

RULES – IMPLEMENTATION

MAY 30, 2019

COMMERCIAL MULTIPLE LINE

LI-ML-2019-018

MISSOURI COMMERCIAL PACKAGE POLICY REVISED PACKAGE MODIFICATION FACTOR REVISION TO BE IMPLEMENTED

KEY MESSAGE

Revised Commercial Package Policy package modification factors for an overall statewide change of **-0.7%** to be implemented.

BACKGROUND

In circular [LI-ML-2019-004](#), we provided you with information about the Commercial Package Policy modification factor experience review.

ISO ACTION

We are implementing ML-2019-RLA1, which presents a review of Commercial Package Policy modification factors experience. Refer to the attachment(s) for complete details.

EFFECTIVE DATE

The ISO revision is subject to the following rule of application:

These changes are applicable to all policies written on or after November 1, 2019.

COMPANY ACTION

If you have authorized us to file on your behalf and decide:

- To use our revision and effective date, you are not required to file anything with the Insurance Department.
- To use our revision with a different effective date, to use our revision with modification, or to not use our revision, you must make an appropriate submission with the Insurance Department.

For guidance on submission requirements, consult the ISO State Filing Handbook.

WE WILL SUBMIT THIS REVISION TO THE INSURANCE DEPARTMENT ON OCTOBER 11, 2019. IF STATE FILING REQUIREMENTS DICTATE THAT YOU MAKE A SUBMISSION WITH THE INSURANCE DEPARTMENT, DO NOT SUBMIT IT PRIOR TO THIS DATE.

In all correspondence with the Insurance Department on this revision, you should refer to ISO Filing Designation Number ML-2019-RLA1, NOT this circular number. Communications with the regulator concerning a filing affecting multiple lines of business (i.e., CL, PL, AL filing designation) should specify the line(s) of business that you are addressing.

RATING SOFTWARE IMPACT

No new attributes are being introduced with this revision.

POLICYHOLDER NOTIFICATION

If you decide to implement this revision, you should check all applicable laws for the state(s) to which this revision applies, to determine whether or not a specific policyholder notice requirement may apply. Please note that circular [LI-CL-2018-044](#) contains the ISO Guide To Renewals With Changed Conditions For Commercial Lines, which is available only as a guide to assist participating companies in complying with various conditional renewal statutes or regulations, for the major commercial lines of insurance serviced by ISO. The information in the Guide does not necessarily reflect all requirements or exceptions that may apply, and it is not intended as a substitute for your review of all applicable statutes and regulations concerning policyholder notification.

REVISION DISTRIBUTION

We will issue a Notice to Manualholders with an edition date of 11-19 (or the earliest possible subsequent date), along with any new and/or revised manual pages.

REFERENCE(S)

- [LI-ML-2019-004](#) (04/03/2019) Commercial Package Policy Experience Reviewed By Staff
- [LI-CL-2018-044](#) (11/27/2018) Revised Lead Time Requirements Listing

ATTACHMENT(S)

- Filing [ML-2019-RLA1](#)
- Excel Workbook

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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DATA QUALITY

Statistical plan data reported to ISO is first processed through a system of rigorous automated data verification procedures so that only valid data would be used for ratemaking. Subsequent to this initial data submission review, additional analyses on the statistical plan data involving an even more customized data review for this line was performed by staff. During these processes, various data records were excluded from the review. The ISO staff responsible for this circular also reviewed the data for reasonableness.

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 revision 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.

CONTACT INFORMATION

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Callers outside the United States, Canada, and the Caribbean may contact us using our global toll-free number (International Access Code + 800 48977489). For information on all ISO products, visit us at www.verisk.com/iso. To keep abreast of the latest Insurance Lines Services updates, view www.verisk.com/ils.

MISSOURI

ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

COMMERCIAL PACKAGE POLICY

ML-2019-RLA1

EXECUTIVE SUMMARY

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.

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. & Liab. Total</u>
Motel/Hotel	0.0%	0.0%	0.0%
Apartment	-3.5%	0.0%	-2.9%
Office	-5.1%	-2.3%	-3.4%
Mercantile	-3.6%	0.0%	-2.1%
Institutional	-6.1%	+1.1%	-4.8%
Services	-2.2%	-2.1%	-2.2%
Indust./Proc.	+1.3%	+5.5%	+3.0%
Contractors	<u>-5.2%</u>	<u>+11.8%</u>	<u>+8.6%</u>
Statewide	-3.6%	+3.3%	-0.7%

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.

MISSOURI

ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

COMMERCIAL PACKAGE POLICY

ML-2019-RLA1

EXECUTIVE SUMMARY

HISTORICAL
SOURCE DATA

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

- Basic Group I: five fiscal accident years ending 12/31/17.
 - Basic Group II: ten fiscal accident years ending 12/31/17.
 - Special Causes of Loss: five fiscal accident years ending 12/31/17.
 - Crime: calendar year ending 06/30/17.
 - Inland Marine: five calendar accident years ending 12/31/17.
 - Fidelity: policy year ending 12/31/16.
 - Owners, Landlords, and Tenants: five fiscal accident years ending 12/31/17.
 - Manufacturers and Contractors: five fiscal accident years ending 12/31/17.
 - Products: three calendar accident years ending 12/31/18.
 - Local Products and Completed Operations: three calendar accident years ending 12/31/18.
-

PRIOR ISO
REVISIONS

The latest revisions in this state are:

<u>Filing</u>	ML-18-RLA1	ML-14-RLA1	ML-10-RLA1
<u>Dates</u>			
Implemented	10/01/18	11/01/14	10/01/10
<u>Changes</u>			
Indicated	+3.2%	+3.8%	+0.1%
Filed	+3.2%	+3.8%	+0.1%
Implemented	+3.2%	+3.8%	+0.1%

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ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

COMMERCIAL PACKAGE POLICY

ML-2019-RLA1

EXECUTIVE SUMMARY

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.

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. Travelers Indemnity Company
 2. Cincinnati Insurance Company
 3. Tokio Marine Companies
 4. Liberty Mutual Insurance Company
 5. Hartford Accident and Indemnity Company
 6. Columbia Insurance Group
 7. Continental Casualty Company
 8. Admiral Insurance Group
 9. American International Group
 10. Acuity A Mutual 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). 47.1%.

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.

MISSOURI

ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

COMMERCIAL PACKAGE POLICY

ML-2019-RLA1

EXECUTIVE SUMMARY

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.

COMMERCIAL PACKAGE POLICY

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COMMERCIAL PACKAGE POLICY
METHODOLOGY OVERVIEW

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.

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.

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.

MISSOURI

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)	1.00	1.00	0.0%	0.96	0.96	0.0%	0.0%
APARTMENT (32)	0.86	0.83	-3.5%	1.00	1.00	0.0%	-2.9%
OFFICE (33)	0.79	0.75	-5.1%	0.86	0.84	-2.3%	-3.4%
MERCANTILE (34)	0.83	0.80	-3.6%	0.90	0.90	0.0%	-2.1%
INSTITUTION (35)	0.98	0.92	-6.1%	0.94	0.95	1.1%	-4.8%
SERVICES (36)	0.90	0.88	-2.2%	0.97	0.95	-2.1%	-2.2%
IND/PROC (37)	0.79	0.80	1.3%	0.91	0.96	5.5%	3.0%
CONTRACTORS (38)	0.96	0.91	-5.2%	0.85	0.95	11.8%	8.6%
STATEWIDE			-3.6%			3.3%	-0.7%

MISSOURI
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	963,633	0.873	2.4%	0.894	0.882
BASIC GRP II	625,226	1.392	5.2	1.464	1.445
SP CAUSE/LOSS	251,025	0.856	-9.5	0.775	0.764
*CRIME	886	0.911	0.0	0.911	0.911
*INL. MAR.	4,291	0.910	6.4	0.968	0.968
*FIDELITY	3,843	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>1,848,904</u>	<u>1.00</u>	<u>1.4%</u>	<u>1.014</u>	<u>1.00</u>
LIABILITY-					
OL&T	1,599,363	0.959	-1.7%	0.943	0.958
<u>TOTAL</u>	<u>1,599,363</u>	<u>0.96</u>	<u>-1.8%</u>	<u>0.943</u>	<u>0.96</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	3,448,267		-0.1%		
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	2,897,379	0.633	1.6%	0.643	0.648
BASIC GRP II	3,222,722	1.271	-6.5	1.188	1.197
SP CAUSE/LOSS	1,280,868	0.886	-14.4	0.758	0.764
*CRIME	516	0.911	0.0	0.911	0.911
*INL. MAR.	1,608	0.910	6.4	0.968	0.968
*FIDELITY	8,747	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>7,411,840</u>	<u>0.86</u>	<u>-4.1%</u>	<u>0.824</u>	<u>0.83</u>
LIABILITY-					
OL&T	1,458,282	1.000	3.4%	1.034	1.000
<u>TOTAL</u>	<u>1,458,282</u>	<u>1.00</u>	<u>3.4%</u>	<u>1.034</u>	<u>1.00</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	8,870,122		-2.9%		

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

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

OFFICE (33) *****	(1)	(2)	(3)	(4)	(5)
COVERAGE	AGGREGATE <u>LOSS COSTS</u>	CURRENT IMPLICIT <u>PMF</u>	NET <u>INDICATION</u>	INDIC. <u>PMF</u>	CAPPED <u>PMF</u>
PROPERTY-					
BASIC GRP I	1,331,479	0.958	2.6%	0.983	0.983
BASIC GRP II	1,190,762	0.663	-4.0	0.636	0.636
SP CAUSE/LOSS	850,230	0.732	-12.7	0.639	0.639
*CRIME	2,836	0.911	0.0	0.911	0.911
*INL. MAR.	37,164	0.910	6.4	0.968	0.968
*FIDELITY	20,164	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>3,432,635</u>	<u>0.79</u>	<u>-4.9%</u>	<u>0.751</u>	<u>0.75</u>
LIABILITY-					
OL&T	5,391,492	0.866	-2.8%	0.842	0.842
M&C	252,738	0.816	7.4	0.876	0.876
<u>TOTAL</u>	<u>5,644,230</u>	<u>0.86</u>	<u>-1.9%</u>	<u>0.843</u>	<u>0.84</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	9,076,865		-3.1%		
MERCANTILE (34) *****	(1)	(2)	(3)	(4)	(5)
COVERAGE	AGGREGATE <u>LOSS COSTS</u>	CURRENT IMPLICIT <u>PMF</u>	NET <u>INDICATION</u>	INDIC. <u>PMF</u>	CAPPED <u>PMF</u>
PROPERTY-					
BASIC GRP I	4,202,485	0.635	-2.1%	0.622	0.622
BASIC GRP II	6,644,806	1.050	-4.1	1.007	1.007
SP CAUSE/LOSS	3,207,654	0.793	-9.7	0.716	0.716
*CRIME	26,696	0.911	0.0	0.911	0.911
*INL. MAR.	637,403	0.910	6.4	0.968	0.968
*FIDELITY	258,796	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>14,977,840</u>	<u>0.83</u>	<u>-3.9%</u>	<u>0.798</u>	<u>0.80</u>
LIABILITY-					
OL&T	7,510,072	0.914	-1.4%	0.901	0.901
M&C	1,544,726	0.945	5.7	0.999	0.999
LOCAL PRODUCT	201,660	0.607	0.1	0.608	0.608
*MULTI PRODUCT	1,119,087	0.862	-1.1	0.853	0.853
<u>TOTAL</u>	<u>10,375,545</u>	<u>0.90</u>	<u>0.1%</u>	<u>0.901</u>	<u>0.90</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	25,353,385		-2.2%		

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

MISSOURI
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	4,476,352	0.954	-4.9%	0.907	0.907
BASIC GRP II	7,102,876	1.070	-5.5	1.011	1.011
SP CAUSE/LOSS	3,218,249	0.854	-9.0	0.777	0.777
*CRIME	18,890	0.911	0.0	0.911	0.911
*INL. MAR.	42,200	0.910	6.4	0.968	0.968
*FIDELITY	138,298	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>14,996,865</u>	<u>0.98</u>	<u>-6.0%</u>	<u>0.921</u>	<u>0.92</u>
LIABILITY-					
OL&T	3,180,831	0.983	-1.2%	0.971	0.971
M&C	268,193	0.655	23.1	0.806	0.806
<u>TOTAL</u>	<u>3,449,024</u>	<u>0.94</u>	<u>1.3%</u>	<u>0.953</u>	<u>0.95</u>

PROP. & LIAB. TOTAL	18,445,889		-4.6%		
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	3,340,285	0.873	3.9%	0.907	0.907
BASIC GRP II	3,773,310	1.021	-4.2	0.978	0.978
SP CAUSE/LOSS	1,755,696	0.760	-10.6	0.679	0.679
*CRIME	12,118	0.911	0.0	0.911	0.911
*INL. MAR.	72,610	0.910	6.4	0.968	0.968
*FIDELITY	103,776	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>9,057,795</u>	<u>0.90</u>	<u>-2.0%</u>	<u>0.882</u>	<u>0.88</u>
LIABILITY-					
OL&T	3,345,800	0.989	-5.3%	0.937	0.937
M&C	2,865,928	0.971	2.3	0.993	0.993
LOCAL PRODUCT	404,746	0.839	1.6	0.852	0.852
*MULTI PRODUCT	62,688	0.914	0.2	0.916	0.916
<u>TOTAL</u>	<u>6,679,162</u>	<u>0.97</u>	<u>-1.6%</u>	<u>0.955</u>	<u>0.95</u>

PROP. & LIAB. TOTAL	15,736,957		-1.8%		

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

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

IND/PROC (37) *****	(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	2,320,439	0.818	12.9%	0.924	0.924
BASIC GRP II	1,679,697	0.724	-0.2	0.723	0.723
SP CAUSE/LOSS	1,324,559	0.811	-17.3	0.671	0.671
*CRIME	3,918	0.911	0.0	0.911	0.911
*INL. MAR.	4,118	0.910	6.4	0.968	0.968
*FIDELITY	72,482	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>5,405,213</u>	<u>0.79</u>	<u>0.8%</u>	<u>0.796</u>	<u>0.80</u>
LIABILITY-					
M&C	2,312,372	0.970	7.1	1.039	1.039
LOCAL PRODUCT	44,581	0.559	2.1	0.571	0.571
*MULTI PRODUCT	1,303,266	0.859	0.5	0.863	0.863
<u>TOTAL</u>	<u>3,660,219</u>	<u>0.91</u>	<u>5.8%</u>	<u>0.963</u>	<u>0.96</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	9,065,432		2.8%		
CONTRACTORS (38) *****	(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	865,291	0.919	1.9%	0.936	0.936
BASIC GRP II	1,039,566	1.004	-6.3	0.941	0.941
SP CAUSE/LOSS	754,942	0.954	-13.2	0.828	0.828
*CRIME	1,088	0.911	0.0	0.911	0.911
*INL. MAR.	5,311	0.910	6.4	0.968	0.968
*FIDELITY	56,353	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>2,722,551</u>	<u>0.96</u>	<u>-5.3%</u>	<u>0.909</u>	<u>0.91</u>
LIABILITY-					
M&C	8,158,808	0.872	13.9	0.993	0.993
LOCAL PRODUCT	3,573,863	0.820	4.8	0.859	0.859
<u>TOTAL</u>	<u>11,732,671</u>	<u>0.85</u>	<u>11.8%</u>	<u>0.951</u>	<u>0.95</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	14,455,222		8.6%		

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

MISSOURI
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-		PMF			
BASIC GRP I	20,397,343	0.785	1.2%	0.794	0.795
BASIC GRP II	25,278,965	1.019	-4.4	0.974	0.975
SP CAUSE/LOSS	12,643,223	0.818	-11.3	0.726	0.726
*CRIME	66,948	0.911	0.0	0.911	0.911
*INL. MAR.	804,705	0.910	6.4	0.968	0.968
*FIDELITY	662,459	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>59,853,643</u>	<u>0.881</u>	<u>-3.6%</u>	<u>0.849</u>	<u>0.849</u>
LIABILITY-					
OL&T	22,485,840	0.930	-2.0%	0.911	0.910
M&C	15,402,765	0.904	10.0	0.994	0.994
LOCAL PRODUCT	4,224,850	0.804	4.2	0.838	0.838
*MULTI PRODUCT	2,485,041	0.862	-0.2	0.860	0.860
<u>TOTAL</u>	<u>44,598,496</u>	<u>0.899</u>	<u>3.3%</u>	<u>0.929</u>	<u>0.928</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	104,452,139		-0.7%		

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

MISSOURI

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)	0.98	0.980	0.98
APARTMENT (32)	0.88	0.855	0.85
OFFICE (33)	0.84	0.806	0.81
MERCANTILE (34)	0.86	0.838	0.84
INSTITUTION (35)	0.97	0.927	0.93
SERVICES (36)	0.93	0.912	0.91
IND/PROC (37)	0.84	0.857	0.86
CONTRACTORS (38)	0.87	0.944	0.94

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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MISSOURI

TABLE 3 - BASIC GROUP I RELATIVITY ANALYSIS

	(1)	(2)	(3)	(4)	(5)
TOP	\$ LST SQ FORMULA RELATIVITY	CREDIBILITY Z	Z-WTD. RELATIVITY	BALANCED RELATIVITY	INDICATED CHANGE *
10	0.849	0.146	0.976	0.990	
31	0.985	0.024	1.000	1.014	+2.4%
32	0.943	0.133	0.992	1.006	+1.6%
33	1.025	0.054	1.001	1.016	+2.6%
34	0.764	0.168	0.956	0.969	-2.1%
35	0.678	0.193	0.928	0.941	-4.9%
36	1.105	0.149	1.015	1.029	+3.9%
37	2.201	0.124	1.103	1.118	+12.9%
38	0.891	0.047	0.995	1.009	+1.9%
RATING GROUP					
01	0.823	0.178	0.966	0.968	
02	1.039	0.178	1.007	1.009	
03	1.095	0.078	1.007	1.010	
04	1.210	0.361	1.071	1.074	
05	1.712	0.032	1.017	1.020	
06	1.115	0.235	1.026	1.028	
07	1.016	0.097	1.002	1.004	
08	0.736	0.277	0.919	0.921	
09	1.481	0.152	1.062	1.064	
10	1.010	0.067	1.001	1.003	
11	1.248	0.063	1.014	1.017	
13	1.381	0.131	1.043	1.046	
14	0.831	0.157	0.971	0.974	
15	0.963	0.075	0.997	1.000	
17	0.369	0.031	0.970	0.972	
18	0.522	0.035	0.978	0.980	
19	0.412	0.017	0.985	0.987	
20	0.393	0.022	0.980	0.982	
21	0.377	0.153	0.861	0.863	
22	0.490	0.085	0.941	0.943	
TERRITORY					
Kansas City	1.013	0.144	1.002	0.984	
Saint Louis City	0.491	0.173	0.884	0.869	
Balance of State	1.053	0.646	1.034	1.016	

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

MISSOURI

TABLE 4 - SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS

	(1)	(2)	(3)	(4)	(5)
	\$ LST SQ FORMULA RELATIVITY	CREDIBILITY Z	Z-WTD. RELATIVITY	BALANCED RELATIVITY	INDICATED CHANGE *
TOP					
10	1.706	0.196	1.110	1.110	
31	1.320	0.020	1.006	1.005	-9.5%
32	0.703	0.144	0.951	0.950	-14.4%
33	0.693	0.083	0.970	0.969	-12.7%
34	1.010	0.263	1.003	1.002	-9.7%
35	1.037	0.303	1.011	1.010	-9.0%
36	0.964	0.191	0.993	0.992	-10.6%
37	0.570	0.152	0.918	0.918	-17.3%
38	0.676	0.094	0.964	0.963	-13.2%
CATEGORY					
01	1.039	0.771	1.030	1.023	
02	0.758	0.079	0.978	0.972	
03	0.519	0.090	0.943	0.936	
04	0.912	0.132	0.988	0.981	
05	0.626	0.082	0.962	0.956	
06	1.353	0.058	1.018	1.011	
07	1.247	0.018	1.004	0.997	
08	0.555	0.145	0.918	0.912	
09	0.390	0.145	0.872	0.867	
10	9.414	0.036	1.084	1.077	
11	0.827	0.170	0.968	0.962	
12	0.406	0.169	0.859	0.853	
13	1.072	0.073	1.005	0.998	
14	1.041	0.125	1.005	0.998	

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

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

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

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 12/31/17 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	81,353	657,765	1.262	1.126	1.184
	02 OTHER HABITATIONAL	183,816	1,153,787	0.694	0.914	0.961
	03 RESTAURANTS & BARS	52,533	259,039	0.029	0.734	0.772
	04 OTHER MERCANTILE RS	601,307	3,350,586	1.121	1.049	1.102
	05 PUBLIC BUILDINGS	28,355	162,955	0.342	0.893	0.939
	06 CHURCHES	31,421	134,043	9.679	2.617	2.752
	07 SCHOOLS	36,061	327,632	0.076	0.848	0.891
	08 OFFICES AND BANKS	410,536	2,160,982	1.224	0.989	1.041
	09 REC. FACILITIES	212,360	1,100,248	0.270	0.784	0.824
	10 HOTELS AND MOTELS	92,954	444,305	0.753	0.925	0.972
	11 HOSPITALS/NURS HOME	152,373	563,120	1.503	1.077	1.133
	13 MOTOR VEHICLE RISKS	190,569	1,071,194	1.793	1.243	1.307
	14 OTHER NON-MANUF.	494,952	2,710,651	0.226	0.637	0.669
	15 STORAGE	150,627	750,161	0.037	0.674	0.709
	17 FOOD MANUFACTURING	16,355	103,268	0.000	0.828	0.871
	18 WOOD MANUFACTURING	39,275	284,645	5.133	1.763	1.853
	19 WEARING APPAREL	14,110	57,312	0.000	0.834	0.877
	20 CHEM. MANUFACTURING	10,273	358,673	0.000	0.883	0.928
	21 METAL MANUFACTURING	197,975	1,097,019	0.710	0.862	0.907
	22 OTHER MANUFACTURING	63,102	337,889	0.000	0.811	0.853
	TOTAL*	3,060,307	17,085,274	0.942	0.937	0.986
31 MULTILINE	10 HOTELS AND MOTELS	963,633	2,430,696	1.713	1.049	1.103
MOTEL/HOTEL	TOTAL*	963,633	2,430,696	1.713	1.049	1.103
32 MULTILINE	01 APARTMENTS	1,578,964	8,030,094	0.699	0.814	0.856
APARTMENT	02 OTHER HABITATIONAL	1,318,415	7,371,264	1.382	0.970	1.020
	TOTAL*	2,897,379	15,401,358	1.010	0.885	0.931
33 MULTILINE	08 OFFICES AND BANKS	1,331,479	5,758,231	0.520	0.793	0.834
OFFICE	TOTAL*	1,331,479	5,758,231	0.520	0.793	0.834
34 MULTILINE	03 RESTAURANTS & BARS	631,883	2,552,063	0.939	0.873	0.918
MERCANTILE	04 OTHER MERCANTILE RS	2,430,052	13,345,303	1.141	0.951	1.000
	08 OFFICES AND BANKS	197,112	812,279	0.313	0.788	0.829
	13 MOTOR VEHICLE RISKS	466,698	1,341,560	2.201	1.108	1.165
	14 OTHER NON-MANUF.	117,851	584,358	0.649	0.851	0.895
	15 STORAGE	358,889	1,619,102	0.209	0.762	0.801
	TOTAL*	4,202,485	20,254,665	1.096	0.930	0.978

ENTIRE STATE

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

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 12/31/17 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	35,406	164,434	0.994	0.877	0.921
	05 PUBLIC BUILDINGS	238,009	1,139,461	2.837	1.219	1.282
	06 CHURCHES	2,069,079	12,123,370	0.548	0.791	0.832
	07 SCHOOLS	839,640	3,971,069	0.074	0.718	0.755
	08 OFFICES AND BANKS	412,556	2,180,100	0.488	0.786	0.827
	09 REC. FACILITIES	232,117	1,214,171	0.091	0.752	0.791
	11 HOSPITALS/NURS HOME	442,816	2,121,808	0.943	0.883	0.929
	13 MOTOR VEHICLE RISKS	3,912	24,605	0.000	0.733	0.771
	14 OTHER NON-MANUF.	202,817	942,746	0.125	0.763	0.802
	TOTAL*	4,476,352	23,881,764	0.575	0.806	0.848
36 MULTILINE SERVICES	03 RESTAURANTS & BARS	102,113	557,810	0.063	0.892	0.938
	04 OTHER MERCANTILE RS	249,325	1,439,933	1.191	1.154	1.213
	08 OFFICES AND BANKS	516,078	2,999,798	0.117	0.586	0.616
	09 REC. FACILITIES	957,348	4,875,666	1.785	1.542	1.621
	13 MOTOR VEHICLE RISKS	748,365	3,551,860	1.689	1.423	1.497
	14 OTHER NON-MANUF.	514,488	2,524,287	0.855	0.967	1.017
	15 STORAGE	161,255	869,544	1.035	1.057	1.111
	21 METAL MANUFACTURING	15,710	127,625	0.088	1.004	1.056
	22 OTHER MANUFACTURING	75,603	529,921	0.147	0.830	0.873
	TOTAL*	3,340,285	17,476,444	1.184	1.188	1.249
37 MULTILINE INDUST/PROCESS	04 OTHER MERCANTILE RS	192,157	1,096,819	5.786	2.762	2.904
	08 OFFICES AND BANKS	41,642	217,273	0.538	0.972	1.021
	13 MOTOR VEHICLE RISKS	3,324	14,641	0.000	0.472	0.496
	14 OTHER NON-MANUF.	74,303	436,131	0.419	0.954	1.003
	15 STORAGE	501	21,938	0.000	1.052	1.106
	17 FOOD MANUFACTURING	219,885	1,191,398	0.037	0.667	0.702
	18 WOOD MANUFACTURING	187,125	1,164,383	0.994	1.073	1.129
	19 WEARING APPAREL	99,974	614,306	1.992	1.433	1.507
	20 CHEM. MANUFACTURING	51,712	540,483	0.045	0.824	0.867
	21 METAL MANUFACTURING	968,824	5,988,760	0.675	0.820	0.862
	22 OTHER MANUFACTURING	480,992	2,829,616	1.035	1.081	1.136
TOTAL*	2,320,439	14,115,748	1.169	1.074	1.129	

ENTIRE STATE

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

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 12/31/17 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	594,765	3,406,855	0.950	1.032	1.085
CONTRACTORS	08 OFFICES AND BANKS	215,689	1,221,070	0.224	0.803	0.844
	14 OTHER NON-MANUF.	54,837	252,136	0.367	0.958	1.008
	TOTAL*	865,291	4,880,061	0.732	0.970	1.020
TOTAL ALL TOPS*	01 APARTMENTS	1,660,317	8,687,859	0.727	0.830	0.872
	02 OTHER HABITATIONAL	1,537,637	8,689,485	1.291	0.961	1.010
	03 RESTAURANTS & BARS	786,529	3,368,912	0.765	0.866	0.911
	04 OTHER MERCANTILE RS	4,067,606	22,639,496	1.333	1.075	1.131
	05 PUBLIC BUILDINGS	266,364	1,302,416	2.571	1.184	1.245
	06 CHURCHES	2,100,500	12,257,413	0.685	0.819	0.861
	07 SCHOOLS	875,701	4,298,701	0.074	0.723	0.760
	08 OFFICES AND BANKS	3,125,092	15,349,733	0.508	0.786	0.827
	09 REC. FACILITIES	1,401,825	7,190,085	1.275	1.296	1.363
	10 HOTELS AND MOTELS	1,056,587	2,875,001	1.629	1.038	1.091
	11 HOSPITALS/NURS HOME	595,189	2,684,928	1.087	0.933	0.981
	13 MOTOR VEHICLE RISKS	1,412,868	6,003,860	1.863	1.291	1.357
	14 OTHER NON-MANUF.	1,459,248	7,450,309	0.483	0.816	0.858
	15 STORAGE	671,272	3,260,745	0.369	0.813	0.855
	17 FOOD MANUFACTURING	236,240	1,294,666	0.034	0.679	0.714
	18 WOOD MANUFACTURING	226,400	1,449,028	1.712	1.193	1.254
	19 WEARING APPAREL	114,084	671,618	1.746	1.359	1.429
	20 CHEM. MANUFACTURING	61,985	899,156	0.038	0.834	0.877
	21 METAL MANUFACTURING	1,182,509	7,213,404	0.673	0.830	0.872
	22 OTHER MANUFACTURING	619,697	3,697,426	0.821	1.023	1.075
	TOTAL*	23,457,650	121,284,241	0.965	0.951	1.000

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

MISSOURI

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 12/31/17 AGGREGATE LOSS COSTS	5 - YEAR AGGREGATE LOSS COSTS	5 - YEAR EXPERIENCE RATIO	RELATIVITY
10 MONOLINE	01 BUILDINGS	1,209,759	6,257,492	1.650	1.848
	02 RES. APTS. AND COND	21,362	168,750	0.077	0.086
	03 OFFICES	118,493	648,425	0.411	0.460
	04 MERCANTILE - HIGH	140,610	739,932	0.352	0.394
	05 MERCANTILE - MEDIUM	21,811	118,157	0.277	0.310
	06 MERCANTILE - LOW	19,117	129,921	0.109	0.122
	07 MOTELS AND HOTELS	18,631	94,148	8.772	9.823
	08 INSTITUTIONAL - HIG	27,695	163,860	1.040	1.165
	09 INSTITUTIONAL - LOW	51,192	208,583	0.299	0.335
	10 INDUST-PROC - HIGH	7,576	63,609	0.599	0.671
	11 INDUST-PROC - LOW	66,561	409,718	0.425	0.476
	12 SERVICE - HIGH	53,782	330,334	0.286	0.320
	13 SERVICE - LOW	49,511	321,983	2.867	3.211
	14 CONTRACTORS	17,107	92,538	0.842	0.943
	TOTAL*	1,823,207	9,747,450	1.380	1.545
31 MULTILINE MOTEL/HOTEL	01 BUILDINGS	195,482	636,536	1.358	1.521
	07 MOTELS AND HOTELS	55,543	173,348	0.525	0.588
	TOTAL*	251,025	809,884	1.174	1.315
32 MULTILINE APARTMENT	01 BUILDINGS	1,067,281	5,576,160	0.671	0.751
	02 RES. APTS. AND COND	213,587	1,126,157	0.517	0.579
	TOTAL*	1,280,868	6,702,317	0.645	0.722
33 MULTILINE OFFICE	01 BUILDINGS	671,475	2,846,880	0.647	0.725
	03 OFFICES	176,967	785,108	0.777	0.870
	04 MERCANTILE - HIGH	265	1,210	0.000	0.000
	08 INSTITUTIONAL - HIG	1,469	7,286	0.000	0.000
	11 INDUST-PROC - LOW	48	204	0.000	0.000
	12 SERVICE - HIGH	6	1,143	10.269	11.499
	14 CONTRACTORS	0	62	0.000	0.000
	TOTAL*	850,230	3,641,893	0.673	0.754

MISSOURI

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 12/31/17 AGGREGATE LOSS COSTS	5 - YEAR AGGREGATE LOSS COSTS	5 - YEAR EXPERIENCE RATIO	RELATIVITY	
34 MULTILINE MERCANTILE	01 BUILDINGS	2,520,353	10,666,228	0.960	1.075	
	03 OFFICES	4,247	6,125	0.000	0.000	
	04 MERCANTILE - HIGH	263,177	1,519,350	1.368	1.532	
	05 MERCANTILE - MEDIUM	212,665	1,201,366	0.592	0.663	
	06 MERCANTILE - LOW	185,266	799,649	1.294	1.449	
	08 INSTITUTIONAL - HIG	279	1,524	0.000	0.000	
	11 INDUST-PROC - LOW	2,244	3,913	0.000	0.000	
	12 SERVICE - HIGH	4,832	19,454	0.000	0.000	
	13 SERVICE - LOW	3,659	17,979	0.000	0.000	
	14 CONTRACTORS	10,932	48,954	0.000	0.000	
	TOTAL*	3,207,654	14,284,542	0.981	1.099	
	35 MULTILINE INSTITUTIONAL	01 BUILDINGS	2,340,144	12,810,089	0.991	1.110
		03 OFFICES	355	737	0.000	0.000
		08 INSTITUTIONAL - HIG	436,978	2,290,266	0.529	0.592
09 INSTITUTIONAL - LOW		438,550	2,282,484	0.379	0.424	
11 INDUST-PROC - LOW		0	17	0.000	0.000	
12 SERVICE - HIGH		228	739	0.000	0.000	
14 CONTRACTORS		1,994	9,293	0.000	0.000	
TOTAL*		3,218,249	17,393,625	0.844	0.945	
36 MULTILINE SERVICES	01 BUILDINGS	1,135,357	5,659,324	0.925	1.036	
	03 OFFICES	2,951	11,817	0.000	0.000	
	04 MERCANTILE - HIGH	3,661	16,267	0.000	0.000	
	05 MERCANTILE - MEDIUM	4,847	21,041	4.895	5.482	
	06 MERCANTILE - LOW	353	1,271	0.000	0.000	
	08 INSTITUTIONAL - HIG	13,658	74,325	0.000	0.000	
	09 INSTITUTIONAL - LOW	12,779	57,702	0.000	0.000	
	10 INDUST-PROC - HIGH	98	155	0.000	0.000	
	11 INDUST-PROC - LOW	218	854	0.000	0.000	
	12 SERVICE - HIGH	412,358	2,699,222	0.371	0.415	
	13 SERVICE - LOW	156,825	833,469	0.743	0.832	
	14 CONTRACTORS	12,591	56,840	0.000	0.000	
	TOTAL*	1,755,696	9,432,287	0.765	0.857	

MISSOURI

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 12/31/17 AGGREGATE LOSS COSTS	5 - YEAR AGGREGATE LOSS COSTS	5 - YEAR EXPERIENCE RATIO	RELATIVITY	
37 MULTILINE INDUST/PROC	01 BUILDINGS	768,021	4,004,493	0.492	0.551	
	03 OFFICES	942	5,924	4.165	4.664	
	04 MERCANTILE - HIGH	979	1,810	0.000	0.000	
	05 MERCANTILE - MEDIUM	25	416	0.000	0.000	
	06 MERCANTILE - LOW	131	471	0.000	0.000	
	10 INDUST-PROC - HIGH	76,490	500,475	5.356	5.998	
	11 INDUST-PROC - LOW	475,031	2,658,728	0.485	0.543	
	12 SERVICE - HIGH	843	2,163	0.000	0.000	
	13 SERVICE - LOW	360	633	0.000	0.000	
	14 CONTRACTORS	1,737	3,906	0.000	0.000	
	TOTAL*	1,324,559	7,179,019	0.771	0.863	
	38 MULTILINE CONTRACTORS	01 BUILDINGS	413,018	2,174,235	0.640	0.717
		03 OFFICES	5,675	26,611	0.719	0.805
		04 MERCANTILE - HIGH	853	5,607	0.251	0.281
08 INSTITUTIONAL - HIG		659	1,871	0.000	0.000	
11 INDUST-PROC - LOW		1,069	2,907	0.000	0.000	
12 SERVICE - HIGH		1,758	4,591	0.000	0.000	
13 SERVICE - LOW		287	965	0.000	0.000	
14 CONTRACTORS		331,623	1,940,552	0.656	0.735	
TOTAL*		754,942	4,157,339	0.644	0.721	
TOTAL ALL TOPS*		01 BUILDINGS	10,320,890	50,631,437	0.954	1.068
	02 RES. APTS. AND COND	234,949	1,294,907	0.477	0.534	
	03 OFFICES	309,630	1,484,747	0.627	0.702	
	04 MERCANTILE - HIGH	409,545	2,284,176	1.000	1.120	
	05 MERCANTILE - MEDIUM	239,348	1,340,980	0.650	0.728	
	06 MERCANTILE - LOW	204,867	931,312	1.180	1.321	
	07 MOTELS AND HOTELS	74,174	267,496	2.597	2.908	
	08 INSTITUTIONAL - HIG	480,738	2,539,132	0.541	0.606	
	09 INSTITUTIONAL - LOW	502,521	2,548,769	0.361	0.404	
	10 INDUST-PROC - HIGH	84,164	564,239	4.922	5.512	
	11 INDUST-PROC - LOW	545,171	3,076,341	0.474	0.531	
	12 SERVICE - HIGH	473,807	3,057,646	0.355	0.398	
	13 SERVICE - LOW	210,642	1,175,029	1.227	1.374	
	14 CONTRACTORS	375,984	2,152,145	0.617	0.691	
	TOTAL*	14,466,430	73,348,356	0.893	1.000	

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

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.

MISSOURI

TABLE 7 - BASIC GROUP II RELATIVITY ANALYSIS

	(1) ACCIDENT YEAR ENDING 12/31/17 AGGR. LOSS COSTS AT CURRENT IMPLICIT PMF	(2) ACCIDENT YEARS 2008-2017 EXPER. RATIO AT CURRENT PMF A	(3) FORMULA RELATIVITY (2)/ 1.199	(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	2,890,176	1.303	1.087	0.428	1.037	1.037	1.0415	
MULTILINE	25,278,965	1.187	0.990	0.856	0.991	0.991	0.9954	
COVERAGE	28,169,141	1.199	1.000			0.9957 B	1.0001	
MULTILINE TOP								
31 MOTEL/HOTEL	625,226	2.332	1.945	0.089	1.084	1.091	1.0957	+5.2%
32 APARTMENT	3,222,722	1.100	0.917	0.430	0.964	0.970	0.9742	-6.5%
33 OFFICE	1,190,762	1.133	0.945	0.182	0.990	0.996	1.0003	-4.0%
34 MERCANTILE	6,644,806	1.174	0.979	0.568	0.988	0.994	0.9983	-4.1%
35 INSTITUTIONAL	7,102,876	1.152	0.961	0.663	0.974	0.980	0.9842	-5.5%
36 SERVICES	3,773,310	1.166	0.972	0.472	0.987	0.993	0.9973	-4.2%
37 INDUST/PROCESS	1,679,697	1.315	1.097	0.299	1.029	1.035	1.0395	-0.2%
38 CONTRACTORS	1,039,566	1.011	0.843	0.215	0.966	0.972	0.9762	-6.3%
	25,278,965	1.187 B	0.990		0.985 B	0.991 B	0.9954	

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) * (0.991/0.985)

F - (7) = (6) / 0.9957

G - (8) = (NORMALIZED RELATIVITY FOR TOP)/(NORMALIZED MONOLINE RELATIVITY (TOP 10)) - 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.

TABLES 8 AND 9

Tables 8 and 9 are not applicable this year. Commercial Inland Marine relativities are not being reviewed in 2019.

TABLE 10
MISSOURI
OWNERS, LANDLORDS AND TENANTS
BASIC LIMIT RELATIVE CHANGE ANALYSIS

	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE
TOP					
10	1.052	0.290	1.015	1.016	
31	0.984	0.114	0.998	0.999	-1.7%
32	1.482	0.125	1.050	1.051	+3.4%
33	0.934	0.192	0.987	0.988	-2.8%
34	1.003	0.255	1.001	1.002	-1.4%
35	1.017	0.194	1.003	1.004	-1.2%
36	0.767	0.148	0.962	0.962	-5.3%
CLASS GROUP					
01	0.929	0.125	0.991	0.993	
02	0.808	0.180	0.962	0.964	
03	0.991	0.128	0.999	1.001	
04	1.178	0.026	1.004	1.006	
05	1.407	0.043	1.015	1.017	
06	1.011	0.067	1.001	1.003	
07	1.095	0.131	1.012	1.014	
08	1.464	0.054	1.021	1.023	
09	0.753	0.170	0.953	0.955	
10	0.927	0.176	0.987	0.989	
11	0.918	0.130	0.989	0.991	
12	1.067	0.298	1.020	1.022	
13	1.814	0.104	1.064	1.066	
16	1.043	0.073	1.003	1.005	
TERRITORY					
1	1.326	0.205	1.060	1.066	
2	0.974	0.298	0.992	0.998	
3	0.931	0.379	0.973	0.979	

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

TABLE 11
MISSOURI
MANUFACTURERS AND CONTRACTORS
BASIC LIMIT RELATIVE CHANGE ANALYSIS

	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE
TOP					
10	0.782	0.243	0.942	0.948	
33	1.429	0.031	1.011	1.018	+7.4%
34	0.944	0.080	0.995	1.002	+5.7%
35	4.308	0.101	1.159	1.167	+23.1%
36	0.741	0.126	0.963	0.970	+2.3%
37	1.099	0.081	1.008	1.015	+7.1%
38	1.298	0.267	1.072	1.080	+13.9%
CLASS GROUP					
30	0.868	0.118	0.983	0.982	
31	1.079	0.169	1.013	1.012	
32	1.033	0.277	1.009	1.008	
33	1.046	0.121	1.005	1.004	
34	0.885	0.129	0.984	0.983	
35	2.334	0.024	1.021	1.019	
36	0.728	0.075	0.976	0.975	
37	0.566	0.041	0.977	0.976	
38	1.312	0.107	1.030	1.028	

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

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

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TERRITORY	ALL	(1)	(2)	(3)	(4)	(5)	(6)	
		CALENDAR A.Y.E. 12/31/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	CALENDAR 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							
10 MONOLINE	01 FOOD&BEV. (RETAIL)	\$417,519	\$1,294,498	1.027		65		
	02 RESTAURANTS	429,315	3,531,772	0.848		164		
	03 STORES	182,111	767,033	1.320		43		
	04 VENDING & RENTAL	14,872	86,661	0.000		0		
	05 FOOD & BEV. DIST.	28,607	158,931	1.770		8		
	06 NON-FOOD&BEV.DIST	137,831	726,955	1.264		23		
	07 CLUBS,AMSMT&SPRTS	545,527	2,186,211	1.472		147		
	08 HEALTH CARE FACIL	12,172	107,346	2.113		7		
	09 HOTELS AND MOTELS	1,096,549	5,671,955	0.760		279		
	10 SCHLS & CHURCHES	324,062	1,484,781	0.997		80		
	11 APARTMENTS	714,267	2,855,930	1.228		89		
	12 BUILDINGS&OFFICES	2,506,625	12,058,952	0.926		538		
	13 MISC. PREMISES	182,534	925,102	1.196		68		
	16 GOVT SUBDIVISIONS	10,756	49,852	2.443		8		
		TOTAL *	\$6,602,747	\$31,905,979	1.012		1,519	
	31 MULT MOTEL/HOTEL	09 HOTELS AND MOTELS	\$986,044	\$3,761,411	0.737		234	
TOTAL *		\$986,044	\$3,761,411	0.737		234		
32 MULT APARTMENT	11 APARTMENTS	\$747,119	\$4,222,231	1.034		219		
	12 BUILDINGS&OFFICES	151,945	665,404	2.882		63		
	TOTAL *	\$899,064	\$4,887,635	1.347		282		
33 MULT OFFICE	12 BUILDINGS&OFFICES	\$3,282,931	\$15,629,684	0.953		655		
	13 MISC. PREMISES	41,047	210,264	4.035		11		
	TOTAL *	\$3,323,978	\$15,839,948	0.992		666		
34 MULT MERCANTILE	01 FOOD&BEV. (RETAIL)	\$883,011	\$4,473,223	0.800		219		
	02 RESTAURANTS	1,715,908	7,509,553	0.784		424		
	03 STORES	706,047	3,062,242	0.865		233		
	04 VENDING & RENTAL	5,704	41,274	1.241		3		
	05 FOOD & BEV. DIST.	137,387	621,645	1.290		26		
	06 NON-FOOD&BEV.DIST	342,218	1,690,415	0.850		59		
	12 BUILDINGS&OFFICES	839,856	4,424,806	1.241		210		
	TOTAL *	\$4,630,131	\$21,823,158	0.903		1,174		

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

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TERRITORY	ALL	(1)	(2)	(3)	(4)	(5)	(6)
		CALENDAR A. Y. E. 12/31/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	CALENDAR 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	\$81,283	\$298,829	0.831		11	
	08 HEALTH CARE FACIL	222,759	1,247,735	1.450		47	
	10 SCHLS & CHURCHES	1,281,332	6,921,569	0.916		477	
	12 BUILDINGS&OFFICES	49,693	268,141	1.406		49	
	13 MISC. PREMISES	34,929	187,654	1.586		6	
	16 GOVT SUBDIVISIONS	291,059	1,466,004	0.904		90	
	TOTAL *	\$1,961,055	\$10,389,932	0.996		680	
36 MULT SERVICES	03 STORES	\$115,409	\$494,845	0.638		21	
	04 VENDING & RENTAL	39,579	200,310	1.320		10	
	07 CLUBS, AMSMT&SPRTS	1,174,829	5,392,053	0.628		152	
	08 HEALTH CARE FACIL	10,575	38,059	0.000		0	
	09 HOTELS AND MOTELS	74,433	394,915	0.573		8	
	10 SCHLS & CHURCHES	2,596	14,756	0.603		1	
	12 BUILDINGS&OFFICES	377,858	1,849,916	1.278		93	
	13 MISC. PREMISES	267,483	1,467,962	1.495		110	
TOTAL *	\$2,062,762	\$9,852,816	0.868		395		
TOTAL ALL	TOP						
	01 FOOD&BEV. (RETAIL)	\$1,300,530	\$5,767,721	0.873		284	
	02 RESTAURANTS	2,145,223	11,041,325	0.797		588	
	03 STORES	1,003,567	4,324,120	0.921		297	
	04 VENDING & RENTAL	60,155	328,245	0.986		13	
	05 FOOD & BEV. DIST.	165,994	780,576	1.373		34	
	06 NON-FOOD&BEV. DIST	480,049	2,417,370	0.969		82	
	07 CLUBS, AMSMT&SPRTS	1,801,639	7,877,093	0.893		310	
	08 HEALTH CARE FACIL	245,506	1,393,140	1.420		54	
	09 HOTELS AND MOTELS	2,157,026	9,828,281	0.743		521	
	10 SCHLS & CHURCHES	1,607,990	8,421,106	0.932		558	
	11 APARTMENTS	1,461,386	7,078,161	1.129		308	
	12 BUILDINGS&OFFICES	7,208,908	34,896,903	1.038		1,608	
	13 MISC. PREMISES	525,993	2,790,982	1.595		195	
	16 GOVT SUBDIVISIONS	301,815	1,515,856	0.959		98	
	TOTAL *	\$20,465,781	\$98,460,879	0.970		4,950	

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

TABLE 13
MISSOURI
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)
		CALENDAR A. Y. E. 12/31/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	CALENDAR 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	\$897,380	\$2,545,800	0.621	0.632	64	0.932
	31 LIGHT CONTRACTING	641,000	2,812,764	1.028	1.046	147	0.960
	32 MEDIUM CONTRCTING	3,285,390	15,387,711	0.845	0.860	550	0.956
	33 HEAVY CONTRACTING	1,195,386	5,878,428	0.546	0.556	75	0.953
	34 DEALER OR DISTRIB	667,612	3,015,660	0.650	0.661	82	0.933
	35 LGT. MANUFACTURER	79,276	489,362	2.197	2.236	5	0.967
	36 MED. MANUFACTURER	374,105	1,683,741	0.604	0.615	45	0.925
	37 HVY. MANUFACTURER	200,718	974,310	0.500	0.509	7	0.926
	38 MISC. OPERATION	445,856	2,010,255	1.029	1.047	90	0.975
	TOTAL *	\$7,786,723	\$34,798,031	0.775		1,065	
33 MULT OFFICE	31 LIGHT CONTRACTING	\$799	\$11,997	0.000	0.000	0	1.030
	32 MEDIUM CONTRCTING	6,142	23,743	0.000	0.000	0	1.026
	33 HEAVY CONTRACTING	61,693	296,354	1.828	1.860	4	1.023
	38 MISC. OPERATION	87,185	422,842	1.706	1.736	14	1.047
		TOTAL *	\$155,819	\$754,936	1.678		18
34 MULT MERCANTILE	30 SERVICE	\$20,756	\$95,960	0.001	0.001	0	0.985
	32 MEDIUM CONTRCTING	105,124	345,076	0.112	0.114	10	1.010
	34 DEALER OR DISTRIB	774,375	3,811,080	0.722	0.734	89	0.986
	36 MED. MANUFACTURER	233	16,258	0.000	0.000	0	0.978
	38 MISC. OPERATION	51,871	182,728	4.737	4.821	19	1.031
	TOTAL *	\$952,359	\$4,451,102	0.857		118	
35 MULT INSTITUT.	31 LIGHT CONTRACTING	\$6,347	\$32,503	1.130	1.150	3	1.181
	32 MEDIUM CONTRCTING	159,000	767,703	4.508	4.587	181	1.176
		TOTAL *	\$165,347	\$800,206	4.378		184
36 MULT SERVICES	30 SERVICE	\$56,445	\$268,549	0.654	0.666	20	0.952
	31 LIGHT CONTRACTING	95,394	558,774	0.277	0.282	24	0.981
	32 MEDIUM CONTRCTING	98,571	497,289	1.043	1.061	19	0.977
	33 HEAVY CONTRACTING	48,469	258,824	1.121	1.141	15	0.974
	34 DEALER OR DISTRIB	1,013,847	3,887,903	0.758	0.771	130	0.953
	36 MED. MANUFACTURER	8,897	48,392	4.416	4.494	2	0.946
	38 MISC. OPERATION	445,287	1,904,244	0.622	0.633	76	0.997
	TOTAL *	\$1,766,910	\$7,423,975	0.739		286	

MISSOURI
 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)
		CALENDAR A.Y.E. 12/31/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	CALENDAR 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	\$557	\$2,902	0.000	0.000	0	1.027
	32 MEDIUM CONTRCTING	172,574	887,448	2.025	2.061	24	1.023
	33 HEAVY CONTRACTING	40,642	212,383	0.089	0.090	4	1.019
	34 DEALER OR DISTRIB	23,165	60,685	0.165	0.168	2	0.998
	35 LGT. MANUFACTURER	88,807	421,240	2.160	2.198	6	1.034
	36 MED. MANUFACTURER	623,324	3,087,237	0.705	0.717	55	0.990
	37 HVY. MANUFACTURER	454,533	2,182,038	0.582	0.592	24	0.990
	38 MISC. OPERATION	22,028	98,552	1.456	1.482	6	1.044
	TOTAL *	\$1,425,630	\$6,952,485	0.901		121	
38 MULT CONTRACTORS	30 SERVICE	\$743,441	\$3,645,036	1.182	1.203	169	1.060
	31 LIGHT CONTRACTING	1,027,960	4,801,359	1.322	1.346	342	1.092
	32 MEDIUM CONTRCTING	2,326,091	11,149,570	1.197	1.218	607	1.088
	33 HEAVY CONTRACTING	909,038	4,415,343	1.677	1.706	169	1.084
	38 MISC. OPERATION	23,561	149,746	0.310	0.315	2	1.110
	TOTAL *	\$5,030,091	\$24,161,054	1.303		1,289	
TOTAL ALL TOP	30 SERVICE	\$1,718,022	\$6,555,345	0.858		253	
	31 LIGHT CONTRACTING	1,772,057	8,220,299	1.158		516	
	32 MEDIUM CONTRCTING	6,152,892	29,058,540	1.096		1,391	
	33 HEAVY CONTRACTING	2,255,228	11,061,332	1.041		267	
	34 DEALER OR DISTRIB	2,478,999	10,775,328	0.712		303	
	35 LGT. MANUFACTURER	168,083	910,602	2.178		11	
	36 MED. MANUFACTURER	1,006,559	4,835,628	0.700		102	
	37 HVY. MANUFACTURER	655,251	3,156,348	0.557		31	
	38 MISC. OPERATION	1,075,788	4,768,367	1.087		207	
	TOTAL *	\$17,282,879	\$79,341,789	0.983		3,081	

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

TABLE 14
STATE MISSOURI
PRODUCTS
BASIC LIMIT RELATIVE CHANGE ANALYSIS

	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE *
TOP					
10	0.988	0.372	0.995	0.996	
34	1.036	0.371	1.013	1.014	+ 1.8%
36	1.005	0.187	1.001	1.002	+ 0.6%
37	0.988	0.507	0.994	0.994	- 0.2%
CLASS GROUP					
3	0.924	0.500	0.961	0.965	
4	1.048	0.406	1.019	1.024	
5	1.107	0.132	1.014	1.018	
6	1.007	0.320	1.002	1.006	
7	1.006	0.182	1.001	1.005	

* 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: 0.972
TOP 36: 0.996
TOP 37: 1.007

TABLE 15
MULTISTATE
PRODUCTS
BASIC LIMIT RELATIVE CHANGE ANALYSIS

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1)	(2)	(3)	(4)	(5)	(6)
		CALENDAR A.Y.E. 12/31/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	CALENDAR A.Y.E. 2013 - 2017 AGG LOSS COST CURRENT LEVEL	FIVE YEAR EXPERIENCE RATIO	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.
10 MONOLINE	03 MAN,DLR,DSTFD/DRG	\$18,227,491	\$79,500,211	0.856	0.869	1,461	0.961
	04 DLR,DST-NOTFD/DRG	9,616,743	42,155,667	1.119	1.136	640	1.019
	05 MAN.NTFD/DRG (LOW)	1,605,615	6,748,634	1.039	1.055	84	1.014
	06 MAN.NTFD/DRG (MED)	9,640,686	42,498,903	0.958	0.972	466	1.002
	07 MAN.NTFD/DRG (HGH)	2,568,561	11,286,663	1.018	1.033	129	1.001
	TOTAL *	\$41,659,096	\$182,190,078	0.957		2,780	
34 MULT MERCANTILE	03 MAN,DLR,DSTFD/DRG	\$5,166,155	\$25,851,441	1.131	1.148	791	0.979
	04 DLR,DST-NOTFD/DRG	29,011,611	140,165,685	1.037	1.052	1,972	1.038
	06 MAN.NTFD/DRG (MED)	7,625	57,567	0.000	0.000	0	1.020
	TOTAL *	\$34,185,391	\$166,074,693	1.051		2,763	
36 MULT SERVICES	04 DLR,DST-NOTFD/DRG	\$3,197,904	\$14,609,890	1.041	1.057	699	1.025
	06 MAN.NTFD/DRG (MED)	54,898	258,512	0.781	0.793	1	1.008
	TOTAL *	\$3,252,802	\$14,868,402	1.037		700	
37 MULT INDUST/PROC.	03 MAN,DLR,DSTFD/DRG	\$16,474,514	\$81,117,947	0.888	0.901	2,761	0.960
	05 MAN.NTFD/DRG (LOW)	4,070,679	20,897,437	1.092	1.108	269	1.012
	06 MAN.NTFD/DRG (MED)	28,248,516	131,744,418	0.987	1.002	1,582	1.001
	07 MAN.NTFD/DRG (HGH)	7,346,721	36,933,393	0.965	0.980	537	1.000
	TOTAL *	\$56,140,430	\$270,693,195	0.963		5,149	
TOTAL ALL TOP	03 MAN,DLR,DSTFD/DRG	\$39,868,160	\$186,469,599	0.905		5,013	
	04 DLR,DST-NOTFD/DRG	41,826,258	196,931,242	1.056		3,311	
	05 MAN.NTFD/DRG (LOW)	5,676,294	27,646,071	1.077		353	
	06 MAN.NTFD/DRG (MED)	37,951,725	174,559,400	0.979		2,049	
	07 MAN.NTFD/DRG (HGH)	9,915,282	48,220,056	0.979		666	
	TOTAL *	\$135,237,719	\$633,826,368	0.985		11,392	

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

TABLE 16
STATE MISSOURI
LOCAL PRODUCTS/COMPLETED OPERATIONS
BASIC LIMIT RELATIVE CHANGE ANALYSIS

	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE *
TOP					
10	0.969	0.752	0.977	0.973	
34	0.959	0.541	0.978	0.974	+ 0.1%
36	0.986	0.516	0.993	0.989	+ 1.6%
37	0.972	0.138	0.996	0.993	+ 2.1%
38	1.025	0.962	1.024	1.020	+ 4.8%
CLASS GROUP					
1	0.918	0.550	0.954	0.948	
2	1.037	0.495	1.018	1.012	
11	1.095	0.352	1.032	1.026	
12	1.016	1.000	1.016	1.010	
13	0.785	0.266	0.938	0.932	

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

TABLE 16
MULTISTATE

LOCAL PRODUCTS/COMPLETED OPERATIONS
BASIC LIMIT RELATIVE CHANGE ANALYSIS *

STATE	(1) BAILEY FORMULA RELATIV	(2) CREDIBILITY Z	(3) Z-WTD RELATIV	(4) BALANCED RELATIV.
	1.418	0.386	1.144	1.144
	1.202	0.623	1.122	1.121
	1.425	0.229	1.085	1.084
	1.144	0.427	1.059	1.059
	1.413	0.160	1.057	1.057
	1.437	0.153	1.057	1.057
	1.197	0.263	1.049	1.048
	1.096	0.505	1.048	1.047
	1.135	0.345	1.045	1.044
	1.122	0.368	1.043	1.043
	1.191	0.231	1.041	1.041
	1.128	0.326	1.040	1.040
	1.173	0.239	1.039	1.039
	1.148	0.224	1.031	1.031
	1.059	0.435	1.025	1.025
	1.052	0.453	1.023	1.023
	1.257	0.100	1.023	1.023
	1.083	0.227	1.018	1.018
	1.101	0.187	1.018	1.018
	1.090	0.192	1.017	1.016
	1.045	0.369	1.016	1.016
Missouri	1.037	0.307	1.011	1.011
	1.019	0.449	1.008	1.008
	1.027	0.143	1.004	1.003
	1.002	0.494	1.001	1.000
	1.002	0.131	1.000	1.000
	0.994	0.097	0.999	0.999
	0.992	0.402	0.997	0.997
	0.989	0.377	0.996	0.995
	0.975	0.190	0.995	0.995
	0.965	0.458	0.984	0.983
	0.924	0.241	0.981	0.981
	0.933	0.349	0.976	0.976
	0.895	0.260	0.972	0.971
	0.892	0.285	0.968	0.968
	0.788	0.160	0.963	0.962
	0.693	0.104	0.963	0.962
	0.889	0.364	0.958	0.958
	0.759	0.154	0.958	0.958
	0.843	0.288	0.952	0.952
	0.720	0.158	0.949	0.949
	0.765	0.195	0.949	0.949
	0.906	0.547	0.948	0.947
	0.793	0.238	0.946	0.946
	0.512	0.084	0.945	0.945
	0.639	0.136	0.941	0.941
	0.813	0.308	0.938	0.938
	0.889	0.581	0.934	0.933
	0.846	0.470	0.924	0.924
	0.756	0.321	0.914	0.914
	0.602	0.179	0.913	0.913
	0.804	0.575	0.882	0.882

* Sorted by balanced relative change.

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

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1)	(2)	(3)	(4)	(5)	(6)
		CALENDAR A.Y.E. 12/31/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	CALENDAR A.Y.E. 2013 - 2017 AGG LOSS COST CURRENT LEVEL	FIVE YEAR EXPERIENCE RATIO	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.
10 MONOLINE	01 RET. STRS-FOOD/DRG	\$21,978	\$135,295	1.089	1.005	15	0.933
	02 RET. STRS-NTFD/DRG	26,718	88,603	0.528	0.487	2	0.996
	11 COMP. OPS. (LOW)	51,870	220,186	0.063	0.058	3	1.010
	12 COMP. OPS. (MED)	1,329,569	6,548,276	0.551	0.509	81	0.994
	13 COMP. OPS. (HGH)	188,229	844,584	0.357	0.329	8	0.917
	TOTAL *	\$1,618,364	\$7,836,944	0.520		109	
34 MULT MERCANTILE	01 RET. STRS-FOOD/DRG	\$71,391	\$311,866	1.591	1.467	64	0.934
	02 RET. STRS-NTFD/DRG	37,486	159,313	1.469	1.355	16	0.997
	12 COMP. OPS. (MED)	9,122	36,250	0.579	0.534	1	0.995
	TOTAL *	\$117,999	\$507,429	1.474		81	
36 MULT SERVICES	01 RET. STRS-FOOD/DRG	\$9,904	\$42,087	1.584	1.461	3	0.948
	02 RET. STRS-NTFD/DRG	122,927	488,122	2.757	2.543	55	1.012
	11 COMP. OPS. (LOW)	9,174	56,096	4.180	3.856	9	1.026
	12 COMP. OPS. (MED)	85,005	322,150	2.944	2.716	14	1.010
	13 COMP. OPS. (HGH)	9,822	45,911	0.000	0.000	0	0.932
	TOTAL *	\$236,832	\$954,366	2.716		81	
37 MULT INDUST/PROC.	01 RET. STRS-FOOD/DRG	\$637	\$2,610	0.000	0.000	0	0.952
	11 COMP. OPS. (LOW)	226	1,750	4.459	4.113	1	1.030
	12 COMP. OPS. (MED)	25,223	154,806	7.713	7.116	5	1.014
	13 COMP. OPS. (HGH)	0	4	0.000	0.000	0	0.935
	TOTAL *	\$26,086	\$159,170	7.497		6	
38 MULT CONTRACTORS	11 COMP. OPS. (LOW)	\$134,862	\$553,745	0.989	0.913	11	1.059
	12 COMP. OPS. (MED)	1,739,871	8,150,468	1.324	1.222	215	1.042
	13 COMP. OPS. (HGH)	216,468	929,450	1.273	1.174	18	0.961
	TOTAL *	\$2,091,201	\$9,633,663	1.297		244	
TOTAL ALL TOP	01 RET. STRS-FOOD/DRG	\$103,910	\$491,858	1.474		82	
	02 RET. STRS-NTFD/DRG	187,131	736,038	2.181		73	
	11 COMP. OPS. (LOW)	196,132	831,777	0.897		24	
	12 COMP. OPS. (MED)	3,188,790	15,211,950	1.094		316	
	13 COMP. OPS. (HGH)	414,519	1,819,949	0.827		26	
	TOTAL *	\$4,090,482	\$19,091,572	1.117		521	

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

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

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1)	(2)	(3)	(4)	(5)	(6)
		CALENDAR A.Y.E. 12/31/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	CALENDAR A.Y.E. 2013 - 2017 AGG LOSS COST CURRENT LEVEL	FIVE YEAR EXPERIENCE RATIO	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.
10 MONOLINE	01 RET. STRS-FOOD/DRG	\$2,570,942	\$11,000,189	0.978		762	
	02 RET. STRS-NTFD/DRG	2,629,603	11,663,817	1.219		494	
	11 COMP. OPS. (LOW)	4,024,036	18,069,271	1.329		705	
	12 COMP. OPS. (MED)	82,107,926	364,826,722	1.080		6,242	
	13 COMP. OPS. (HGH)	7,801,373	39,341,081	0.703		282	
	TOTAL *	\$99,133,880	\$444,901,080	1.062		8,485	
34 MULT MERCANTILE	01 RET. STRS-FOOD/DRG	\$8,002,266	\$37,342,335	0.940		3,591	
	02 RET. STRS-NTFD/DRG	5,186,195	23,434,483	1.012		665	
	12 COMP. OPS. (MED)	2,043,786	10,139,349	1.186		140	
	TOTAL *	\$15,232,247	\$70,916,167	0.997		4,396	
36 MULT SERVICES	01 RET. STRS-FOOD/DRG	\$729,961	\$3,439,653	1.065		197	
	02 RET. STRS-NTFD/DRG	12,256,900	48,452,562	1.088		2,518	
	11 COMP. OPS. (LOW)	3,094,937	14,012,389	1.111		510	
	12 COMP. OPS. (MED)	4,447,208	21,021,492	0.941		694	
	13 COMP. OPS. (HGH)	989,332	5,061,195	1.199		87	
	TOTAL *	\$21,518,338	\$91,987,291	1.065		4,006	
37 MULT INDUST/PROC.	01 RET. STRS-FOOD/DRG	\$26,867	\$90,627	2.388		1	
	11 COMP. OPS. (LOW)	114,535	530,208	1.229		19	
	12 COMP. OPS. (MED)	3,550,014	17,334,430	1.039		268	
	13 COMP. OPS. (HGH)	40,532	307,938	0.580		0	
	TOTAL *	\$3,731,948	\$18,263,203	1.050		288	
38 MULT CONTRACTORS	11 COMP. OPS. (LOW)	\$8,122,432	\$37,446,153	1.157		634	
	12 COMP. OPS. (MED)	143,209,202	677,397,379	1.125		12,565	
	13 COMP. OPS. (HGH)	14,631,915	67,788,410	0.919		693	
	TOTAL *	\$165,963,549	\$782,631,942	1.108		13,892	
TOTAL ALL TOP	01 RET. STRS-FOOD/DRG	\$11,330,036	\$51,872,804	0.960		4,551	
	02 RET. STRS-NTFD/DRG	20,072,698	83,550,862	1.086		3,677	
	11 COMP. OPS. (LOW)	15,355,940	70,058,021	1.193		1,868	
	12 COMP. OPS. (MED)	235,358,136	1,090,719,372	1.105		19,909	
	13 COMP. OPS. (HGH)	23,463,152	112,498,624	0.858		1,062	
	TOTAL *	\$305,579,962	\$1,408,699,683	1.084		31,067	

* 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.

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. ALCCCL have been trended.

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.

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^{th} type of policy;

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

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

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

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

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

j^{th} class group and k^{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
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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^{th} type of policy;

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

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

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

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

and j^{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^{th} type of policy;

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

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

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

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

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

j^{th} class group and k^{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.

COMMERCIAL PACKAGE POLICY

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 COMMERCIAL PACKAGE POLICY
 PACKAGE MODIFICATION FACTORS

MISSOURI (24)

PACKAGE MODIFICATION FACTORS

Package Modification Assignment (PMA)	Premium From CLM Division			
	Two	Three, Four, Five, Eight Property	Four, Six Liability	All Other Divisions
Apartment House	.90	.83	1.00	1.00
Contractors	.90	.91	.95	1.00
Industrial & Processing	.90	.80	.96	1.00
Institutional	.90	.92	.95	1.00
Mercantile	.90	.80	.90	1.00
Motel/Hotel	.90	1.00	.96	1.00
Office	.90	.75	.84	1.00
Service	.90	.88	.95	1.00

Table 1. Package Modification Factors