Gain based on Log Normal Distribution
State Group 2 and 3

Long Term	Coefficient of Variation					
Loss Ratio	50%	75%	90%	100%	110%	120%
80%	19.6%	20.1%	20.6%	21.0%	21.4%	21.8%
90%	14.2%	15.9%	16.9%	17.5%	18.1%	18.7%
100%	9.1%	11.9%	13.3%	14.2%	15.0%	15.7%
110%	4.3%	8.1%	9.9%	11.0%	12.0%	12.9%
120%	-0.2%	4.5%	6.7%	8.0%	9.1%	10.2%
130%	-4.3%	1.1%	3.7%	5.1%	6.5%	7.7%
140%	-8.0%	-2.0%	0.8%	2.5%	3.9%	5.3%
150%	-11.4%	-4.9%	-1.8%	-0.1%	1.5%	3.0%

Long Term Expected Underwriting Gain based on Log Normal Distribution
State Group 1

Long Term	Coefficient of Variation					
Loss Ratio	50%	75%	90%	100%	110%	120%
80%	12.9%	12.1%	12.1%	12.1%	12.3%	12.5%
90%	7.3%	7.4%	7.8%	8.1%	8.5%	8.9%
100%	1.7%	2.8%	3.7%	4.2%	4.8%	5.4%
110%	-3.9%	-1.7%	-0.4%	0.4%	1.2%	2.0%
120%	-9.2%	-6.0%	-4.3%	-3.3%	-2.3%	-1.3%
130%	-14.4%	-10.2%	-8.1%	-6.8%	-5.6%	-4.5%
140%	-19.2%	-14.2%	-11.7%	-10.2%	-8.8%	-7.5%
150%	-23.8%	-18.0%	-15.1%	-13.4%	-11.8%	-10.4%

Other Considerations

- The Profit on the previous pages only applies to the Commercial Fund.
- Underwriting Gain Dollars reduced by:
  - Assigned Risk Fund cession
  - 6.5% Mandatory Quota Share
- Does not consider any shortfall of the A&O Expense Allowance

Final Considerations

- Profitability varies considerably from state to state
- Complex models are available to help decide which fund each policy should be assigned

2012 Farm Bill

One Proposal

- Babcock Proposal – Substitute free Government Revenue coverage on a County basis for some portion of current Farm subsidies
  - Distributed by Federal Government
  - Eliminates Underwriting Gains and expense reimbursement to Private companies
  - Private Companies would only provide unsubsidized coverage for local perils such as hail