

# OLIVER WYMAN

Oliver Wyman Actuarial Consulting, Inc.

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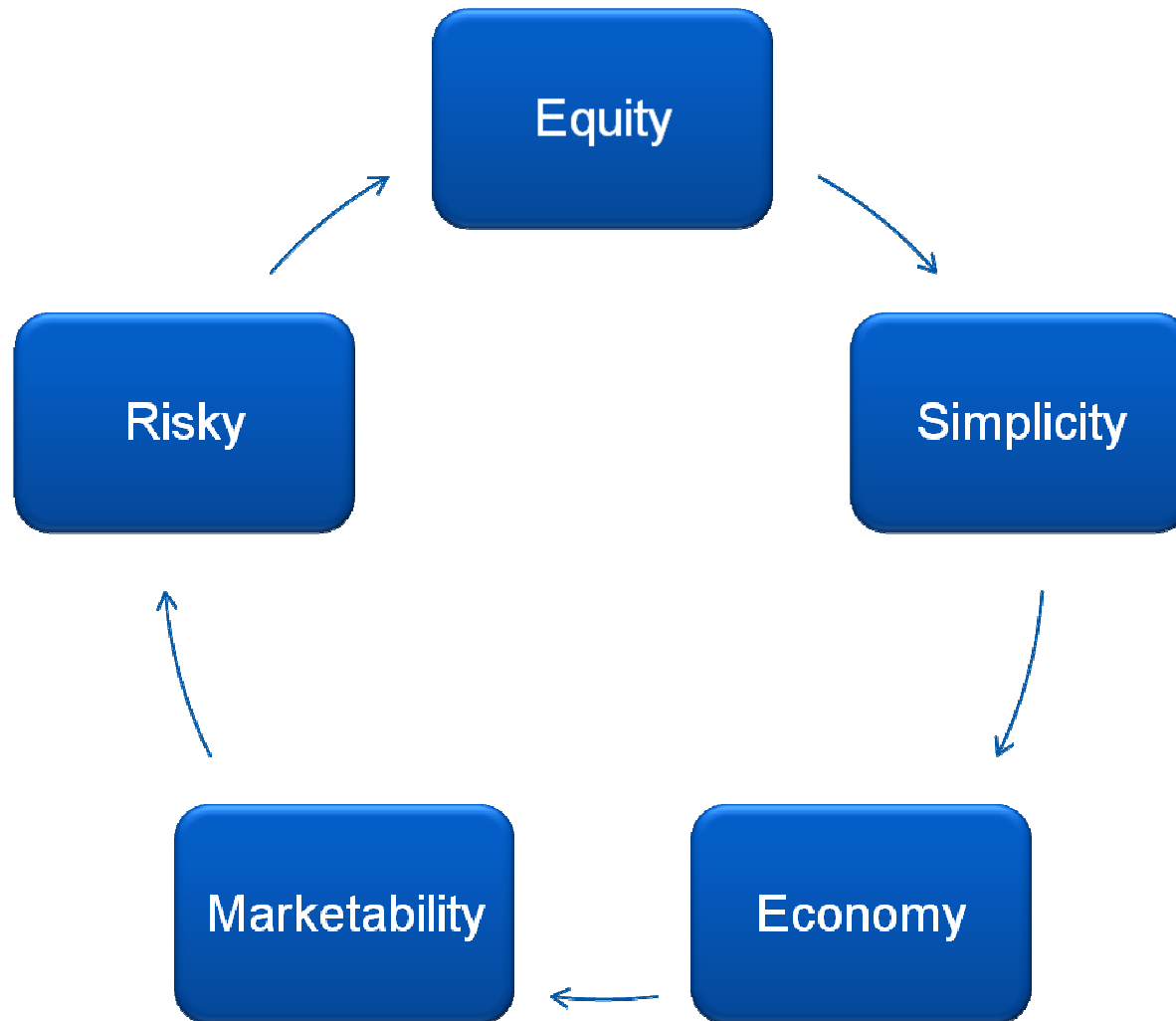
## **Experience Rating Plan Update—Stakeholder's Session**

William Hansen, FCAS, MAAA  
Columbus, Ohio



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## Objectives of this Session



## Objectives Session outline

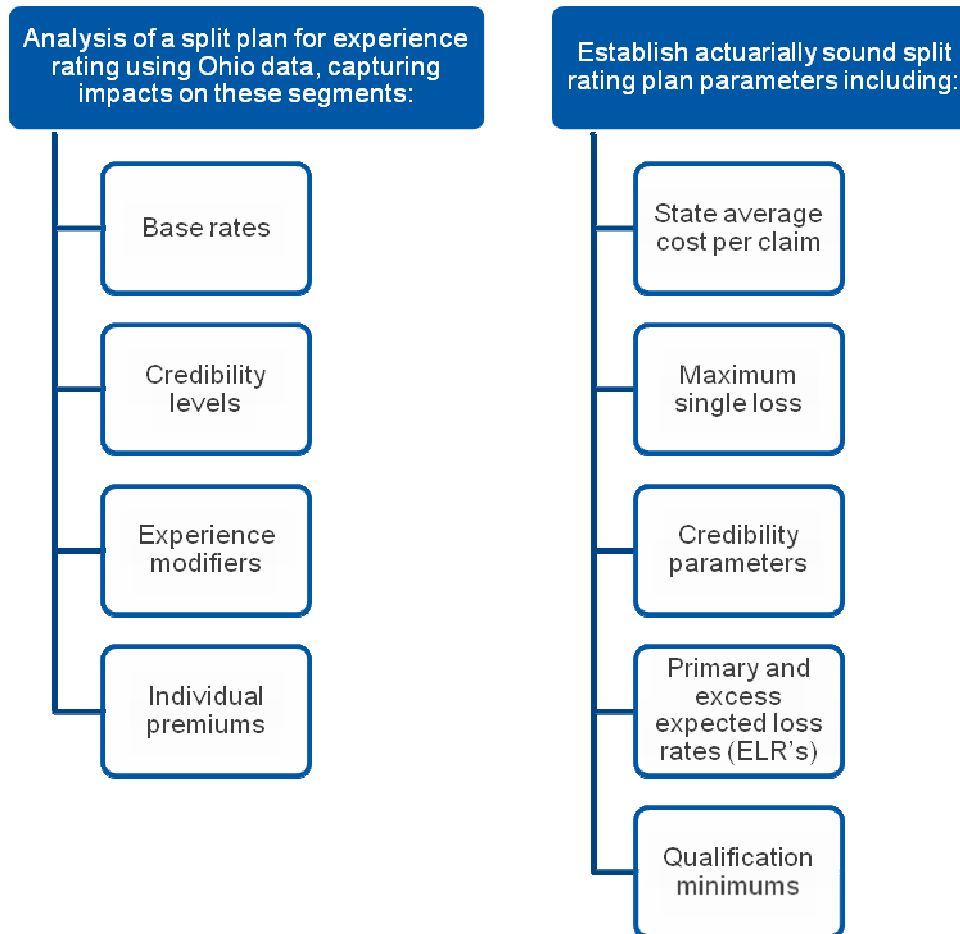
Review experience rating plan designs and how performance is measured

Discuss and interpret initial results of split plan testing with Ohio data

Examine policyholder impacts of adopting a new plan, including mitigation options

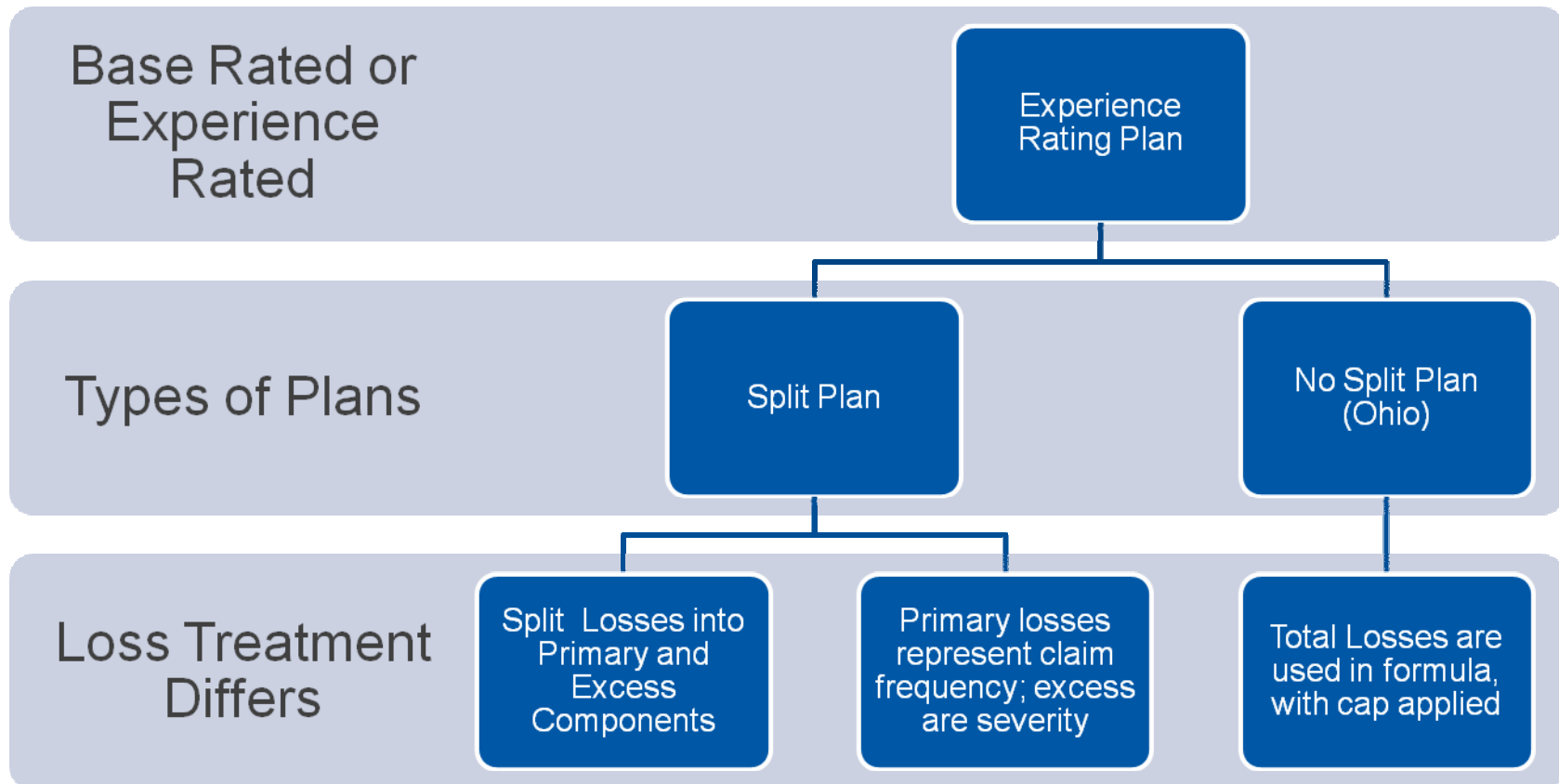
## Objectives Project Outline

For the first phase of the project, as defined by the workgroup, the scope includes the following:



## Comparison of Experience Rating Plans

## Comparison of Experience Rating Plans Losses





## Comparison of Experience Rating Plans Losses

Sample calculations of actual primary and actual excess loss with a \$250,000 accident limitation (algorithm is different for medical only claims)

- Lost time claim of \$275,000
  - Total loss limited to \$250,000
  - Primary loss = \$5,000
  - Excess loss = \$245,000
- Medical only claim of \$7,000
  - Primary loss = \$5,000 x 30% = \$1,500
  - Excess loss = \$2,000 x 30% = \$600

## Comparison of Experience Rating Plans Credibility

### Split Plan Credibility

Separate Credibility  
measures for  
Primary and Excess  
losses ( $Z_p$  and  $Z_e$ )

Max of 91% for  
Primary, and 57%  
for Excess;  
Combined Max  
range from 60% to  
75%

### No Split Plan Credibility

One Credibility  
measure applied to  
the total losses

Current Max of 85%  
at \$1 million



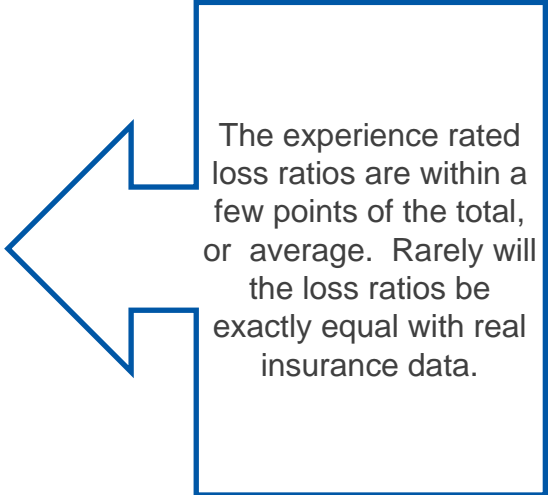
## Performance Measures

## Performance Measures Loss Ratio Equity

- How do we know if experience rating is fair and equitable? Is the plan predictive of future loss cost differences?
- A basic way to review plan performance is to examine the loss ratios before and after experience rating has been applied—the desired outcome is equal loss ratios across the range of debit and credit risk groups. [we are ignoring possible expense differences]

### Example of desired experience rating plan results

Quintile Rank	Description	Manual Loss Ratio	Exp Rated Loss Ratio
1	Highest	150%	85%
2	High	100%	78%
3	Average	80%	83%
4	Low	60%	75%
5	Lowest	40%	82%
Total		80%	80%



The experience rated loss ratios are within a few points of the total, or average. Rarely will the loss ratios be exactly equal with real insurance data.

## Performance Measures Credibility

Credibility is the measure that determines the degree to which past loss experience is predictive of future loss costs

How much is predictive, and how much is random noise?

Too little Credibility results in credit mods that are too high...

And in debits that are not high enough

Too much credibility results in...

Credit mods that are too low, meaning too much credit...

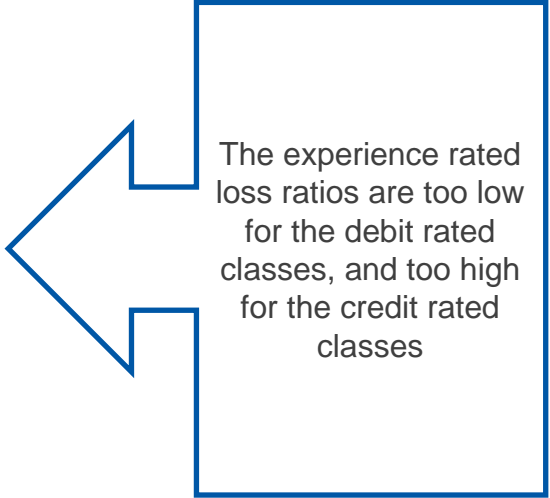
And debit mods that are too high, or too much increase

## Performance Measures Loss Ratio Equity

- How do we know if experience rating is fair and equitable? In this case the plan is giving too much weight to past results, and the resulting loss ratios are not equitable.

Too much credibility given to historical experience

Quintile Rank	Description	Manual Loss Ratio	Exp Rated Loss Ratio
1	Highest	150%	60%
2	High	100%	72%
3	Average	80%	81%
4	Low	60%	91%
5	Lowest	40%	98%
Total		80%	80%



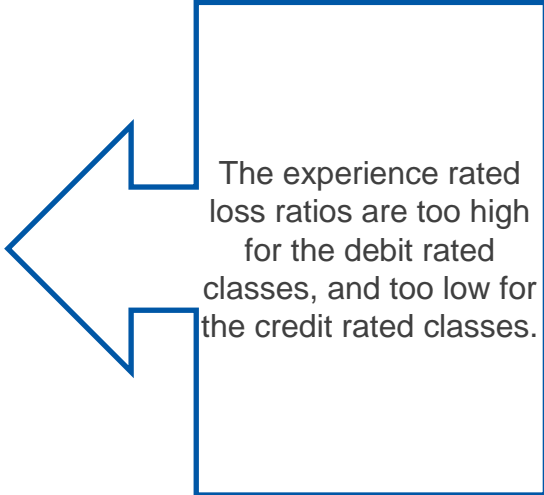
The experience rated loss ratios are too low for the debit rated classes, and too high for the credit rated classes

## Performance Measures Loss Ratio Equity

- How do we know if experience rating is fair and equitable? In this case the plan is not giving enough weight to past results, and the resulting loss ratios are not equitable.

Too little credibility given to historical experience

Quintile Rank	Description	Manual Loss Ratio	Exp Rated Loss Ratio
1	Highest	150%	105%
2	High	100%	92%
3	Average	80%	83%
4	Low	60%	69%
5	Lowest	40%	58%
Total		80%	80%



The experience rated loss ratios are too high for the debit rated classes, and too low for the credit rated classes.

## Split Plan Summary Results



# Split Plan Scenario

\$10,000 Split (primary)

MSL \$175k

Max Credibility of 66%

SACC = \$7,000; G=7.0

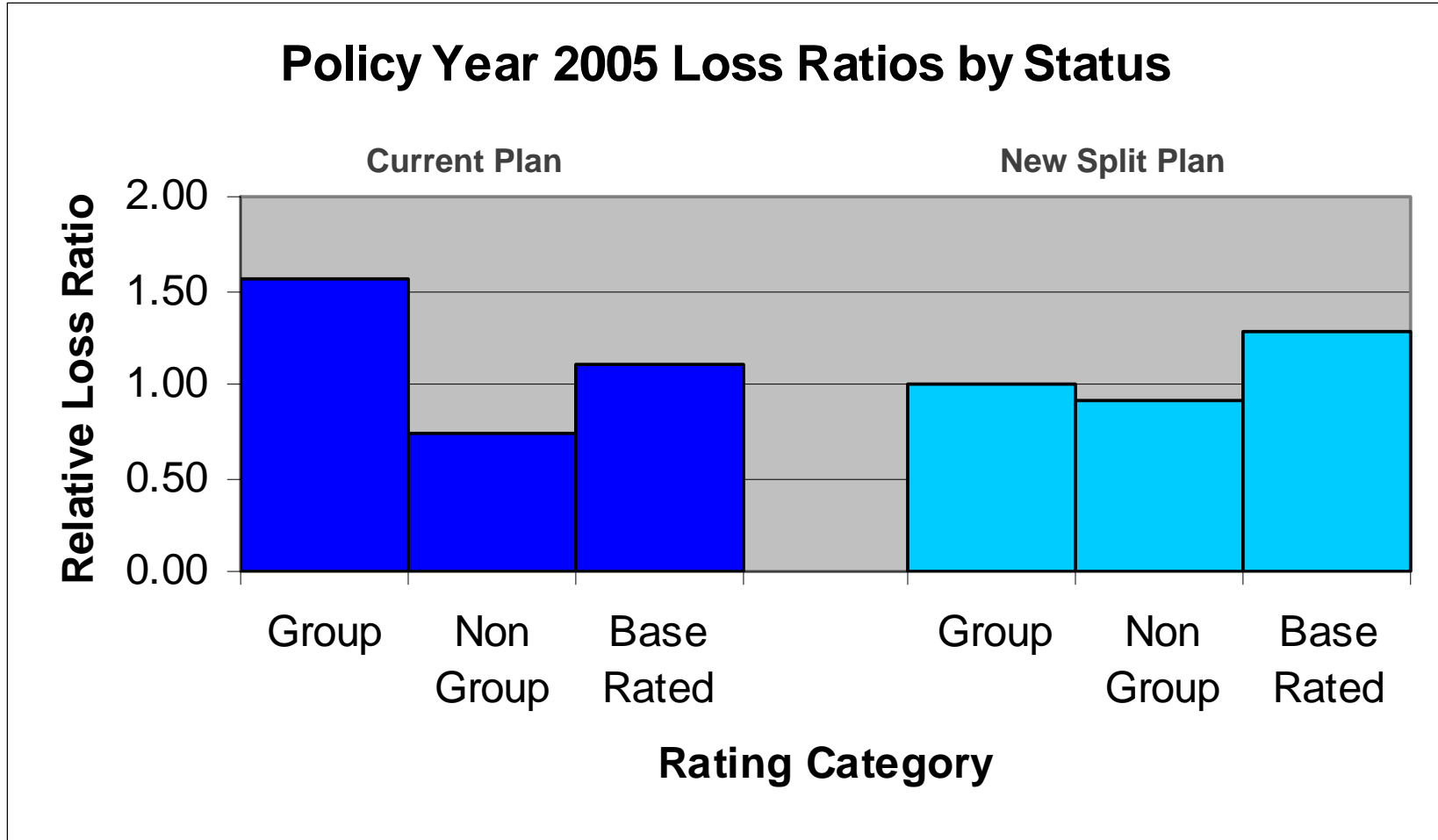
## Split Plan Summary Results \$10,000 Split Point

### Loss Ratios by Group Status

Policy Status	Policy Year 2003		Policy Year 2004		Policy Year 2005	
	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N
Group	145.1%	89.0%	131.7%	77.8%	117.7%	75.7%
Non Group	63.8%	79.7%	53.4%	67.7%	56.1%	69.2%
Base Rated	80.2%	106.8%	73.7%	90.0%	83.0%	96.1%
Total	87.5%	87.5%	75.0%	75.0%	75.5%	75.5%

The loss ratios of Group and Non Group segments move towards the average (total) with this split plan scenario

**Split Plan Summary Results**  
**\$10,000 Split Point**



## Split Plan Summary Results \$10,000 Split Point

Loss Ratios by Premium Size

Premium Ranges	Policy Year 2003		Policy Year 2004		Policy Year 2005	
	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N
\$4,500,000 >	148.5%	86.9%	156.2%	84.0%	126.8%	76.4%
\$1,000,001 to \$4,500,000	124.2%	83.3%	95.1%	68.2%	103.4%	73.1%
\$250,001 to \$1,000,000	62.1%	76.0%	49.8%	62.1%	60.3%	71.9%
\$50,001 to \$250,000	61.8%	79.3%	53.7%	70.6%	54.6%	70.3%
\$50,000 <	69.5%	86.9%	59.1%	75.3%	56.7%	68.5%
Total	89.2%	84.2%	75.3%	72.3%	74.0%	72.1%

The loss ratios by premium size also move towards the total average with this split plan

## Split Plan Summary Results \$10,000 Split Point

Experience Rated Loss Ratios by Size and Quintile--Policy Year 2005

Quintile	Greater than \$4,500,000		\$1,000,001 to \$4,500,000		\$250,001 to \$1,000,000		\$50,001 to \$250,000		Less than \$50,000	
	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N
1	420.2%	74.6%	378.1%	87.8%	91.2%	71.9%	57.3%	64.6%	47.6%	62.1%
2	276.9%	97.9%	166.1%	75.3%	58.9%	65.6%	57.9%	78.2%	54.3%	74.0%
3	230.3%	88.9%	115.6%	77.7%	57.0%	70.6%	58.4%	56.7%	49.4%	57.8%
4	104.7%	77.0%	86.1%	70.8%	44.9%	64.1%	42.7%	73.8%	58.9%	63.1%
5	59.3%	61.0%	58.5%	59.8%	60.7%	83.3%	57.4%	75.5%	64.6%	82.3%
Test Statistic	30.73	0.66	53.60	0.61	0.49	0.07	0.18	0.16	0.13	0.11

- As demonstrated on slide 11, the equity in the rating plan is improved with the new split plan, as the loss ratios are much more similar across the quintile segments.
- The test statistic is a formal measure of performance:
  - A measure above 1.00 means the experience rating plan is making results worse, or less equitable
  - A measure below 1.00 means the experience rating plan is predictive of higher costs, improving equity
  - In all cases a lower measure is better

**Split Plan Summary Results**  
**\$10,000 Split Point**



## Split Plan Summary Results \$10,000 Split Point

Experience Rated Loss Ratios by Size and Quintile--Policy Year 2004

Quintile	Greater than \$4,500,000		\$1,000,001 to \$4,500,000		\$250,001 to \$1,000,000		\$50,001 to \$250,000		Less than \$50,000	
	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N
1	513.6%	104.3%	392.8%	85.0%	72.5%	54.3%	54.7%	65.2%	45.0%	47.7%
2	477.6%	90.2%	144.6%	72.9%	42.0%	54.3%	57.7%	72.8%	43.1%	86.3%
3	180.8%	92.9%	93.3%	68.9%	53.7%	54.0%	49.0%	68.7%	55.3%	69.7%
4	95.6%	68.7%	75.9%	60.3%	42.8%	74.5%	51.4%	67.9%	56.0%	75.1%
5	74.3%	67.4%	57.5%	60.9%	47.5%	68.4%	55.6%	75.5%	76.8%	87.4%
Test Statistic	64.17	0.96	67.82	0.51	0.44	0.14	0.05	0.04	0.28	0.22

- The test statistic is a formal measure of performance:
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  - In all cases a lower measure is better

## Split Plan Summary Results \$10,000 Split Point

Experience Rated Loss Ratios by Size and Quintile--Policy Year 2003

Quintile	Greater than \$4,500,000		\$1,000,001 to \$4,500,000		\$250,001 to \$1,000,000		\$50,001 to \$250,000		Less than \$50,000	
	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N	Current	Plan 10N
1	639.6%	113.0%	467.0%	92.3%	92.0%	74.2%	61.1%	63.7%	55.5%	60.5%
2	421.4%	119.1%	197.4%	91.9%	56.5%	74.6%	62.1%	86.8%	41.6%	71.1%
3	185.5%	101.9%	128.9%	81.7%	55.2%	68.1%	61.2%	70.4%	80.2%	100.9%
4	105.3%	84.2%	100.9%	77.3%	70.4%	77.3%	58.0%	76.7%	67.1%	82.0%
5	74.3%	69.6%	76.4%	78.6%	51.0%	82.7%	64.9%	90.7%	82.6%	97.5%
Test Statistic	135.61	2.34	32.13	0.13	0.79	0.04	0.02	0.13	0.40	0.19

- The test statistic is a formal measure of performance:
  - A measure above 1.00 means the experience rating plan is making results worse, or less equitable
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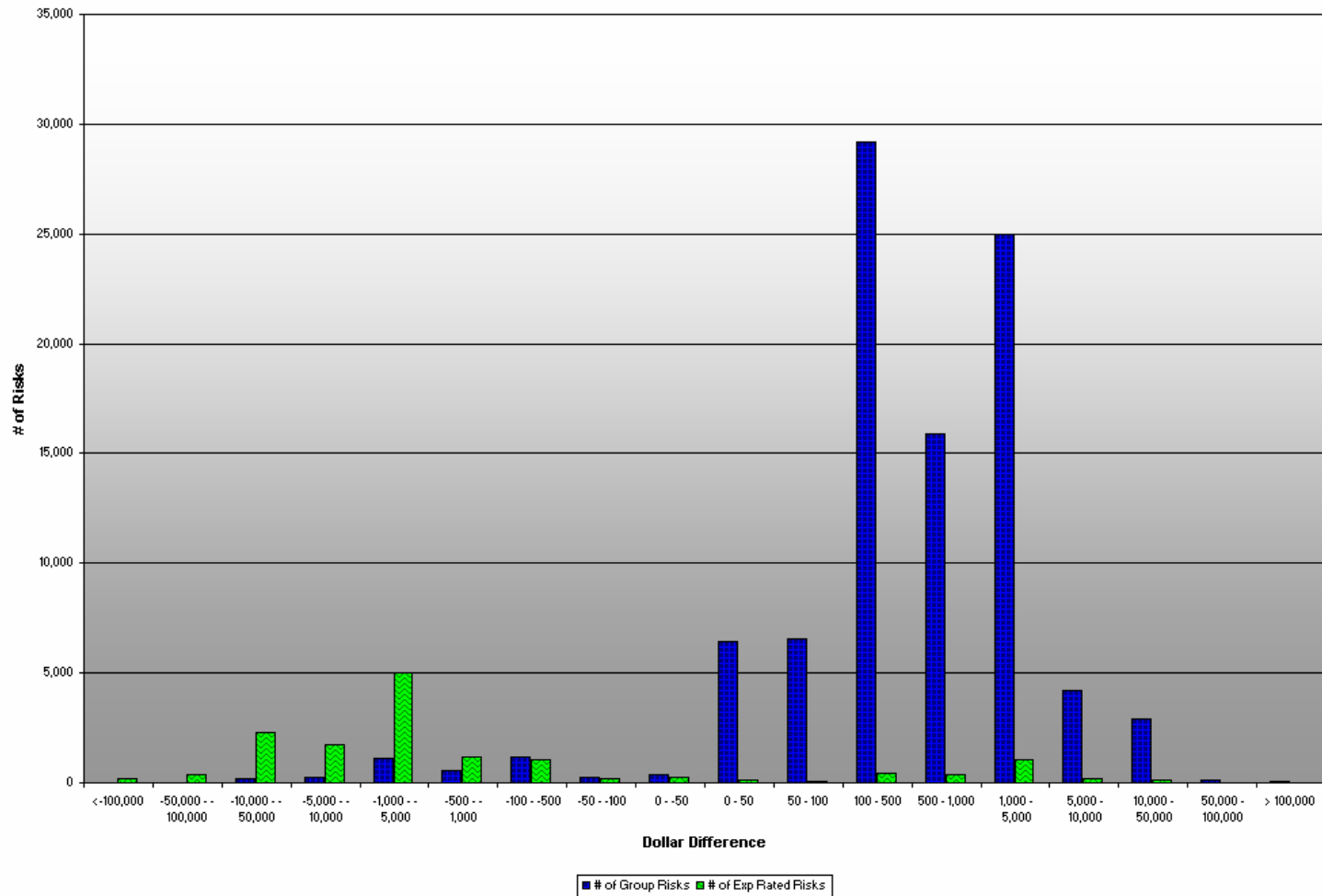


## Policy Level Impacts

# Policy Level Impacts

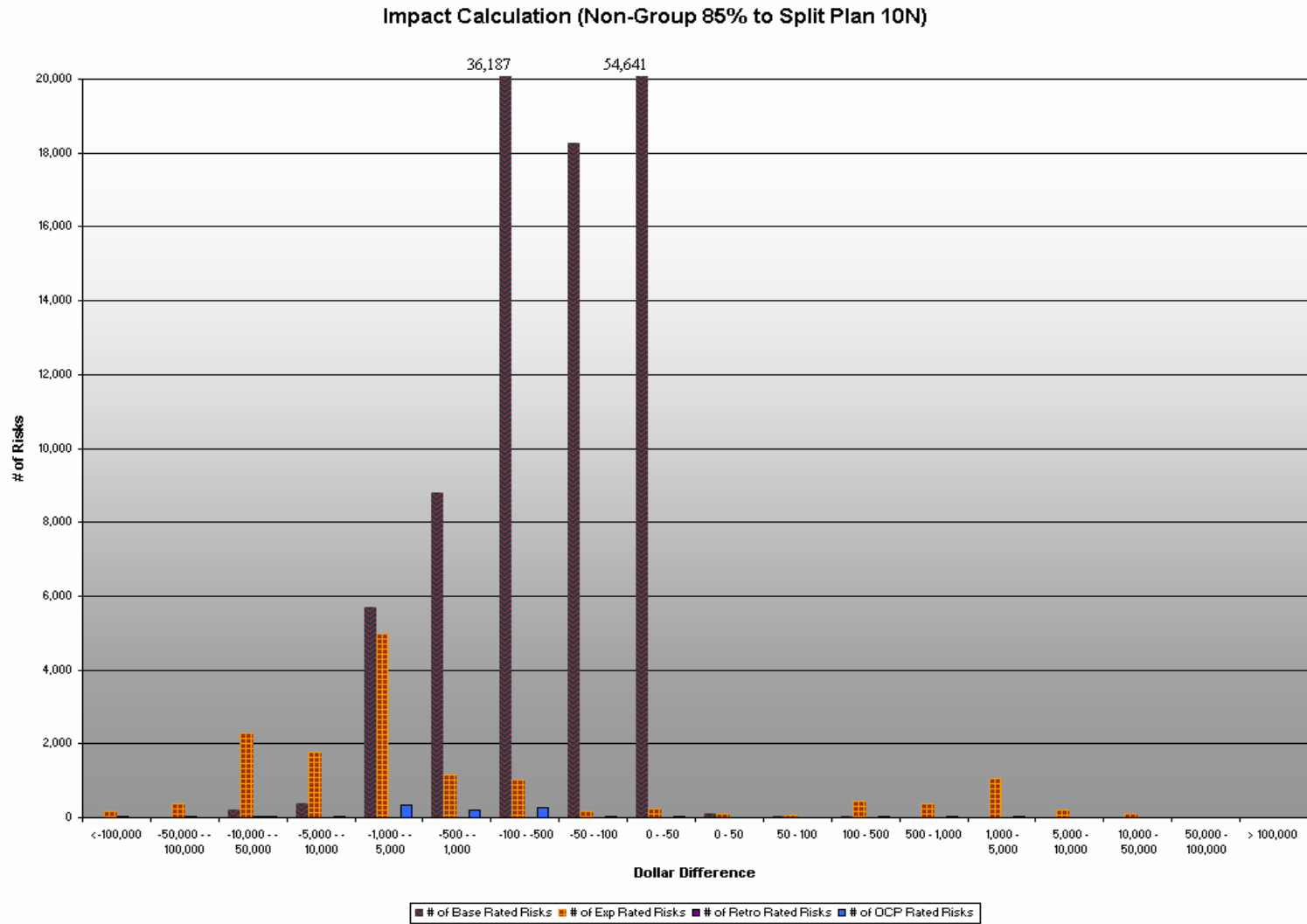
## Dollar impact of split plan by policy

Impact Calculation (85% to Split Plan 10N)  
Experience Rated Risks Only



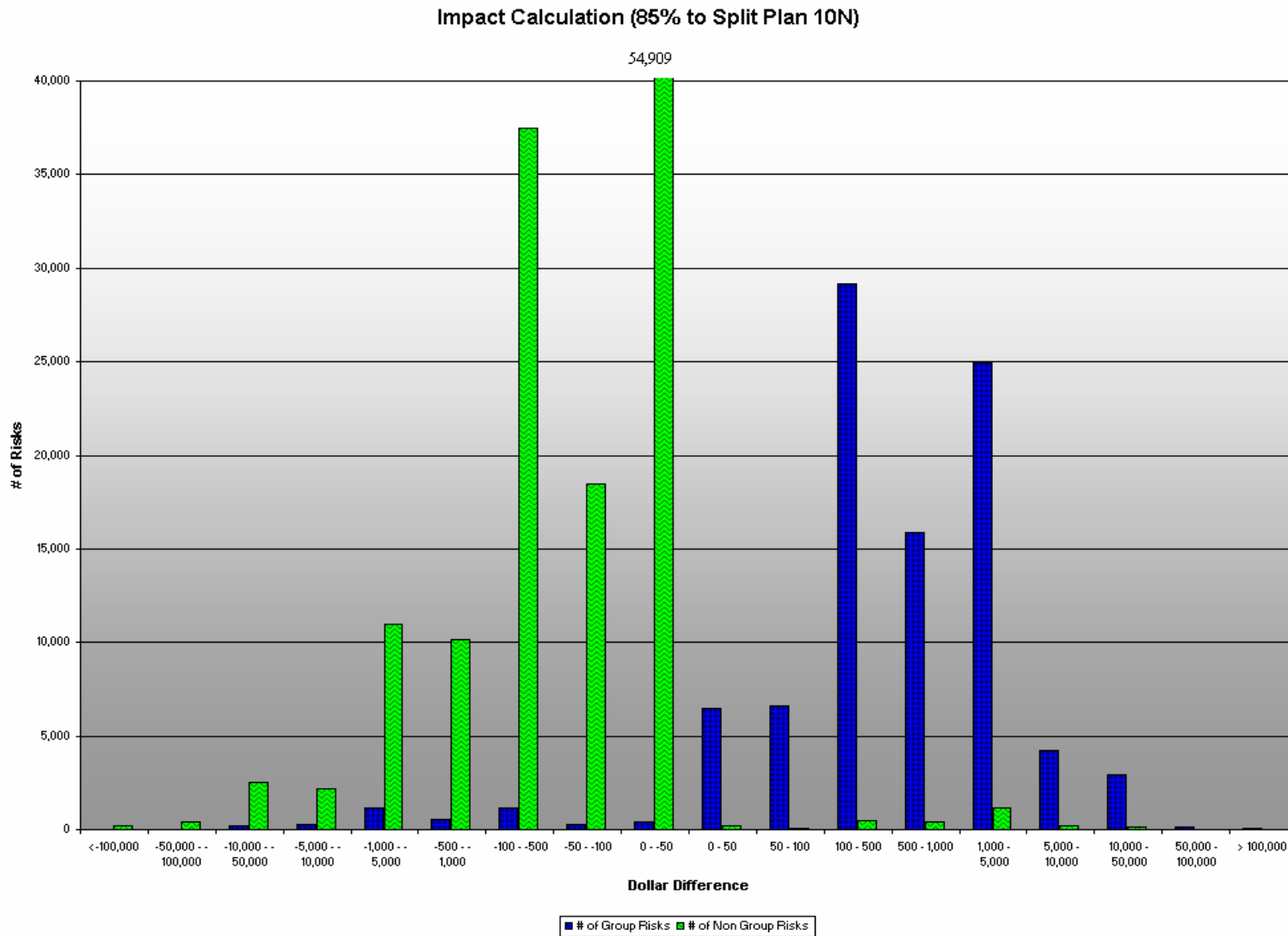
# Policy Level Impacts

## Dollar impact of split plan by policy



# Policy Level Impacts

## Dollar impact of split plan by policy



Recap



## Recap Summary

- Understanding differences between experience rating plans
- Performance measures—equity
- Initial results are encouraging
- Policy level impacts are a challenge
- Matching premiums with expected costs

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