

Crop Insurance CS - 11 Seminar on Reinsurance Casualty Actuarial Society

Southampton, Bermuda

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June 6-7, 2013

Overview of Presentation

- Brief History of crop insurance in the United States
- Summary of MPCl results and insurance policies
- Discussion of SRA and typical third party reinsurance
- Price risk and the implications on reinsurance
- Future outlook of US crop insurance
 - Unless noted, all results and figures pertain to the FCIC MPCl program (excludes private hail policies and FCIC livestock program)
 - All premiums (loss ratios) exclude the FCIC A&O subsidy

Abbreviations and Definitions

- A&O Subsidy - Administrative and Operational Expenses paid to AIP by FCIC
- AGR - Adjusted Gross Revenue
- AIP - Approved Insurance Provider
- APH - Actual Production History
- AR – Assigned Risk Fund
- ARH – Actual Revenue History
- CAT - Catastrophic Coverage 50% of APH and 55% of price
- CF – Commercial Fund
- DOL – Dollar Plan of Insurance
- FCIC - Federal Crop Insurance Corporation
- FSA – USDA Farm Services Agency
- GRIP - Group Risk Income Plan
- GRP - Group Risk Plan
- LGM - Livestock Gross Margin
- LRP - Livestock Risk Protection
- MPCl - Multi-peril Crop Insurance
- NASS - United States Department of Agriculture - National Agricultural Statistics Service
- NOAA-CPC - National Oceanic and Atmospheric Administration - Climate Prediction Center
- RAINF – Rainfall Index
- RMA - Risk Management Agency of the United States Department of Agriculture
- RP – Revenue Protection
- RPHPE – Revenue Protection Excluding Harvest Option
- SRA - Standard Reinsurance Agreement (between AIP and FCIC)
- SOB - Summary of Business from RMA (Insurance Experience of MPCl)
- TDO – Tree Dollar Plan of Insurance
- USDA - United States Department of Agriculture
- VI - Vegetation Index
- YDO – Yield Based Dollar Plan
- YP – Yield Protection

BRIEF HISTORY OF UNITED STATES CROP INSURANCE

History of US Federal Crop Insurance Program

- FCIC was created in 1938 after severe droughts in 1934 and 1936 (Dust Bowl)
- Between 1938 and 1980 program was more of a free disaster coverage
- In 1980 Act changed to traditional insurance program with subsidy to encourage participation, but only major crops and producing regions
- Major droughts (1983 and 1988-89) and flood (1993) led to Federal Crop Insurance Reform Act of 1994
 - CAT coverage introduced (to be eligible for other federal programs)
 - Expanded coverage to additional crops
- Agriculture Risk Protection Act – 2000
 - Increased subsidies and insurance options
 - Increased participation in revenue policies
- 2011 RMA modified SRA and introduced COMBO policies
 - Made SRA less favorable to AIPs and reduced rates for most crops and states
 - Limited A&O Subsidy and agents' commissions
 - COMBO eliminated favorable policy terms selections (price/rates) for most farmers
- 2013 Farm Bill (not passed yet)
 - Additional insurance option allows growers to buy MPCl and country based indexed insurance
 - Eliminate “direct payments” from FSA

Federal vs. Private Crop Insurance

■ Federal

- Premium subsidy to encourage participation
- Rates administered by RMA, no rate competition between AIPs
- Insured on a unit or farm level basis
- Named peril coverage; typically only “in the field”
- Designed to be an encompassing risk management tool

■ Private/Hail

- No subsidy provided
- Rates may be regulated by states; competition between AIPs
- Typically insured on an acre basis
- Named perils (hail, fire, transport, storage)
- Designed to fill gaps from MPCl
- Payments made quickly after peril (although some plans pay after harvest)

US Federal Crop Insurance Subsidy

- Premium subsidy was almost \$7B in 2012 compared with \$11B overall premium (63%)
- Subsidy decreases with higher coverage levels
- Following table shows standard subsidy factors:

Coverage Level	50%	55%	60%	65%	70%	75%	80%	85%
Premium Subsidy	67%	64%	64%	59%	59%	55%	48%	38%
Insured Premium Share	33%	36%	36%	41%	41%	45%	52%	62%

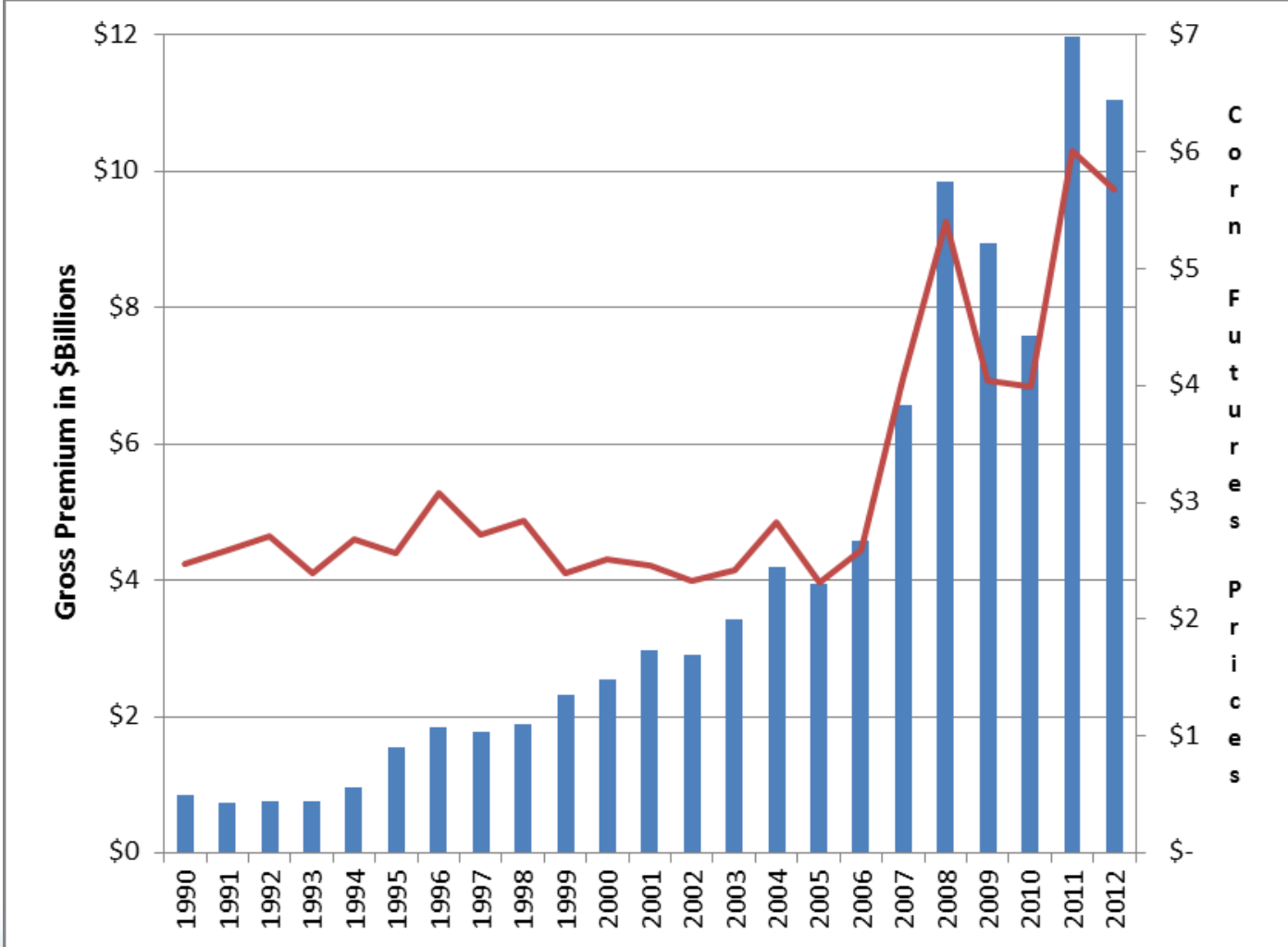
- Different Subsidies for various plans/units
- CAT policies charged flat \$300/crop per county

NOTE: Above figures do not include A&O Subsidy, RMA administration costs, etc.

SUMMARY OF FEDERAL CROP INSURANCE RESULTS

Includes all policies reinsured by the SRA; does not include livestock price reinsurance agreement (LPRA)

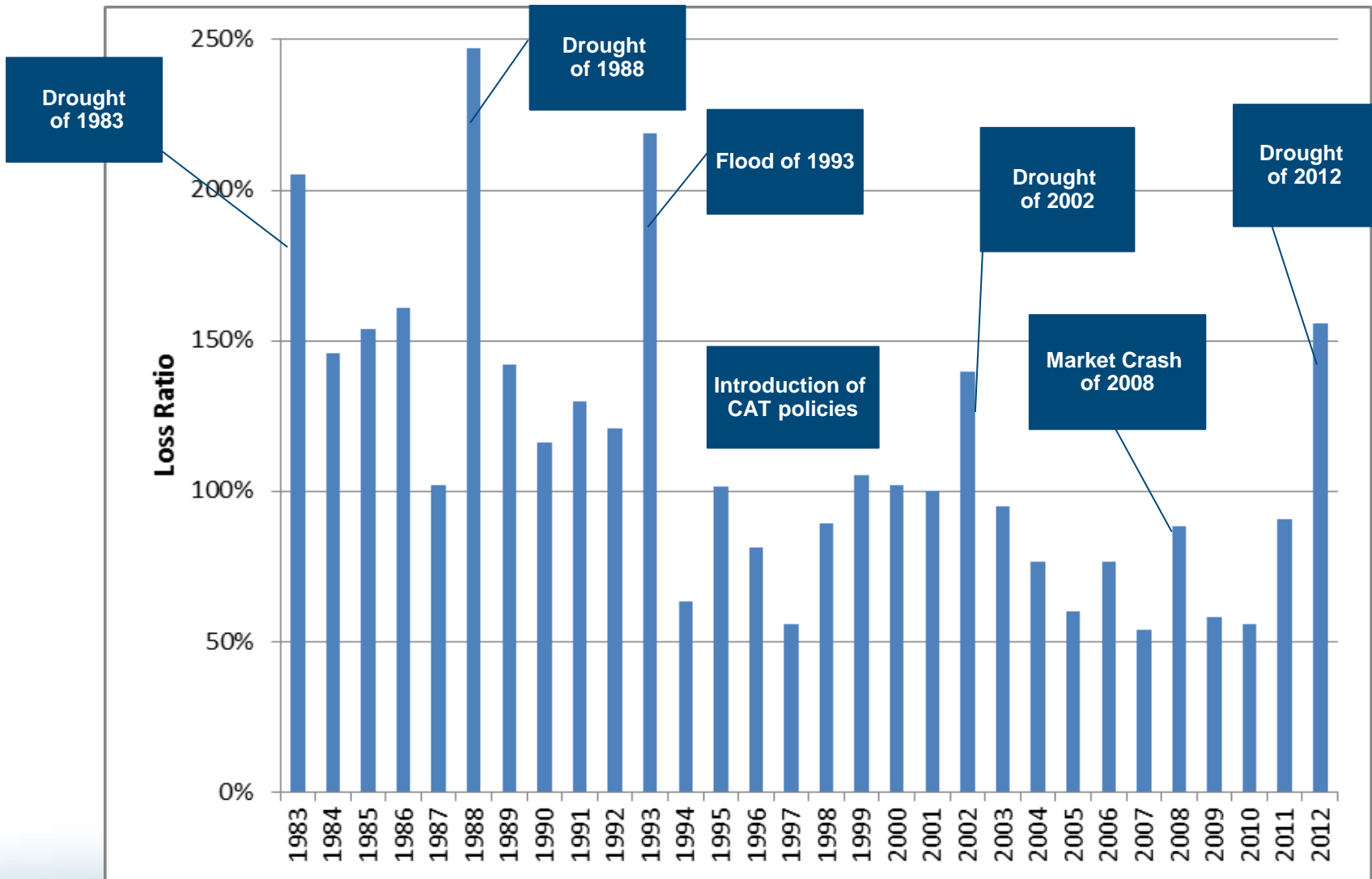
MPCI Gross Premium vs. Corn Prices



Note: Corn Future Price is the average February price of the December Future
 Source: RMA Summary of Business and Bloomberg

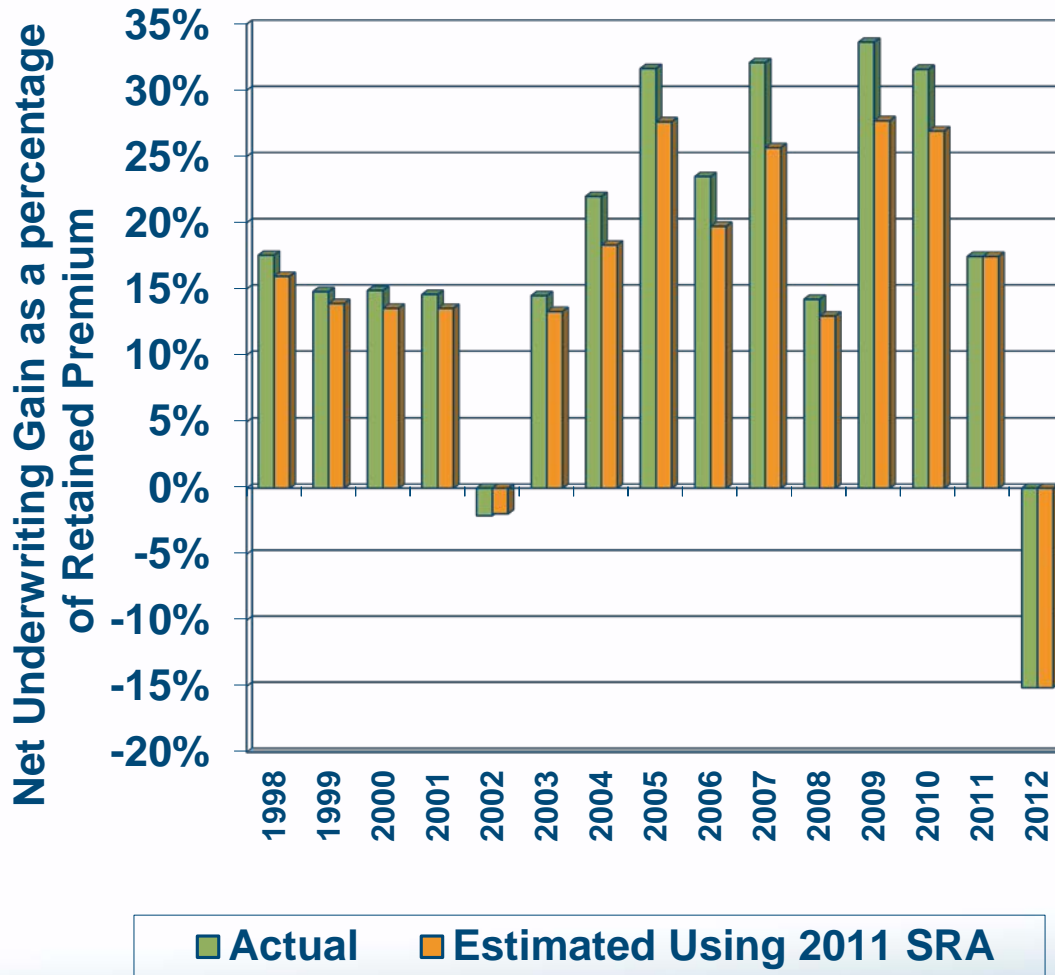


MPCI Gross Loss Ratios



Source: RMA – Summary of Business as of May 15, 2013

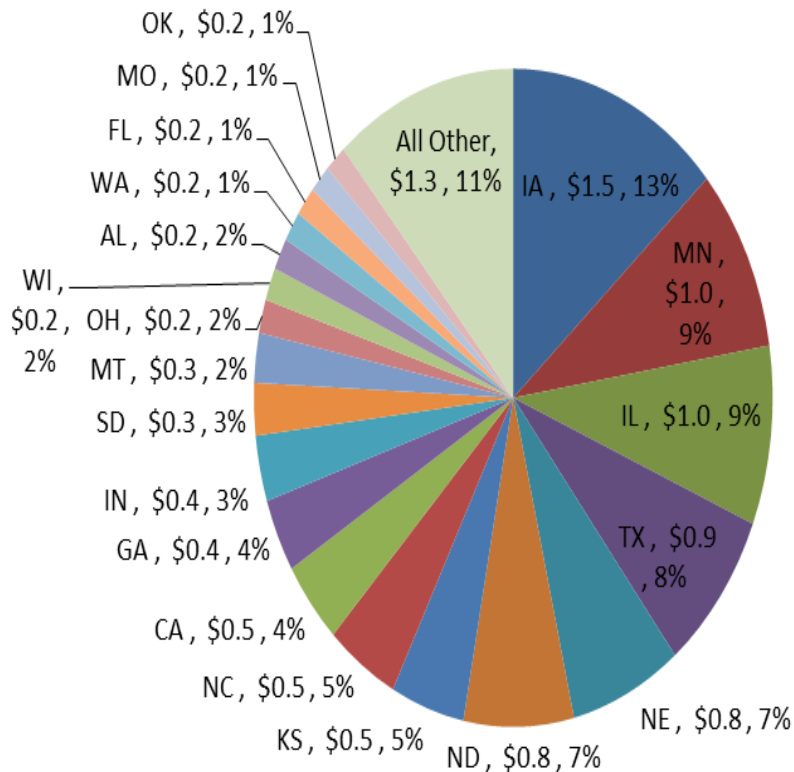
Combined AIP Net Underwriting Gain



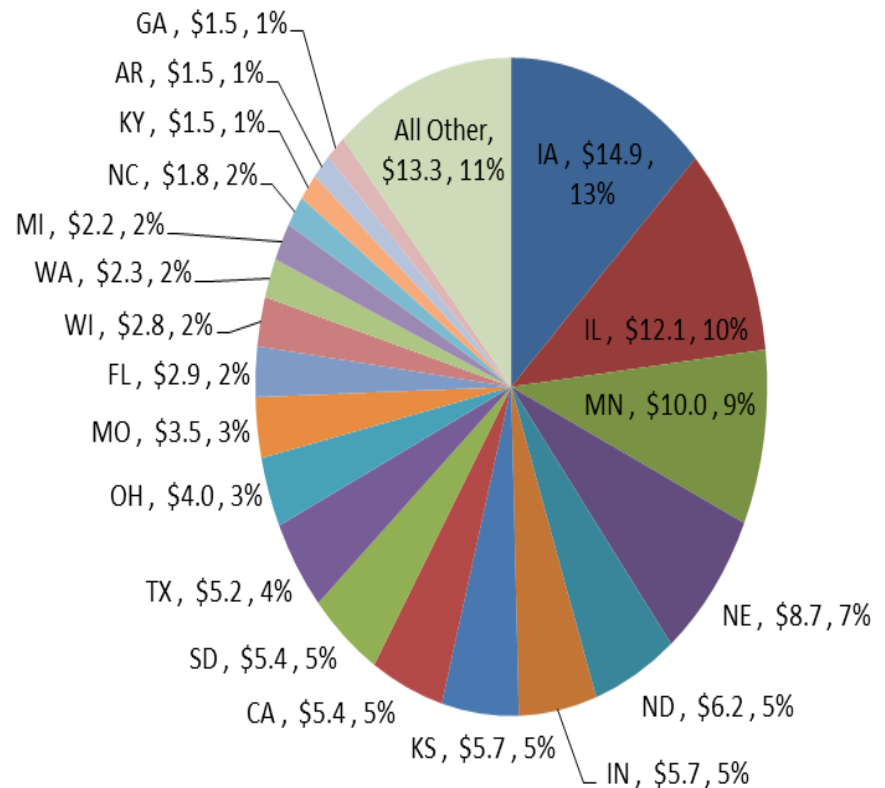
Source: USDA-RMA Reinsurance Reports online as of May 23, 2013

MPCI Insured Liability By State in \$B

1993 Insured Liability By State



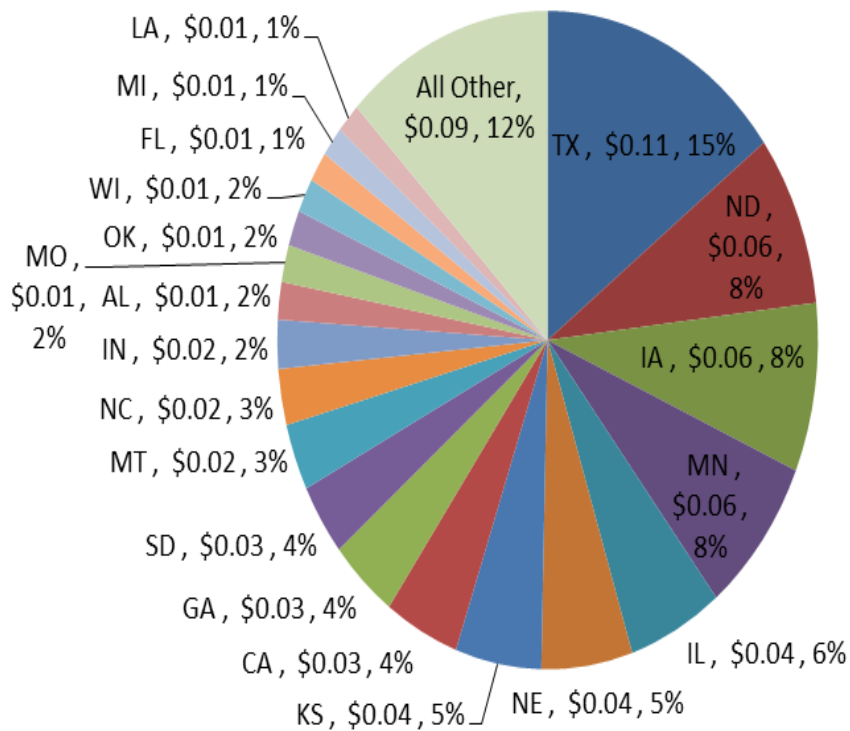
2012 Insured Liability By State



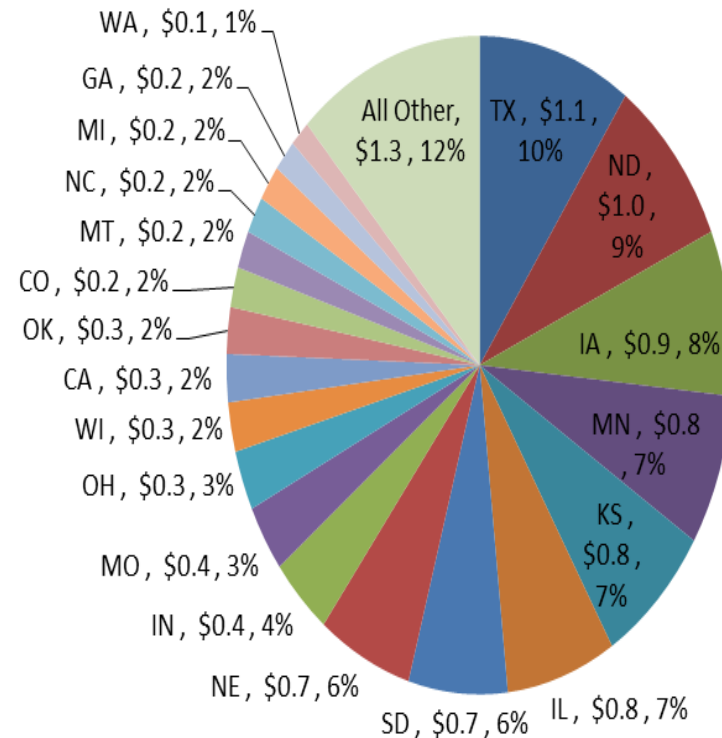
Source: RMA – Summary of Business as of May 15, 2013

MPCI Gross Premium By State in \$B

1993 Gross Premium By State

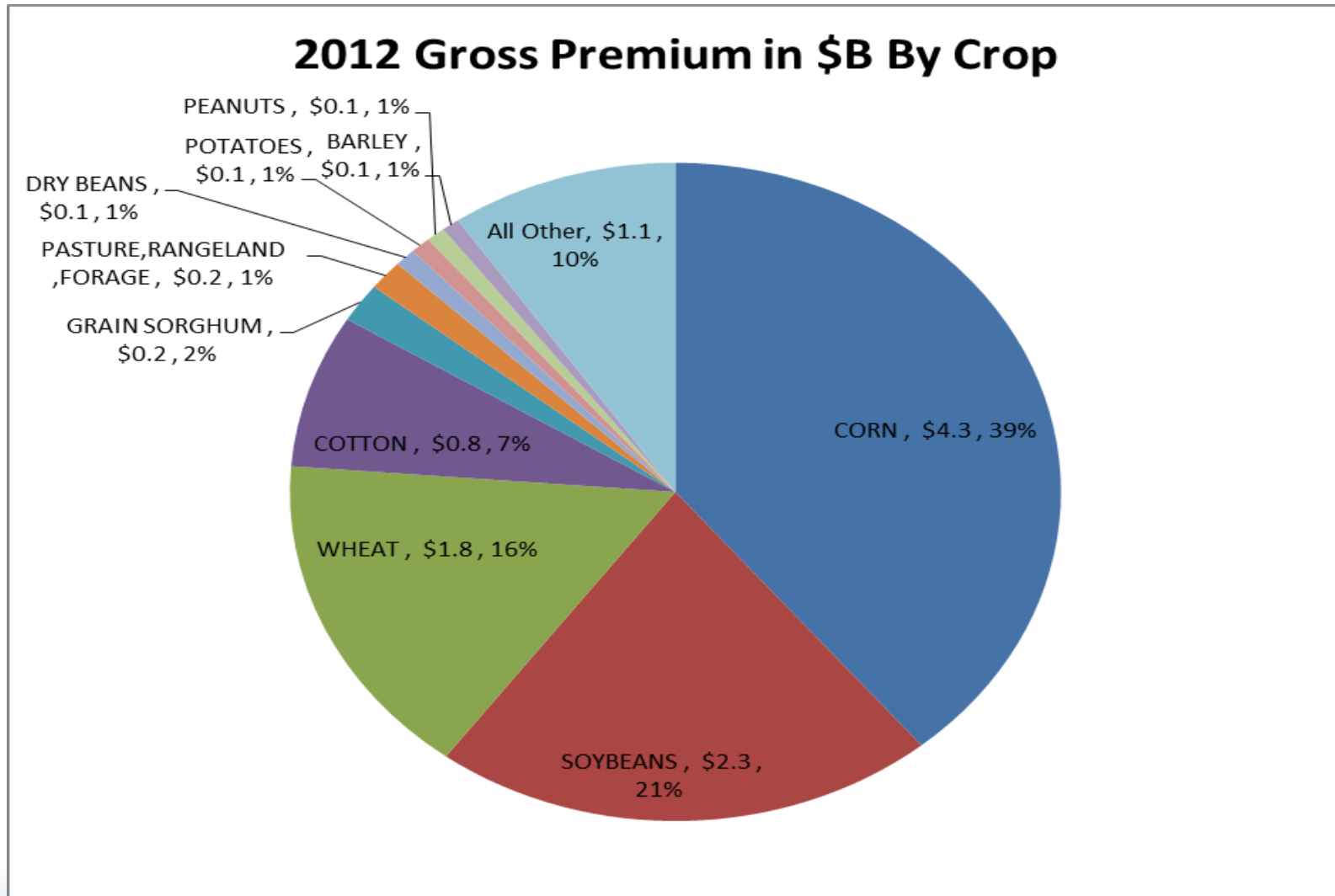


2012 Gross Premium By State



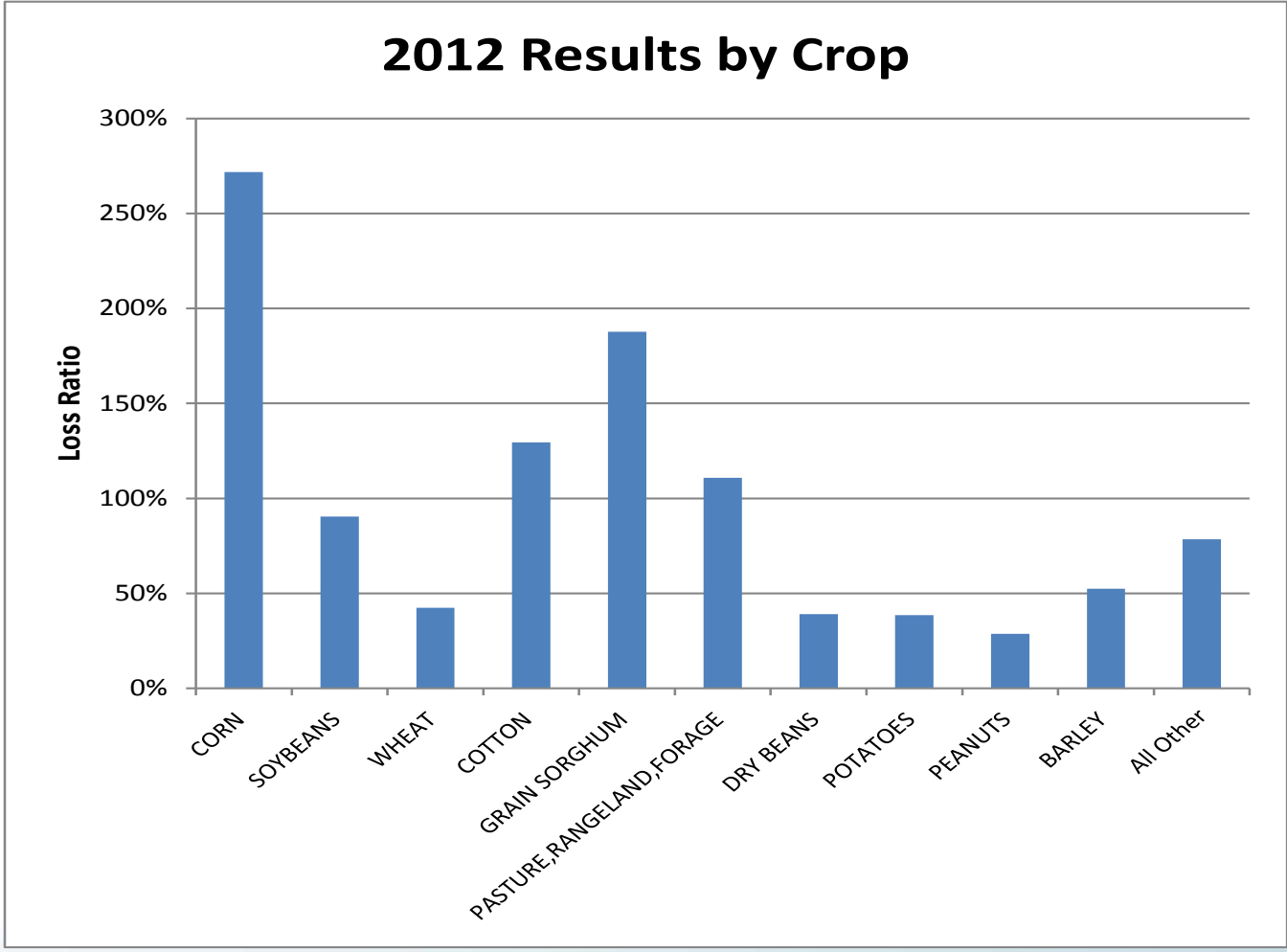
Source: RMA – Summary of Business as of May 15, 2013

MPCI 2012 Gross Premium By Crop



Source: RMA – Summary of Business as of May 15, 2013

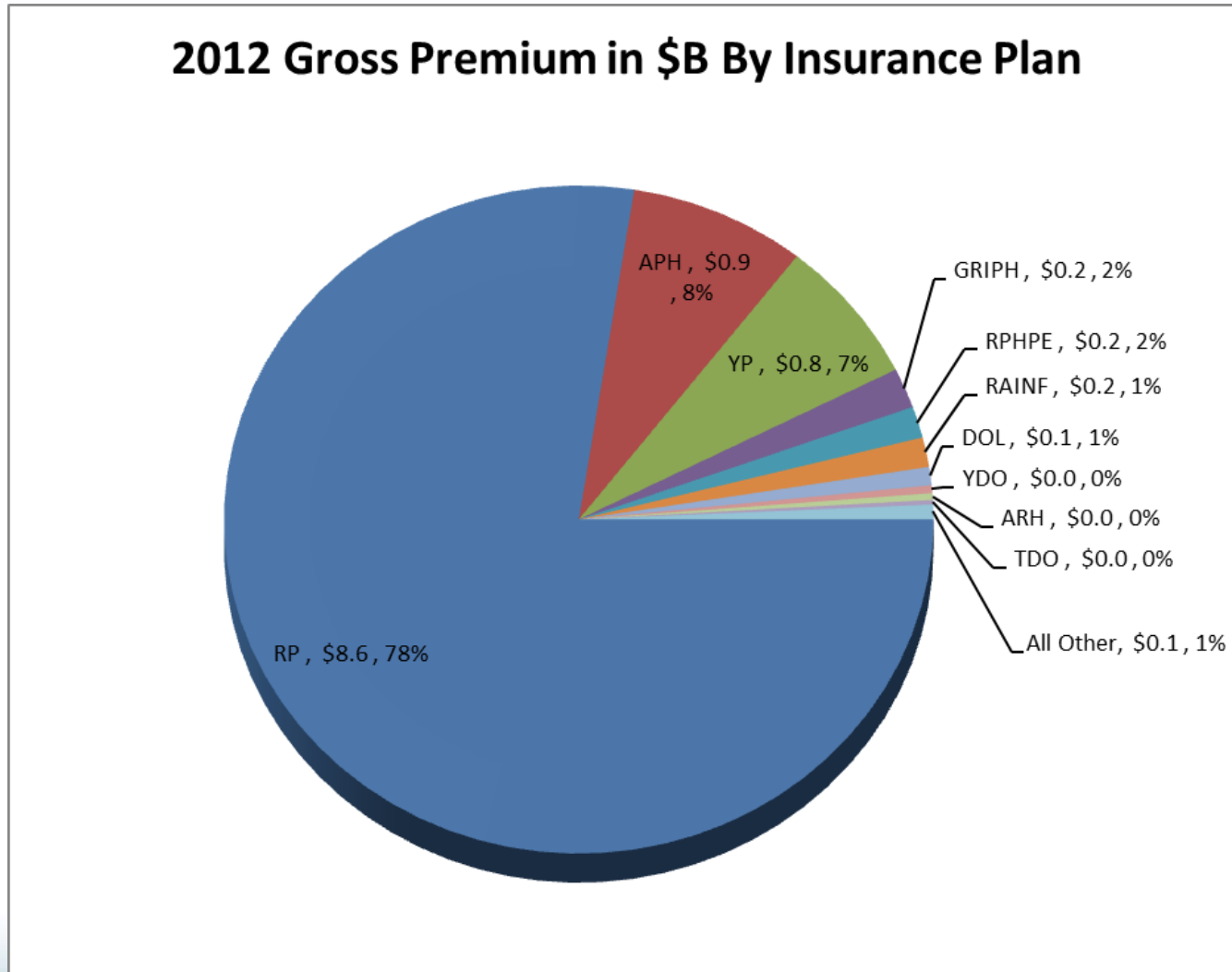
MPCI 2012 Gross Loss Ratio By Crop



Source: RMA – Summary of Business as of May 15, 2013

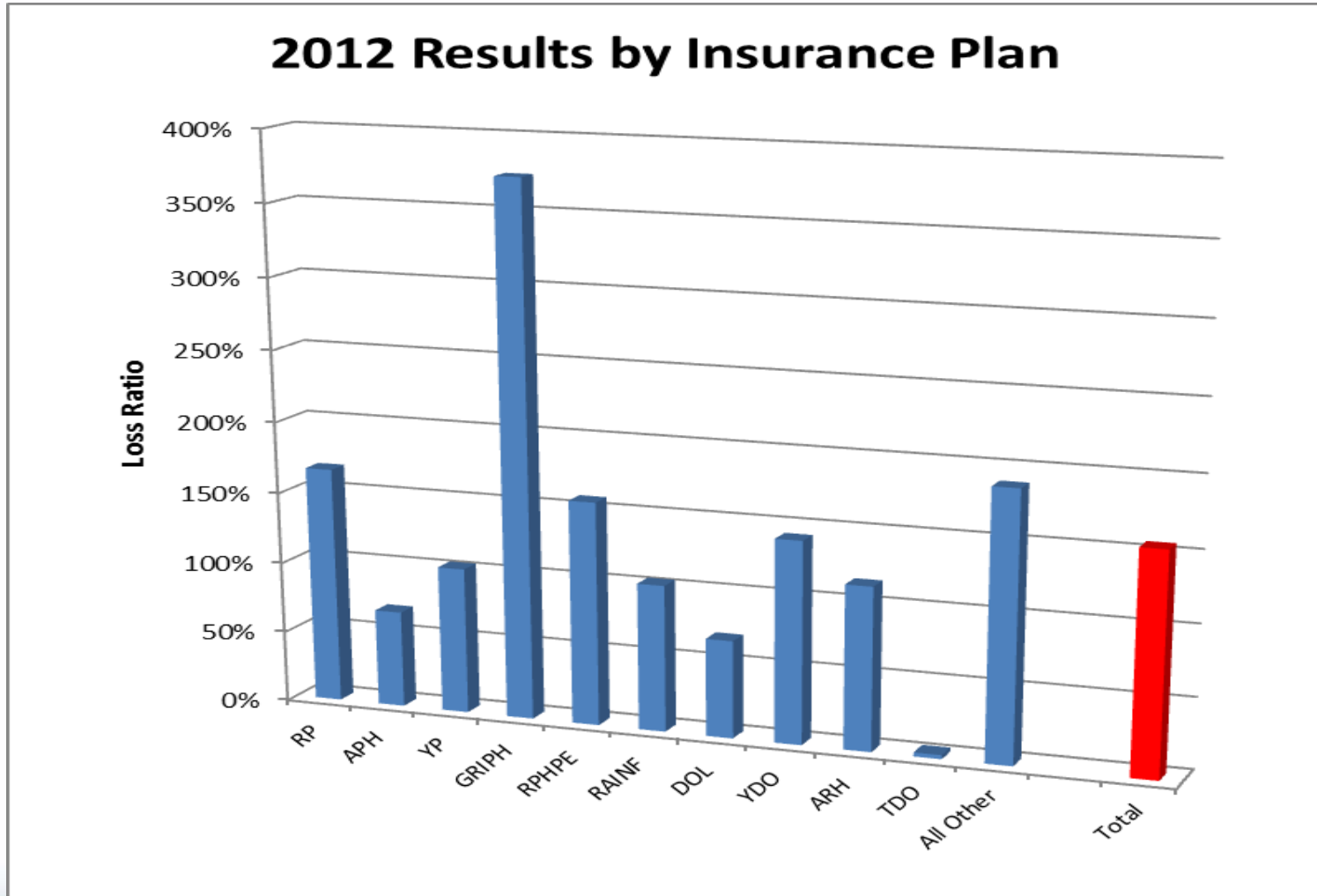


MPCI 2012 Gross Premium By Plan



Source: RMA – Summary of Business as of May 15, 2013

MPCI 2012 Gross Loss Ratio By Plan



Source: RMA – Summary of Business as of May 15, 2013

DISCUSSION OF MAJOR INSURANCE PLANS

- Why is Revenue Protection (RP) most popular plan?

		Notes	YP	High Price Example		Low Price Example	
				RP	RPE	RP	RPE
(A)	Spring Price	given	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00
(B)	APH	given	150	150	150	150	150
(C)	Coverage Level	given	75%	75%	75%	75%	75%
(D)	Liability	$=(A) \times (B) \times (C)$	\$ 675	\$ 675	\$ 675	\$ 675	\$ 675
(E)	Actual Yield	given	50	50	50	50	50
(F)	Fall/Harvest Price	given	\$ 6.00	\$ 8.00	\$ 8.00	\$ 4.00	\$ 4.00
(G)	Guarantee	$=(D) \text{ or } \max(A, F) \times B \times C$	\$ 675	\$ 900	\$ 675	\$ 675	\$ 675
(H)	Production to Count	$=(E) \times (F)$	\$ 300	\$ 400	\$ 400	\$ 200	\$ 200
(I)	Indemnity	$=\text{Max} \{0, (G) - (H) \}$	\$ 375	\$ 500	\$ 275	\$ 475	\$ 475

- In 2012, estimated at \$3.2B (20% of all indemnity and 30% gross loss ratio) additional payout for RP coverage

2013 APPROVED INSURANCE PROVIDERS

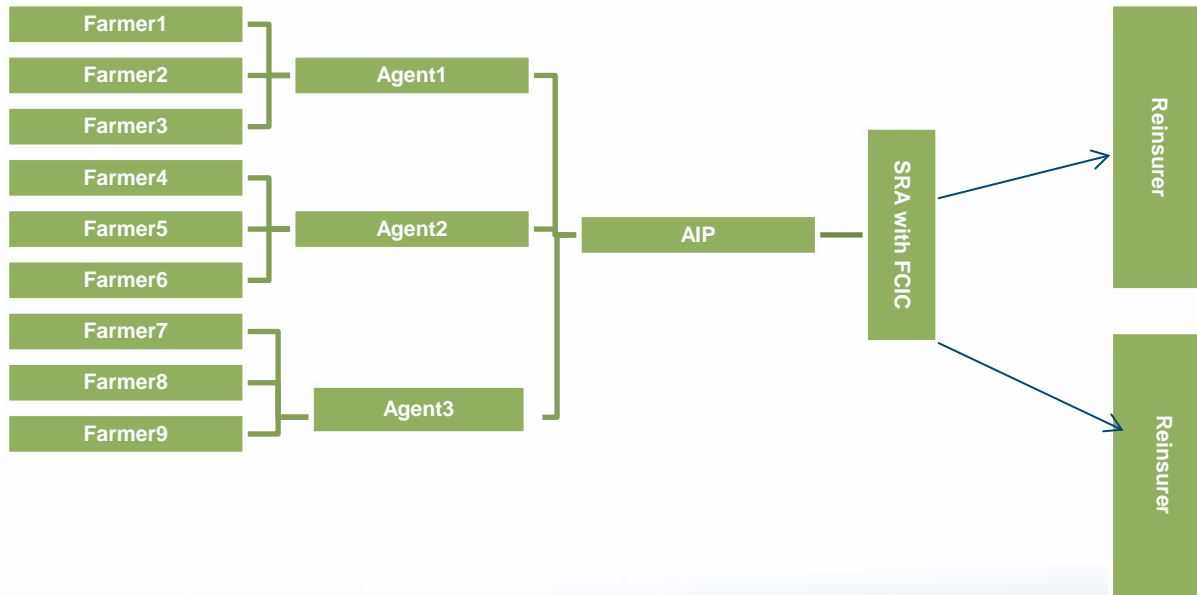
AIP	Group	2012 Est. GWP in Millions	2012 Est. GWP %
RCIS	Wells Fargo	\$ 2,598	23%
Rain and Hail	ACE	\$ 2,136	19%
NAU Country	QBE	\$ 1,502	13%
Great American	American Financial Group	\$ 958	8%
ARMtech	Endurance Re	\$ 830	7%
ProAg	CUNA Mutual	\$ 637	6%
CGB Diversified	Main Street America	\$ 497	4%
Farmers Mutual of Iowa	Farmers Mutual of Iowa	\$ 490	4%
John Deere	John Deere	\$ 374	3%
American Farm Bureau	Farm Bureau	\$ 310	3%
Heartland Crop	Everest Re	\$ 276	2%
ADM Crop Risk	Acher-Daniels-Midland Co.	\$ 263	2%
Agrilogic	IAT Reinsurance	\$ 206	2%
Hudson Insurance	Fairfax Financial Holding	\$ 181	2%
Country Mutual	COUNTRY Financial	\$ 139	1%
International Ag	Starr Indemnity	New in 2013	0%
Global Ag	XL Reinsurance	New in 2013	0%

Source: SNL Financial and RMA

DISCUSSION OF THE STANDARD REINSURANCE AGREEMENT (SRA)

Overview of SRA

- Standard Reinsurance Agreement between AIP and FCIC
 - SRA applies first before any third party reinsurance
 - Includes reinsurance protections and A&O subsidies



Overview of 2011 (Current) SRA Provisions

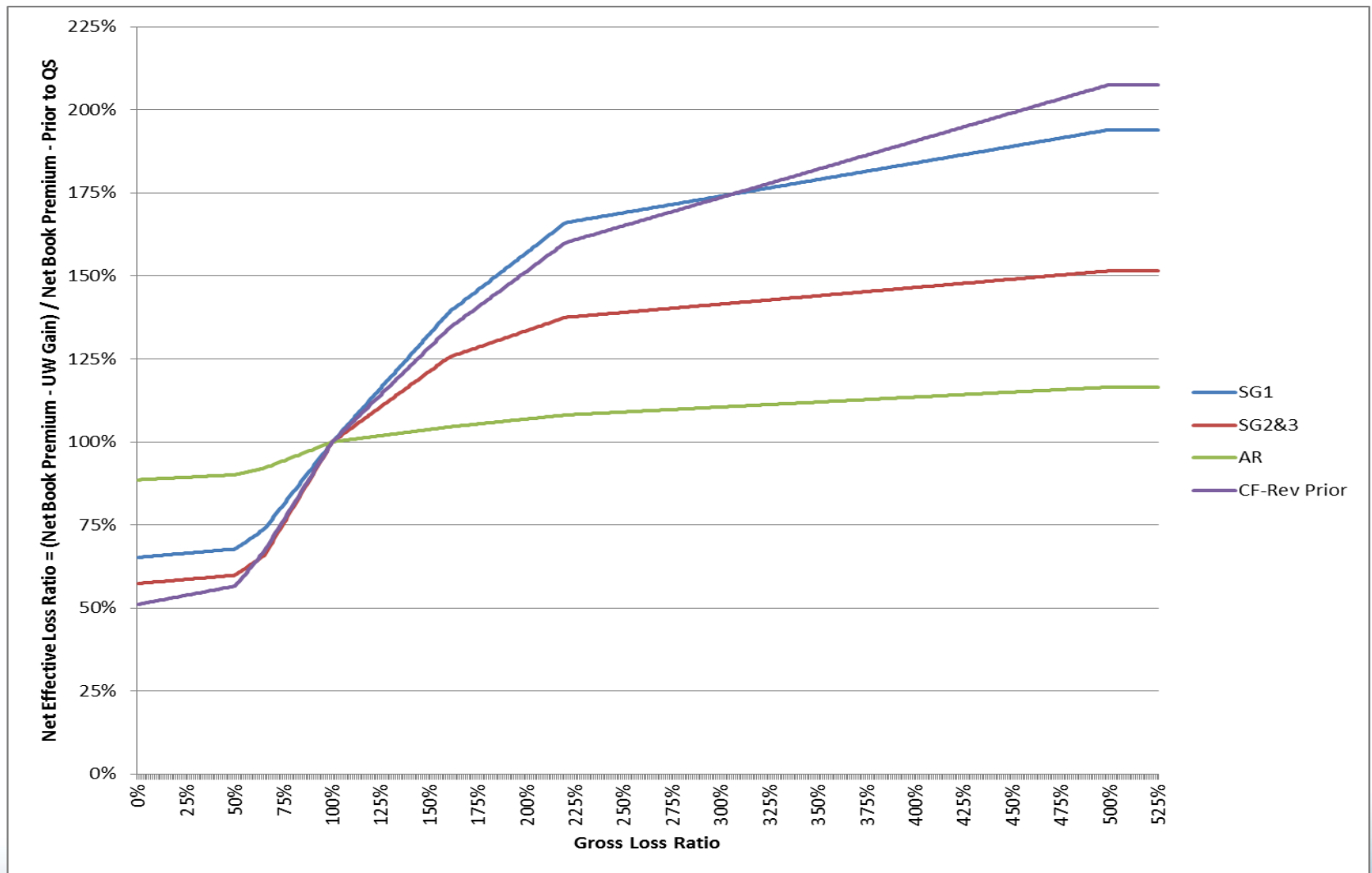
- AIP places each policy into Assigned Risk or Commercial Fund
 - Maximum 75% premium can be placed in AR for each state
 - AR cedes quota share 80% to FCIC
 - AIP can cede up to 65% QS to FCIC for Commercial Fund by state
- UW gain/loss calculated for each AR or CF by state
- Underwriting gain/(loss) shared between AIP and FCIC
- Additional 6.5% quota share after total UW gain/loss calculated by fund/state
- Encouragement to write in underserved states (Group 3)
- RMA believes there is an expected return of 14.5% to AIPs
 - Source: RMA “Standard Reinsurance Agreement Final Draft Fact Sheet” - Issued June 10, 2010

Current SRA Example

SRA Example									
Net Underwriting Gain/Loss									
per 2011 SRA									
Reinsurance Year YYYY									
		A	B	C	D	E	F	G	H
					=A*C	=B*C	=E/D	From SRA	=(D - G)/D
		Net Book Premium	Indemnity	AIP Retention	Retained Net Book Premium	Retained Indemnity	Loss Ratio	Net Underwriting Gain/(Loss)	Net Effective Loss Ratio
SG	State								
Commercial Fund									
2	Arkansas	90	150	100%	90	150	167%	(24.2)	127%
1	Illinois	525	305	100%	525	305	58%	152.3	71%
1	Iowa	580	650	100%	580	650	112%	(45.5)	108%
2	Texas	250	140	65%	163	91	56%	61.3	62%
	CF Total	1,445	1,245		1,358	1,196	88%	144.0	89%
Assigned Risk Fund									
	Arkansas	20	75	20%	4	15	375%	(0.5)	113%
	Illinois	40	25	20%	8	5	63%	0.7	92%
	Iowa	20	80	20%	4	16	400%	(0.5)	114%
	Texas	300	400	20%	60	80	133%	(1.5)	103%
	AR Total	380	580		76	116	153%	(1.9)	102%
	Grand Total	1,825	1,825		1,434	1,291		142.1	90%
	6.5% QS to FCIC				-93	-84		(9.2)	
	Net to AIP				1,340	1,207		132.8	90%
					Net Underwriting Gain/(Loss):			9.9%	

$$E = D - G$$

Current SRA (2011) Compared to Prior



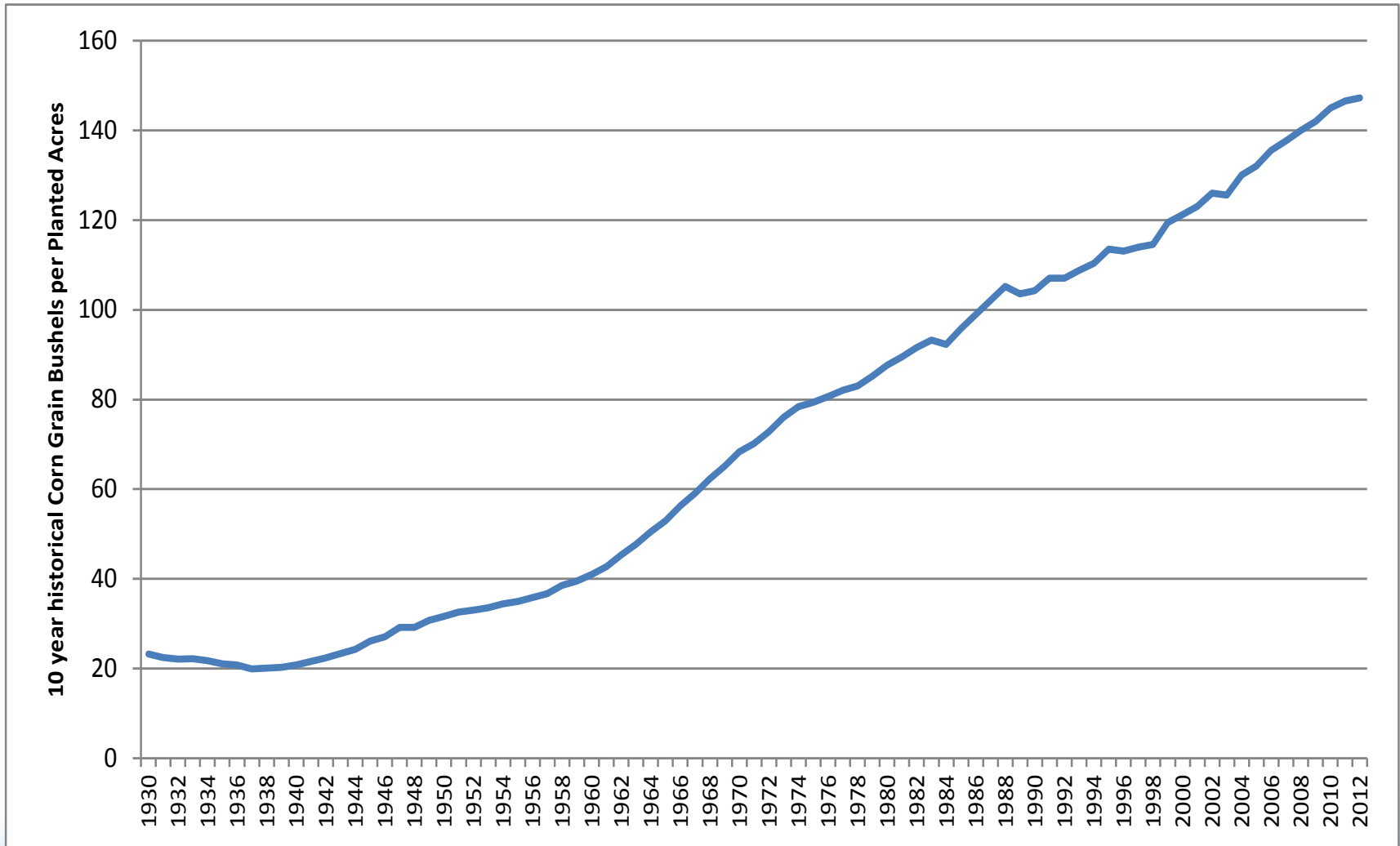
TYPES OF THIRD PARTY REINSURANCE

- Separate coverage for MPCl and Private
- MPCl third party Re applies after SRA (provision of SRA)
- AIP must disclose third party reinsurance to FCIC
- Similar coverage for private hail, although purchased together

Loss Ratio after SRA							
150.0% - 160.0%	R e i n s u r e r	R e i n s u r e r	Re1	Re2	Re5	Re6	A I P
140.0% - 150.0%			Re1	Re2	Re5	Re6	
130.0% - 140.0%			Re1	Re2	Re5	Re6	
120.0% - 130.0%			Re1	Re2	Re3	Re4	
110.0% - 120.0%			Re1	Re2	Re3	Re4	
100.0% - 110.0%			Re1	Re2	Re3	Re4	
90.0% - 100.0%	1	2	AIP				
80.0% - 90.0%							
70.0% - 80.0%							
60.0% - 70.0%							
50.0% - 60.0%							
40.0% - 50.0%							
30.0% - 40.0%	Q S	Q S	AIP				
20.0% - 30.0%							
10.0% - 20.0%							
0.0% - 10.0%							

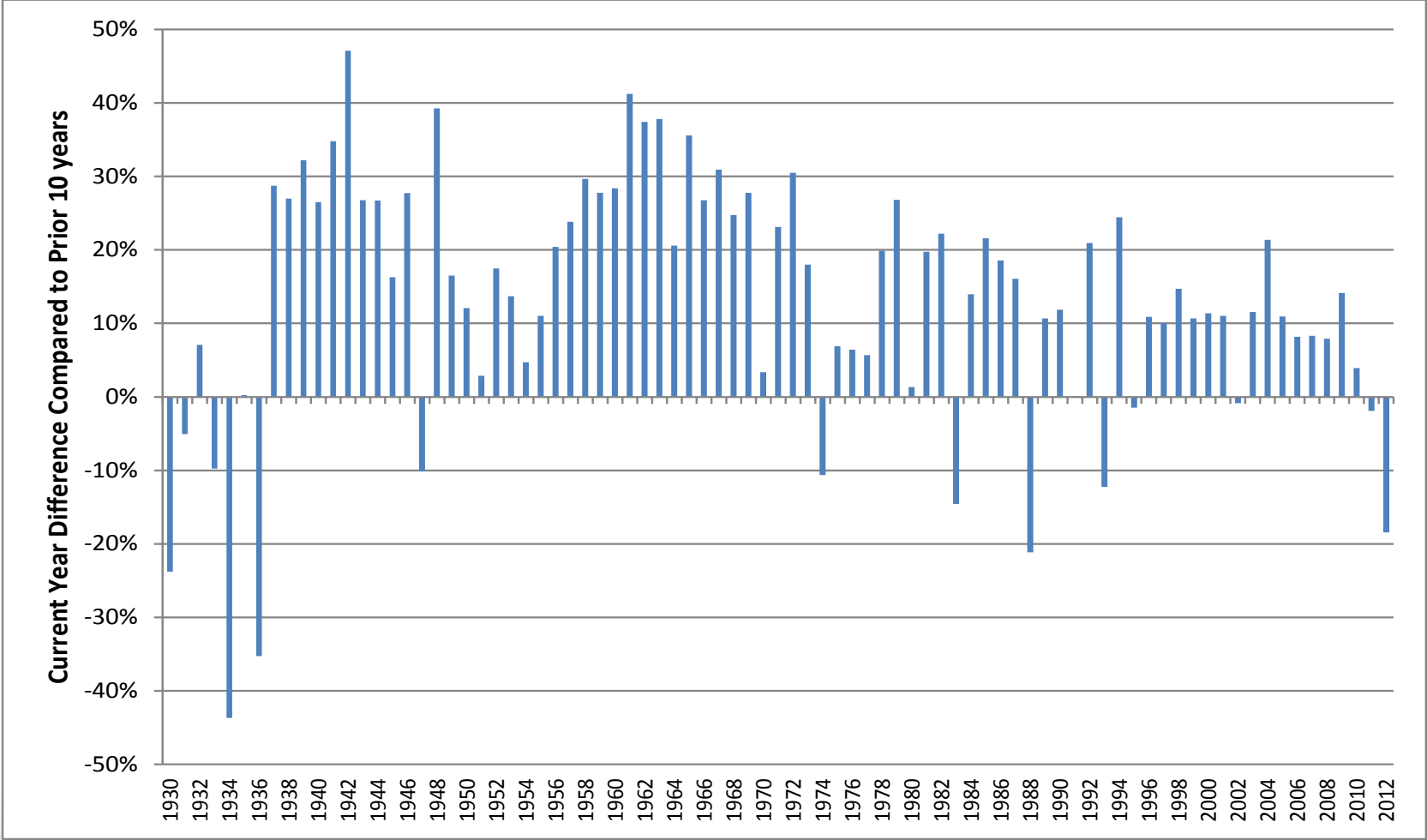
PRICE RISK AND IMPLICATIONS ON THIRD PARTY REINSURANCE

NASS CORN YIELDS LAST 10 YEAR AVE



Source: USDA - NASS

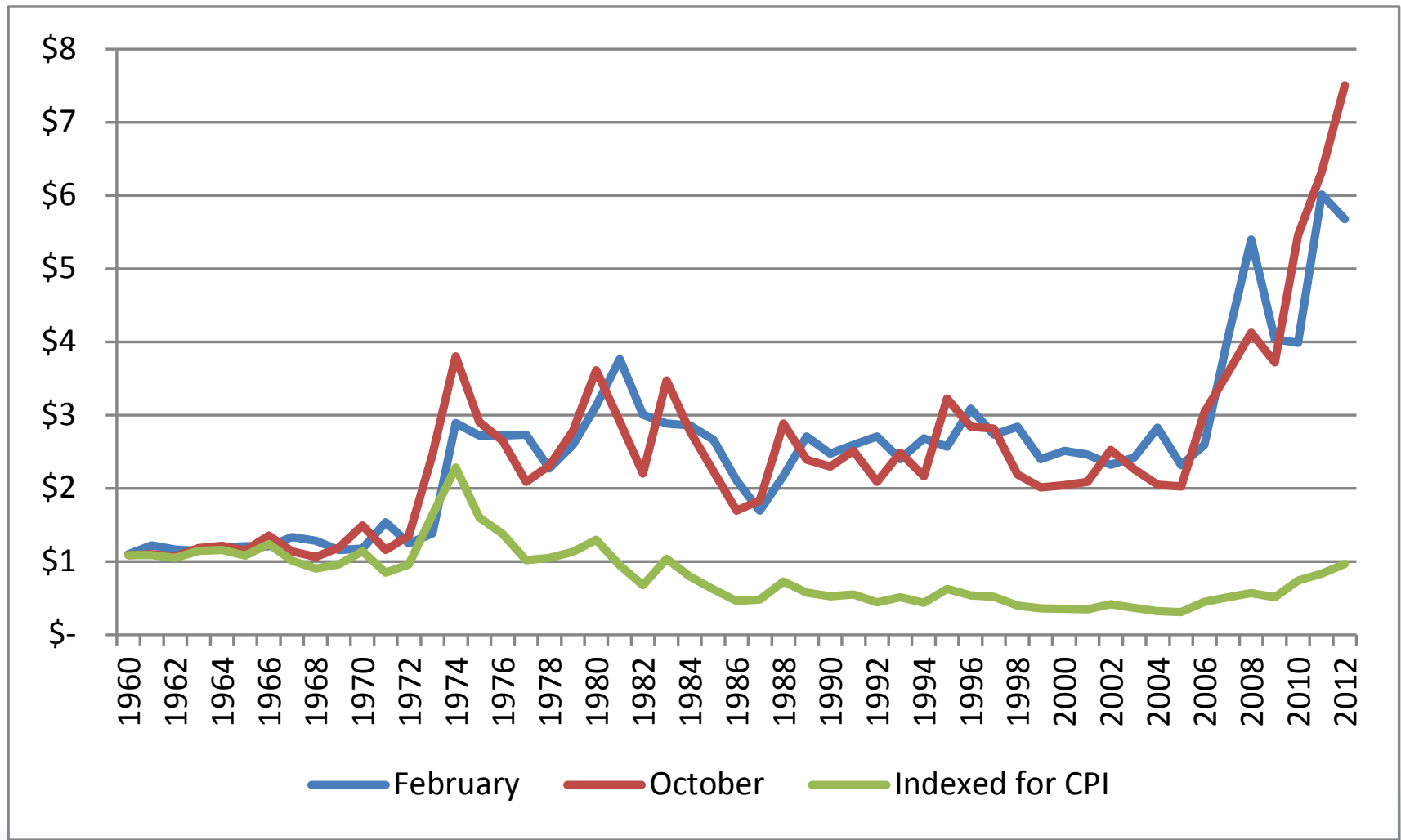
CURRENT YEAR NASS CORN YIELD COMPARED TO PRIOR 10 YEAR AVE



Source: USDA - NASS

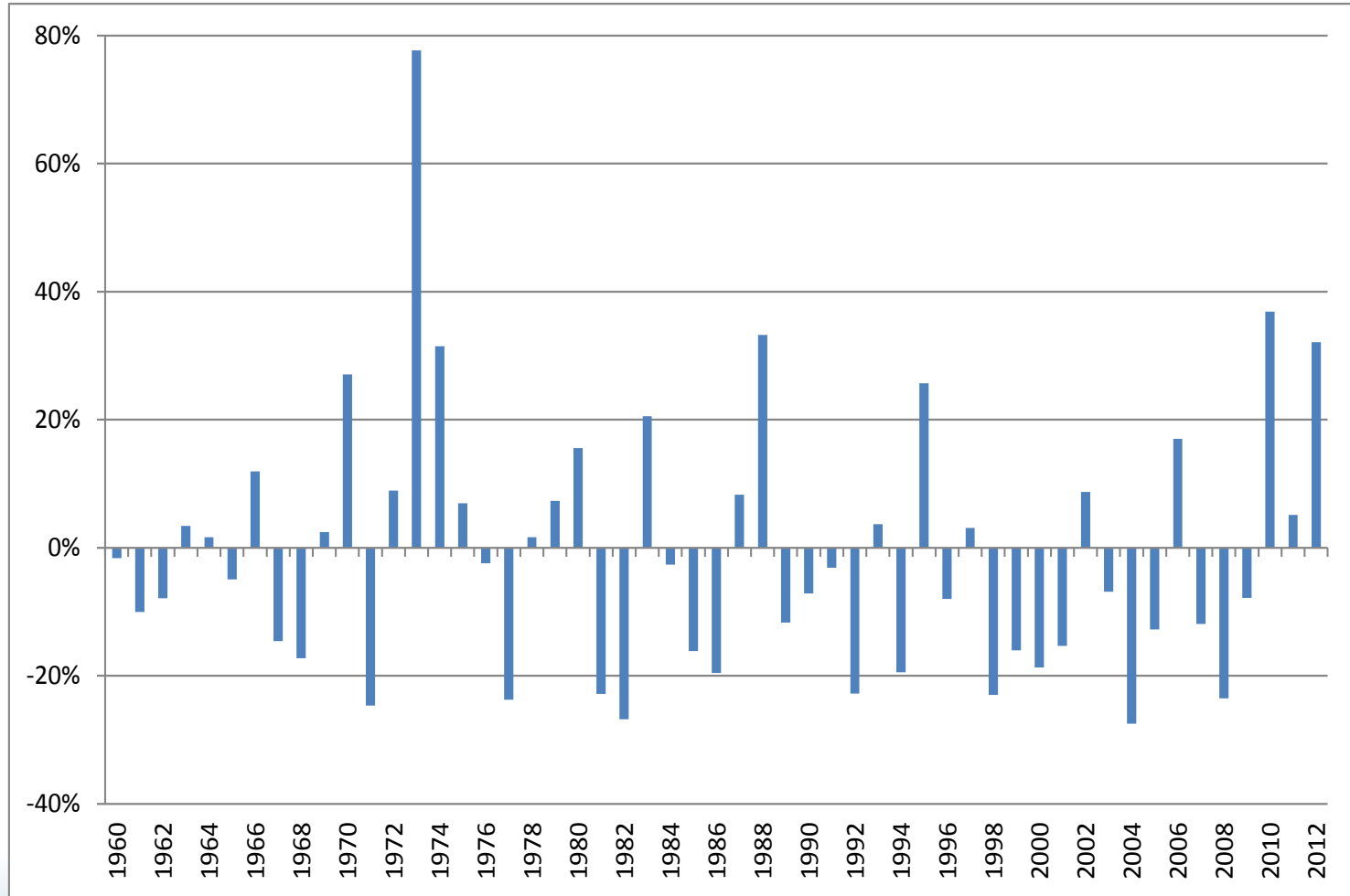


DECEMBER CORN FUTURES PRICE



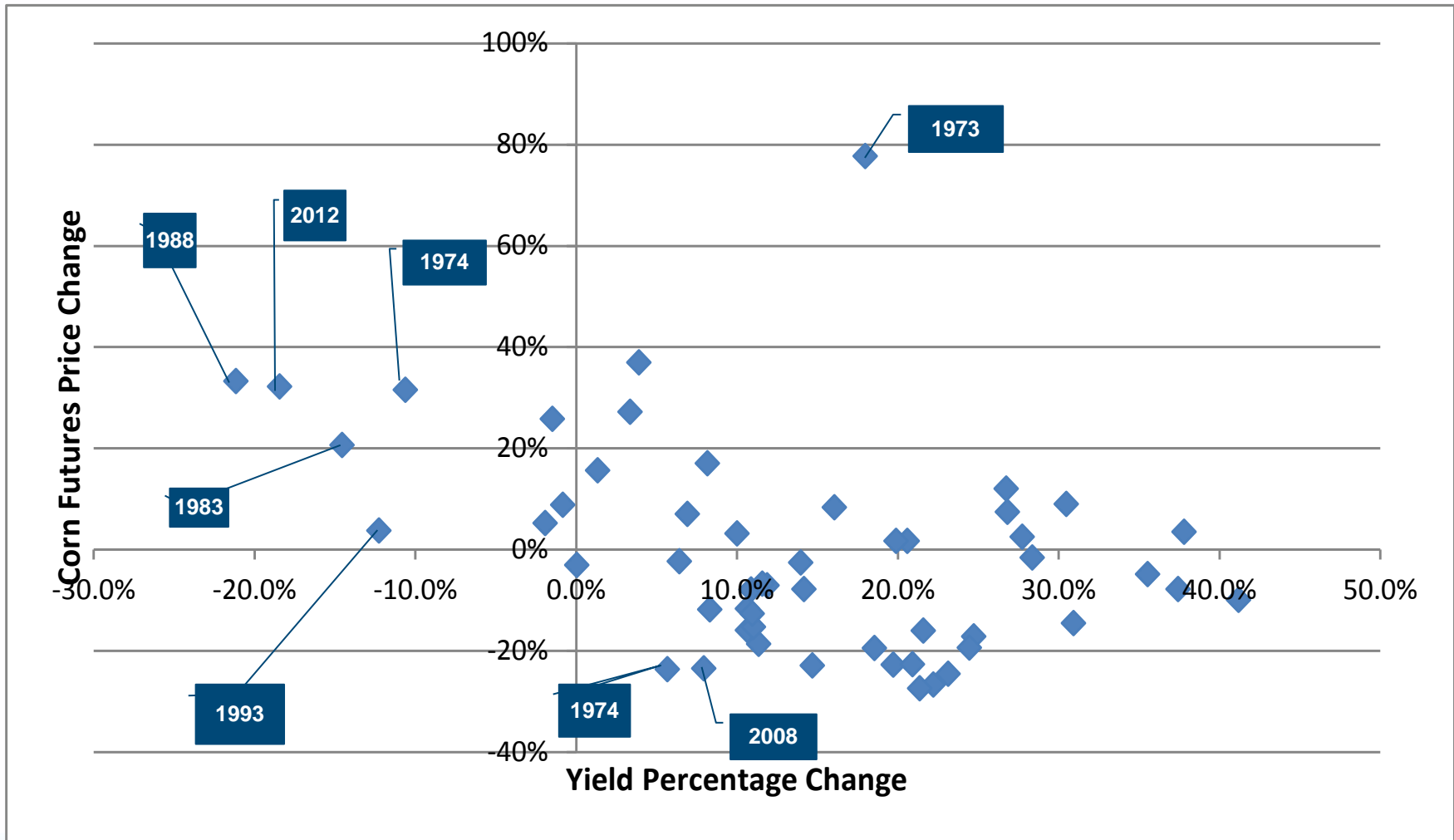
Source: Bloomberg

DECEMBER CORN FUTURES PRICE OCTOBER COMPARED TO FEBRUARY



Source: Bloomberg

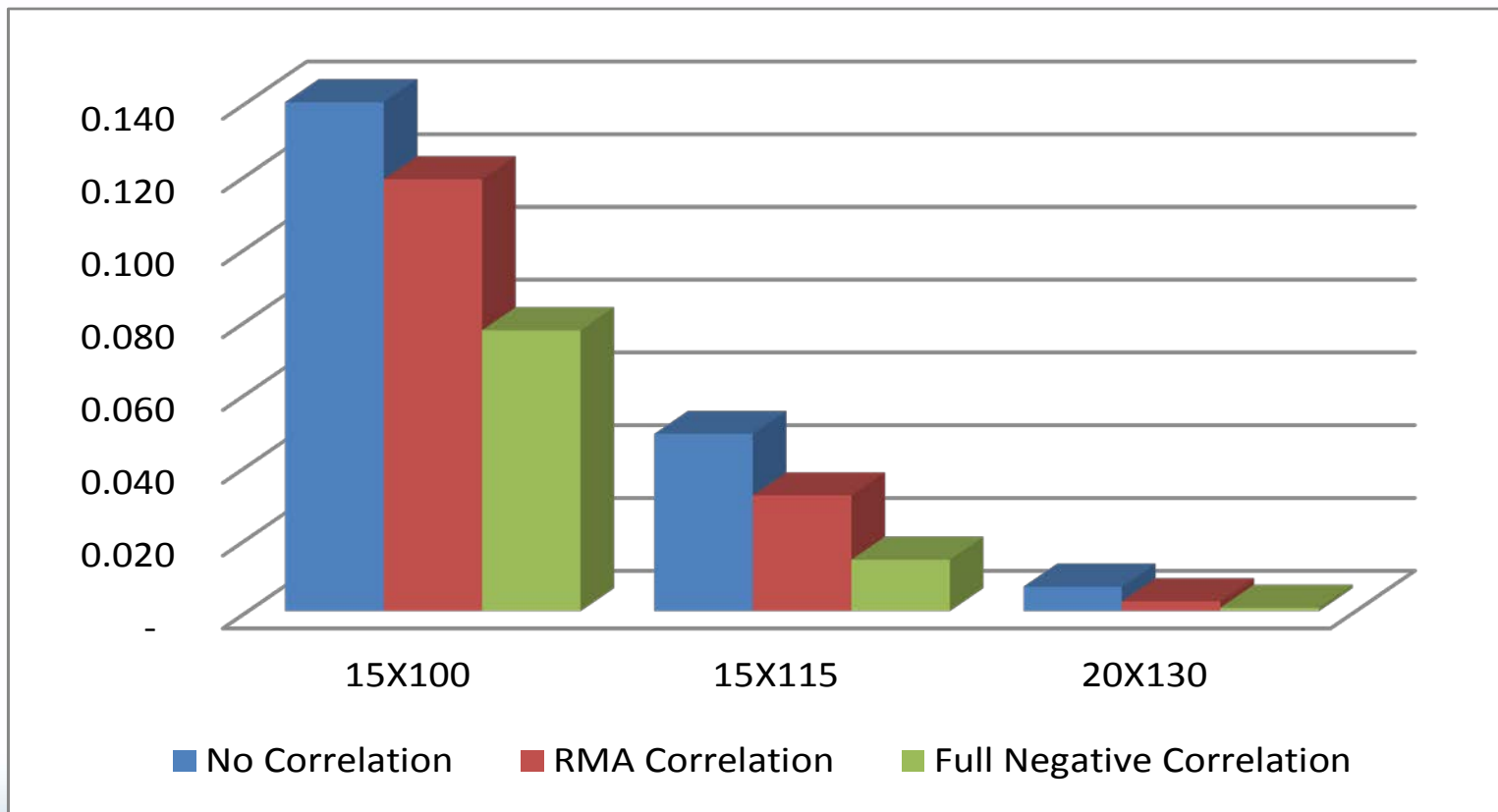
CORN PRICE YIELD CORRELATION



Source: USDA-NASS and Bloomberg
Overall correlation = -0.41

Price/Yield Correlation Effects on Reinsurance

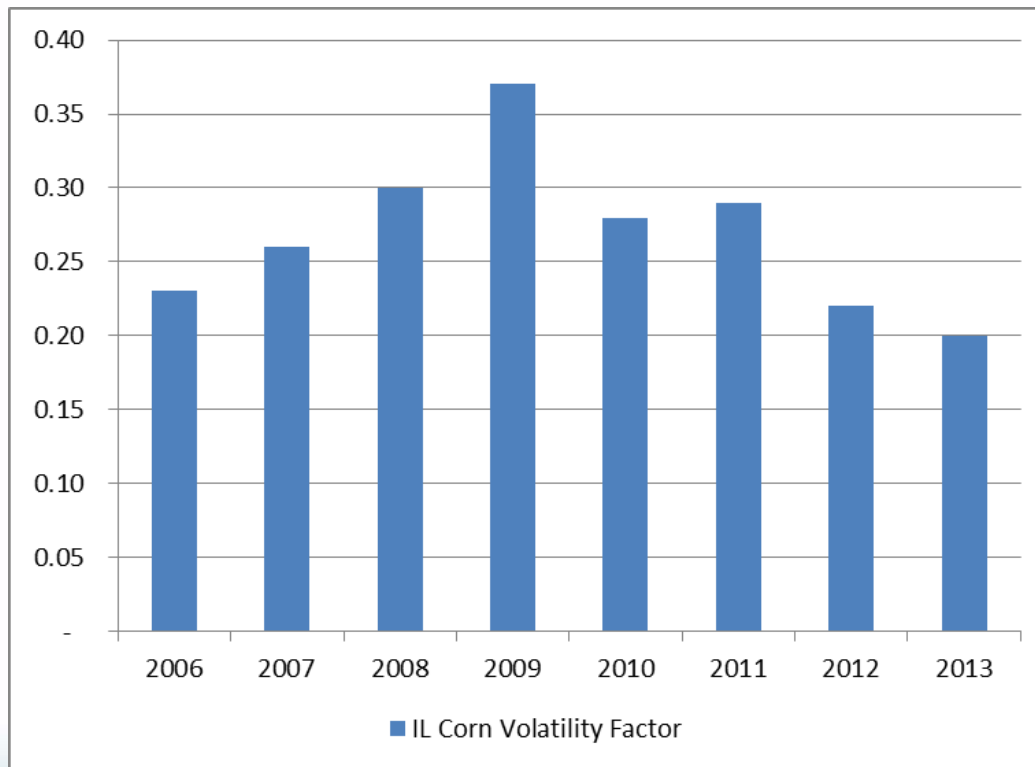
- Changing only correlation assumptions can give very different loss costs on excess layers
- Percentage difference increase at higher layers



Source: Hypothetical MPCI portfolio - Estimated using Milliman SRA simulation model

Price Volatility Factor

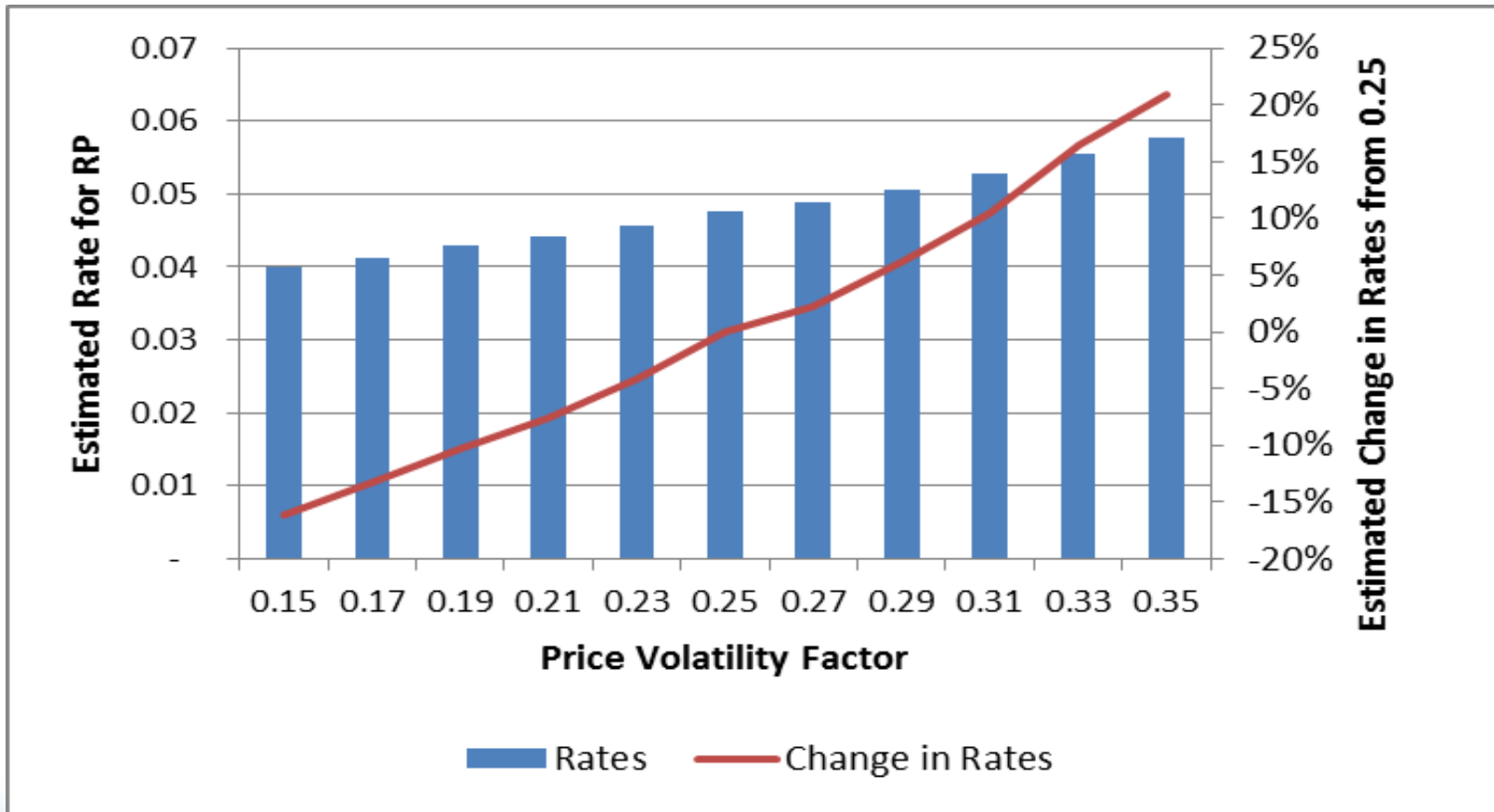
- Used to calculate premium for RP and RPE plans
- Adjusted implied volatility factor published by BarChart.com
 - See “Volatility Factor Calculation Methodology” – RMA, Feb 2011



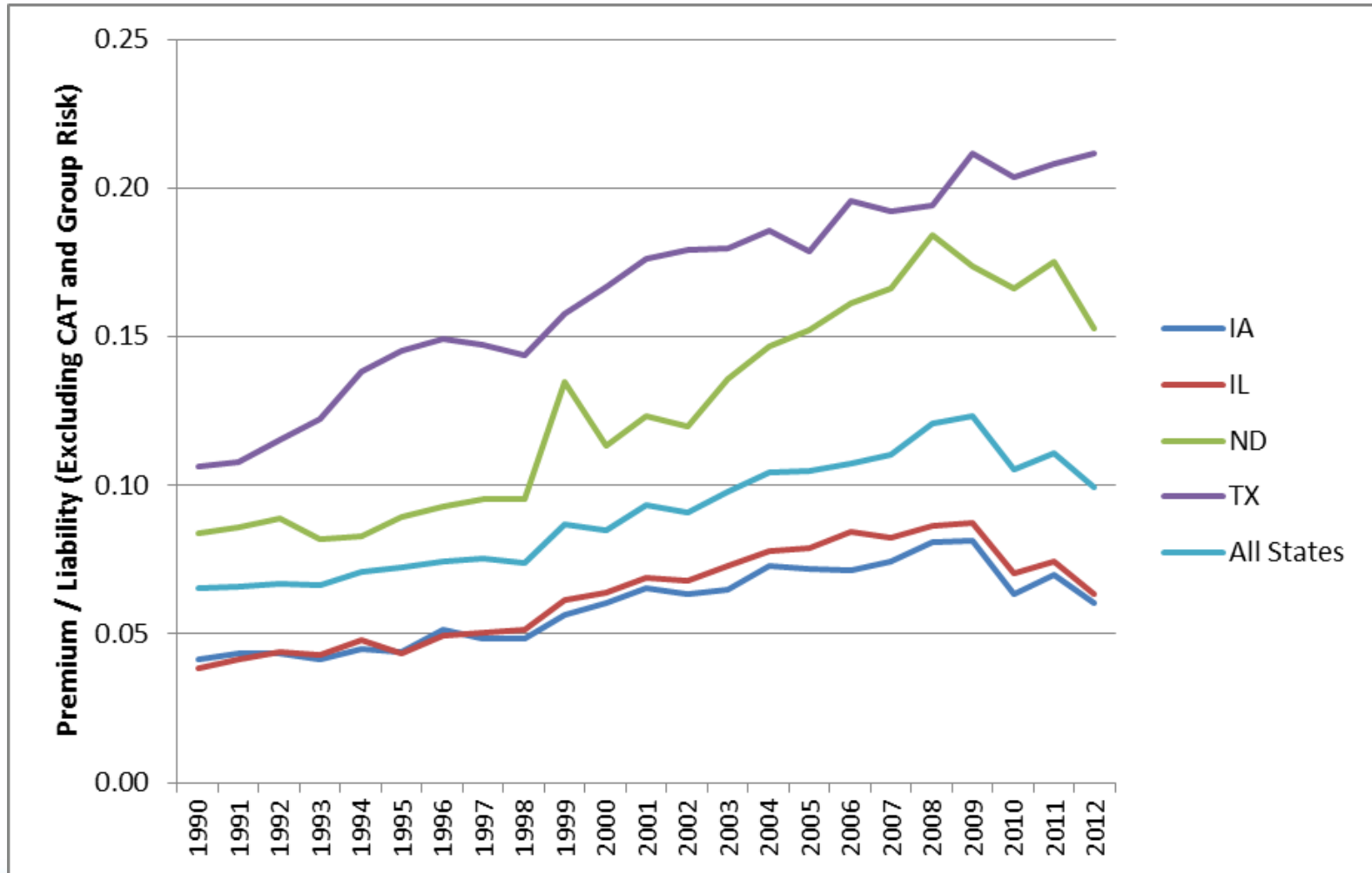
Source: USDA-RMA; Values shown for RA 2006-2010; RP 2011-13

Price Volatility Factor - Example

- Example of premium difference for RP plan based on different Price Volatility Factors using same base (YP) rate

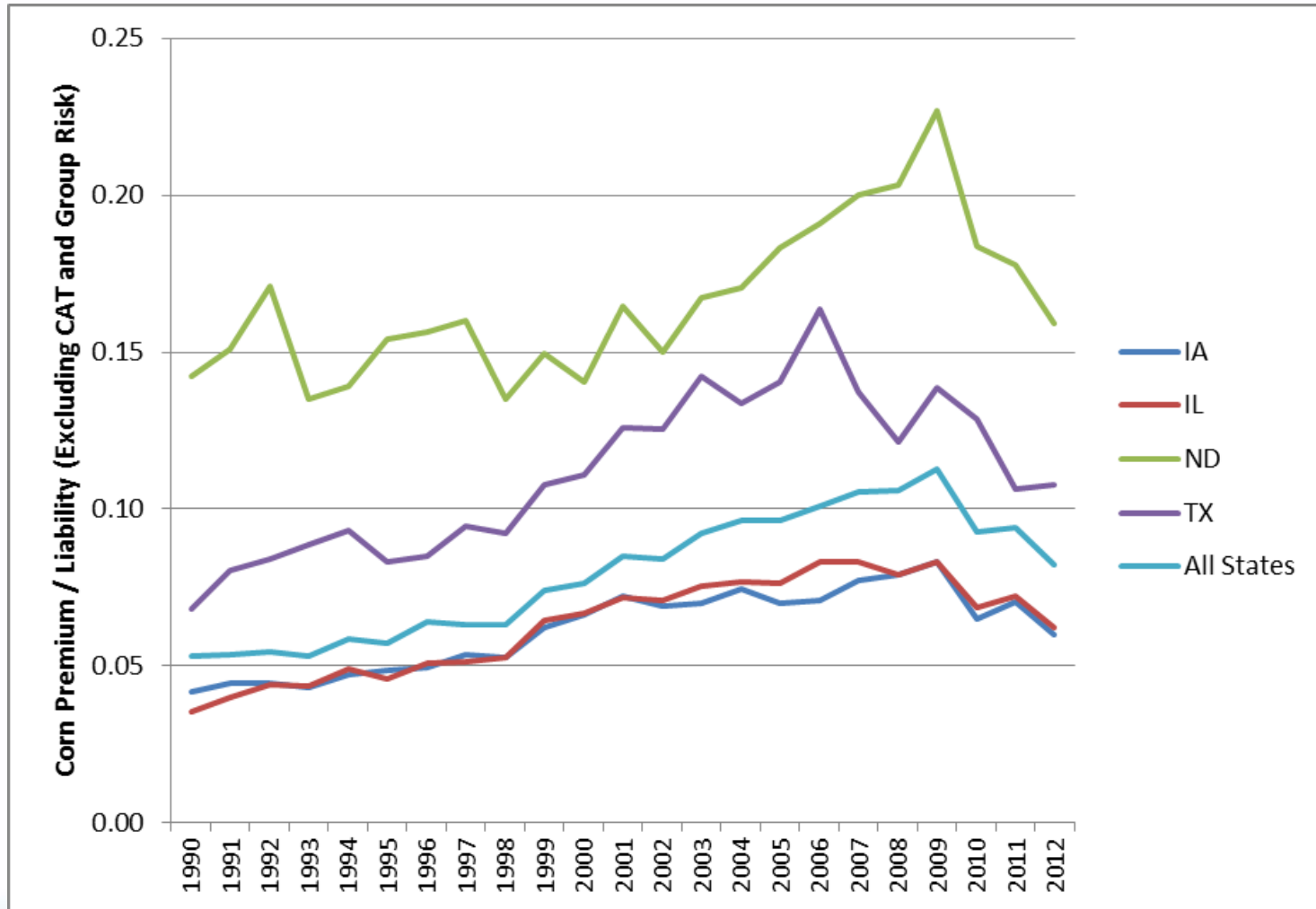


Premium to Liability Ratios



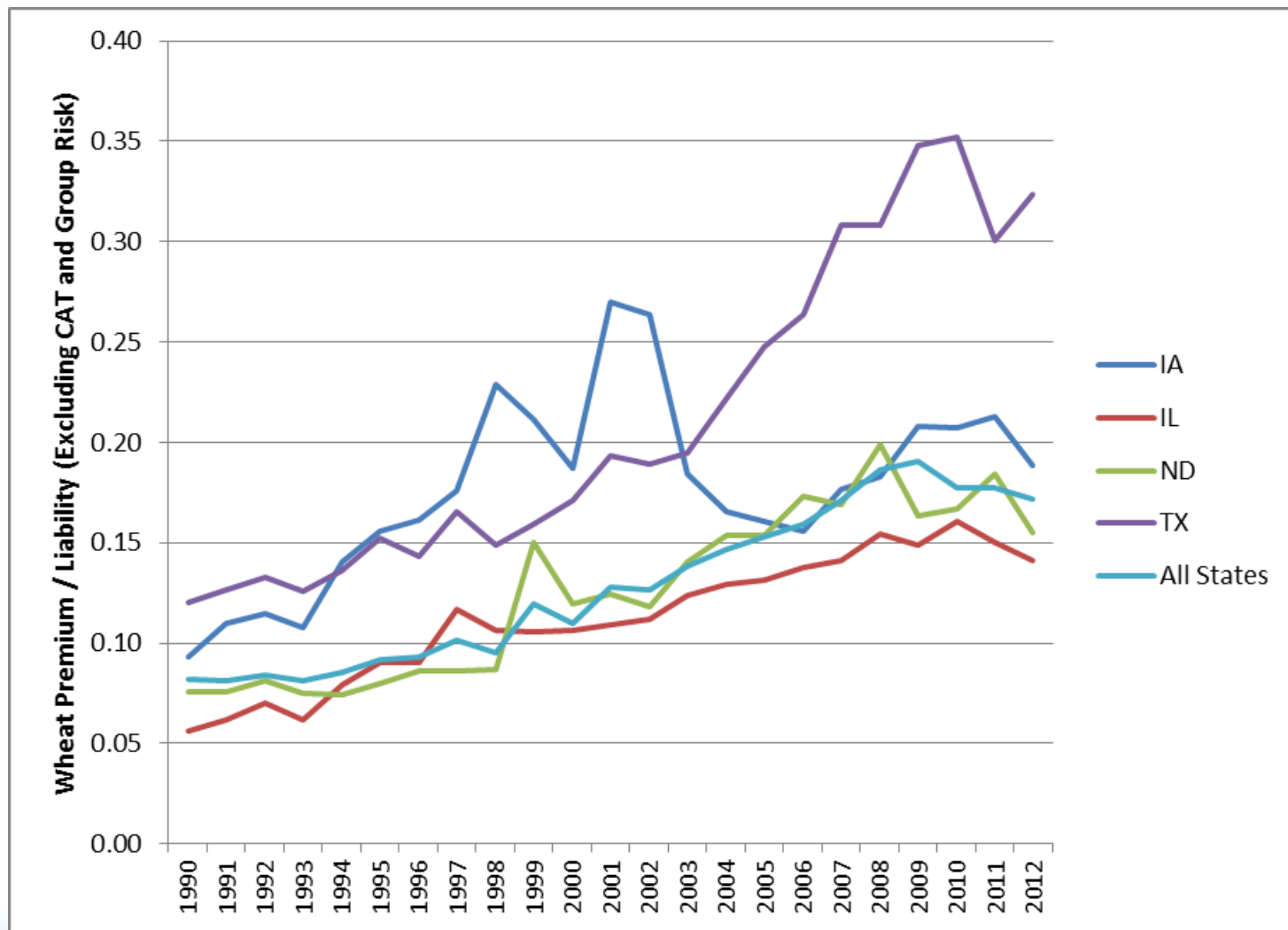
Source: RMA – Summary of Business as of May 15, 2013
 Not adjusted for coverage level differences

Corn Premium to Liability Ratios



Source: RMA – Summary of Business as of May 15, 2013
 Not adjusted for coverage level differences

Wheat Premium to Liability Ratios



Source: RMA – Summary of Business as of May 15, 2013
Not adjusted for coverage level differences

FUTURE OUTLOOK ON U.S. CROP INSURANCE

FUTURE OUTLOOK - U.S. CROP INSURANCE

- Continued expansion into underserved markets
 - Group 3 States
 - Fruit and Vegetables
 - Livestock/aquaculture
 - Organic
- Farm Bill 2013 – not passed at this time
 - Farmer can buy traditional MPCl policy plus GRIP type coverage (county index)
 - Elimination of direct payments from FSA
 - May change purchasing behavior of traditional MPCl policies

FUTURE OUTLOOK - U.S. CROP INSURANCE

- Increase in farmers' coverages/guarantees
 - Trend Adjusted APH (introduced in 2012)
 - Personal T-Yield history
 - Addition of Group Risk coverage combined with MPCl
 - Limited Irrigation Practice
- Continued modification to rating of MPCl policies
 - Pressure from growers' associations to lower rates
 - Reviews of price/yield correlations for pricing RP/RPE
- Budgetary concerns
 - Proposal to change subsidies could impact MPCl buying decisions
 - Continued scrutiny of AIP gains and agents' compensation

Questions?