

RULES – INFORMATION

DECEMBER 28, 2018

COMMERCIAL MULTIPLE LINE

LI-ML-2018-064

## OHIO COMMERCIAL PACKAGE POLICY PACKAGE MODIFICATION FACTOR ANALYSIS FURNISHED FOR INFORMATION; EXCEL WORKBOOK NEWLY INCLUDED

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### KEY MESSAGE

This analysis is provided for your information. We are NOT revising the current package modification factors based on this analysis.

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### BACKGROUND

In circular [LI-ML-2018-044](#), we provided you with information about the package modification factor review.

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### ISO ACTION

We are:

- NOT making a submission to the Insurance Department based on this analysis.
- NOT implementing any changes, at this time, to the current package modification factors for this jurisdiction.

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### COMPANY ACTION

You may wish to evaluate your package modification factor needs. The methods described in the attached analysis are based on the judgments of Insurance Services Office, Inc. You should evaluate and substitute your own judgments and procedures where appropriate and consider your own loss experience when determining your package modification factor needs.

If you decide to independently file a package modification factor revision, you must comply with the applicable regulatory filing requirements.

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### REFERENCE(S)

[LI-ML-2018-044](#) (10/30/2018) Commercial Package Policy Experience Reviewed By Staff

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### ATTACHMENT(S)

- Informational Analysis
- Excel Workbook

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## FILES AVAILABLE FOR DOWNLOAD

To download all files associated with this circular, including attachments in the full circular PDF and/or any additional files not included in the PDF, search for the circular number on [ISOnet Circulars](#). Then click the Word/Excel link under the Full Circular column on the Search Results screen.

Please note that in some instances, not all files listed in the Attachment(s) block (if applicable) are included in the PDF.

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## ACKNOWLEDGMENT OF ACTUARIAL QUALIFICATIONS

The American Academy of Actuaries' "Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States" requires that an actuary issuing a Statement of Actuarial Opinion should include an acknowledgment with the opinion that he/she has met the qualification standards of the AAA. ISO considers this rule document a Statement of Actuarial Opinion; therefore we are including the following acknowledgment:

I, Rimma Maasbach, am an Actuarial Consultant in Actuarial Operations for ISO, and I, Bei Zhou, am an Actuarial Product Director for Commercial Property for ISO. We are jointly responsible for the content of this Statement of Actuarial Opinion. We are both members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

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OHIO

ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

COMMERCIAL PACKAGE POLICY

EXECUTIVE SUMMARY

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PURPOSE

This document:

- presents a review of advisory Package Modification Factors (PMFs). PMFs are relativity factors used to adjust monoline loss costs as appropriate for multiline risks.
- provides the analyses used to derive these advisory PMFs.

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PMF CHANGES

The proposed Commercial Package Policy (CPP) Package Modification Factor changes are:

<u>Type of Policy</u>	<u>Property</u>	<u>Liability</u>	<u>Prop. &amp; Liab. Total</u>
Motel/Hotel	-5.3%	-5.1%	-5.2%
Apartment	-4.3	0.0	-3.7
Office	-8.8	-3.2	-6.1
Mercantile	-4.3	0.0	-2.9
Institutional	-7.9	0.0	-6.5
Services	-1.0	0.0	-0.7
Indust./Proc.	-1.3	-3.4	-2.1
Contractors	<u>-5.4</u>	<u>+1.2</u>	<u>0.0</u>
Statewide	-4.3%	-0.4%	-2.8%

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INDICATED  
VS. CAPPED

Indicated PMF changes are based on standard ISO methodology. Differences between indicated and capped PMF changes are caused by rounding each indicated PMF to the nearest one percent and applying an upper cap of 1.00, where necessary.

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# OHIO

## ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

### COMMERCIAL PACKAGE POLICY

#### EXECUTIVE SUMMARY

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##### HISTORICAL SOURCE DATA

The data used in this review is from ISO reporting companies for:

- Basic Group I: five fiscal accident years ending 09/30/17.
  - Basic Group II: ten fiscal accident years ending 09/30/17.
  - Special Causes of Loss: five fiscal accident years ending 09/30/17.
  - Crime: calendar year ending 06/30/16.
  - Inland Marine: five calendar accident years ending 12/31/16.
  - Fidelity: policy year ending 12/31/15.
  - Owners, Landlords, and Tenants: five fiscal accident years ending 09/30/17.
  - Manufacturers and Contractors: five fiscal accident years ending 09/30/17.
  - Products: three calendar accident years ending 12/31/16.
  - Local Products and Completed Operations: three calendar accident years ending 12/31/16.
- 

##### PRIOR ISO REVISIONS

The latest revisions in this state are:

<u>Filing</u>	ML-17-RLA1	ML-12-RLA1	ML-10-RLA1
<u>Dates</u>			
Implemented	06/01/18	10/01/12	10/01/10
<u>Changes</u>			
Indicated	-3.9%	+3.6%	+5.7%
Filed	-3.9%	+3.6%	+5.7%
Implemented	-3.9%	+3.6%	+5.7%

OHIO

ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

COMMERCIAL PACKAGE POLICY

EXECUTIVE SUMMARY

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ADJUSTMENTS  
TO REPORTED  
EXPERIENCE

Standard actuarial procedures have been used in the reviews underlying the calculation of the PMFs, including adjusting the fire and liability losses to ultimate settlement level and, for all coverages, reflecting all loss adjustment expenses and trend. Specific procedures vary by subline.

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TEN LARGEST  
GROUPS IN  
ISO DATA BASE

Insurers are listed in descending order based on the percent of statewide written premium volume from Annual Statement Page 15 for the year ending 12/31/17 for the Annual Statement Line of Business (ASLOB) indicated.

COMMERCIAL MULTI PERIL (ASLOB 51 & 52)

1. Cincinnati Insurance Company
  2. Westfield Insurance Company
  3. Travelers Indemnity Company
  4. Liberty Mutual Insurance Company
  5. Nationwide Mutual Insurance Company
  6. Tokio Marine Companies
  7. Continental Casualty Company
  8. Motorists Mutual Insurance Company
  9. Hartford Accident & Indemnity Company
  10. Hanover Insurance Company
- 

SIZE OF ISO  
DATA BASE

The market share of ISO participating insurers as measured by Annual Statement Page 15 written premium for the year ending 12/31/17 is:

Commercial Multi Peril (ASLOB 51 & 52). 58.0%.

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ADDITIONAL  
SUPPORTING  
MATERIAL

Additional supporting material underlying the calculation of the experience review indications used in this PMF analysis may be found in the respective monoline experience review documents for each line.

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## OHIO

### ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

#### COMMERCIAL PACKAGE POLICY

#### EXECUTIVE SUMMARY

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##### COMPANY DECISION

We encourage each insurer to decide independently whether the judgments made and the procedures or data used by ISO in developing the PMFs contained herein are appropriate for your use. We have included within this document the information upon which ISO relied in order to enable companies to make such independent judgments. The data underlying the enclosed material comes from companies reporting to Insurance Services Office, Inc. Therefore, the ISO experience permits the establishment of a much broader statistical ratemaking base than could be employed by using any individual company's data. A broader data base enhances the validity of ratemaking analysis derived therefrom.

At the same time, however, an individual company may benefit from a comparison of its own experience to the aggregate ISO experience, and may reach valid conclusions with respect to the manner in which its own costs can be expected to differ from ISO's projection based on the aggregate data.

Some calculations included in this document involve areas of ISO staff judgment. Each company should carefully review and evaluate whether the ISO selected PMFs are appropriate for its use.

The material has been developed exclusively by the staff of Insurance Services Office, Inc.

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COMMERCIAL PACKAGE POLICY

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COMMERCIAL PACKAGE POLICY  
METHODOLOGY OVERVIEW

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OBJECTIVE

A Commercial Package Policy (CPP) is essentially a combination of monoline coverages. CPP pricing employs monoline loss costs modified by Package Modification Factors (PMFs). These factors vary by the eight CPP types of policy and are reviewed annually. Monoline and multiline experience are combined and reviewed via a monoline/multiline relativity analysis. The resulting indicated PMFs represent the loss cost for a CPP relative to that for monoline policies providing the same coverages.

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STEP 1: THE  
RELATIVITY  
ANALYSES

Each line of insurance develops indicated changes to monoline and multiline aggregate loss costs based on an experience ratio relativity analysis for that coverage. The monoline indication represents the needed change to monoline loss costs. The multiline indication represents the needed change to multiline aggregate loss costs, which is implemented through changes to the PMFs. For this PMF analysis, multiline indications are developed for each line of insurance and Type of Policy. Relativity analyses are explained in Section B.

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STEP 2:  
CALCULATION  
OF THE PMFs

The procedure described above generates indicated Implicit PMFs (IPMFs) which vary by the various lines of insurance and by type of policy. IPMFs represent what the PMF would be for the CPP risk if only a single coverage were written. For each Type of Policy, IPMFs are weighted by CPP aggregate loss costs to determine the indicated property and liability PMFs. These PMFs may be capped, or rounded to the nearest one percent, and certain component IPMFs appropriately adjusted for this change. These calculations are explained in the remainder of Section A.

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OHIO

TABLE 1  
COMMERCIAL PACKAGE POLICY

SUMMARY OF THIS REVIEW

The display below summarizes the review and shows the capped Package Modification Factors for Property and Liability. For each type of risk, the PMFs are determined to be those factors which when applied to the monoline loss costs produce the appropriate CPP aggregate loss cost level as determined by an analysis of the CPP experience.

TYPE OF POLICY	PROPERTY PMFS			LIABILITY PMFS			PROP. & LIAB. TOTAL
	CURRENT	CAPPED	% CHANGE	CURRENT	CAPPED	% CHANGE	% CHANGE
MOTEL/HOTEL (31)	0.94	0.89	-5.3%	0.99	0.94	-5.1%	-5.2%
APARTMENT (32)	0.94	0.90	-4.3%	1.00	1.00	0.0%	-3.7%
OFFICE (33)	0.91	0.83	-8.8%	0.95	0.92	-3.2%	-6.1%
MERCANTILE (34)	0.93	0.89	-4.3%	0.86	0.86	0.0%	-2.9%
INSTITUTION (35)	0.89	0.82	-7.9%	1.00	1.00	0.0%	-6.5%
SERVICES (36)	0.98	0.97	-1.0%	0.94	0.94	0.0%	-0.7%
IND/PROC (37)	0.75	0.74	-1.3%	0.87	0.84	-3.4%	-2.1%
CONTRACTORS (38)	0.93	0.88	-5.4%	0.83	0.84	1.2%	0.0%
STATEWIDE			-4.3%			-0.4%	-2.8%

OHIO  
TABLE 2  
COMMERCIAL PACKAGE POLICY  
CALCULATION OF REVISED CPP PACKAGE MODIFICATION FACTORS (PMF)

MOTEL/HOTEL (31) *****	(1) AGGREG- ATE LOSS COSTS	(2) CURRENT IMPLICIT PMF	(3) NET INDICATION	(4) INDIC. PMF	(5) CAPPED PMF
<u>COVERAGE</u>					
PROPERTY-					
BASIC GRP I	1,382,438	0.755	-9.3%	0.685	0.685
BASIC GRP II	632,309	1.500	-0.8	1.488	1.488
SP CAUSE/LOSS	599,866	1.199	-4.7	1.143	1.143
*CRIME	2,622	0.910	0.0	0.910	0.910
*INL. MAR.	11,783	0.910	0.0	0.910	0.910
*FIDELITY	18,303	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>2,647,321</u>	<u>0.94</u>	<u>-5.1%</u>	<u>0.892</u>	<u>0.89</u>
LIABILITY-					
OL&T	1,514,957	0.990	-4.9%	0.941	0.941
<u>TOTAL</u>	<u>1,514,957</u>	<u>0.99</u>	<u>-4.9%</u>	<u>0.941</u>	<u>0.94</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	4,162,278		-5.0%		
APARTMENT (32) *****	(1) AGGREG- ATE LOSS COSTS	(2) CURRENT IMPLICIT PMF	(3) NET INDICATION	(4) INDIC. PMF	(5) CAPPED PMF
<u>COVERAGE</u>					
PROPERTY-					
BASIC GRP I	13,649,795	0.867	-10.0%	0.780	0.786
BASIC GRP II	6,829,193	1.242	5.1	1.305	1.315
SP CAUSE/LOSS	4,452,324	0.866	-9.7	0.782	0.788
*CRIME	8,221	0.910	0.0	0.910	0.910
*INL. MAR.	3,718	0.910	0.0	0.910	0.910
*FIDELITY	29,479	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>24,972,730</u>	<u>0.94</u>	<u>-5.3%</u>	<u>0.890</u>	<u>0.90</u>
LIABILITY-					
OL&T	3,443,507	1.000	5.2%	1.052	1.000
<u>TOTAL</u>	<u>3,443,507</u>	<u>1.00</u>	<u>5.2%</u>	<u>1.052</u>	<u>1.00</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	28,416,237		-4.0%		

\* indicates coverage for which reviews are on a MULTISTATE basis.

OHIO  
TABLE 2  
COMMERCIAL PACKAGE POLICY  
CALCULATION OF REVISED CPP PACKAGE MODIFICATION FACTORS (PMF)

OFFICE (33) *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE <u>LOSS COSTS</u>	CURRENT IMPLICIT <u>PMF</u>	NET <u>INDICATION</u>	INDIC. <u>PMF</u>	CAPPED <u>PMF</u>
COVERAGE					
PROPERTY-					
BASIC GRP I	3,039,778	0.793	-4.2%	0.760	0.760
BASIC GRP II	2,166,011	0.757	-1.9	0.743	0.743
SP CAUSE/LOSS	4,223,562	1.163	-16.4	0.972	0.972
*CRIME	11,379	0.910	0.0	0.910	0.910
*INL. MAR.	139,645	0.910	0.0	0.910	0.910
*FIDELITY	73,065	1.000	0.0	1.000	1.000
TOTAL	9,653,440	0.91	-8.6%	0.832	0.83
LIABILITY-					
OL&T	7,759,109	0.953	-4.8%	0.907	0.907
M&C	802,759	0.978	2.3	1.000	1.000
TOTAL	8,561,868	0.95	-3.6%	0.916	0.92
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	18,215,308		-6.2%		
MERCANTILE (34) *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE <u>LOSS COSTS</u>	CURRENT IMPLICIT <u>PMF</u>	NET <u>INDICATION</u>	INDIC. <u>PMF</u>	CAPPED <u>PMF</u>
COVERAGE					
PROPERTY-					
BASIC GRP I	19,727,943	0.931	-8.2%	0.855	0.855
BASIC GRP II	10,060,779	1.117	2.3	1.143	1.143
SP CAUSE/LOSS	9,835,559	0.800	-4.3	0.766	0.766
*CRIME	75,900	0.910	0.0	0.910	0.910
*INL. MAR.	994,039	0.910	0.0	0.910	0.910
*FIDELITY	444,546	1.000	0.0	1.000	1.000
TOTAL	41,138,766	0.93	-4.1%	0.892	0.89
LIABILITY-					
OL&T	12,667,730	0.817	-1.0%	0.809	0.809
M&C	2,423,344	1.045	2.0	1.066	1.066
LOCAL PRODUCT	2,017,951	1.034	2.4	1.059	1.059
*MULTI PRODUCT	3,334,302	0.832	3.7	0.862	0.862
TOTAL	20,443,327	0.86	0.4%	0.863	0.86
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	61,582,093		-2.6%		

\* indicates coverage for which reviews are on a MULTISTATE basis.

OHIO  
TABLE 2  
COMMERCIAL PACKAGE POLICY  
CALCULATION OF REVISED CPP PACKAGE MODIFICATION FACTORS (PMF)

INSTITUTION (35) *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE <u>LOSS COSTS</u>	CURRENT IMPLICIT <u>PMF</u>	NET <u>INDICATION</u>	INDIC. <u>PMF</u>	CAPPED <u>PMF</u>
COVERAGE					
PROPERTY-					
BASIC GRP I	7,505,132	0.787	-10.6%	0.704	0.719
BASIC GRP II	6,656,235	0.960	-9.1	0.873	0.891
SP CAUSE/LOSS	6,489,739	0.962	-9.4	0.872	0.890
*CRIME	70,523	0.910	0.0	0.910	0.910
*INL. MAR.	193,097	0.910	0.0	0.910	0.910
*FIDELITY	270,973	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>21,185,699</u>	<u>0.89</u>	<u>-9.4%</u>	<u>0.806</u>	<u>0.82</u>
LIABILITY-					
OL&T	4,177,376	1.037	9.5%	1.136	1.036
M&C	143,983	0.500	0.0	0.500	0.500
<u>TOTAL</u>	<u>4,321,359</u>	<u>1.00</u>	<u>9.3%</u>	<u>1.093</u>	<u>1.00</u>
-----					
PROP. & LIAB. TOTAL	25,507,058		-6.2%		
SERVICES (36) *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE <u>LOSS COSTS</u>	CURRENT IMPLICIT <u>PMF</u>	NET <u>INDICATION</u>	INDIC. <u>PMF</u>	CAPPED <u>PMF</u>
COVERAGE					
PROPERTY-					
BASIC GRP I	11,110,090	0.991	2.0%	1.011	1.011
BASIC GRP II	7,526,898	1.204	-2.4	1.175	1.175
SP CAUSE/LOSS	6,470,212	0.794	-5.0	0.754	0.754
*CRIME	39,429	0.910	0.0	0.910	0.910
*INL. MAR.	113,191	0.910	0.0	0.910	0.910
*FIDELITY	390,504	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>25,650,324</u>	<u>0.98</u>	<u>-1.1%</u>	<u>0.969</u>	<u>0.97</u>
LIABILITY-					
OL&T	3,687,928	0.809	0.2%	0.811	0.811
M&C	4,179,187	0.919	0.9	0.927	0.927
LOCAL PRODUCT	2,147,104	1.346	0.5	1.353	1.353
*MULTI PRODUCT	494,917	0.899	1.7	0.914	0.914
<u>TOTAL</u>	<u>10,509,136</u>	<u>0.94</u>	<u>0.0%</u>	<u>0.940</u>	<u>0.94</u>
-----					
PROP. & LIAB. TOTAL	36,159,460		-0.8%		

\* indicates coverage for which reviews are on a MULTISTATE basis.

OHIO  
TABLE 2  
COMMERCIAL PACKAGE POLICY  
CALCULATION OF REVISED CPP PACKAGE MODIFICATION FACTORS (PMF)

IND/PROC (37) *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE	CURRENT	NET	INDIC.	CAPPED
COVERAGE	<u>LOSS COSTS</u>	<u>IMPLICIT</u>	<u>INDICATION</u>	<u>PMF</u>	<u>PMF</u>
PROPERTY-					
BASIC GRP I	12,230,103	0.886	-0.5%	0.882	0.882
BASIC GRP II	5,087,707	0.808	-8.9	0.736	0.736
SP CAUSE/LOSS	4,370,080	0.500	0.0	0.500	0.500
*CRIME	16,945	0.910	0.0	0.910	0.910
*INL. MAR.	30,295	0.910	0.0	0.910	0.910
*FIDELITY	232,731	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>21,967,861</u>	<u>0.75</u>	<u>-1.8%</u>	<u>0.737</u>	<u>0.74</u>
LIABILITY-					
M&C	5,526,753	0.873	-3.6	0.842	0.842
LOCAL PRODUCT	438,004	0.666	-1.2	0.658	0.658
*MULTI PRODUCT	7,138,989	0.884	-2.8	0.860	0.860
<u>TOTAL</u>	<u>13,103,746</u>	<u>0.87</u>	<u>-3.1%</u>	<u>0.843</u>	<u>0.84</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	35,071,607		-2.3%		
CONTRACTORS (38) *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE	CURRENT	NET	INDIC.	CAPPED
COVERAGE	<u>LOSS COSTS</u>	<u>IMPLICIT</u>	<u>INDICATION</u>	<u>PMF</u>	<u>PMF</u>
PROPERTY-					
BASIC GRP I	3,504,271	0.997	-2.2%	0.975	0.975
BASIC GRP II	1,755,830	0.969	-2.0	0.950	0.950
SP CAUSE/LOSS	2,598,136	0.821	-11.7	0.725	0.725
*CRIME	6,854	0.910	0.0	0.910	0.910
*INL. MAR.	44,167	0.910	0.0	0.910	0.910
*FIDELITY	183,217	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>8,092,475</u>	<u>0.93</u>	<u>-5.5%</u>	<u>0.879</u>	<u>0.88</u>
LIABILITY-					
M&C	14,874,895	0.875	3.5	0.906	0.906
LOCAL PRODUCT	20,827,684	0.802	-0.9	0.795	0.795
<u>TOTAL</u>	<u>35,702,579</u>	<u>0.83</u>	<u>1.0%</u>	<u>0.839</u>	<u>0.84</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	43,795,054		-0.2%		

\* indicates coverage for which reviews are on a MULTISTATE basis.

OHIO  
TABLE 2  
COMMERCIAL PACKAGE POLICY  
CALCULATION OF REVISED CPP PACKAGE MODIFICATION FACTORS (PMF)

STATEWIDE *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE	CURRENT	NET	INDIC.	CAPPED
COVERAGE	<u>LOSS COSTS</u>	<u>IMPLICIT</u>	<u>INDICATION</u>	<u>PMF</u>	<u>PMF</u>
PROPERTY-		<u>PMF</u>			
BASIC GRP I	72,149,550	0.894	-5.5%	0.845	0.848
BASIC GRP II	40,714,962	1.042	-1.8	1.023	1.028
SP CAUSE/LOSS	39,039,478	0.807	-7.2	0.749	0.752
*CRIME	231,873	0.910	0.0	0.910	0.910
*INL. MAR.	1,529,935	0.910	0.0	0.910	0.910
*FIDELITY	1,642,818	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>155,308,616</u>	<u>0.903</u>	<u>-4.7%</u>	<u>0.861</u>	<u>0.864</u>
LIABILITY-					
OL&T	33,250,607	0.894	0.0%	0.894	0.878
M&C	27,950,921	0.893	1.5	0.906	0.906
LOCAL PRODUCT	25,430,743	0.843	-0.5	0.838	0.838
*MULTI PRODUCT	10,968,208	0.868	-0.6	0.863	0.863
<u>TOTAL</u>	<u>97,600,479</u>	<u>0.877</u>	<u>0.2%</u>	<u>0.879</u>	<u>0.874</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	252,909,095		-2.8%		

\* indicates coverage for which reviews are on a MULTISTATE basis.

OHIO

TABLE 2

COMMERCIAL PACKAGE POLICY

COMBINED PMFs

<u>TYPE OF POLICY</u>	<u>CURRENT COMBINED</u>	<u>INDICATED COMBINED</u>	<u>CAPPED COMBINED</u>
MOTEL/HOTEL (31)	0.96	0.909	0.91
APARTMENT (32)	0.95	0.909	0.91
OFFICE (33)	0.93	0.871	0.87
MERCANTILE (34)	0.91	0.882	0.88
INSTITUTION (35)	0.91	0.850	0.85
SERVICES (36)	0.97	0.960	0.96
IND/PROC (37)	0.80	0.773	0.77
CONTRACTORS (38)	0.85	0.845	0.85

NOTE: Combined PMFs are provided for informational purposes only.

## EXPLANATORY NOTES TO TABLE 2

### CALCULATION OF REVISED PACKAGE MODIFICATION FACTORS

**OBJECTIVE** Commercial package policies were introduced in the 1960's as a convenient tool for both insurer and insured to have the many types of insurance needed by commercial risks packaged under one cover. Thus fire, extended coverage, crime, liability insurance, etc. could be written using a single policy instead of several. Today, virtually any type of monoline coverage can also be purchased as part of a package policy such as the CPP.

The types of insured which can be written under a CPP are generally categorized into the following Types of Policy:

- . Motels and Hotels (TOP 31)
- . Apartments (TOP 32)
- . Offices (TOP 33)
- . Mercantile Operations (TOP 34)
- . Institutions (TOP 35)
- . Service Operations (TOP 36)
- . Industrial and Processing Operations (TOP 37)
- . Contractors (TOP 38)

**PRICING OF POLICIES** Since a CPP is essentially a combination of monoline coverages, CPP pricing employs monoline loss costs modified by PMFs (Package Modification Factors). These factors vary by the categories shown above and are reviewed annually.

**CPP PMF REVIEW PROCEDURE** The CPP review of Package Modification Factors, which appears in Table 2 of this document, determines the appropriate PMF loss cost level for each of the eight CPP categories. This is done by combining the indications of the simultaneous reviews of monoline and multiline experience for the various lines (or coverages).

A detailed explanation of the calculation of the revised PMFs follows.

## EXPLANATORY NOTES TO TABLE 2 (Cont'd)

### LINES OF INSURANCE (COVERAGES) INCLUDED

The CPP review reflects the contribution from each significant coverage which can be written on a CPP. Included are:

#### Property Coverages

- . Basic Group I (BGI) - the predominant property coverage included.
- . Basic Group II (BGII) - both Basic Group I and Basic Group II must be purchased under a CPP contract.
- . Special Causes of Loss (SCL) - typically a type of insurance which is purchased in addition to Basic Group I and Basic Group II in order to provide "all risk" property coverage for the insured.
- . Crime (CRIME) - Crime insurance is a commonly purchased CPP coverage.
- . Inland Marine (INL. MAR.) - A highly specialized line of property insurance, Inland Marine coverages can be purchased as part of a package policy.
- . Fidelity (FIDELITY) - Certain forms of fidelity insurance can be part of the CPP package. Various forms of employee dishonesty coverage are available.

#### Liability Coverages

- . Owners, Landlords and Tenants (OL&T) Liability - this is the prevalent type of Premises/Operations liability for CPP insureds.
- . Manufacturers and Contractors Liability (M&C) - this is the type of Premises/Operations liability insurance for risks whose liability exposure is more heavily off-premises than on.
- . Products/Completed Operations Liability (PROD) - this type of insurance protects against claims for damages arising from products/completed operations in conjunction with an insured's business. For review purposes, this line of insurance is split into the following two categories:
  - Products: experience for this category is reviewed on a multistate basis.
  - Local Products/ Completed Operations: experience for this category reflects an exposure to loss which is local in nature; therefore, individual state experience is used.

EXPLANATORY NOTES TO TABLE 2 (Cont'd)

THE IMPLICIT  
PACKAGE  
MODIFICATION  
FACTOR

For each applicable coverage listed under each of the eight (8) CPP categories, a "current implicit PMF" is shown in column (2). The definition of this factor follows:

For a given CPP category (e.g., apartments) the published Package Modification Factor (PMF) represents the loss cost for a CPP relative to that for monoline policies providing the same coverages. Thus a property (liability) PMF of .80 represents a 20% lower aggregate loss cost for a CPP than for the comparable monoline policies. This PMF, however, represents the CPP "loss cost" for all property (liability) coverages combined. Based on CPP experience, it has been determined that this CPP "loss cost" can differ significantly if it is determined for each property (liability) coverage individually. The IPMF represents what the PMF would be for that CPP risk if only a single coverage were written. The use of the IPMF in monoline/multiline ratemaking and in the determination of revised CPP Package Modification Factors is significant in that it appropriately identifies how different the component parts of the multiline "loss cost" are.

THE MULTILINE  
INDICATION

Under the CPP ratemaking procedures, monoline and multiline experience are combined for each coverage. The results of these coverage analyses are indicated changes to monoline loss costs and also indicated CPP aggregate loss cost level changes. The CPP indications by coverage are then incorporated in the CPP PMF review. These indications (shown in column (3)) represent the needed adjustments to the IPMFs (shown in column (2)) described above.

The development of these indications is detailed in Section B.

THE INDICATED  
PMF

For each CPP category (and for property vs. liability), the indicated PMF is calculated as follows:

Each of the current IPMFs in column (2) is multiplied by the indicated percent change shown in column (3). A weighted average of the indicated IPMFs, using weights based on latest year aggregate loss costs at current ISO loss cost level (column (1) divided by column (2)), yields the indicated PMF at the bottom of column (4).

THE CAPPED  
PMF

The indicated PMF for each category (and for property vs. liability) shown at the bottom of column (4) is limited to a maximum of 1.00 in arriving at the proposed PMF (bottom of column (5)). All indicated PMFs which are below 1.00 are rounded to the nearest .01 in determining the proposed PMF. To the extent that any indicated PMFs are capped at 1.00, indicated PMFs below this value are adjusted in order to minimize any revenue changes which would result from capping.

In addition to the adjustments just described, the IPMFs (for property and liability) shown in column (4) are subject to minimum and maximum values and adjusted in column (5) so that they average to the proposed PMF shown at the bottom of column (5).

COMMERCIAL PACKAGE POLICY

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## OHIO

TABLE 3 - BASIC GROUP I RELATIVITY ANALYSIS

	(1)	(2)	(3)	(4)	(5)
	\$ LST SQ FORMULA RELATIVITY	CREDIBILITY Z	Z-WTD. RELATIVITY	BALANCED RELATIVITY	INDICATED CHANGE *
-----					
TOP					
10	1.173	0.288	1.047	1.052	
31	0.447	0.064	0.950	0.954	-9.3%
32	0.868	0.420	0.942	0.947	-10.0%
33	1.031	0.123	1.004	1.008	-4.2%
34	0.926	0.508	0.962	0.966	-8.2%
35	0.806	0.305	0.936	0.941	-10.6%
36	1.191	0.375	1.068	1.073	+2.0%
37	1.112	0.392	1.042	1.047	-0.5%
38	1.170	0.150	1.024	1.029	-2.2%
RATING GROUP					
01	1.039	0.570	1.022	1.027	
02	1.015	0.429	1.006	1.011	
03	0.936	0.398	0.974	0.979	
04	0.970	0.708	0.979	0.983	
05	1.134	0.094	1.012	1.017	
06	1.038	0.285	1.011	1.016	
07	0.843	0.277	0.954	0.959	
08	0.971	0.461	0.987	0.991	
09	0.951	0.335	0.983	0.988	
10	1.750	0.152	1.089	1.094	
11	1.056	0.107	1.006	1.011	
12	0.850	0.010	0.998	1.003	
13	1.063	0.337	1.021	1.026	
14	0.945	0.282	0.984	0.989	
15	0.969	0.263	0.992	0.997	
17	0.942	0.120	0.993	0.998	
18	0.987	0.121	0.998	1.003	
19	0.926	0.027	0.998	1.003	
20	0.879	0.062	0.992	0.997	
21	0.937	0.408	0.974	0.979	
22	1.084	0.358	1.029	1.034	
TERRITORY					
Cincinnati	0.970	0.316	0.990	0.995	
Cleveland	0.846	0.275	0.955	0.960	
Columbus	1.114	0.301	1.033	1.038	
Toledo	0.711	0.176	0.942	0.947	
Akron	2.300	0.115	1.101	1.106	
Dayton	0.643	0.141	0.940	0.944	
Balance of State	0.996	0.855	0.997	1.002	

\* INDICATED CHANGE = (BALANCED RELATIVITY FOR TOP)/MONOLINE RELATIVITY (TOP10) -1

## OHIO

TABLE 4 - SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS

	(1)	(2)	(3)	(4)	(5)
TOP	\$ LST SQ FORMULA RELATIVITY	CREDIBILITY Z	Z-WTD. RELATIVITY	BALANCED RELATIVITY	INDICATED CHANGE *
10	1.144	0.532	1.074	1.069	
31	1.433	0.066	1.024	1.019	-4.7%
32	0.917	0.359	0.969	0.965	-9.7%
33	0.725	0.333	0.898	0.894	-16.4%
34	1.051	0.554	1.028	1.023	-4.3%
35	0.948	0.499	0.974	0.969	-9.4%
36	1.048	0.450	1.021	1.016	-5.0%
37 **	-----	-----	1.074	1.069	0.0%
38	0.805	0.241	0.949	0.944	-11.7%
-----					
CATEGORY					
01	1.036	0.902	1.032	1.024	
02	0.933	0.160	0.989	0.981	
03	0.862	0.380	0.945	0.938	
04	0.686	0.434	0.849	0.843	
05	1.527	0.386	1.178	1.168	
06	0.801	0.196	0.957	0.950	
07	0.722	0.042	0.986	0.979	
08	1.375	0.446	1.153	1.144	
09	0.421	0.272	0.790	0.784	
10	1.329	0.084	1.024	1.016	
11	0.615	0.384	0.830	0.823	
12	0.863	0.356	0.949	0.942	
13	0.741	0.316	0.910	0.903	
14	1.271	0.287	1.071	1.063	

\* INDICATED CHANGE = (BALANCED RELATIVITY FOR TOP)/MONOLINE RELATIVITY (TOP10) -1

\*\* - TOP 37 IMPLICIT PMF CAPPED AT 0.500.

EXPLANATORY NOTES TO TABLES 3 AND 4

BASIC GROUP I AND SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS

OBJECTIVE

The explanations which follow clarify Tables 3 and 4, the Basic Group I Relativity Analysis and the Special Causes of Loss Relativity Analysis, respectively. The purpose of these analyses is to:

- (1) determine monoline classification and territorial loss cost level needs for Basic Group I;
- (2) determine monoline category loss cost level need for Special Causes of Loss;
- (3) determine indicated changes to the eight property CPP Package Modification Factors based on Basic Group I/Special Causes of Loss experience.

COLUMN (1)

LEAST SQUARES FORMULA RELATIVITIES

The Least Squares Formula Relativities are the marginal relativities which result from the application of the simultaneous review procedure to the raw experience (where marginal refers to the relativities for a given rating variable, e.g. type of policy, across all subsets of any other rating variables, i.e. rating group and territory for Basic Group I, and category for Special Causes of Loss).

The purpose of such a simultaneous review procedure is to arrive at a set of type of policy relativities (which will serve to price CPP policies relative to monoline policies via the PMF); a set of rating group/territory relativities for Basic Group I; and a set of category relativities for Special Causes of Loss that best represent the experience. This procedure is in contrast to a review of each rating variable's experience separately. Such one-way types of review do not take into account differing percentages of monoline and multiline experience in each rating variable, or differing percentages of a particular rating variable's experience in the monoline and multiline types of policy. The simultaneous relativity procedure accounts for these different distributions in generating relativities for the various rating variables.

EXPLANATORY NOTES TO TABLES 3 AND 4 (Cont'd)

COLUMN (1)  
(Cont'd)

The procedure uses an iterative technique to determine a set of marginal relativities by rating variable that is a best fit to the individual cell relativities, with each cell being defined as the cross-section of specific values of each rating variable. The process uses the relativity of the five year experience ratios by rating cell to the overall statewide experience ratio and the latest year aggregate loss costs for each rating cell. (This experience is shown in Table 5 for Basic Group I and Table 6 for Special Causes of Loss). Specifically, the iteration procedure uses the following formulas:

BASIC GROUP I:

$$TOP_i = \frac{\sum_{j=1}^n \sum_{k=1}^t W_{ijk}^2 R_{ijk} RG_j TER_k}{\sum_{j=1}^n \sum_{k=1}^t W_{ijk}^2 RG_j^2 TER_k^2}, \text{ where } 1 \leq i \leq m;$$

$$RG_j = \frac{\sum_{k=1}^t \sum_{i=1}^m W_{ijk}^2 R_{ijk} TOP_i TER_k}{\sum_{k=1}^t \sum_{i=1}^m W_{ijk}^2 TOP_i^2 TER_k^2}, \text{ where } 1 \leq j \leq n$$

$$TER_k = \frac{\sum_{j=1}^n \sum_{i=1}^m W_{ijk}^2 R_{ijk} TOP_i RG_j}{\sum_{j=1}^n \sum_{i=1}^m W_{ijk}^2 TOP_i^2 RG_j^2}, \text{ where } 1 \leq k \leq t$$

EXPLANATORY NOTES TO TABLES 3 AND 4 (Cont'd)

COLUMN (1)  
(Cont'd)

SPECIAL CAUSES OF LOSS:

$$TOP_i = \frac{\sum_{j=1}^n W_{ij}^2 R_{ij} CAT_j}{\sum_{j=1}^n W_{ij}^2 CAT_j^2}, \text{ where } 1 \leq i \leq m;$$

$$CAT_j = \frac{\sum_{i=1}^m W_{ij}^2 R_{ij} TOP_i}{\sum_{i=1}^m W_{ij}^2 TOP_i^2}, \text{ where } 1 \leq j \leq n$$

- $TOP_i$  is the relativity for the  $i$ th Type of Policy;
- $RG_j$  is the relativity for the  $j$ th Rating Group;
- $CAT_j$  is the relativity for the  $j$ th Category;
- $TER_k$  is the relativity for the  $k$ th Territory;
- $W_{ijk}$  is the loss cost volume at current level for the  $i$ th Type of Policy,  $j$ th Rating Group or Category and  $k$ th Territory;
- $R_{ijk}$  is the experience ratio relativity for the  $i$ th Type of Policy,  $j$ th Rating Group or Category and  $k$ th Territory;
- $R_{ij}$  is the experience ratio relativity for the  $i$ th Type of Policy,  $j$ th Rating Group or Category;

EXPLANATORY NOTES TO TABLES 3 AND 4 (Cont'd)

COLUMN (1)  
(Cont'd)

- m is the number of Types of Policy in the analysis;
- n is the number of Rating Groups or Categories in the analysis;
- t is the number of Territories in the analysis.

The procedure determines m Type of Policy relativities using the above formulas. Then, using those results, a set of n Rating Group and t Territory relativities are determined. These steps form an iterative process which continues until there is no appreciable difference in results from one iteration to the next.

COLUMN (2)

CREDIBILITY

The credibility of the experience for each rating variable is determined from the formula:

$$Z = \frac{P}{P + K}$$

where P is the 5-year adjusted aggregate loss costs for a given rating variable, and K is a constant value. For Basic Group I, K equals an aggregate loss cost volume of \$55,000,000 for territory, \$40,000,000 for rating group, and \$100,000,000 for type of policy. For Special Causes of Loss, K equals an aggregate loss cost volume of \$15,000,000.

COLUMN (3)

CREDIBILITY-WEIGHTED RELATIVITIES

Credibility-weighted relativities are calculated based on the formula

$$W = R^Z$$

where Z is the credibility, R is the least squares formula relativity and W is the credibility-weighted relativity for a given rating variable.

This formula implicitly assigns the complement of credibility to a relativity of unity.

EXPLANATORY NOTES TO TABLES 3 AND 4 (Cont'd)

COLUMN (4)

BALANCED RELATIVITIES

The credibility-weighted relativities are balanced to assure that the average relativity across all rating variables remains at unity.

MULTILINE  
CONSIDERATIONS

The type of policy (TOP) relativities are used to generate multiline indications which apply to the current Implicit Package Modification Factors (IPMFs). The indicated IPMFs are calculated as follows:

$$\text{TOP y indicated IPMF} = \frac{(\text{TOP y current IPMF}) \times (\text{TOP y relativity})}{\text{monoline relativity}}$$

For each CPP Type of Policy the indicated IPMF is subject to a minimum value of 0.50 and a maximum value of 1.50. If an indicated IPMF falls outside one of those limits, it is capped at that amount, the aggregate loss costs for that Type of Policy are adjusted to the capped IPMF level, and the entire relativity review as described above is re-performed to take this into account. If an IPMF has been capped it is so noted at the bottom of Table 3 and Table 4.

Loss cost changes for each TOP are calculated as described on Tables 3 and 4.

ENTIRE STATE

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OHIO  
 BASIC GROUP I RELATIVITY ANALYSIS  
 TABLE 5 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 09/30/17 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) Z-WEIGHTED EXPERIENCE RATIO	(5) Z-WEIGHTED RELATIVITY
10 MONOLINE	01 APARTMENTS	954,497	4,902,702	1.074	1.251	1.325
	02 OTHER HABITATIONAL	1,038,141	5,372,102	1.423	1.308	1.386
	03 RESTAURANTS & BARS	250,738	1,424,804	0.932	1.167	1.236
	04 OTHER MERCANTILE RS	1,543,028	7,907,614	0.986	1.142	1.210
	05 PUBLIC BUILDINGS	144,027	890,018	0.710	0.999	1.058
	06 CHURCHES	73,424	335,494	6.320	2.040	2.161
	07 SCHOOLS	157,290	1,143,979	0.260	0.934	0.989
	08 OFFICES AND BANKS	654,814	3,315,625	1.487	1.271	1.346
	09 REC. FACILITIES	444,569	2,326,355	0.397	1.031	1.092
	10 HOTELS AND MOTELS	61,354	272,700	5.179	2.083	2.207
	11 HOSPITALS/NURS HOME	64,934	583,902	1.887	1.212	1.284
	12 BLDGS UNDER CONST.	1,319	12,892	0.000	0.935	0.990
	13 MOTOR VEHICLE RISKS	289,830	1,518,104	2.609	1.405	1.488
	14 OTHER NON-MANUF.	625,580	3,444,962	1.378	1.177	1.247
	15 STORAGE	337,900	1,743,296	1.056	1.105	1.171
	17 FOOD MANUFACTURING	85,864	380,249	1.548	1.130	1.197
	18 WOOD MANUFACTURING	79,027	403,817	0.057	1.338	1.418
	19 WEARING APPAREL	32,775	136,801	0.000	0.750	0.795
	20 CHEM. MANUFACTURING	73,021	443,653	0.000	1.137	1.204
	21 METAL MANUFACTURING	408,875	2,340,549	1.052	1.092	1.156
	22 OTHER MANUFACTURING	292,088	1,556,356	0.793	1.013	1.073
	TOTAL*	7,613,095	40,455,974	1.212	1.197	1.268
31 MULTILINE MOTEL/HOTEL	10 HOTELS AND MOTELS	1,382,438	6,882,415	0.497	0.714	0.756
	TOTAL*	1,382,438	6,882,415	0.497	0.714	0.756
32 MULTILINE APARTMENT	01 APARTMENTS	8,923,147	48,036,359	0.887	0.851	0.902
	02 OTHER HABITATIONAL	4,726,648	24,399,465	0.932	0.875	0.927
	TOTAL*	13,649,795	72,435,824	0.903	0.860	0.911
33 MULTILINE OFFICE	08 OFFICES AND BANKS	3,039,778	14,050,685	1.250	0.953	1.010
	TOTAL*	3,039,778	14,050,685	1.250	0.953	1.010
34 MULTILINE MERCANTILE	03 RESTAURANTS & BARS	4,596,344	23,001,870	0.677	0.776	0.822
	04 OTHER MERCANTILE RS	11,944,367	64,128,554	0.836	0.832	0.881
	08 OFFICES AND BANKS	741,871	3,594,271	1.766	1.068	1.131
	13 MOTOR VEHICLE RISKS	563,757	3,027,141	0.406	0.721	0.764
	14 OTHER NON-MANUF.	404,501	1,989,895	0.966	0.828	0.877
	15 STORAGE	1,477,103	7,435,349	0.915	0.832	0.881
	TOTAL*	19,727,943	103,177,080	0.830	0.824	0.873

ENTIRE STATE

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OHIO  
 BASIC GROUP I RELATIVITY ANALYSIS  
 TABLE 5 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 09/30/17 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) Z-WEIGHTED EXPERIENCE RATIO	(5) Z-WEIGHTED RELATIVITY
35 MULTILINE INSTITUTIONAL	02 OTHER HABITATIONAL	63,055	248,141	0.812	0.828	0.877
	05 PUBLIC BUILDINGS	602,659	3,262,733	0.925	0.856	0.908
	06 CHURCHES	2,598,552	15,602,430	0.719	0.766	0.812
	07 SCHOOLS	2,162,700	14,208,090	0.478	0.660	0.699
	08 OFFICES AND BANKS	668,010	3,258,431	0.124	0.657	0.696
	09 REC. FACILITIES	211,960	1,507,017	0.728	0.793	0.841
	11 HOSPITALS/NURS HOME	874,984	4,184,511	0.627	0.784	0.830
	13 MOTOR VEHICLE RISKS	12,607	91,540	0.000	0.679	0.719
	14 OTHER NON-MANUF.	310,605	1,586,787	0.255	0.702	0.743
	TOTAL*	7,505,132	43,949,680	0.583	0.734	0.777
36 MULTILINE SERVICES	03 RESTAURANTS & BARS	444,308	1,974,324	0.779	1.050	1.113
	04 OTHER MERCANTILE RS	1,295,521	6,848,059	0.964	1.028	1.090
	08 OFFICES AND BANKS	923,438	5,123,646	0.842	1.020	1.080
	09 REC. FACILITIES	2,954,403	16,325,907	1.210	1.193	1.264
	13 MOTOR VEHICLE RISKS	2,798,742	15,538,686	1.437	1.166	1.235
	14 OTHER NON-MANUF.	1,309,980	6,458,321	1.088	1.061	1.124
	15 STORAGE	855,350	4,568,269	1.106	1.040	1.101
	21 METAL MANUFACTURING	131,131	762,456	2.769	1.276	1.352
	22 OTHER MANUFACTURING	397,217	2,484,766	3.328	1.482	1.570
	TOTAL*	11,110,090	60,084,434	1.262	1.131	1.198
37 MULTILINE INDUST/PROCESS	04 OTHER MERCANTILE RS	928,804	4,963,946	0.865	1.003	1.063
	08 OFFICES AND BANKS	245,363	1,247,543	1.415	1.167	1.236
	13 MOTOR VEHICLE RISKS	28,072	119,419	0.273	0.769	0.816
	14 OTHER NON-MANUF.	274,419	1,521,243	0.532	1.004	1.064
	15 STORAGE	112,257	559,694	0.000	0.968	1.025
	17 FOOD MANUFACTURING	1,089,069	5,080,499	0.903	1.003	1.062
	18 WOOD MANUFACTURING	1,024,828	5,100,219	0.898	1.035	1.097
	19 WEARING APPAREL	163,164	961,057	0.294	0.935	0.990
	20 CHEM. MANUFACTURING	391,132	2,177,891	0.293	0.929	0.984
	21 METAL MANUFACTURING	4,612,576	24,460,140	0.770	0.957	1.014
	22 OTHER MANUFACTURING	3,360,419	18,250,142	1.172	1.113	1.179
	TOTAL*	12,230,103	64,441,793	0.888	1.018	1.078

ENTIRE STATE

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OHIO  
 BASIC GROUP I RELATIVITY ANALYSIS  
 TABLE 5 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 09/30/17 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) Z-WEIGHTED EXPERIENCE RATIO	(5) Z-WEIGHTED RELATIVITY
38 MULTILINE	04 OTHER MERCANTILE RS	2,557,465	13,001,705	1.038	1.079	1.143
CONTRACTORS	08 OFFICES AND BANKS	723,975	3,569,228	0.932	1.033	1.094
	12 BLDGS UNDER CONST.	84,247	380,240	0.000	0.949	1.006
	14 OTHER NON-MANUF.	138,584	710,569	1.848	1.157	1.226
	TOTAL*	3,504,271	17,661,742	1.023	1.070	1.133
TOTAL ALL TOPS*	01 APARTMENTS	9,877,644	52,939,061	0.905	0.890	0.943
	02 OTHER HABITATIONAL	5,827,844	30,019,708	1.018	0.952	1.008
	03 RESTAURANTS & BARS	5,291,390	26,400,998	0.698	0.817	0.866
	04 OTHER MERCANTILE RS	18,269,185	96,849,878	0.888	0.915	0.969
	05 PUBLIC BUILDINGS	746,686	4,152,751	0.883	0.884	0.937
	06 CHURCHES	2,671,976	15,937,924	0.873	0.801	0.849
	07 SCHOOLS	2,319,990	15,352,069	0.463	0.678	0.719
	08 OFFICES AND BANKS	6,997,249	34,159,429	1.138	0.991	1.050
	09 REC. FACILITIES	3,610,932	20,159,279	1.081	1.150	1.218
	10 HOTELS AND MOTELS	1,443,792	7,155,115	0.696	0.772	0.817
	11 HOSPITALS/NURS HOME	939,918	4,768,413	0.714	0.813	0.862
	12 BLDGS UNDER CONST.	85,566	393,132	0.000	0.949	1.006
	13 MOTOR VEHICLE RISKS	3,693,008	20,294,890	1.358	1.113	1.178
	14 OTHER NON-MANUF.	3,063,669	15,711,777	1.031	1.017	1.077
	15 STORAGE	2,782,610	14,306,608	0.954	0.934	0.990
	17 FOOD MANUFACTURING	1,174,933	5,460,748	0.950	1.012	1.072
	18 WOOD MANUFACTURING	1,103,855	5,504,036	0.838	1.057	1.120
	19 WEARING APPAREL	195,939	1,097,858	0.245	0.904	0.957
	20 CHEM. MANUFACTURING	464,153	2,621,544	0.247	0.962	1.018
	21 METAL MANUFACTURING	5,152,582	27,563,145	0.844	0.975	1.034
	22 OTHER MANUFACTURING	4,049,724	22,291,264	1.357	1.142	1.210
	TOTAL*	79,762,645	423,139,627	0.944	0.944	1.000

\* TOTALS IN COLUMNS (3), (4) & (5) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

OHIO  
SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS  
TABLE 6 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 09/30/17 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) RELATIVITY
10 MONOLINE	01 BUILDINGS	2,895,090	14,157,430	1.474	1.561
	02 RES. APTS. AND COND	40,919	223,895	0.200	0.212
	03 OFFICES	269,573	1,357,642	0.793	0.840
	04 MERCANTILE - HIGH	432,162	2,021,626	0.447	0.474
	05 MERCANTILE - MEDIUM	159,114	768,968	0.867	0.918
	06 MERCANTILE - LOW	70,349	312,289	0.551	0.584
	07 MOTELS AND HOTELS	6,086	26,912	0.761	0.806
	08 INSTITUTIONAL - HIG	118,698	881,279	0.412	0.436
	09 INSTITUTIONAL - LOW	56,995	386,953	1.198	1.269
	10 INDUST-PROC - HIGH	39,749	183,911	0.025	0.026
	11 INDUST-PROC - LOW	254,996	1,251,257	0.195	0.207
	12 SERVICE - HIGH	116,130	635,337	0.923	0.978
	13 SERVICE - LOW	220,434	1,325,682	0.470	0.498
	14 CONTRACTORS	9,471	62,972	4.915	5.207
	TOTAL*	4,689,766	23,596,153	1.128	1.195
31 MULTILINE MOTEL/HOTEL	01 BUILDINGS	479,853	2,182,372	1.417	1.501
	07 MOTELS AND HOTELS	120,013	635,472	0.987	1.046
	TOTAL*	599,866	2,817,844	1.331	1.410
32 MULTILINE APARTMENT	01 BUILDINGS	3,931,424	19,730,863	0.906	0.960
	02 RES. APTS. AND COND	520,900	2,630,058	0.822	0.871
	TOTAL*	4,452,324	22,360,921	0.896	0.949
33 MULTILINE OFFICE	01 BUILDINGS	2,590,854	12,757,581	0.715	0.757
	03 OFFICES	1,627,596	7,220,796	0.601	0.637
	04 MERCANTILE - HIGH	323	3,341	1.768	1.873
	08 INSTITUTIONAL - HIG	2,731	14,543	0.000	0.000
	11 INDUST-PROC - LOW	121	288	0.000	0.000
	12 SERVICE - HIGH	1,937	7,242	1.780	1.886
	14 CONTRACTORS	0	393	0.000	0.000
	TOTAL*	4,223,562	20,004,184	0.671	0.711
34 MULTILINE MERCANTILE	01 BUILDINGS	5,890,248	29,863,044	1.037	1.099
	03 OFFICES	30,382	142,442	0.405	0.429
	04 MERCANTILE - HIGH	1,541,677	7,633,530	0.707	0.749
	05 MERCANTILE - MEDIUM	1,690,225	8,584,201	1.539	1.630
	06 MERCANTILE - LOW	616,416	3,070,801	0.808	0.856
	08 INSTITUTIONAL - HIG	478	2,240	0.000	0.000
	11 INDUST-PROC - LOW	272	1,236	0.000	0.000
	12 SERVICE - HIGH	15,513	68,961	1.460	1.547
	13 SERVICE - LOW	41,955	233,512	1.449	1.535
	14 CONTRACTORS	8,393	31,943	0.000	0.000
	TOTAL*	9,835,559	49,631,910	1.057	1.120

## OHIO

SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS  
TABLE 6 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 09/30/17 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) RELATIVITY
35 MULTILINE INSTITUTIONAL	01 BUILDINGS	4,295,146	23,463,920	0.936	0.992
	03 OFFICES	9,284	43,088	0.076	0.081
	06 MERCANTILE - LOW	59	174	0.000	0.000
	08 INSTITUTIONAL - HIG	1,436,290	11,043,005	1.253	1.327
	09 INSTITUTIONAL - LOW	739,273	5,156,738	0.376	0.398
	12 SERVICE - HIGH	5,248	39,244	0.000	0.000
	13 SERVICE - LOW	2,968	12,543	0.000	0.000
	14 CONTRACTORS	1,471	5,717	0.000	0.000
	TOTAL*	6,489,739	39,764,429	0.940	0.996
	36 MULTILINE SERVICES	01 BUILDINGS	3,731,101	18,968,973	1.035
03 OFFICES		29,529	161,510	0.983	1.041
04 MERCANTILE - HIGH		59,753	369,860	0.619	0.656
05 MERCANTILE - MEDIUM		8,749	44,206	0.135	0.143
06 MERCANTILE - LOW		7,547	33,936	0.351	0.372
08 INSTITUTIONAL - HIG		30,620	151,566	0.000	0.000
09 INSTITUTIONAL - LOW		14,134	61,198	0.000	0.000
10 INDUST-PROC - HIGH		0	24	0.000	0.000
11 INDUST-PROC - LOW		21,265	103,284	0.628	0.665
12 SERVICE - HIGH		1,501,358	7,530,802	0.863	0.914
13 SERVICE - LOW		1,060,571	5,331,831	0.756	0.801
14 CONTRACTORS		5,585	29,352	2.628	2.784
TOTAL*		6,470,212	32,786,542	0.936	0.992
37 MULTILINE INDUST/PROC		01 BUILDINGS	2,477,750	12,440,527	0.749
	03 OFFICES	7,162	32,115	2.328	2.466
	04 MERCANTILE - HIGH	37,760	162,216	0.697	0.738
	05 MERCANTILE - MEDIUM	855	5,646	0.000	0.000
	08 INSTITUTIONAL - HIG	0	45	0.000	0.000
	10 INDUST-PROC - HIGH	252,262	1,187,416	1.672	1.771
	11 INDUST-PROC - LOW	1,584,949	7,983,782	0.746	0.790
	12 SERVICE - HIGH	5,278	15,357	0.867	0.918
	13 SERVICE - LOW	3,923	15,310	1.261	1.336
	14 CONTRACTORS	141	713	0.000	0.000
	TOTAL*	4,370,080	21,843,127	0.804	0.852

## OHIO

SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS  
TABLE 6 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

TYPE OF POLICY	CATEGORY	(1)	(2)	(3)	(4)
		ACCIDENT YEAR ENDING 09/30/17 AGGREGATE LOSS COSTS	5 - YEAR AGGREGATE LOSS COSTS	5 - YEAR EXPERIENCE RATIO	RELATIVITY
38 MULTILINE CONTRACTORS	01 BUILDINGS	981,157	4,962,072	0.776	0.822
	03 OFFICES	44,077	219,625	1.408	1.492
	04 MERCANTILE - HIGH	301,903	1,308,638	0.839	0.889
	05 MERCANTILE - MEDIUM	7,103	29,788	1.213	1.285
	06 MERCANTILE - LOW	50,231	235,934	0.534	0.566
	08 INSTITUTIONAL - HIG	37	951	0.000	0.000
	11 INDUST-PROC - LOW	646	1,900	0.000	0.000
	12 SERVICE - HIGH	1,133	2,221	0.000	0.000
	13 SERVICE - LOW	4,763	20,138	1.408	1.492
	14 CONTRACTORS	1,207,086	5,910,581	0.976	1.034
	TOTAL*	2,598,136	12,691,848	0.884	0.936
TOTAL ALL TOPS*	01 BUILDINGS	27,272,623	138,526,782	0.989	1.048
	02 RES. APTS. AND COND	561,819	2,853,953	0.777	0.823
	03 OFFICES	2,017,603	9,177,218	0.651	0.690
	04 MERCANTILE - HIGH	2,373,578	11,499,211	0.674	0.714
	05 MERCANTILE - MEDIUM	1,866,046	9,432,809	1.473	1.560
	06 MERCANTILE - LOW	744,602	3,653,134	0.761	0.806
	07 MOTELS AND HOTELS	126,099	662,384	0.976	1.034
	08 INSTITUTIONAL - HIG	1,588,854	12,093,629	1.163	1.232
	09 INSTITUTIONAL - LOW	810,402	5,604,889	0.427	0.452
	10 INDUST-PROC - HIGH	292,011	1,371,351	1.448	1.534
	11 INDUST-PROC - LOW	1,862,249	9,341,747	0.669	0.709
	12 SERVICE - HIGH	1,646,597	8,299,164	0.871	0.923
	13 SERVICE - LOW	1,334,614	6,939,016	0.733	0.776
	14 CONTRACTORS	1,232,147	6,041,671	1.006	1.066
	TOTAL*	43,729,244	225,496,958	0.944	1.000

EXPLANATORY NOTES TO TABLES 5 AND 6

BASIC GROUP I/SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS  
SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

INTRODUCTION      The experience used in the relativity analysis and displayed in Tables 5 and 6 is the latest five years of accident year data as reported under the Commercial Statistical Plan. As in the overall review, loss costs have been adjusted to current ISO loss cost and prospective amount of insurance levels (with multiline aggregate loss costs adjusted additionally by the current implicit package modification factors). Incurred losses are adjusted to prospective cost levels, and are further adjusted by the Basic Group I large loss procedure and the Special Causes of Loss excess procedure. Losses have also been developed to their ultimate settlement value by application of loss development factors.

COLUMN (1)      AGGREGATE LOSS COSTS

The latest year adjusted aggregate loss costs (adjusted as described above) are used as weights both in the calculation of any totals shown in this table and in the iterative formulae used in the simultaneous review procedure.

COLUMN (2)      5 - YEAR AGGREGATE LOSS COSTS

The combined five-year adjusted aggregate loss costs (adjusted as described above) are used to calculate the experience ratios in column (3).

COLUMN (3)      FIVE-YEAR EXPERIENCE RATIOS

These are the ratio of the combined five-year adjusted incurred losses (adjusted as described above) to the combined five-year adjusted aggregate loss costs as shown in Column (2). Any totals which are shown are weighted averages using the adjusted aggregate loss costs in Column (1).

COLUMN (4)      CREDIBILITY (Z) WEIGHTED EXPERIENCE RATIO

A credibility procedure is applied to the initial experience ratios in column (3) on a cell-by-cell basis prior to the simultaneous review procedure. The credibility values are calculated using an empirical Bayesian credibility procedure. In the following discussion, cell refers to an individual combination of TOP, rating group or category, and territory (where applicable).

EXPLANATORY NOTES TO TABLES 5 AND 6 (Cont'd)

COLUMN (4)  
(Cont'd)

The important concept underlying empirical Bayesian credibility is that the credibility should depend both on the overall variation of the group of which the cell is a member, in addition to the variation of the yearly experience ratios for each cell. Therefore, if a cell's data is itself very stable then we would assign a relatively high credibility value, and vice versa.

The empirical Bayesian credibility formula for individual cell credibility is  $Z = ((C-3)/C) (P/(P+K)) + (3/C)$ . P equals the cell's five-year adjusted aggregate loss costs and C equals the number of unique combinations of rating variables (Territory, TOP and Rating Group/Category) within a class group. The K value is estimated from the underlying data using the empirical Bayes method and varies by TOP group and by territory where applicable. The three TOP groups used in this analysis are: Monoline (TOP 10), Premises (TOP's 31-35), and Operations (TOP's 36-38). The 3/C term corrects for the statistical bias associated with the credibility process. The minimum credibility that is possible is 3/C.

The calculated credibility (Z) is then applied to the five-year experience ratio with the complement of credibility applied to the credibility-weighted average of the individual experience ratios of the group, where group refers to the specified TOP/territory group. In a non-territory state, K values would be determined for the three TOP groups on an entire state basis.

COLUMN (5)

WEIGHTED RELATIVITIES

The relativities are the ratios of the five-year credibility-weighted experience ratios shown in column (4) to the average five-year credibility-weighted experience ratio for all TOP's, rating groups and territories (where applicable) combined. These relativities represent how much better or worse than average the experience for a given cell is. They are used along with the aggregate loss costs in column (1) as input for the simultaneous review procedure.

## OHIO

TABLE 7 - BASIC GROUP II RELATIVITY ANALYSIS

	(1) ACCIDENT YEAR ENDING 09/30/17 AGGR. LOSS COSTS AT CURRENT IMPLICIT PMF	(2) ACCIDENT YEARS 2008-2017 EXPER. RATIO AT CURRENT PMF	(3) FORMULA RELATIVITY (2)/ 0.951	(4) CREDI- BILITY Z C	(5) Z WEIGHTED RELA- TIVITY D	(6) BALANCED FORMULA RELA- TIVITY E	(7) NORMALIZED FORMULA RELA- TIVITY F	(8) INDICATED CHANGE G
MONOLINE	3,870,056	0.982	1.033	0.467	1.015	1.015	1.0164	
MULTILINE	40,714,962	0.948	0.997	0.908	0.997	0.997	0.9981	
COVERAGE	44,585,018	0.951	1.000			0.9986	B	0.9997
MULTILINE TOP								
31 MOTEL/HOTEL	632,309	1.027	1.080	0.114	1.009	1.007	1.0084	-0.8%
32 APARTMENT	6,829,193	1.061	1.116	0.592	1.069	1.067	1.0685	+5.1%
33 OFFICE	2,166,011	0.943	0.992	0.287	0.998	0.996	0.9974	-1.9%
34 MERCANTILE	10,060,779	1.006	1.058	0.693	1.040	1.038	1.0395	+2.3%
35 INSTITUTIONAL	6,656,235	0.849	0.893	0.701	0.925	0.923	0.9243	-9.1%
36 SERVICES	7,526,898	0.941	0.989	0.631	0.993	0.991	0.9924	-2.4%
37 INDUST/PROCESS	5,087,707	0.819	0.861	0.525	0.927	0.925	0.9263	-8.9%
38 CONTRACTORS	1,755,830	0.941	0.989	0.290	0.997	0.995	0.9964	-2.0%
	40,714,962	0.948 B	0.997		0.999 B	0.997 B	0.9981 B	

B - AVERAGE WEIGHTED BY COLUMN (1)

C - CREDIBILITY = P/(P+K) WHERE P REPRESENTS THE TOTAL 10 YEAR ADJUSTED LOSS COSTS AND K = 45,000,000

D - (5) = (3) \* (4) + (1.000 - (4))

E - (6) = (5) \* (0.997/0.999)

F - (7) = (6) / 0.9986

G - (8) = (NORMALIZED RELATIVITY FOR TOP)/(NORMALIZED MONOLINE RELATIVITY(TOP10))-1

EXPLANATORY NOTES TO TABLE 7

BASIC GROUP II RELATIVITY ANALYSIS

OBJECTIVE

The explanations which follow clarify Table 7, the Basic Group II (BG II) relativity analysis. The purpose of this analysis is to:

- (1) determine the monoline loss cost level need;
- (2) determine indicated changes to the eight property Commercial Package Policy (CPP) Package Modification Factors (PMFs) based on Basic Group II experience.

COLUMN (1)

AGGREGATE LOSS COSTS

The latest accident year adjusted aggregate loss costs (adjusted in the same manner as in the overall review, i.e. to current manual loss cost and prospective amount of insurance levels, with multiline aggregate loss costs further adjusted to current IPMF level) are used as weights in the calculation of any totals shown in this table.

COLUMN (2)

10 - YEAR EXPERIENCE RATIO

These experience ratios are the ratio of the combined ten year CSP adjusted incurred losses (adjusted to current deductible and prospective cost levels including loss development, and also adjusted to reflect the BGII excess loss procedure) to the combined ten year CSP adjusted aggregate loss costs. Any totals which are shown are weighted averages using the aggregate loss costs in Column (1). When a dash is displayed in the column, it indicates that the indicated IPMF which resulted from this procedure was capped. The procedure which follows when capping occurs is described below.

COLUMN (3)

FORMULA RELATIVITY

The formula relativities are the ratios of the ten year experience ratios for the type of policy (either monoline vs. multiline or individual multiline programs) to the average ten year experience ratio for monoline and multiline combined. These relativities represent how much better or worse than average the experience for a given type of policy is. Again, any totals which are shown are weighted averages and the display of a dash indicates that the resulting IPMF was capped.

EXPLANATORY NOTES TO TABLE 7 (Cont'd)

COLUMN (3)  
(Cont'd)

Unlike the BGI and SCL relativity analyses, the BGII analysis does not employ a simultaneous review procedure since a one way review is involved. That is, the overall loss cost change is only distributed across type of policy; no other rating variables are considered.

COLUMN (4)

CREDIBILITY

The credibility of the experience for each type of policy is determined from the formula:

$$Z = \frac{P}{P + K}$$

where P is the ten year adjusted aggregate loss costs for a given type of policy, and K is a constant loss cost volume of \$45,000,000.

COLUMN (5)

Z - WEIGHTED RELATIVITY

The weighted relativity is a weighted average of the individual TOP formula relativity and the overall (coverage) formula relativity using credibility and its complement as the respective weights. Therefore, to the extent that the indication for a type of policy is not fully credible, the complement of credibility is assigned to the statewide coverage level change.

COLUMN (6)

BALANCED FORMULA RELATIVITY

The individual multiline weighted relativities are balanced to the multiline weighted relativity level by applying a factor equal to the overall multiline relativity (i.e. the weighted relativity for all multiline combined which is shown on the top of the exhibit directly under the corresponding monoline relativity) divided by the average multiline relativity (i.e. the weighted average of the individual multiline weighted relativities which is shown on the bottom of the exhibit). When the indicated IPMF for a type of policy is capped, the balanced relativity is set equal to the product of the capped IPMF and the monoline balanced formula relativity, divided by the current IPMF.

EXPLANATORY NOTES TO TABLE 7 (Cont'd)

COLUMN (7)

NORMALIZED FORMULA RELATIVITY

The normalized relativity is equal to the balanced formula relativity divided by the average monoline/multiline combined relativity. This balances the average monoline/multiline relativity to unity.

COLUMN (8)

INDICATED LOSS COST CHANGES

The indicated multiline (by TOP) changes are calculated by taking the ratio of the TOP relativity (Column 7) to the monoline relativity.

For each type of policy the indicated IPMF is subject to a minimum value of 0.50 and a maximum value of 1.50. If an indicated IPMF falls outside one of those limits, it is capped at that amount, the aggregate loss costs for that type of policy are adjusted to the capped IPMF level, and the entire relativity review as described above is redone to take this into account. If an IPMF has been capped it is so noted in footnote A.

## CRIME AND FIDELITY

The reviews for Burglary and Theft and for Fidelity are done on a multistate basis, combining both multiline and monoline experience. However, unlike other coverages included in a Commercial Package Policy, there is no simultaneous review procedure for either Burglary and Theft or for Fidelity in which separate loss cost level changes can be determined for multiline and monoline experience. In the absence of a simultaneous review procedure, we are unable to determine Type of Policy relativities with which to price CPP policies relative to monoline policies and therefore have assumed a multiline change of 0.0% and thus no change to the historic Crime or Fidelity IPMFs.

OHIO

TABLE 8

COMMERCIAL I.M. RELATIVITY ANALYSIS

(1)	(2)	(3)	(4)	(5)
<u>TOP</u>	<u>BALANCED</u>	<u>CURRENT</u>	<u>INDICATED</u>	<u>SELECTED</u>
<u>10</u>	<u>RELATIVITY</u>	<u>IPMF</u>	<u>IPMF*</u>	<u>IPMF</u>
10	1.000	0.910	0.910	0.910
3X & 7X	1.000			

CLASSIFICATION

150	0.923
191	1.100
192	0.785
220	0.789
221	0.755
234	1.202
235	1.088
240	0.789
241	0.715
327	0.757
328	0.932
340	0.646
341	0.757
342	0.751
343	0.767
403	0.640
451	0.946
452	0.778
453	0.811
454	0.713
460	0.479
482	0.889
510	0.662
514	0.631
530	0.628
534	0.757

\*COLUMN (4) = COLUMN (3) \* (TOP 3X & 7X COLUMN (2) / TOP 10 COLUMN (2) )

## OHIO

COMMERCIAL INLAND MARINE RELATIVITY ANALYSIS  
TABLE 9 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

<u>TYPE OF POLICY</u>	<u>RATING</u> <u>GROUP</u>	(1)	(2)	(3)	(4)
		2016 AGGREGATE <u>LOSS COSTS</u>	2012 - 2016 <u>AGGREGATE LOSS COSTS</u>	FIVE-YEAR <u>EXP RATIO</u>	<u>RELATIVITY</u>
MONOLINE 10	150	311,633	1,898,096	1.151	1.353
	191	5,446,492	15,816,054	1.032	1.213
	192	862,002	2,760,886	0.627	0.737
	220	5,112	87,903	5.716	6.717
	221	1,491	2,853	1.199	1.409
	234	5,224,155	20,144,072	0.600	0.705
	235	8,439,000	24,407,283	0.761	0.894
	240	928,183	3,685,254	0.656	0.771
	241	15,553	114,739	0.053	0.062
	327	18,917	91,546	0.000	0.000
	328	2,319,887	11,908,665	0.792	0.931
	340	40,688	87,993	0.000	0.000
	341	0	0	0.000	0.000
	342	19,188	65,375	0.555	0.652
	343	589	3,417	343.665	578.925
	403	1,600,852	5,771,545	0.345	0.405
	451	3,309,677	12,953,836	0.855	1.005
	452	34,702	137,467	1.628	1.913
	453	45,575	212,456	3.203	3.764
	454	164,836	745,300	0.734	0.863
	460	790,198	3,687,530	0.415	0.488
	482	839,364	2,841,134	0.986	1.159
	510	3,252	39,977	0.020	0.024
	514	446,469	1,612,361	0.339	0.398
	530	504,434	2,697,004	0.489	0.575
	534	0	0	0.000	0.000
	TOTAL#	31,372,249	111,772,746	0.785	0.922

## OHIO

COMMERCIAL INLAND MARINE RELATIVITY ANALYSIS  
TABLE 9 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

<u>TYPE OF POLICY</u>	<u>RATING</u> <u>GROUP</u>	(1)	(2)	(3)	(4)
		2016 AGGREGATE <u>LOSS COSTS</u>	2012 - 2016 <u>AGGREGATE LOSS COSTS</u>	FIVE-YEAR <u>EXP RATIO</u>	<u>RELATIVITY</u>
MULTILINE ##	150	720,095	3,333,227	0.795	0.934
3X & 7X	191	603,595	2,704,067	0.774	0.910
	192	202,803	783,492	0.826	0.971
	220	6,439	28,512	1.526	1.793
	221	5,606	27,010	0.258	0.303
	234	12,669,443	52,530,286	1.162	1.365
	235	478,171	2,380,353	2.879	3.383
	240	11,651	60,061	1.983	2.330
	241	5,028	15,371	0.019	0.022
	327	2,942	18,862	0.000	0.000
	328	396	2,751	168.726	198.268
	340	32,828	132,609	0.016	0.019
	341	0	0	0.000	0.000
	342	6,082	30,546	0.000	0.000
	343	2,369	7,996	0.000	0.000
	403	479,869	2,417,275	0.739	0.868
	451	95,342	438,635	0.360	0.423
	452	38,096	206,651	0.535	0.629
	453	34,375	104,958	0.147	0.173
	454	228,162	984,183	0.274	0.322
	460	3,613,811	15,118,089	0.318	0.374
	482	127,496	760,961	0.693	0.814
	510	23,290	121,842	0.000	0.000
	514	63,169	300,866	0.073	0.086
	530	1,129,574	4,779,992	0.414	0.486
	534	0	0	0.000	0.000
	TOTAL#	20,580,632	87,288,595	0.952	1.119

## REFLECTS CURRENT IPMF OF 0.910.

## OHIO

COMMERCIAL INLAND MARINE RELATIVITY ANALYSIS  
TABLE 9 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

<u>TYPE OF POLICY</u>	<u>RATING</u>	(1)	(2)	(3)	(4)
<u>TOTAL ALL TOPS#</u>	<u>GROUP</u>	<u>2016 AGGREGATE</u>	<u>2012 - 2016</u>	<u>FIVE-YEAR</u>	<u>RELATIVITY</u>
		<u>LOSS COSTS</u>	<u>AGGREGATE LOSS COSTS</u>	<u>EXP RATIO</u>	
	150	1,031,728	5,231,323	0.903	1.061
	191	6,050,087	18,520,121	1.006	1.182
	192	1,064,805	3,544,378	0.665	0.781
	220	11,551	116,415	3.380	3.972
	221	7,097	29,863	0.456	0.536
	234	17,893,598	72,674,358	0.998	1.173
	235	8,917,171	26,787,636	0.875	1.028
	240	939,834	3,745,315	0.672	0.790
	241	20,581	130,110	0.045	0.053
	327	21,859	110,408	0.000	0.000
	328	2,320,283	11,911,416	0.821	0.965
	340	73,516	220,602	0.007	0.008
	341	0	0	0.000	0.000
	342	25,270	95,921	0.421	0.495
	343	2,958	11,413	267.552	314.397
	403	2,080,721	8,188,820	0.436	0.512
	451	3,405,019	13,392,471	0.841	0.988
	452	72,798	344,118	1.056	1.241
	453	79,950	317,414	1.889	2.220
	454	392,998	1,729,483	0.467	0.549
	460	4,404,009	18,805,619	0.335	0.394
	482	966,860	3,602,095	0.947	1.113
	510	26,542	161,819	0.002	0.002
	514	509,638	1,913,227	0.306	0.360
	530	1,634,008	7,476,996	0.437	0.514
	534	0	0	0.000	0.000
	<b>TOTAL#</b>	<b>51,952,881</b>	<b>199,061,341</b>	<b>0.851</b>	<b>1.000</b>

# TOTAL IN COLUMN (3) IS AN AVERAGE USING COLUMN (1) AS WEIGHTS.

## EXPLANATORY NOTES TO TABLES 8 AND 9

### COMMERCIAL INLAND MARINE RELATIVITY ANALYSIS

EXPERIENCE BASE	<p>The Commercial Inland Marine IPMF review presented in the attached exhibits is based on a review of the latest available five years of monoline and multiline experience through accident year 2016 for all companies reporting data to Insurance Services Office under the Inland Marine Module of the Commercial Statistical Plan (CSP) and the Intermediate Level of the Commercial Minimum Statistical Plan (CMSP).</p>
ADJUSTMENT OF DATA	<p>Aggregate loss costs for each year in the review period have been adjusted to the levels which would have been earned had the current loss costs applied throughout the experience period. Reported premiums are adjusted to current level on an individual policy basis by applying a factor equal to all loss cost level changes that have been implemented subsequent to the policy being written. These adjusted premiums are then converted to a loss cost at current level. In order to eliminate the impact of company deviations from the manual level and individual risk modifications which were in effect at the time the policy was written, aggregate loss costs are further adjusted based on reported Rate Modification and Rate Departure Factors/Loss Cost Multipliers. Multiline aggregate loss costs are further adjusted to the level of the current Implicit Package Modification Factor (IPMF). Incurred losses are loaded for all loss adjustment expenses by applying a factor of 1.105.</p>
RELATIVITY ANALYSIS	<p>For Inland Marine coverage, a <u>multistate</u> IPMF level is determined via a two-way relativity analysis similar to the analysis used in Basic Group I. The experience for all reviewed classes is used to form class group relativities. These relativities for monoline and multiline (all programs combined) are determined through an iterative procedure. The ratio of the multiline relativity to the monoline relativity is multiplied by the current IPMF to yield the indicated IPMF. The indicated IPMF is subject to a minimum value of 0.500 and a maximum value of 1.500. If an indicated IPMF falls outside one of those limits, it is capped at that amount, the premiums for that Type of Policy (i.e., TOP 10 versus TOP 3X) are adjusted to the capped IPMF level, and the entire relativity review is performed again to take this into account.</p>

TABLE 10  
OHIO  
OWNERS, LANDLORDS AND TENANTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
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	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE *
TOP					
10	0.992	0.292	0.998	0.998	
31	0.717	0.158	0.949	0.949	-4.9%
32	1.275	0.198	1.049	1.050	+5.2%
33	0.844	0.308	0.949	0.950	-4.8%
34	0.970	0.433	0.987	0.988	-1.0%
35	1.353	0.292	1.092	1.093	+9.5%
36	0.998	0.246	1.000	1.000	+0.2%
CLASS GROUP					
01	0.983	0.210	0.996	0.991	
02	0.954	0.315	0.985	0.980	
03	0.842	0.184	0.969	0.964	
04	1.127	0.053	1.006	1.001	
05	0.343	0.050	0.948	0.943	
06	0.847	0.095	0.984	0.979	
07	1.145	0.200	1.027	1.022	
08	1.058	0.061	1.003	0.998	
09	1.077	0.183	1.014	1.009	
10	0.812	0.276	0.944	0.940	
11	0.835	0.204	0.964	0.959	
12	1.167	0.414	1.066	1.061	
13	1.380	0.125	1.041	1.036	
16	0.658	0.060	0.975	0.970	
TERRITORY					
1	1.069	0.221	1.015	1.014	
2	0.873	0.119	0.984	0.983	
3	0.847	0.222	0.964	0.963	
4	0.717	0.122	0.960	0.959	
5	1.209	0.254	1.049	1.048	
6	0.845	0.108	0.982	0.981	
7	1.297	0.116	1.031	1.029	
8	0.900	0.190	0.980	0.979	
9	0.996	0.546	0.998	0.997	
10	1.049	0.162	1.008	1.007	

\* INDICATED CHANGE = (BALANCED RELATIVITY FOR TOP)/MONOLINE RELATIVITY (TOP10))-1

TABEL 11  
OHIO  
MANUFACTURERS AND CONTRACTORS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
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TOP	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE **
10	0.985	0.341	0.995	0.989	
33	1.297	0.067	1.018	1.012	+2.3%
34	1.113	0.138	1.015	1.009	+2.0%
35 *	-	-	0.995	0.989	0.0%
36	1.016	0.231	1.004	0.998	+0.9%
37	0.748	0.147	0.958	0.953	-3.6%
38	1.072	0.425	1.030	1.024	+3.5%

\* TOP 35 IMPLICIT PMF CAPPED AT 0.500

CLASS  
GROUP

30	1.061	0.191	1.011	1.007
31	1.214	0.298	1.060	1.055
32	1.009	0.393	1.004	1.000
33	0.950	0.153	0.992	0.988
34	0.909	0.195	0.982	0.978
35	0.529	0.048	0.970	0.966
36	0.972	0.119	0.997	0.993
37	0.752	0.081	0.977	0.973
38	0.880	0.176	0.978	0.974

\*\* INDICATED CHANGE = (BALANCED RELATIVITY FOR TOP)/MONOLINE RELATIVITY (TOP10))-1

TABLE 12  
OHIO  
OWNERS, LANDLORDS AND TENANTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

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SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TERRITORY	ALL	(1)	(2)	(3)	(4)	(5)	(6)	
TYPE OF POLICY	CLASS GROUP	FISCAL A.Y.E. 09/30/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	FISCAL A.Y.E. 2013 - 2017 AGG LOSS COST CURRENT LEVEL	FIVE YEAR EXPERIENCE RATIO	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.	
10 MONOLINE	01 FOOD&BEV. (RETAIL)	\$330,673	\$1,315,940	0.910		101		
	02 RESTAURANTS	464,804	2,157,593	0.674		176		
	03 STORES	119,541	571,782	1.717		90		
	04 VENDING & RENTAL	22,690	120,584	0.800		8		
	05 FOOD & BEV. DIST.	48,746	175,023	0.048		6		
	06 NON-FOOD&BEV.DIST	126,146	581,277	1.352		29		
	07 CLUBS, AMSMT&SPRTS	494,044	2,342,900	1.442		172		
	08 HEALTH CARE FACIL	11,913	118,629	0.944		7		
	09 HOTELS AND MOTELS	237,303	1,242,226	0.856		127		
	10 SCHLS & CHURCHES	357,188	1,717,818	0.653		79		
	11 APARTMENTS	953,611	3,564,793	0.842		132		
	12 BUILDINGS&OFFICES	1,604,997	7,385,567	1.182		539		
	13 MISC. PREMISES	141,474	586,140	1.017		70		
	16 GOVT SUBDIVISIONS	3,430	15,395	0.111		1		
		TOTAL *	\$4,916,560	\$21,895,667	1.020		1,537	
	31 MULT MOTEL/HOTEL	09 HOTELS AND MOTELS	\$1,043,359	\$4,861,087	0.773		450	
TOTAL *		\$1,043,359	\$4,861,087	0.773		450		
32 MULT APARTMENT	11 APARTMENTS	\$2,127,568	\$10,881,670	1.076		618		
	12 BUILDINGS&OFFICES	243,993	1,158,055	1.432		91		
	TOTAL *	\$2,371,561	\$12,039,725	1.113		709		
33 MULT OFFICE	12 BUILDINGS&OFFICES	\$5,290,569	\$24,781,219	0.969		1,692		
	13 MISC. PREMISES	53,170	213,058	2.407		24		
	TOTAL *	\$5,343,739	\$24,994,277	0.984		1,716		
34 MULT MERCANTILE	01 FOOD&BEV. (RETAIL)	\$1,441,737	\$6,575,708	0.948		698		
	02 RESTAURANTS	3,922,516	17,633,264	0.947		1,621		
	03 STORES	1,212,272	5,740,423	0.690		429		
	04 VENDING & RENTAL	15,539	89,533	0.316		6		
	05 FOOD & BEV. DIST.	290,270	1,352,456	0.386		40		
	06 NON-FOOD&BEV.DIST	716,383	3,598,046	0.712		134		
	12 BUILDINGS&OFFICES	1,125,607	5,998,085	1.187		457		
	13 MISC. PREMISES	8	24	0.000		0		
	TOTAL *	\$8,724,332	\$40,987,539	0.903		3,385		

TABLE 12  
OHIO  
OWNERS, LANDLORDS AND TENANTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

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SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TERRITORY	ALL	(1)	(2)	(3)	(4)	(5)	(6)
		FISCAL A.Y.E. 09/30/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	FISCAL A.Y.E. 2013 - 2017 AGG LOSS COST CURRENT LEVEL	FIVE YEAR EXPERIENCE RATIO	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.
TYPE OF POLICY	CLASS GROUP						
35 MULT INSTITUT.	07 CLUBS, AMSMT&SPRTS	\$68,835	\$354,191	0.848		26	
	08 HEALTH CARE FACIL	160,435	1,497,946	1.413		62	
	10 SCHLS & CHURCHES	2,372,229	12,894,967	1.124		1,294	
	12 BUILDINGS&OFFICES	72,123	386,062	1.621		91	
	13 MISC. PREMISES	12,976	103,083	0.938		4	
	16 GOVT SUBDIVISIONS	190,383	1,165,277	0.900		65	
	TOTAL *	\$2,876,981	\$16,401,526	1.131		1,542	
36 MULT SERVICES	03 STORES	\$227,754	\$1,066,348	1.014		94	
	04 VENDING & RENTAL	87,259	435,565	1.336		37	
	07 CLUBS, AMSMT&SPRTS	1,394,869	6,511,439	1.077		523	
	08 HEALTH CARE FACIL	1,882	9,489	0.000		0	
	09 HOTELS AND MOTELS	139,365	760,036	1.387		26	
	10 SCHLS & CHURCHES	4,852	24,473	2.496		3	
	12 BUILDINGS&OFFICES	326,283	1,640,025	1.106		225	
	13 MISC. PREMISES	357,631	1,801,576	1.351		185	
	TOTAL *	\$2,539,895	\$12,248,951	1.142		1,093	
TOTAL ALL	TOP						
	01 FOOD&BEV. (RETAIL)	\$1,772,410	\$7,891,648	0.941		799	
	02 RESTAURANTS	4,387,320	19,790,857	0.918		1,797	
	03 STORES	1,559,567	7,378,553	0.816		613	
	04 VENDING & RENTAL	125,488	645,682	1.113		51	
	05 FOOD & BEV. DIST.	339,016	1,527,479	0.337		46	
	06 NON-FOOD&BEV.DIST	842,529	4,179,323	0.807		163	
	07 CLUBS, AMSMT&SPRTS	1,957,748	9,208,530	1.161		721	
	08 HEALTH CARE FACIL	174,230	1,626,064	1.366		69	
	09 HOTELS AND MOTELS	1,420,027	6,863,349	0.847		603	
	10 SCHLS & CHURCHES	2,734,269	14,637,258	1.065		1,376	
	11 APARTMENTS	3,081,179	14,446,463	1.004		750	
	12 BUILDINGS&OFFICES	8,663,572	41,349,013	1.061		3,095	
	13 MISC. PREMISES	565,259	2,703,881	1.357		283	
	16 GOVT SUBDIVISIONS	193,813	1,180,672	0.886		66	
	TOTAL *	\$27,816,427	\$133,428,772	0.998		10,432	

\* TOTALS IN COLUMN (3) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

TABLE 13  
OHIO  
MANUFACTURERS AND CONTRACTORS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

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SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1)	(2)	(3)	(4)	(5)	(6)
		FISCAL A.Y.E. 09/30/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	FISCAL A.Y.E. 2013 - 2017 AGG LOSS COST CURRENT LEVEL	FIVE YEAR EXPERIENCE RATIO	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.
10 MONOLINE	30 SERVICE	\$512,686	\$1,803,720	1.076	1.063	134	0.996
	31 LIGHT CONTRACTING	762,100	3,398,891	1.548	1.529	476	1.044
	32 MEDIUM CONTRCTING	3,968,664	19,241,128	0.934	0.923	1,052	0.989
	33 HEAVY CONTRACTING	659,463	3,085,975	1.163	1.149	83	0.978
	34 DEALER OR DISTRIB	497,617	2,186,710	0.562	0.556	106	0.967
	35 LGT. MANUFACTURER	36,597	250,248	0.542	0.536	8	0.956
	36 MED. MANUFACTURER	451,214	2,092,799	0.837	0.827	60	0.982
	37 HVY. MANUFACTURER	335,124	1,655,705	0.995	0.983	25	0.963
	38 MISC. OPERATION	461,327	2,003,013	0.987	0.975	105	0.963
	TOTAL *	\$7,684,792	\$35,718,189	0.998		2,049	
33 MULT OFFICE	31 LIGHT CONTRACTING	\$8,136	\$117,037	0.000	0.000	0	1.068
	32 MEDIUM CONTRCTING	17,453	90,460	0.103	0.102	1	1.011
	33 HEAVY CONTRACTING	196,052	988,626	1.002	0.990	18	1.000
	38 MISC. OPERATION	331,223	1,634,640	1.404	1.387	64	0.985
		TOTAL *	\$552,864	\$2,830,763	1.200		83
34 MULT MERCANTILE	30 SERVICE	\$128,089	\$618,618	0.702	0.693	13	1.016
	32 MEDIUM CONTRCTING	248,258	1,143,967	0.840	0.830	28	1.009
	34 DEALER OR DISTRIB	1,133,731	5,809,590	1.056	1.043	225	0.986
	38 MISC. OPERATION	158,892	829,579	1.621	1.602	77	0.983
		TOTAL *	\$1,668,970	\$8,401,754	1.050		343
35 MULT INSTITUT.	31 LIGHT CONTRACTING	\$24,733	\$137,396	0.407	0.402	2	1.044
	32 MEDIUM CONTRCTING	74,429	435,453	1.012	1.000	54	0.989
		TOTAL *	\$99,162	\$572,849	0.862		56
36 MULT SERVICES	30 SERVICE	\$95,209	\$492,224	1.132	1.119	59	1.005
	31 LIGHT CONTRACTING	354,591	1,693,659	1.634	1.614	177	1.053
	32 MEDIUM CONTRCTING	255,809	1,133,907	0.851	0.840	41	0.998
	33 HEAVY CONTRACTING	83,921	493,248	1.031	1.018	15	0.986
	34 DEALER OR DISTRIB	994,753	4,284,144	1.050	1.037	350	0.976
	36 MED. MANUFACTURER	43,980	202,291	0.677	0.669	13	0.991
	38 MISC. OPERATION	1,049,965	4,559,086	0.717	0.708	311	0.972
		TOTAL *	\$2,878,228	\$12,858,559	0.979		966

TABLE 13  
OHIO  
MANUFACTURERS AND CONTRACTORS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

-----  
SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1)	(2)	(3)	(4)	(5)	(6)
		FISCAL A.Y.E. 09/30/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	FISCAL A.Y.E. 2013 - 2017 AGG LOSS COST CURRENT LEVEL	FIVE YEAR EXPERIENCE RATIO	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.
37 MULT INDUST/PROC.	31 LIGHT CONTRACTING	\$633	\$3,018	0.000	0.000	0	1.005
	32 MEDIUM CONTRCTING	242,782	1,191,720	0.925	0.914	55	0.952
	33 HEAVY CONTRACTING	176,306	1,000,883	0.519	0.513	18	0.942
	34 DEALER OR DISTRIB	39,897	165,948	1.175	1.160	7	0.931
	35 LGT. MANUFACTURER	161,074	757,716	0.398	0.393	34	0.920
	36 MED. MANUFACTURER	1,885,998	9,272,173	0.775	0.766	182	0.946
	37 HVY. MANUFACTURER	1,273,091	6,014,291	0.505	0.499	94	0.927
	38 MISC. OPERATION	26,523	143,919	0.167	0.165	2	0.928
	TOTAL *	\$3,806,304	\$18,549,668	0.666		392	
38 MULT CONTRACTORS	30 SERVICE	\$1,426,741	\$7,069,312	1.187	1.173	457	1.032
	31 LIGHT CONTRACTING	2,361,782	11,538,947	1.167	1.153	948	1.081
	32 MEDIUM CONTRCTING	5,148,619	25,352,925	1.170	1.156	1,558	1.024
	33 HEAVY CONTRACTING	1,248,103	6,472,329	0.981	0.969	291	1.012
	38 MISC. OPERATION	59,173	253,043	0.594	0.587	3	0.997
	TOTAL *	\$10,244,418	\$50,686,556	1.146		3,257	
TOTAL ALL TOP	30 SERVICE	\$2,162,725	\$9,983,874	1.129		663	
	31 LIGHT CONTRACTING	3,511,975	16,888,948	1.289		1,603	
	32 MEDIUM CONTRCTING	9,956,014	48,589,560	1.051		2,789	
	33 HEAVY CONTRACTING	2,363,845	12,041,061	1.001		425	
	34 DEALER OR DISTRIB	2,665,998	12,446,392	0.963		688	
	35 LGT. MANUFACTURER	197,671	1,007,964	0.424		42	
	36 MED. MANUFACTURER	2,381,192	11,567,263	0.785		255	
	37 HVY. MANUFACTURER	1,608,215	7,669,996	0.607		119	
	38 MISC. OPERATION	2,087,103	9,423,280	0.944		562	
	TOTAL *	\$26,934,738	\$129,618,338	1.012		7,146	

\* TOTALS IN COLUMN (3) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

TABLE 14  
OHIO  
PRODUCTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
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TOP	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE *
10	0.908	0.385	0.964	0.961	
34	1.062	0.394	1.024	1.021	+ 6.2%
36	0.945	0.198	0.989	0.986	+ 2.6%
37	1.036	0.541	1.019	1.017	+ 5.8%
CLASS GROUP					
3	0.939	0.535	0.967	0.971	
4	1.062	0.425	1.026	1.029	
5	1.158	0.132	1.020	1.023	
6	0.984	0.341	0.995	0.998	
7	0.957	0.186	0.992	0.995	

\* INDICATED CHANGE =  
(BALANCED RELATIVITY FOR TOP) / (BALANCED MONOLINE (TOP 10) RELATIVITY) - 1

NOTE: THE INDICATED CHANGES BY TOP WERE FURTHER ADJUSTED BY THE FOLLOWING DIFFERENTIALS:  
TOP 34: 0.976  
TOP 36: 0.991  
TOP 37: 0.919

TABLE 15  
MULTISTATE  
PRODUCTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

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SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1)	(2)	(3)	(4)	(5)	(6)
		CALENDAR A.Y.E. 12/31/2016 AGGREGATE LOSS COSTS AT CURRENT LEVEL	CALENDAR A.Y.E. 2012 - 2016 AGG LOSS COST CURRENT LEVEL	FIVE YEAR EXPERIENCE RATIO	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.
10 MONOLINE	03 MAN,DLR,DSTFD/DRG	\$21,602,530	\$83,447,793	0.852	0.787	1,581	0.933
	04 DLR,DST-NOTFD/DRG	9,679,270	41,811,675	1.278	1.182	666	0.990
	05 MAN.NTFD/DRG (LOW)	1,692,267	7,299,063	0.767	0.709	64	0.984
	06 MAN.NTFD/DRG (MED)	10,333,678	44,740,395	0.937	0.867	509	0.960
	07 MAN.NTFD/DRG (HGH)	2,805,495	12,365,722	1.011	0.935	148	0.957
	TOTAL *	\$46,113,240	\$189,664,648	0.967		2,968	
34 MULT MERCANTILE	03 MAN,DLR,DSTFD/DRG	\$5,884,889	\$28,782,063	1.470	1.359	936	0.991
	04 DLR,DST-NOTFD/DRG	32,124,091	153,045,789	1.148	1.061	2,174	1.051
	06 MAN.NTFD/DRG (MED)	15,743	64,180	0.000	0.000	0	1.019
	TOTAL *	\$38,024,723	\$181,892,032	1.197		3,110	
36 MULT SERVICES	04 DLR,DST-NOTFD/DRG	\$3,789,140	\$17,974,549	1.089	1.007	780	1.016
	06 MAN.NTFD/DRG (MED)	60,544	302,132	0.755	0.698	8	0.985
	TOTAL *	\$3,849,684	\$18,276,681	1.084		788	
37 MULT INDUST/PROC.	03 MAN,DLR,DSTFD/DRG	\$18,758,762	\$92,830,487	1.011	0.935	3,210	0.987
	05 MAN.NTFD/DRG (LOW)	3,999,375	22,161,197	1.454	1.345	287	1.040
	06 MAN.NTFD/DRG (MED)	30,062,799	137,041,119	1.114	1.030	1,814	1.015
	07 MAN.NTFD/DRG (HGH)	8,087,615	39,304,471	1.047	0.968	549	1.012
	TOTAL *	\$60,908,551	\$291,337,274	1.096		5,860	
TOTAL ALL TOP	03 MAN,DLR,DSTFD/DRG	\$46,246,181	\$205,060,343	0.995		5,727	
	04 DLR,DST-NOTFD/DRG	45,592,501	212,832,013	1.171		3,620	
	05 MAN.NTFD/DRG (LOW)	5,691,642	29,460,260	1.250		351	
	06 MAN.NTFD/DRG (MED)	40,472,764	182,147,826	1.068		2,331	
	07 MAN.NTFD/DRG (HGH)	10,893,110	51,670,193	1.038		697	
	TOTAL *	\$148,896,198	\$681,170,635	1.082		12,726	

\* TOTALS IN COLUMN (3) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

TABLE 16  
OHIO  
LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
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TOP	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE *
10	1.004	0.764	1.003	1.001	
34	1.045	0.588	1.026	1.025	+2.4%
36	1.014	0.533	1.007	1.006	+0.5%
37	0.935	0.146	0.990	0.989	-1.2%
38	0.994	1.000	0.994	0.992	-0.9%
CLASS GROUP					
1	0.852	0.596	0.909	0.903	
2	1.029	0.508	1.015	1.008	
11	1.067	0.341	1.022	1.015	
12	1.022	1.000	1.022	1.015	
13	0.802	0.282	0.940	0.933	

\* INDICATED CHANGE =  
(BALANCED RELATIVITY FOR TOP) / (BALANCED MONOLINE (TOP 10) RELATIVITY) - 1

TABLE 16C  
MULTISTATE  
LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS \*

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STATE	(1) BAILEY FORMULA RELATIV	(2) CREDIBILITY Z	(3) Z-WTD RELATIV	(4) BALANCED RELATIV.
	1.319	0.399	1.117	1.114
	1.178	0.648	1.112	1.108
	1.137	0.606	1.081	1.078
	1.443	0.200	1.076	1.073
	1.133	0.577	1.075	1.072
	1.174	0.429	1.071	1.068
	1.288	0.243	1.063	1.060
	1.101	0.442	1.043	1.040
	1.129	0.344	1.043	1.040
	1.093	0.371	1.034	1.031
	1.088	0.381	1.033	1.030
	1.129	0.256	1.032	1.029
	1.206	0.162	1.031	1.028
	1.056	0.508	1.028	1.025
	1.118	0.206	1.023	1.020
	1.126	0.166	1.020	1.017
	1.043	0.224	1.009	1.007
	1.032	0.251	1.008	1.005
	1.004	0.291	1.001	0.998
	1.005	0.228	1.001	0.998
	0.997	0.274	0.999	0.996
	0.968	0.150	0.995	0.992
	0.979	0.474	0.990	0.987
	0.958	0.229	0.990	0.987
	0.966	0.333	0.989	0.986
	0.954	0.247	0.988	0.986
	0.971	0.363	0.989	0.986
	0.886	0.104	0.988	0.985
	0.965	0.336	0.988	0.985
	0.964	0.347	0.987	0.984
	0.955	0.307	0.986	0.983
	0.968	0.428	0.986	0.983
	0.963	0.462	0.983	0.980
	0.773	0.097	0.975	0.972
	0.933	0.385	0.974	0.971
	0.837	0.161	0.972	0.969
	0.933	0.512	0.965	0.963
	0.879	0.281	0.965	0.962
	0.901	0.382	0.961	0.958
	0.831	0.230	0.958	0.956
	0.759	0.166	0.955	0.952
	0.526	0.076	0.952	0.950
	0.757	0.206	0.944	0.941
	0.699	0.168	0.942	0.939
	0.837	0.337	0.942	0.939
	0.474	0.085	0.939	0.936
	0.680	0.164	0.939	0.936
	0.705	0.188	0.936	0.934
	0.849	0.407	0.936	0.933
	0.809	0.350	0.928	0.926
Ohio	0.788	0.594	0.868	0.865
	0.731	0.502	0.854	0.852

\* Sorted by balanced relative change.

TABLE 17  
OHIO  
LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

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SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1)	(2)	(3)	(4)	(5)	(6)
		CALENDAR A.Y.E. 12/31/2016 AGGREGATE LOSS COSTS AT CURRENT LEVEL	CALENDAR A.Y.E. 2012 - 2016 AGG LOSS COST CURRENT LEVEL	FIVE YEAR EXPERIENCE RATIO	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.
10 MONOLINE	01 RET. STRS-FOOD/DRG	\$80,052	\$384,337	0.235	0.244	19	0.782
	02 RET. STRS-NTFD/DRG	66,076	336,449	2.710	2.811	22	0.873
	11 COMP. OPS. (LOW)	157,104	731,365	0.986	1.023	19	0.880
	12 COMP. OPS. (MED)	3,799,221	17,436,009	0.673	0.698	289	0.880
	13 COMP. OPS. (HGH)	447,234	2,225,889	0.607	0.630	20	0.809
	TOTAL *	\$4,549,687	\$21,114,049	0.699		369	
34 MULT MERCANTILE	01 RET. STRS-FOOD/DRG	\$710,430	\$3,035,058	0.571	0.592	263	0.801
	02 RET. STRS-NTFD/DRG	317,986	1,462,648	0.482	0.500	36	0.894
	12 COMP. OPS. (MED)	134,668	647,798	0.829	0.860	7	0.900
	TOTAL *	\$1,163,084	\$5,145,504	0.576		306	
36 MULT SERVICES	01 RET. STRS-FOOD/DRG	\$53,869	\$263,647	0.482	0.500	11	0.786
	02 RET. STRS-NTFD/DRG	598,111	2,710,372	1.061	1.101	124	0.877
	11 COMP. OPS. (LOW)	266,446	1,200,296	1.117	1.159	62	0.884
	12 COMP. OPS. (MED)	244,565	1,426,638	0.632	0.656	47	0.884
	13 COMP. OPS. (HGH)	74,533	435,735	0.463	0.480	4	0.812
	TOTAL *	\$1,237,524	\$6,036,688	0.927		248	
37 MULT INDUST/PROC.	01 RET. STRS-FOOD/DRG	\$68	\$328	0.000	0.000	0	0.772
	11 COMP. OPS. (LOW)	3,316	13,997	0.000	0.000	0	0.869
	12 COMP. OPS. (MED)	246,161	1,117,577	0.977	1.014	20	0.869
	13 COMP. OPS. (HGH)	2,907	15,829	0.000	0.000	0	0.798
	TOTAL *	\$252,452	\$1,147,731	0.953		20	
38 MULT CONTRACTORS	11 COMP. OPS. (LOW)	\$647,142	\$2,776,410	0.640	0.664	52	0.872
	12 COMP. OPS. (MED)	10,499,637	50,467,664	0.794	0.823	909	0.872
	13 COMP. OPS. (HGH)	857,650	4,307,038	0.723	0.750	43	0.801
	TOTAL *	\$12,004,429	\$57,551,112	0.780		1,004	
TOTAL ALL TOP	01 RET. STRS-FOOD/DRG	\$844,419	\$3,683,370	0.533		293	
	02 RET. STRS-NTFD/DRG	982,173	4,509,469	0.984		182	
	11 COMP. OPS. (LOW)	1,074,008	4,722,068	0.807		133	
	12 COMP. OPS. (MED)	14,924,252	71,095,686	0.764		1,272	
	13 COMP. OPS. (HGH)	1,382,324	6,984,491	0.670		67	
	TOTAL *	\$19,207,176	\$90,995,084	0.760		1,947	

\* TOTALS IN COLUMN (3) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

TABLE 18  
MULTISTATE  
LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

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SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1)	(2)	(3)	(4)	(5)	(6)
		CALENDAR A.Y.E. 12/31/2016 AGGREGATE LOSS COSTS AT CURRENT LEVEL	CALENDAR A.Y.E. 2012 - 2016 AGG LOSS COST CURRENT LEVEL	FIVE YEAR EXPERIENCE RATIO	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.
10 MONOLINE	01 RET. STRS-FOOD/DRG	\$3,182,470	\$12,836,961	0.802		767	
	02 RET. STRS-NTFD/DRG	2,924,031	13,338,270	1.084		529	
	11 COMP. OPS. (LOW)	4,590,082	20,152,490	1.003		479	
	12 COMP. OPS. (MED)	89,807,887	402,728,315	1.020		6,697	
	13 COMP. OPS. (HGH)	9,315,286	47,098,800	0.569		288	
	TOTAL *	\$109,819,756	\$496,154,836	0.977		8,760	
34 MULT MERCANTILE	01 RET. STRS-FOOD/DRG	\$11,273,352	\$48,403,501	0.849		4,326	
	02 RET. STRS-NTFD/DRG	6,296,498	28,377,450	0.986		731	
	12 COMP. OPS. (MED)	2,181,403	11,063,115	1.184		135	
	TOTAL *	\$19,751,253	\$87,844,066	0.930		5,192	
36 MULT SERVICES	01 RET. STRS-FOOD/DRG	\$987,984	\$4,706,764	0.976		241	
	02 RET. STRS-NTFD/DRG	12,294,939	51,500,224	0.993		2,617	
	11 COMP. OPS. (LOW)	3,802,998	17,264,990	1.018		578	
	12 COMP. OPS. (MED)	4,612,981	22,645,594	0.873		739	
	13 COMP. OPS. (HGH)	1,135,617	6,185,367	1.014		99	
	TOTAL *	\$22,834,519	\$102,302,939	0.973		4,274	
37 MULT INDUST/PROC.	01 RET. STRS-FOOD/DRG	\$21,108	\$91,573	4.607		1	
	11 COMP. OPS. (LOW)	147,528	681,634	0.448		17	
	12 COMP. OPS. (MED)	4,476,886	21,707,150	0.929		305	
	13 COMP. OPS. (HGH)	51,521	451,549	0.415		1	
	TOTAL *	\$4,697,043	\$22,931,906	0.925		324	
38 MULT CONTRACTORS	11 COMP. OPS. (LOW)	\$9,387,261	\$43,651,462	1.034		677	
	12 COMP. OPS. (MED)	170,776,868	810,357,428	0.965		13,853	
	13 COMP. OPS. (HGH)	17,514,981	81,681,764	0.873		809	
	TOTAL *	\$197,679,110	\$935,690,654	0.960		15,339	
TOTAL ALL TOP	01 RET. STRS-FOOD/DRG	\$15,464,914	\$66,038,799	0.852		5,335	
	02 RET. STRS-NTFD/DRG	21,515,468	93,215,944	1.004		3,877	
	11 COMP. OPS. (LOW)	17,927,869	81,750,576	1.018		1,751	
	12 COMP. OPS. (MED)	271,856,025	1,268,501,602	0.983		21,729	
	13 COMP. OPS. (HGH)	28,017,405	135,417,480	0.777		1,197	
	TOTAL *	\$354,781,681	\$1,644,924,401	0.964		33,889	

\* TOTALS IN COLUMN (3) ARE AVERAGES USING COLUMN (1) AS WEIGHTS

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

OBJECTIVES

The objectives of this procedure are to:

- 1) determine monoline loss cost level needs for the appropriate rating variables;
- 2) determine indicated changes to the eight liability Commercial Package Policy (CPP) Package Modification Factors (PMFs) based on Premises/Operations and Products/Completed Operations data.

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EXPERIENCE  
BASE

The experience used in this relativity analysis is the latest five (5) years of accident year data, as reported under the Commercial Statistical Plan with aggregate loss costs adjusted to current loss cost level (multiline aggregate loss costs adjusted additionally by the current Implicit Package Modification Factors). Losses have been trended and developed in the Relativity Analysis. ALCCL have been trended.

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SIMULTANEOUS  
DETERMINATION  
OF RATING  
VARIABLE  
RELATIVITIES

Once the aggregate loss costs at current level and incurred losses used in the analysis have been appropriately adjusted, the 5-year experience ratios are calculated for each combination of the appropriate rating variables. From these ratios, relativities to the statewide 5-year experience ratio are calculated. These relativities are then used in a minimum bias iterative review procedure, which simultaneously determines the relativities for each rating variable.

The purpose of a simultaneous review procedure is to arrive at a set of relativities for each rating variable that best represent the experience. For example, the type of policy relativities will serve to derive the relationship of CPP policies relative to monoline policies, via the PMF, while the class group and territory (if applicable) relativities will serve to derive the relationship of the various classification and territories relative to one another. An iterative technique is used to derive relativities for each rating variable. This procedure is in contrast to a one-way type of review, wherein relativities for each rating variable would each be reviewed separately.

Such one-way types of review do not take into account differing percentages of experience of each rating variable within the other rating variables. The simultaneous review procedure accounts for these different distributions in generating relativities for each rating variable.

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RATING  
VARIABLES  
USED

For Premises/Operations and Products/Completed Operations, the rating variables used in the relativity analysis are as follows:

Manufacturers and Contractors -	type of policy and class group
Owners, Landlords and Tenants -	type of policy, territory and class group
Products -	type of policy and class group
Local Products/Completed Operations-	type of policy, state and class group

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

ITERATIVE  
PROCEDURE

The iterative technique referred to in the previous paragraph solves for a set of relativities for each rating variable based on the experience for the cells; that is, based on the experience ratio and latest year adjusted aggregate loss cost volume for each combination of rating variables relative to the experience ratio and adjusted aggregate loss cost volume for all combinations of rating variables combined. Specifically, the iterative procedure uses the following formulas:

For Owners, Landlords and Tenants:

$$TOP_i = \frac{\sum_j \sum_k W_{ijk} r_{ijk}}{\sum_j \sum_k W_{ijk} CG_j TER_k} \quad \text{where } 1 \leq i \leq m$$

$$CG_j = \frac{\sum_i \sum_k W_{ijk} r_{ijk}}{\sum_i \sum_k W_{ijk} TOP_i TER_k} \quad \text{where } 1 \leq j \leq n$$

$$TER_k = \frac{\sum_i \sum_j W_{ijk} r_{ijk}}{\sum_i \sum_j W_{ijk} TOP_i CG_j} \quad \text{where } 1 \leq k \leq p$$

$TOP_i$  is the relative change for the  $i^{\text{th}}$  type of policy;

$CG_j$  is the relative change for the  $j^{\text{th}}$  class group;

$TER_k$  is the relative change for the  $k^{\text{th}}$  territory;

$W_{ijk}$  is the aggregate loss costs at current level for the  $i^{\text{th}}$

type of policy,  $j^{\text{th}}$  class group and  $k^{\text{th}}$  territory;

$r_{ijk}$  is the relative change for the  $i^{\text{th}}$  type of policy,

$j^{\text{th}}$  class group and  $k^{\text{th}}$  territory;

$m$  is the number of types of policy in the analysis;

$n$  is the number of class groups in the analysis;

$p$  is the number of territories in the analysis;

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

For Manufacturers and Contractors, and Products:

$$TOP_i = \frac{\sum_j W_{ij} r_{ij}}{\sum_j W_{ij} CG_j} \quad \text{where } 1 \leq i \leq m$$
$$CG_j = \frac{\sum_i W_{ij} r_{ij}}{\sum_i W_{ij} TOP_i} \quad \text{where } 1 \leq j \leq n$$

$TOP_i$  is the relative change for the  $i^{\text{th}}$  type of policy;

$CG_j$  is the relative change for the  $j^{\text{th}}$  class group;

$W_{ij}$  is the aggregate loss costs at current level for the  $i^{\text{th}}$

type of policy and  $j^{\text{th}}$  class group;

$r_{ij}$  is the relative change for the  $i^{\text{th}}$  type of policy

and  $j^{\text{th}}$  class group;

$m$  is the number of types of policy in the analysis;

$n$  is the number of class groups in the analysis;

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

For Local Products/Completed Operations:

$$TOP_i = \frac{\sum_j \sum_k W_{ijk} r_{ijk}}{\sum_j \sum_k W_{ijk} CG_j ST_k} \quad \text{where } 1 \leq i \leq m$$

$$CG_j = \frac{\sum_i \sum_k W_{ijk} r_{ijk}}{\sum_i \sum_k W_{ijk} TOP_i ST_k} \quad \text{where } 1 \leq j \leq n$$

$$ST_k = \frac{\sum_i \sum_j W_{ijk} r_{ijk}}{\sum_i \sum_j W_{ijk} TOP_i CG_j} \quad \text{where } 1 \leq k \leq p$$

$TOP_i$  is the relative change for the  $i^{\text{th}}$  type of policy;

$CG_j$  is the relative change for the  $j^{\text{th}}$  class group;

$ST_k$  is the relative change for the  $k^{\text{th}}$  state;

$W_{ijk}$  is the aggregate loss costs at current level for the  $i^{\text{th}}$

type of policy,  $j^{\text{th}}$  class group and  $k^{\text{th}}$  state;

$r_{ijk}$  is the relative change for the  $i^{\text{th}}$  type of policy,

$j^{\text{th}}$  class group and  $k^{\text{th}}$  state;

$m$  is the number of types of policy in the analysis;

$n$  is the number of class groups in the analysis;

$p$  is the number of states in the analysis;

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

ITERATIVE  
PROCEDURE  
(Cont'd)

For example, for Owners, Landlords and Tenants, the procedure starts by inserting the actual relativities for type of policy and class group into the third formula to get a territory relativity. This result is then used with the class group relativity in the first formula to get a new type of policy relativity, which in turn is substituted along with the territory relativity into the second formula to get a new class group relativity. The process continues on in that fashion until there is no appreciable difference from one iteration to the next.

APPLICATION OF  
CREDIBILITY

Consideration is then given to the credibility of the experience for each rating variable. The credibility of each of these categories is based on the formula  $Z = \sqrt{P/18,000}$  for Owners, Landlords and Tenants,  $Z = \sqrt{P/18,000}$  for Manufacturers and Contractors and  $Z = \sqrt{P/20,000}$  for Products, where P is the 5 year occurrence total for a given class group, territory or type of policy. For Local Products/Completed Operations, separate formulas are used to calculate the credibility of the experience for each type of policy and class group versus the credibility of the experience for each state, namely  $Z = \sqrt{P/15,000}$  for type of policy and class group, and  $Z = \sqrt{P/5,500}$  for state (in this case, P is the 5 year occurrence total for a given state). Credibility-weighted relativities are then calculated as follows:

$$W = R^Z \quad \text{where:}$$

Z is the class group, territory, state or type of policy credibility;

R is the class group, territory, state or type of policy relativity;

W is the credibility-weighted relativity.

The resulting credibility-weighted relativities are then balanced to assure that the average relativity remains at unity.

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

MULTILINE  
CONSIDERATIONS

The monoline relativities and the class group, territory (if applicable) and state relativities which result from the aforementioned procedures are then used to generate indicated monoline classification loss cost changes. The multiline relativities are used to generate multiline indications that apply to the current Implicit Package Modification Factors. The indicated IPMFs are calculated as follows:

$$\text{TOP y indicated IPMF} = \frac{(\text{TOP y current IPMF}) \times (\text{TOP y relativity})}{(\text{monoline relativity})}$$

For each CPP Type of Policy the indicated IPMF is subject to a minimum value of 0.50 and a maximum value of 1.50. If an indicated IPMF falls outside one of those limits, it is capped at that amount, the aggregate loss costs for that Type of Policy are adjusted to the capped IPMF level, and the entire relativity review as described above is re-performed to take this into account.

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