Select Actuarial Services

State of Missouri Workers Compensation Insurance

Actuarial Review of NCCI Loss Cost Filing Effective January 1, 2015

November 24, 2014

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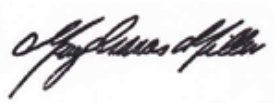

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Select Actuarial Services

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Executive Summary

Select Actuarial Services has been engaged by the Missouri Department of Insurance to conduct an independent actuarial review of the National Council on Compensation Insurance's voluntary loss cost filing, effective January 1, 2015.

Scope of Assignment: We were asked by the Department

- to review the filed loss cost change for actuarial soundness;
- to calculate the effect on the filed loss costs, had the NCCI excluded assigned risk loss experience and included the loss adjustment expense experience of Missouri Employers Mutual in its calculations; and
- to recommend an alternative overall change to loss costs, if warranted by our findings.

Summary of NCCI Filing: The NCCI has filed for an overall 3.7% decrease in loss costs, effective January 1, 2015. This moderate indicated decrease offsets about half of the experience-based increase (+7.6%) included in the loss costs effective January 1, 2014 (the 1/1/14 loss costs also reflected the effect of SB 1).

The most significant drivers of the experience indication are

- Medical experience for the 2012 policy year was much better than for either of the two preceding policy years. The 2015 indication is based on experience from policy years 2011 and 2012. Last year's indication was based on policy years 2010 and 2011.
- Indemnity loss ratios continue to decline, at about the same rate as in last year's filing.
- As indemnity ratios decline over time, medical costs make up an increasing percentage of total workers compensation losses. Over time, improvements in indemnity have a smaller and smaller offsetting effect against increasing medical costs.

SB1 shifted a substantial portion of the losses previously covered by the Second Injury Fund (SIF) to the insurance system. The estimated effect of SB1 is reflected in both the 1/1/2014 and 1/1/2015 loss costs, but it will be several years before the actual effect of the law change appears in insurers' experience.

Overall Findings: With two notable exceptions, the NCCI's calculations are actuarially sound. We continue to believe that NCCI's calculation of the provision for loss adjustment expenses consistently overstates the actual ultimate experience, resulting in an overstatement of the needed provision by at least 1%. NCCI has selected a country-wide LAE provision of 20.1%, while we estimate that the true provision is between 18.6% and 19.7%. The result is an indicated Missouri loss cost change between -4.8% and -4.0% rather than the filed -3.7%.

In addition, this year the NCCI has reverted to using only the latest two years' observed paid loss development statistics in selecting loss development factors. We believe that reliance on only two years of data introduces needless volatility into the ratemaking process without improving the predictive value of the calculations. We also believe that use of only two years of paid factors while relying on the latest five observed paid+case factors when they exhibit similar patterns of instability (probably not trends) is inconsistent. While the resulting estimated ultimate losses for medical benefits are not materially different, the paid and paid+case methods for indemnity benefits are materially different (see Exhibit D). NCCI has simply averaged the two results without accounting for the differences or justifying the selections. Using last year's combination (3 years for the paid method/5 years for paid+case) for the indemnity losses would increase the indicated decrease to -4.6%. Various combinations of two, three and four years of factors results in indicated decreases from -3.2% to -4.6% (See Exhibit E). Given that the NCCI's selection falls toward the middle of the range of outcomes that we tested, we do not proposed a particular alternative, but call the reader's attention to the resulting uncertainty in the estimates.

As calculated by the NCCI, excluding the assigned risk program from the experience has no effect on the indicated loss cost change. Including MEM's loss adjustment expense experience in the LAE provision calculation changes the NCCI's indicated loss cost change from -3.7% to -3.5%.

Combining the effect of including MEM experience with our recommended changes to the loss adjustment expense provision results in a range of indicated loss cost changes from -3.8% to -4.7%. Calculation of the indicated loss cost changes is presented in Exhibit B in the Exhibits section of this report.

Summary of Loss Cost Changes

	NCCI	SAS Low	SAS High	Recommended
LAE Excluding MEM	-3.7%	-4.8%	-4.0%	
LAE Including MEM	-3.5%	-4.7%	-3.8%	-4.4%

SAS Review of NCCI experience filing: We have reviewed the overall methodology and calculations employed in the filing. There are, in fact, very few places where the NCCI exercises judgment in individual filings, the principal places being the selection of cost trend and loss development. Most of the judgment that goes into NCCI filings is done at a meta-filing level. That is, significant study (and judgment) went into the design of the methodology, deliberately removing the need to make choices among competing estimates in each and every filing. The advantage to such a methodology is that there is little or no opportunity for bias – conscious or unconscious – to operate. The result should be a better estimate of the actual loss costs over the long term; however, there is always the potential that use of pre-selected averages will miss real trends in the data. Outside the judgment-call of trend factor selection, however, we believe that there needs to be significant evidence that NCCI's methodology is producing a biased result before different selections are made.

We have specifically reviewed the following components, where NCCI's judgment plays a significant role:

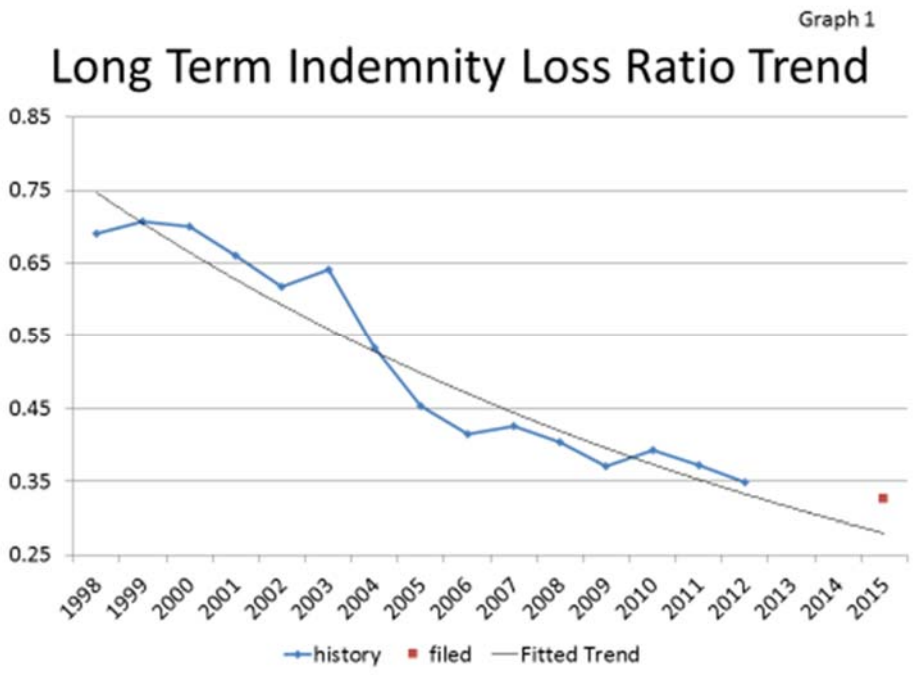
1) **Selection of loss development factors**. NCCI relies on a combination of paid loss development and paid+case loss development to estimate ultimate losses for Missouri. Recent practice had used an average of the latest two observed paid ratios and an average of the latest five observed paid+case ratios. In last year's filing, NCCI chose to use the latest three paid ratios to increase stability in its estimates. This year's filing returns to the two-year average for the paid development selection. As discussed above, we question this decision, and in fact would have selected an average of more years, especially for the first several maturities where paid development factors tend to be highly variable. For medical losses, the NCCI's paid and paid+case methods do not produce materially different estimates for this filing. However, for indemnity losses, the paid method produces estimates of ultimate losses that are 4% and 9% higher than the paid+case method for policy years 2011 and 2012, respectively.

   We believe that the NCCI needs to examine its methodology for

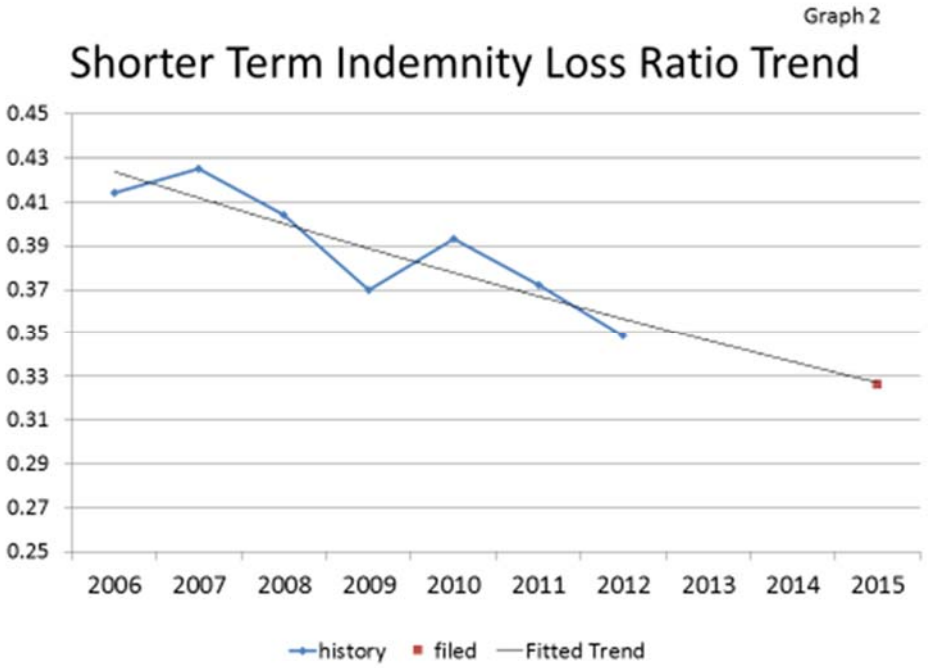
selecting loss development factors – especially in light of the fact that in developing ultimate losses for ratemaking purposes the exercise is not to predict next year's development but, rather, to predict the development that will occur at all maturities for very immature policy years. Some of that development will not occur until more than a decade into the future. This fact alone tends to argue for more stability in the selections. Without such a study, it is very hard to select among the various potential averages. It may be, for example, that a much longer-term average is most appropriate. There are also techniques in the actuarial literature for selecting paid and paid+case loss development factors simultaneously, reflecting the relative predictive value of varying amounts of case reserves in the data. A description of these techniques is beyond the scope of this report.

2) **Selection of loss ratio trend factors**. Over the very long term, **indemnity loss ratios** have been decreasing at about 5.5% per year (see graph 1). Over the shorter term, indemnity trend has fallen to less than -3% (see graph 2), but it is not possible to predict whether this trend will continue or move back toward the longer term norm. The NCCI's selected annual trend, -3%, produces a projected 2015 policy year indemnity loss ratio very close to the short term trend line.

Graph 1

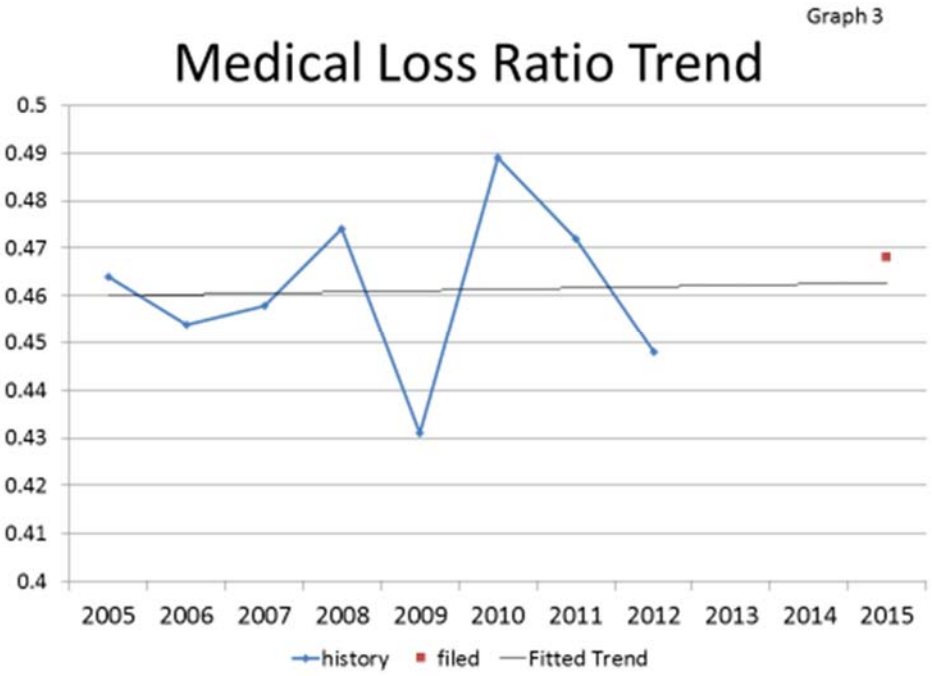


Graph 2

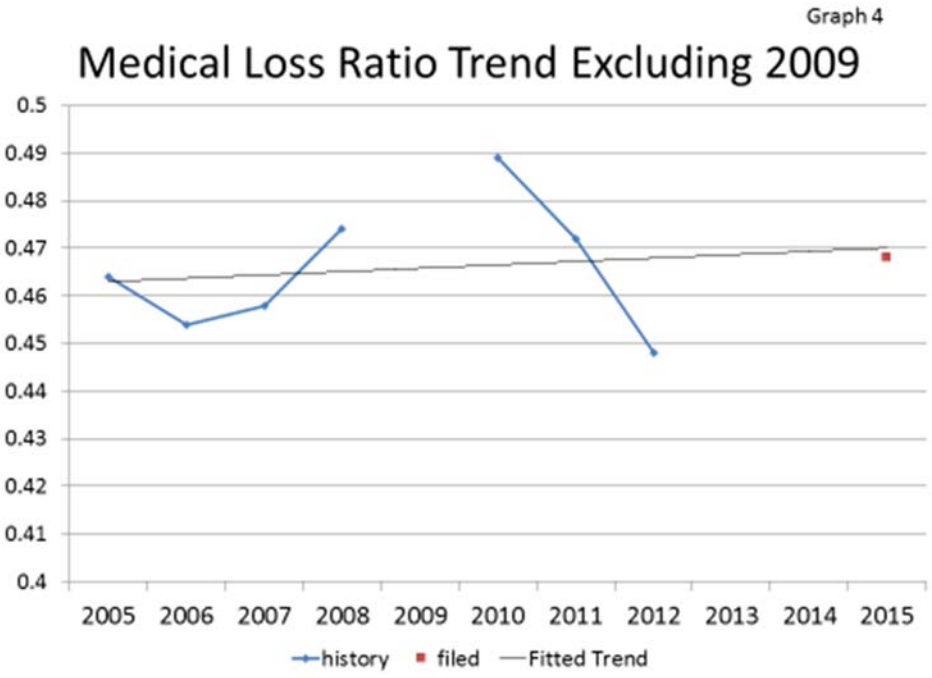


Medical loss ratios tend to be more volatile than indemnity ratios, making trend selections more difficult. Graph 3 shows the most recent eight policy years, the fitted trend, and the NCCI's projected loss ratio for 2015. In this graph, the NCCI selection of +0.5% per year appears slightly high; however, the trend line is very heavily influenced by policy year 2009 experience, which appears anomalous at this time. As can be seen in graph 4, excluding 2009 the projected 2015 medical loss ratio is reasonable, and graph 5 supports the selection using a longer trend period. The year to year volatility displayed on graph 5 also indicates that it would not be surprising to see a 2015 medical loss ratio anywhere in the range from 45% to 50%.

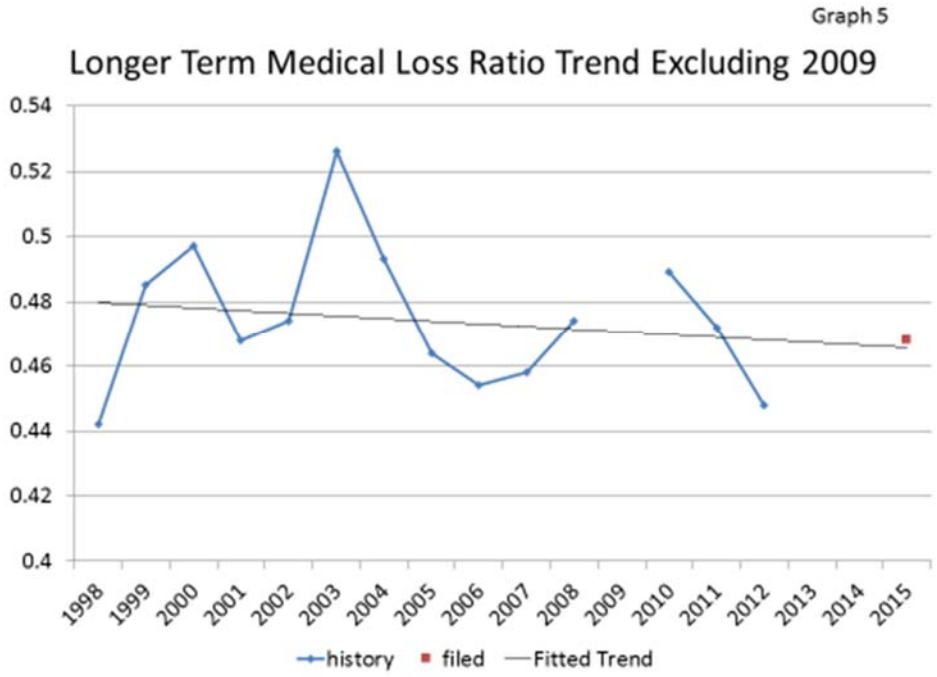
Graph 3



Graph 4

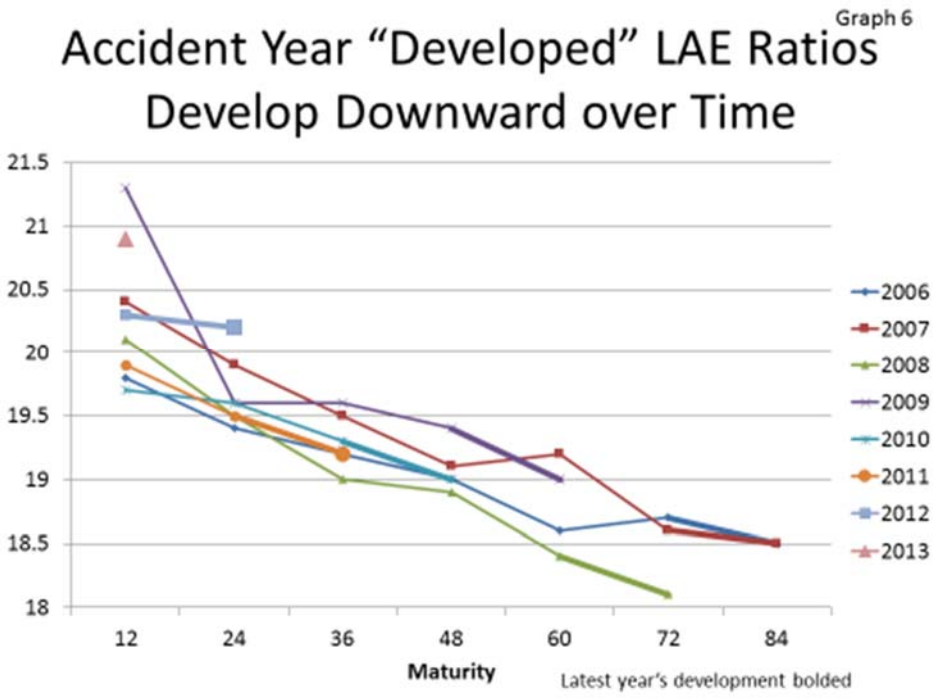


Graph 5



3) **Selection of a provision for loss adjustment expenses**. The loss costs include a provision to account for the cost of settling claims, called loss adjustment expenses. These expenses include both costs that can be allocated directly to individual claims, such as legal expenses and medical exam costs, and costs that cannot be allocated, such as salaries for claim adjusters. In most years, NCCI separately develops countrywide ultimate losses and ultimate adjustment expenses on an accident year basis, and then takes the ratio of the two developed ultimate estimates to estimate the ultimate ratio of adjustment expenses to losses. The average of the two latest years' ratios is then usually selected as the countrywide provision for loss adjustment expenses (LAE).

   This appears at first to be a reasonable approach; however, NCCI's estimates of the ratio of ultimate LAE to ultimate losses changes over time in a consistently downward direction. For example, NCCI's estimate of the ratio for accident year 2008 used in filings effective in 2010 was 20.1%. That same accident year 2008 ratio presented in filings effective in 2011 was 19.5%, and the current estimate of the 2008 accident year LAE ratio is just 18.1% of losses. Other years show a similar pattern, as seen on graph 6 (2008 is the green line on graph 6).

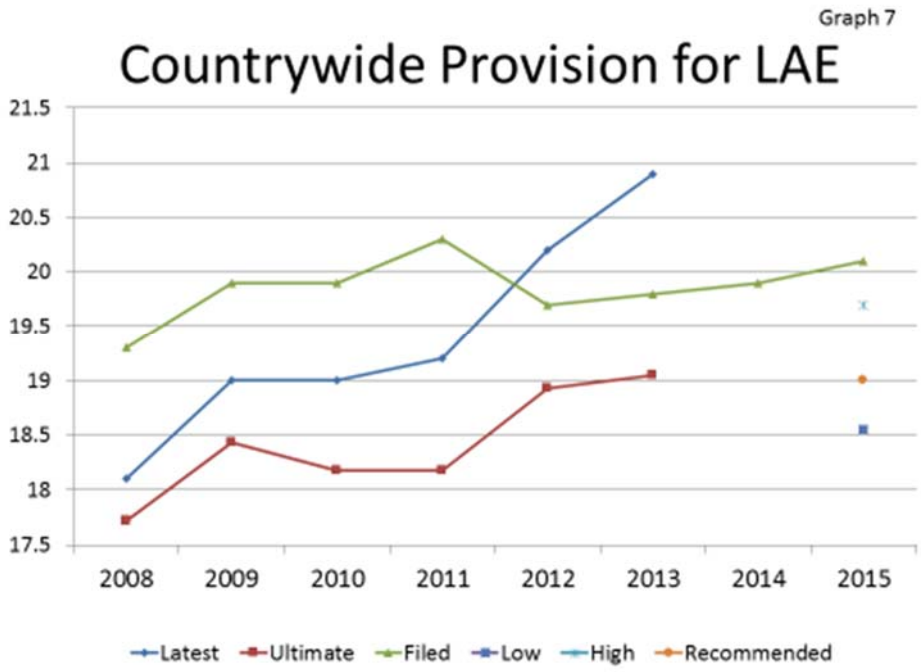


The result is that NCCI has consistently overestimated the ratio of LAE to losses in its filings. The NCCI has somewhat mitigated the effect of this approach for 2015 filings, selecting a three year average rather than two years. The selected countrywide provision for 2015 is the average of the current 2011, 2012 and 2013 values, that is an average of the orange circle at 36 months (2011), the grey box at 24 months (2012) and the pink triangle at 12 months in Graph 6 (2013) = 20.1%.

Graph 7 shows the filed countrywide provision for LAE from 2008 through 2015 (green line) along with the NCCI's current estimate of the actual LAE provision (blue line). With the exception of the 2012 and 2013 accident years, actual experience is already well below the filed provisions for every year. Our estimate of the *ultimate* LAE to loss ratio (red line) reflects expected additional downward development based on the changes observed in the ratios in the NCCI filings over time. Our best estimate of the indicated countrywide provision for LAE for the 2015 policy year is 19.0%. An alternate potential selection, without relying on the assumption that the LAE ratios will continue to develop as they have in the past, at the very least excludes the accident year 2013 ratio from the calculation. The LAE ratio has only once exceeded 20% after the first observation, indicating that any selection that relies on a first observation over 20% is biased upward. The average of the NCCI's current estimates for 2011 and 2012 is 19.7%. This estimate represents the high end of our range of

reasonable estimates. It is unreasonable to expect that the 2015 LAE ratio will be 20.1%, as filed.

Graph 7



After adjusting for Missouri-specific defense and cost containment ratios and for the inclusion of MEM experience, we conclude that the range of reasonable estimates of the LAE ratio for 2015 in Missouri is from 18.5% to 19.6% (Exhibit B), and we recommend a provision of 18.9%.

4) **Allocation of loss costs to individual classes:** The NCCI's methodology for distributing the overall indication to the various classes is well documented and well supported. We concur with the methodology and did not find any exceptions in this filing. Loss costs changes for individual classes in this filing range from -27% to +19%.

   We did not review NCCI's calculation of the effect of changes to the U.S. Longshore and Harbor Workers' Compensation Act.

Exclusion of assigned risk experience and inclusion of MEM adjustment experience: At our request, the NCCI calculated that excluding assigned risk experience would have no effect on the indicated loss cost change. Missouri Employers Mutual experience is not included in the NCCI's calculations. MEM's defense and cost containment expense ratio is substantially lower than the ratio for the rest of the insurance industry in Missouri, and for many years the DIFP has recommended loss costs

reflecting this difference. MEM's adjusting and other expense ratio, however, is substantially higher than the ratio for the rest of the insurance industry. In fact, MEM's total expense experience is very close to (actually slightly higher than) industry overall experience. Including MEM's total expense experience in the calculation of the Missouri LAE ratio increases the ratio from 19.7% to 20.0%, resulting in an indicated loss cost change of -3.5% (Exhibit B).

Section
2

Introduction

Select Actuarial Services has prepared this report for the Missouri Department of Insurance. The specific objectives of this report are to review the loss costs filed by the National Council on Compensation Insurance to be effective January 1, 2015; to recommend changes as appropriate, and to calculate the indicated loss cost change taking into account any recommended changes along with the effect of excluding assigned risk experience and including Missouri Employers Mutual adjustment expense experience in the filing.

This report is an actuarial analysis of data, conditions, and practices communicated as of October 27, 2014, to Select Actuarial Services as described in the section entitled "Considerations." While we believe these communications to be reliable, we have not attempted to audit the information and cannot guarantee the accuracy of any information supplied. However, the NCCI's calculations have been reviewed for reasonableness and consistency with filings in other states. The estimates in this report are based upon appropriate actuarial assumptions and procedures. Select Actuarial Services assumes no responsibility for any loss or damage that might arise from the use of or reliance upon this report other than for the purposes set forth herein.

This report was prepared for the use of and is only to be relied upon by the Missouri Department of Insurance. If this report is provided to any other party, the report must be provided in its entirety. We recommend that any such party have its own actuary review this report to ensure that the party understands the assumptions and uncertainties inherent in our estimates and those of the NCCI.

Mary Frances Miller is a Fellow of the Casualty Actuarial Society and a Member of the American Academy of Actuaries. She meets the Qualification Standards of the American Academy of Actuaries to render property/casualty actuarial opinions.

Overview of Filing

We show some of the key results in the NCCI loss cost filing in the following tables and paragraphs, along with key factors selected by NCCI in the calculation of the indicated change in loss costs.

The overall filed -3.7% change in loss costs has the following **effects by industry group**:

Industry Group	Loss Cost Change	Missouri Exposure Distribution[1]
Manufacturing	-4.4%	10.7%
Contracting	-1.3%	5.5%
Office & Clerical	-7.2%	59.6%
Goods & Services	-4.3%	19.3%
Miscellaneous	-2.2%	4.9%
Total	-3.7%	100%

Of the top twenty classifications (based on premium), the **largest changes in classification loss costs** are:

Large Classes with Loss Cost Increase >0%			
Class	Class Description	Size Rank based on Premium[2]	Loss Cost Change
5645	Carpentry – detached dwellings	5	+2.0%
7380	Chauffeurs, Drivers – NOC Commercial	8	+0.9%
8232	Lumberyard – new materials	13	+3.7%
5190	Electrical wiring within buildings	16	+8.0%
7600	Telephone – all other employees and drivers	18	+5.6%

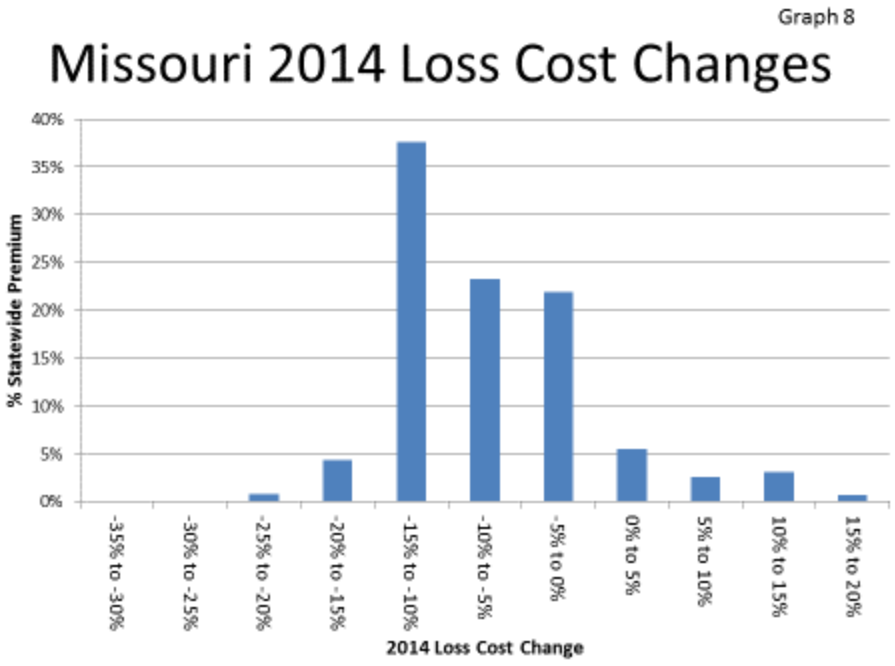
[1] Exposure distribution based on 7/1/11-12 payroll excluding F-classes
[2] Rank based on 7/1/11-12 payroll x 1/1/2015 proposed loss cost

Large Classes with Loss Cost Decrease >-5.0%				
Class	Class Description	Size Rank based on Premium[3]	2015 Loss Cost Change	2014 Loss Cost Change
8810	Clerical NOC	2	-11.1%	+0.0%
8742	Outside Salespersons	6	-9.5%	+16.7%
9082	Restaurant NOC	3	-9.6%	+10.6%
8829	Convalescent or Nursing Homes	11	-5.7%	+18.8%
5183	Plumbing NOC	12	-7.5%	+9.5%
5551	Roofing	13	-8.4%	+22.3%
5537	HVAC	19	-7.5%	+19.1%

Distribution of loss costs by size of change: As shown in the chart on the next page, the proposed loss cost changes result in decreases between -15% and -10% for 37.6% of statewide premium[4], decreases between -10% and -5% for 23.3% of statewide premium, and decreases between -5% and 0% for 21.9% of statewide premium. 88% of statewide premium will see a decrease, and 3.9% of statewide premium will experience an increase in excess of 10%.

[3] Rank based on 7/1/11-12 payroll x 1/1/2015 proposed loss cost
[4] Premium = 7/1/11-12 payroll x 1/1/2015 proposed loss cost

Graph 8



Over an extended period of time, the DIFP reviewer's recommended loss cost change has generated lower overall loss costs than the NCCI filed loss costs, in part due to the lower expense load that results when MEM defense and cost containment experience is taken into account in determining the provision for LAE. The next graph shows a **retrospective test of advisory loss costs**. It compares Missouri statewide ultimate losses by policy year to those anticipated by:

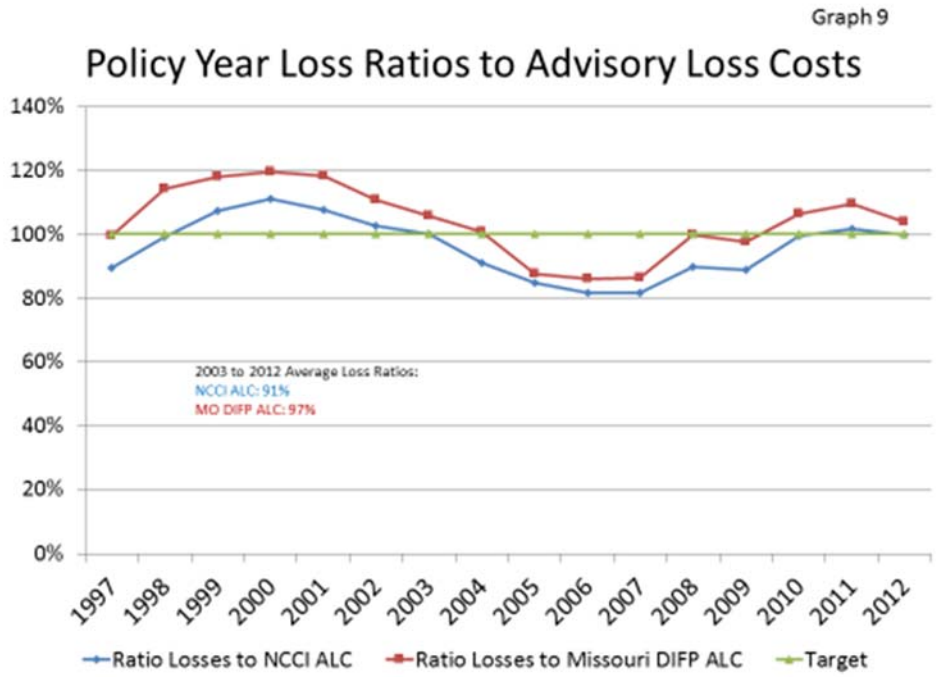
- NCCI advisory loss costs (blue line)
- NCCI advisory loss costs as adjusted by Missouri DIFP reviewers (red line)

When the advisory loss cost ratio is higher than the 100% target, the advisory loss costs were lower than needed to cover the actual losses. Loss cost ratios under 100% occur in years where the advisory loss costs were higher than the ultimate losses. Because loss cost levels for any particular policy year are necessarily based on experience for policy years three and four years earlier, the results tend to be somewhat cyclic and very slow to react to changes in cost trends. Because the DIFP reviewer's recommended loss cost change has generated lower overall loss costs than the NCCI filed loss costs, the DIFP reviewer's recommended loss costs result in consistently higher loss ratios compared to the NCCI ALC.

In 8 of the last 16 years, the Missouri DIFP ALC was closer to the target than the NCCI ALC. Over the last ten years, the Missouri DIFP ALC loss ratio has averaged 98%, while the NCCI ALC loss ratio has averaged 92%. The NCCI

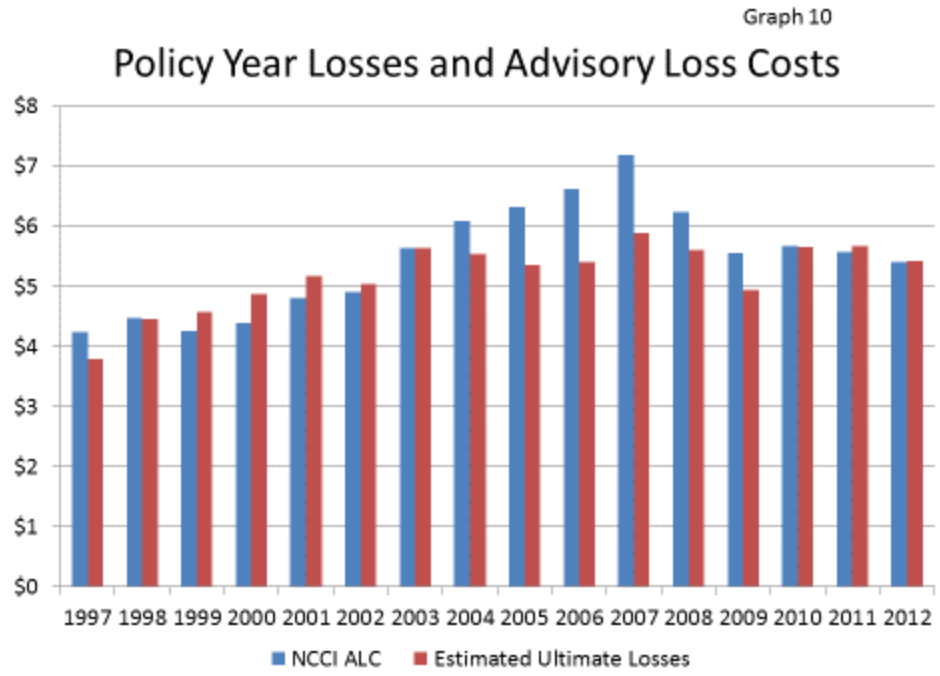
ALC overestimated the actual losses (loss ratios under 100%) for policy years 2004 through 2009. While the Missouri DIFP ALC also overestimated the losses for policy years 2005 through 2007, it was very close to 100% for policy years 2004, 2008 and 2009. In contrast, while the NCCI ALC was very close to actual losses for policy years 2010 through 2012, the Missouri DIFP ALC underestimated the losses for those years (loss ratios over 100%).

Graph 9



Graph 10 shows the **NCCI's ALC compared to the current estimate of ultimate losses** for each policy year, rather than the ratio of the two values as in Graph 9. (Losses are shown in $100's of millions). Losses (red bars) increased substantially from year to year from 1997 through 2003, increasing from $380,000,000 to $565,000,000 during that period. Over the last decade, however, losses have fluctuated around $550,000,000. Because the NCCI's ratemaking process relies entirely on insurance industry data that is three years in arrears, NCCI's ALC (blue bars) continued to increase through policy year 2007, followed by significant decreases for the 2008 and 2009 policy years.

Graph 10



Significant NCCI factors: NCCI's selections for key factors in the determination of the advisory loss costs are shown in the tables below. Most of the changes from the 2014 to 2015 filings are minor, but the changes in the indemnity paid loss development factors had a material effect on the results:

NCCI Factors Applied to Most Recent Policy Year			
	2014 Filing	**2015 Filing**	**% Change**
Premium Development Factor	1.000	1.003	+0.3%
Paid Loss Development Factor – Indemnity	3.445	3.665	+6.5%
Incurred Loss Development Factor – Indemnity	1.263	1.288	+2.0%
Paid Loss Development Factor – Medical	1.613	1.613	+0.0%
Incurred Loss Development Factor – Medical	1.114	1.101	-1.2%
Indemnity Trend Factor	0.885	0.913	+3.2%
Medical Trend Factor	1.015	1.015	0.0%
Loss Adjustment Expense Factor	1.196	1.197	+0.1%
Excess Loss Loading	1.026	1.013	-1.3%

NCCI Factors Applied to Penultimate Policy Year			
	2014 Filing	2015 Filing	% Change
Premium Development Factor	0.999	0.999	+0.0%
Paid Loss Development Factor – Indemnity	1.891	2.003	+5.9%
Incurred Loss Development Factor – Indemnity	1.133	1.156	+2.0%
Paid Loss Development Factor – Medical	1.311	1.311	+0.0%
Incurred Loss Development Factor – Medical	1.065	1.054	-1.0%
Indemnity Trend Factor	0.849	0.885	+4.2%
Medical Trend Factor	1.020	1.020	0.0%
Loss Adjustment Expense Factor	1.196	1.197	+0.1%
Excess Loss Loading	1.026	1.013	-1.3%

Definitions

The following definitions may be of assistance to the reader:

Accident Year: All of the events with occurrence dates during a particular calendar year make up the corresponding accident year. The dollars associated with those events total the accident year's losses, even though they may be paid long after the end of the year. Losses are grouped by accident year for some of the NCCI's calculations.

Policy Year: All of the policies written during a particular calendar year and all of the events associated with those policies make up the corresponding policy year. Since a policy written on January 1 expires December 31 of the same year, but a policy written on December 31 does not expire until the end of the following year, accidents associated with a single policy year occur over the course of two calendar years. Experience from the two most recent complete policy years (2011 and 2012) makes up the bulk of the NCCI's calculation of the indicated loss cost change for this filing.

Ultimate Losses: The total amount that will eventually be paid on all losses for a particular accident year or policy year.

Paid Losses: Dollars paid as of the latest available evaluation on losses incurred through the latest available evaluation.

Case Reserves: Reserves established on individual claims by the claims adjusters, as of the latest available evaluation. The case reserve plus the amount paid to date represents the adjuster's best estimate of the ultimate value of a particular claim.

Incurred Losses: Paid losses plus case reserves as of the latest available evaluation, sometimes referred to by the NCCI as paid+case.

Loss Development: The change in the paid losses or the incurred losses over time. As more information is provided and claims settle, individual claim estimates get closer and closer to the ultimate value of the claims. The increase in the total incurred losses through time is the incurred loss development. Similarly, as losses are paid out over time, the increase in total paid losses is the paid loss development.

Actuarial Central Estimate: An estimate that represents an expected value over the range of reasonably possible outcomes. Such a range of reasonably possible outcomes may not include all conceivable outcomes, as, for example, it would not include conceivable extreme events where the contribution of such events to an expected value estimate is not reliably

measurable. The estimates of ultimate losses in the NCCI's filings are actuarial central estimates.

Section
3

Exhibits

Exhibit A	Development of Recommended LAE Provision
Exhibit B	Inclusion of MEM and Overall Indications
Exhibit C	Calculation of Historical Loss Ratios
Exhibit D	Indemnity Paid and Paid+Case Loss Development Factors
Exhibit E	Indicated Changes under Various Assumptions

Observed AY Countrywide Ultimate LAE Ratios from NCCI filings

Year	Maturity 12	24	36	48	60	72	84	96	108	120
1994										15.3
1995									16	15.8
1996								15.8	15.7	15.6
1997							16.2	16.1	16.2	16
1998						15.7	15.5	15.7	15.9	15.9
1999					15.4	14.9	15.2	15.4	15.3	15.4
2000				15.8	15.3	15.6	15.9	15.8	15.8	16
2001			16.3	16.1	16	16.4	16.5	16.4	16.6	
2002		16.6	16.2	16.6	17.1	17.1	17.1	17.2		16.9
2003	17.1	16.9	17.4	18.2	18.2	18.1	18.2		17.9	17.5
2004	15.9	16.7	17.6	17.7	17.7	17.8		17.4	17	17
2005	17.5	19.3	18.8	18.7	18.7		18.3	17.8	17.7	
2006	19.8	19.4	19.2	19	18.6	18.7	18.5	18.4		
2007	20.4	19.9	19.5	19.1	19.2	18.6	18.5			
2008	20.1	19.5	19	18.9	18.4	18.1				
2009	21.3	19.6	19.6	19.4	19.0					
2010	19.7	19.6	19.3	19.0						
2011	19.9	19.5	19.2							
2012	20.3	20.2								
2013	20.9									

Age-to-Age Factors

	12:24	24:36	36:48	48:60	60:72	72:84	84:96	96:108	108:120	120:Ult
1994										
1995									0.988	
1996								0.994	0.994	
1997							0.994	1.006	0.988	
1998						0.987	1.013	1.013	1.000	
1999					0.968	1.020	1.013	0.994	1.007	
2000				0.968	1.020	1.019	0.994	1.000	1.013	
2001			0.988	0.994	1.025	1.006	0.994	1.012		
2002		0.976	1.025	1.030	1.000	1.000	1.006			
2003	0.988	1.030	1.046	1.000	0.995	1.006			0.978	
2004	1.050	1.054	1.006	1.000	1.006			0.977	1.000	
2005	1.103	0.974	0.995	1.000			0.973	0.994		
2006	0.980	0.990	0.990	0.979	1.005	0.989	0.995			
2007	0.975	0.980	0.979	1.005	0.969	0.995				
2008	0.970	0.974	0.995	0.974	0.984					
2009	0.920	1.000	0.990	0.979						
2010	0.995	0.985	0.984							
2011	0.980	0.985								
2012	0.995									
Average	0.996	0.995	1.000	0.993	0.997	1.003	0.998	0.999	0.996	
Last 3	0.990	0.990	0.990	0.986	0.991	0.996	0.991	0.995	0.997	
Cum L3	0.911	0.937	0.947	0.957	0.970	0.979	0.982	0.991	0.997	1.000

Estimated Ultimate Countrywide LAE Ratios

Accident Year	Current	Factor	Ultimate
1995	15.8	1.000	15.8
1996	15.6	1.000	15.6
1997	16.0	1.000	16.0
1998	15.9	1.000	15.9
1999	15.4	1.000	15.4
2000	16.0	1.000	16.0
2001	0.0	1.000	0.0
2002	16.9	1.000	16.9
2003	17.5	1.000	17.5
2004	17.0	1.000	17.0
2005	17.7	0.997	17.6
2006	18.4	0.991	18.2
2007	18.5	0.982	18.2
2008	18.1	0.979	17.7
2009	19.0	0.970	18.4
2010	19.0	0.957	18.2
2011	19.2	0.947	18.2
2012	20.2	0.937	18.9
2013	20.9	0.911	19.0

Recommended	Low	18.6	5 Year Average
	Mid	19.0	2 Year Average
	High	19.7	Undeveloped Avg 2011&2012

					SAS Recommendations				
					Low Estimate		High Estimate		Recommended
		Excluding MEM	MEM	Including MEM	Excluding MEM	Including MEM	Excluding MEM	Including MEM	Including MEM
1	3-Year Missouri Paid Losses	1,993,939	211,930	2,205,869					
2	3-Year Missouri Paid DCCE	239,189	13,248	252,437					
3	DCCE to Paid Ratio	12.0%	6.3%	11.4%					
4	3-Year Countrywide Paid Losses	114,134,070	211,930	68,473,680					
5	3-Year Countrywide Paid DCCE	13,141,300	13,248	7,895,562					
6	DCCE to Paid Ratio	11.5%	6.3%	11.5%					
7	Indicated Missouri Differential	1.043		0.992					
8	NCCI Selected Countrywide DCCE Provision	12.8%		12.8%					
9	NCCI Selected Missouri DCCE Provision	13.4%		12.7%					
10	NCCI Selected Countrywide AOE Provision	7.3%		7.3%					
11	NCCI Selected Countrywide LAE Provision	20.1%		20.1%	18.6%	18.6%	19.7%	19.7%	19.0%
12	Indicated Missouri LAE Provision	20.7%		20.0%	19.1%	18.5%	20.2%	19.6%	18.9%
13	Effect of SB1 on Losses	4.6%		4.6%	4.6%	4.6%	4.6%	4.6%	4.6%
14	Indicated Missouri LAE Provision after SB1	19.7%		19.1%	18.3%	17.7%	19.3%	18.7%	18.1%
15	Filed Missouri LAE Provision after SB1	19.7%							
16	Loss Cost Indication prior to change in LAE	-3.8%							
17	LAE Provision effective 1/1/2014	19.6%							
18	Selected LAE Provision effective 1/1/2015	19.7%		19.1%	18.3%	17.7%	19.3%	18.7%	18.1%
19	Indicated Loss Cost Change effective 1/1/2015	-3.7%		-4.2%	-4.8%	-5.3%	-4.0%	-4.5%	-5.0%

Rows 1, 2,4,5 - Excluding MEM from NCCI filing; MEM provided by Missouri DOI. Losses in $000's
Row 3 = Row 2 / Row 1
Row 6 = Row 5 / Row 4
Row 7 = Row 3 / Row 6
Rows 8,10 - from NCCI filing
*Row 9 = Row 7 * Row 8*
Row 11 = Row 8 + Row 10; SAS from Exhibit A
*Row 12 = Row 9 + Row 10; SAS = NCCI Row 12 / NCCI Row 11 * SAS Row 11*
Row 13 - from NCCI 1/1/14 filing (SB 1 effects not yet reflected in experience for 1/1/14 filing)
Row 14 = Row 12 / (1 + Row 13)
Rows 15,16,17 - from NCCI filing
Row 18 = Row 14 except NCCI filing = Row 15
*Row 19 = (1+Row 16) * (1+Row 18)/(1+Row 17) - 1*

(A) Policy Year	(B) Voluntary Premium (ALC)	(C) Premium Development Factor	(D) Estimated Ultimate Premium	(E) Voluntary Paid + Case Losses Indemnity	(F) Voluntary Paid + Case Losses Medical	(G) Loss Development Factors Paid + Case Losses Indemnity	(H) Loss Development Factors Paid + Case Losses Medical	(I) LAE Factor	(J) Excess Provision	(K) Estimated Ultimate Losses and LAE Indemnity	(L) Estimated Ultimate Losses and LAE Medical
1997	408,635	1.000	408,635	153,689	145,883	1.013	1.031	1.181	1.013	186,289	179,969
1998	440,658	1.000	440,658	193,210	162,166	1.013	1.030	1.176	1.013	233,197	199,013
1999	420,729	1.000	420,729	197,922	177,641	1.014	1.026	1.161	1.013	236,043	214,363
2000	433,041	1.000	433,041	207,669	193,200	1.014	1.027	1.141	1.013	243,370	229,317
2001	467,683	1.000	467,683	219,656	200,920	1.017	1.030	1.142	1.013	258,490	239,464
2002	466,191	1.000	466,191	200,700	194,120	1.020	1.036	1.150	1.013	238,411	234,211
2003	525,996	1.000	525,996	209,621	208,416	1.021	1.038	1.169	1.013	253,370	256,108
2004	571,706	1.000	571,706	195,984	223,212	1.023	1.041	1.180	1.013	239,732	277,841
2005	604,157	1.000	604,157	174,595	220,581	1.027	1.051	1.198	1.013	217,647	281,398
2006	644,341	1.000	644,341	177,931	232,200	1.032	1.053	1.201	1.013	223,473	297,566
2007	705,731	1.000	705,731	198,873	253,387	1.036	1.053	1.187	1.013	247,837	320,955
2008	614,426	1.000	614,426	178,388	250,465	1.049	1.050	1.184	1.013	224,438	315,421
2009	548,472	1.000	548,472	163,507	219,155	1.067	1.047	1.187	1.013	209,850	275,997
2010	561,714	1.000	561,714	173,375	263,501	1.103	1.050	1.182	1.013	229,012	331,336
2011	546,558	0.999	546,011	160,902	262,708	1.156	1.054	1.184	1.013	223,009	331,983
2012	517,716	1.003	519,269	133,955	235,352	1.288	1.101	1.185	1.013	207,086	311,015

(A) Policy Year	(M) Missouri DIFP Reviewer Relativity to NCCI ALC	(N) Missouri Statewide Loss & LAE Ratio NCCI ALC	(O) Missouri Statewide Loss & LAE Ratio Missouri DIFP ALC
1997	0.899	90%	100%
1998	0.870	98%	113%
1999	0.911	107%	118%
2000	0.929	109%	117%
2001	0.910	106%	117%
2002	0.928	101%	109%
2003	0.946	97%	102%
2004	0.902	91%	100%
2005	0.967	83%	85%
2006	0.948	81%	85%
2007	0.946	81%	85%
2008	0.900	88%	98%
2009	0.909	89%	97%
2010	0.937	100%	106%
2011	0.930	102%	109%
2012	0.961	100%	104%
2013	0.979		
2014	0.987		
2015	0.987		

2003-2012 Average Loss & LAE Ratio to Advisory Loss Costs:

	Average	Weighted Average
NCCI ALC	91%	90%
Missouri DIFP ALC	97%	97%

(B) = Page 2, Column (D)
(C),(G),(H),(J) - from NCCI filing
*(D) = (B) * (C)*
(E) = Page 2, Column (I)
(F) = Page 2, Column (J)
(I) = Page 2, Column (V)
*(K) = (E) * (G) * (I) * (J)*
*(L) = (F) * (H) * (I) * (J)*

(M) from prior actuarial report for 2014 and prior; calculated for 2015 at .95/.963
(N) = [(K) + (L)] / (D)
(O) = (N) / (M)

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
				Statewide		Assigned Risk		Voluntary	
Policy	Statewide	Assigned		Paid + Case Losses		Paid + Case Losses		Paid + Case Losses	
Year	Premium (ALC)	Risk Premium	Voluntary Premium	Indemnity	Medical	Indemnity	Medical	Indemnity	Medical
1997	423,987	15,352	408,635	160,033	151,170	6,343	5,286	153,689	145,883
1998	448,356	7,698	440,658	198,858	167,543	5,648	5,377	193,210	162,166
1999	426,151	5,422	420,729	201,427	180,248	3,505	2,607	197,922	177,641
2000	439,469	6,428	433,041	213,698	199,962	6,029	6,762	207,669	193,200
2001	481,042	13,359	467,683	228,587	208,428	8,930	7,507	219,656	200,920
2002	491,219	25,028	466,191	214,342	206,096	13,642	11,976	200,700	194,120
2003	563,905	37,909	525,996	230,839	232,125	21,219	23,709	209,621	208,416
2004	608,942	37,236	571,706	211,525	238,087	15,541	14,875	195,984	223,212
2005	632,735	28,578	604,157	186,023	239,123	11,429	18,543	174,595	220,581
2006	662,153	17,812	644,341	184,306	241,311	6,374	9,111	177,931	232,200
2007	719,063	13,332	705,731	204,638	263,082	5,765	9,695	198,873	253,387
2008	624,016	9,590	614,426	182,805	263,080	4,416	12,615	178,388	250,465
2009	555,999	7,527	548,472	165,652	223,209	2,145	4,054	163,507	219,155
2010	568,172	6,458	561,714	174,929	266,217	1,555	2,716	173,375	263,501
2011	557,453	10,895	546,558	163,269	269,477	2,367	6,769	160,902	262,708
2012	540,868	23,152	517,716	138,220	248,455	4,265	13,103	133,955	235,352

(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)	(S)	(T)	(U)	(V)
	Missouri State Page Direct Paid Loss			Missouri State Page Direct DCC Paid			Voluntary		Estimated	Countrywide	Voluntary
Calendar		Assigned			Assigned		Ratio	Policy	Voluntary	A&O	LAE
Year	Statewide	Risk	Voluntary	Statewide	Risk	Voluntary	DCC to Loss	Year	DCC Ratio	Ratio	Factor
1996	284,523	30,921	253,602	32,817	2,660	30,157	11.9%				
1997	315,499	21,340	294,159	36,971	674	36,297	12.3%	1997	10.8%	7.4%	1.181
1998	334,418	11,546	322,872	31,105	1,069	30,036	9.3%	1998	10.2%	7.4%	1.176
1999	398,635	8,471	390,164	43,561	522	43,039	11.0%	1999	8.7%	7.4%	1.161
2000	491,332	9,372	481,960	34,649	1,509	33,140	6.9%	2000	6.7%	7.4%	1.141
2001	522,946	15,673	507,273	34,796	1,457	33,339	6.6%	2001	6.9%	7.4%	1.142
2002	565,430	40,229	525,201	41,628	4,169	37,459	7.1%	2002	7.6%	7.4%	1.150
2003	592,204	45,832	546,372	49,526	5,592	43,934	8.0%	2003	9.5%	7.4%	1.169
2004	589,472	43,565	545,907	63,307	3,524	59,783	11.0%	2004	10.9%	7.1%	1.180
2005	592,988	47,047	545,941	64,242	4,606	59,636	10.9%	2005	12.3%	7.5%	1.198
2006	542,562	28,909	513,653	74,582	3,638	70,944	13.8%	2006	12.3%	7.8%	1.201
2007	535,272	20,520	514,752	58,685	2,736	55,949	10.9%	2007	10.9%	7.8%	1.187
2008	556,888	16,281	540,607	61,091	1,514	59,577	11.0%	2008	11.4%	7.0%	1.184
2009	411,268	-4,135	415,403	49,379	-12	49,391	11.9%	2009	11.2%	7.5%	1.187
2010	462,853	1,515	461,338	49,638	482	49,156	10.7%	2010	11.0%	7.2%	1.182
2011	445,367	5,901	439,466	50,685	583	50,102	11.4%	2011	11.5%	6.9%	1.184
2012	474,023	14,267	459,756	54,497	1,578	52,919	11.5%	2012	11.2%	7.3%	1.185
2013	479,250	18,139	461,111	52,334	2,245	50,089	10.9%	2013	11.2%	7.6%	1.188

(B),(C) - from prior actuarial report for 2010 and prior; 2011 and 2012 from NCCI filing
(D) = (B) - (C)
(E),(F),(G),(H) - calculated from prior actuarial report + latest observed age-to-age development for 2010 and prior; 2011 and 2012 from NCCI filing
(I) = (E) - (G)
(J) = (F) - (H)
(L),(M),(O),(P) - from prior actuarial report for 2012 and prior; 2013 provided by NCCI
(N) = (L) - (M)
(Q) = (O) - (P)
(R) = (Q) / (N)
(T) = 2-year weighted average of (R)
(U) - current NCCI calculations for 2004-2013; 2003 and prior = average of 2004 through 2013
(V) = 1 + (T) + (U)

Policy Year	1st/2nd	2nd/3rd	3rd/4th	4th/5th	5th/6th	6th/7th	7th/8th	8th/9th	9th/10th	10/11th	11th/12th
1997											
1998											1.007
1999										1.015	1.006
2000									1.008	1.008	1.003
2001								1.01	1.01	1.01	1.007
2002							1.028	1.018	1.008	1.009	
2003						1.034	1.024	1.016	1.017		
2004					1.05	1.032	1.021	1.02			
2005				1.081	1.045	1.036	1.022				
2006			1.117	1.068	1.04	1.032					
2007		1.271	1.125	1.077	1.053						
2008	1.793	1.247	1.159	1.09							
2009	1.799	1.293	1.142								
2010	1.872	1.292									
2011	1.787										
var	0.00158	0.00047	0.00035	0.00008	0.00003	0.00000	0.00001	0.00002	0.00002	0.00001	0.00000
pd/pd+case	9.37426	2.49801	1.64389	1.39860	5.15789	0.05954	2.05357	3.29412	1.00000	1.39759	0.76786
2 yr	1.830	1.293	1.151	1.084	1.047	1.034	1.022	1.018	1.013	1.010	1.005
3 yr	1.819	1.277	1.142	1.078	1.046	1.033	1.022	1.018	1.012	1.009	1.005
4 yr	1.813	1.276	1.136	1.079	1.047	1.034	1.024	1.016	1.011	1.011	1.006
Cumulative											
2 yr	3.647	1.993	1.542	1.340	1.237	1.182	1.143	1.119	1.099	1.086	1.076
3 yr	3.526	1.938	1.517	1.329	1.232	1.178	1.140	1.115	1.095	1.083	1.073
4 yr	3.498	1.930	1.513	1.332	1.234	1.179	1.141	1.114	1.097	1.085	1.074

	12th/13th	13th/14th	14th/15th	15th/16th	16th/17th	17th/18th	18th/19th	19th/Ult
1991							1.003	
1992						1.004	1.004	
1993					1.005	1.002	1.004	
1994				1.005	1.004	1.005	1.001	
1995			1.008	1.004	1.007	1.004		
1996		1.005	1.004	1.005	1.005			
1997	1.006	1.004	1.004	1.002				
1998	1.007	1.005	1.006					
1999	1.006	1.008						
2000	1.013							
var	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
pd/pd+case	3.40000	0.33645	0.28387	1.00000	1.72727	1.18750	3.00000	
2 yr	1.010	1.007	1.005	1.004	1.006	1.005	1.003	1.031
3 yr	1.009	1.006	1.005	1.004	1.005	1.004	1.003	1.031
4 yr	1.008	1.006	1.006	1.004	1.005	1.004	1.003	1.031
Cumulative								
2 yr	1.070	1.060	1.053	1.048	1.044	1.038	1.034	1.031
3 yr	1.067	1.058	1.052	1.047	1.043	1.038	1.034	1.031
4 yr	1.068	1.059	1.053	1.048	1.043	1.038	1.034	1.031

1.830	1.293	1.151	1.084	1.047	1.034	1.022	1.018	1.013	1.010	
1.819	1.277	1.142	1.078	1.046	1.033	1.022	1.018	1.012	1.009	
1.813	1.276	1.136	1.079	1.047	1.034	1.024	1.016	1.011	1.011	

Policy Year	1st/2nd	2nd/3rd	3rd/4th	4th/5th	5th/6th	6th/7th	7th/8th	8th/9th	9th/10th	10/11th	11th/12th
1997											
1998											1.002
1999										1.001	0.999
2000									0.998	1.003	1.003
2001								1.002	1.007	0.997	1.004
2002							1.004	1.006	1.005	1.002	
2003						1.016	1.006	1.005	1.007		
2004					1.014	0.997	1.001	1.001			
2005				1.016	1.016	1.006	1.005				
2006			1.027	1.013	1.016	1.004					
2007		1.045	1.024	1.009	1.02						
2008	1.115	1.041	1.055	1.027							
2009	1.119	1.068	1.027								
2010	1.125	1.065									
2011	1.095										
var	0.00017	0.00019	0.00021	0.00006	0.00001	0.00006	0.00000	0.00001	0.00002	0.00001	0.00000
2 yr	1.110	1.067	1.041	1.018	1.018	1.005	1.003	1.003	1.006	1.000	1.004
3 yr	1.113	1.058	1.035	1.016	1.017	1.002	1.004	1.004	1.006	1.001	1.002
4 yr	1.114	1.055	1.033	1.016	1.017	1.006	1.004	1.004	1.004	1.001	1.002
Cumulative											
2 yr	1.328	1.196	1.122	1.077	1.058	1.040	1.034	1.031	1.028	1.022	1.023
3 yr	1.309	1.176	1.111	1.074	1.056	1.038	1.036	1.032	1.028	1.021	1.020
4 yr	1.300	1.168	1.107	1.071	1.054	1.037	1.031	1.027	1.023	1.019	1.018

	12th/13th	13th/14th	14th/15th	15th/16th	16th/17th	17th/18th	18th/19th	19th/Ult
1991							1.002	
1992						1.002	1.002	
1993					1.001	1.002	1.003	
1994				1.001	1	1	1.001	
1995			0.998	1	1	1		
1996		0.996	1	1.001	1.002			
1997	1.001	0.999	0.999	0.998				
1998	1.005	1.001	1.006					
1999	1.002	1.003						
2000	1.004							
var	0.00000	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000	
2 yr	1.003	1.002	1.003	1.000	1.001	1.000	1.002	1.009
3 yr	1.004	1.001	1.002	1.000	1.001	1.001	1.002	1.009
4 yr	1.003	1.000	1.001	1.000	1.001	1.001	1.002	1.009
Cumulative								
2 yr	1.019	1.016	1.014	1.012	1.012	1.011	1.011	1.009
3 yr	1.018	1.015	1.014	1.012	1.012	1.012	1.011	1.009
4 yr	1.016	1.013	1.014	1.013	1.013	1.012	1.011	1.009

Section
4

Appendix

Appendix A Additional Information Provided by NCCI

Request:

On Exhibit II, provide the accident year developed LAE ratios for 2004-2008.

Response:

Please see page 2.

MISSOURI

EXHIBIT II

Workers Compensation Loss Adjustment Expense Provision

Section A - Determination of Loss Adjustment Expense Provision

NCCI has computed the loss adjustment expense allowance on an accident year basis using data obtained from the NCCI Call for Loss Adjustment Expense. For this filing, NCCI proposes a 19.7% loss adjustment expense allowance as a percentage of incurred losses.

Accident Year	Accident Year Developed LAE Ratio	Accident Year Developed DCCE Ratio	Accident Year Developed AOE Ratio
2004	17.0%	9.9%	7.1%
2005	17.7%	10.2%	7.5%
2006	18.4%	10.6%	7.8%
2007	18.5%	10.7%	7.8%
2008	18.1%	11.1%	7.0%
2009	19.0%	11.5%	7.5%
2010	19.0%	11.8%	7.2%
2011	19.2%	12.3%	6.9%
2012	20.2%	12.9%	7.3%
2013	20.9%	13.3%	7.6%
Countrywide selected:	20.1%	12.8%	7.3%
Missouri selected: (13.4% = 12.8% x 1.043)	**20.7%**	**13.4%**	**7.3%**

Section B - Determination of Missouri DCCE Relativity

(1a) Missouri paid losses (in '000s)	1,993,939
(1b) Missouri paid DCCE (in '000s)	239,189
(1c) Ratio (1b)/(1a)	12.0%
(2a) Countrywide paid losses (in '000s)	114,134,070
(2b) Countrywide paid DCCE (in '000s)	13,141,300
(2c) Ratio (2b)/(2a)	11.5%
(3) Missouri DCCE relativity (1c)/(2c)	1.043

Section C - Proposed Change in Missouri Loss Adjustment Expense Provision

(1) Current Missouri LAE Provision = Current LAE Provision x Senate Bill 1 Adjustment* = [1 + 20.6%] x 0.992	19.6%
(2) Indicated Missouri LAE Provision = Indicated LAE Provision x Senate Bill 1 Adjustment* = [1 + 20.7%] x 0.992	19.7%
(3) Proposed Change in LAE Provision = [1 + (2)] / [1 + (1)] - 1	1.001 0.1%

* An adjustment of -0.8% (0.992) is applied to the LAE provision due to Senate Bill 1, effective for accidents occurring on or after 1/1/2014. The analysis of Senate Bill 1 was included in the Missouri 1/1/2014 filing.

Notes

NAIC Annual Statement data is used in the above calculations. The countrywide figures exclude state funds.

Request:

What is the indication if you exclude assigned risk from the calculations?

Response:

The indication excluding assigned risk data from the experience period is –3.7%.

Request 1:

Provide the PY 2011 and PY 2012 paid + case losses broken into voluntary and assigned risk.

Response 1:

The following chart breaks paid + case losses into voluntary and assigned risk components. Note that the losses provided below are limited and based on private carrier + state fund data.

Policy Year	Voluntary Paid + Case Losses		Assigned Risk Paid + Case Losses	
	Indemnity	Medical	Indemnity	Medical
2011	$160,902,232	$262,708,540	$2,366,749	$6,768,621
2012	$133,955,421	$235,351,544	$4,264,569	$13,102,961

Request 2:

Provide the CY 2013 paid losses and paid DCCE broken into voluntary and assigned risk.

Response 2:

The CY 2013 Annual Statement data (paid losses and paid DCCE) used for the loss adjustment analysis cannot be broken into voluntary and assigned risk components due to lack of granularity in the data.

Missouri Calendar Year 2013 Data		
	Paid Losses (000s)	Paid DCCE (000s)
Page 14 Data	479,250	52,334
Assigned Risk	18,139	2,245
Derived CY 2013 Voluntary Data	461,111	50,089

Request 3:

Provide the PY 2011 and PY 2012 premiums broken into voluntary and assigned risk.

Response 3:

The following chart breaks standard earned premium into voluntary and assigned risk components. Note that the premiums provided below are based on private carrier + state fund data.

Policy Year	Standard Earned Premium	
	Voluntary	Assigned Risk
2011	$546,558,017	$10,894,847
2012	$517,715,566	$23,152,091

Request 4:

Update the attached large loss triangle with the 2013 diagonal.

Response 4:

Please see attached Excel spreadsheet for the 2013 diagonal. Note that some of the prior diagonal values may have changed slightly due to this year's state financial data validation.

Request 5:

Last year, you used 3 diagonals to select loss development factors for the paid method. This year, you have reverted to 2. What was the basis for this change? Do you really think you've got credibility with only two diagonals? Did you consider the fact that the incurred method is producing materially different estimates for both policy years for indemnity paid + case?

Response 5:

The 2-year paid average is consistent with prior Missouri filings, with the exception of last year's filing (effective 1/1/2014), which proposed a 3-year paid average.

In last year's filing, an increase in paid loss development factors in the latest diagonal (paid losses valued as of 12/31/2012) was observed. In addition, applying a high development factor to a high experience base would have resulted in overstating paid ultimate losses. To smooth out the observed cyclicality of the factors, a 3-year average was selected.

Gaining an additional diagonal this year, a similar increase in indemnity paid loss development was observed in this latest diagonal (paid losses valued as of 12/31/2013) and a decrease for medical paid. To be responsive to emerging patterns, a 2-year average was selected (reverting back to the standard paid average in Missouri).

NCCI considers shorter term averages for paid to be responsive to changes in loss experience and reflect appropriate stability. In addition, a shorter term average captures any distortion that may be due to changes in loss payment patterns.

Averaging the paid and paid + case methods has become an increasingly popular approach for NCCI and is now the most commonly filed method in NCCI states. As in previous filings, both methods were deemed appropriate for use in Missouri. The different indemnity paid + case estimates for both policy years did not warrant a methodology change. Therefore, an average of paid and paid + case methods was appropriate and again selected, consistent with the last several filings.