

Mary Jean King, FCAS, FCA, MAAA
Consulting Actuary
118 Warfield Road
Cherry Hill, NJ 08034
P:856.428.5961 F:856.428.5962
mking@bynac.com

By The Numbers
Actuarial 
Consulting, Inc.



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September 27, 2012

Mr. David H. Lillard, Jr., Tennessee State Treasurer
Chairman, Advisory Council on Workers' Compensation
State Capitol, 1st Floor
600 Charlotte Avenue
Nashville, Tennessee 37243-0225

Dear Mr. Lillard:

Enclosed is the actuarial report prepared for the Tennessee Advisory Council on Workers' Compensation. This report contains our review of the National Council on Compensation Insurance, Inc. (NCCI) filing effective 3/1/13.

The estimates and analysis contained in this report are based on data provided by NCCI including the technical supplement dated 8/10/12 and the answers to questions concerning the filings provided by NCCI. Any discrepancy in the completeness, interpretation, or accuracy of the information used may require a revision to this report.

If you have any questions, please call or write. It is a pleasure to be of service to the Advisory Council.

Sincerely,



Mary Jean King, FCAS, FCA, MAAA
Consulting Actuary



Lisa Dennison, FCAS, FCA, MAAA
President and Consulting Actuary

cc: Lynn Ivanick, Esq.
Administrator, Advisory Council on Workers' Compensation

TENNESSEE ADVISORY COUNCIL ON WORKERS' COMPENSATION

ACTUARIAL REPORT

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TENNESSEE ADVISORY COUNCIL ON WORKERS' COMPENSATION

ACTUARIAL REPORT

PURPOSE

By the Numbers Actuarial Consulting, Inc. (BYNAC) has been retained by the Tennessee Advisory Council on Workers' Compensation to prepare this actuarial report to present a professional analysis of the National Council on Compensation Insurance, Inc. (NCCI) Tennessee Workers Compensation Loss Costs and Rating Values Tennessee Voluntary Market filing effective 3/1/13. The basis of the analysis is the NCCI filing memorandum dated 8/10/12 including the technical supplement. BYNAC did not audit the premium or loss data underlying the NCCI filing, nor did we verify the accuracy of NCCI's detail calculations. An analysis of the federal classifications changes and the assigned risk multiplier is beyond the scope of this report.

The following items will be addressed in this report:

- An analysis of NCCI's methodology in arriving at its calculation of the proposed change in loss costs and loss adjustment expense.
- An examination of the appropriateness of the methodology used by NCCI in its selection of estimates employed to arrive at ultimate loss cost for past and forecast periods.
- An analysis of NCCI's selection of loss adjustment expense allowance.

FINDINGS

Based on BYNAC's review of the NCCI filings, the proposed change of +2.3% effective 3/1/13 has been reasonably calculated in accordance with actuarial standards of practice.

Due to the large amount of actuarial analysis underlying most of the exhibits in this filing, it was impossible to review all of the detail calculations in the time given for BYNAC's review. As in BYNAC's previous review of the NCCI Tennessee annual filing, certain procedures were selected for more detailed review. BYNAC's main focus in this review has been on the selection of the loss adjustment expense (LAE) allowance.

BYNAC reviewed paid as well as incurred development and experience for policy years 2006 through 2008 in addition to the policy years underlying the filing of 2009 and 2010 in order to test the assumptions made by NCCI in selecting the data and development method for review. No significant differences to the NCCI calculations were found in this review and BYNAC is in general agreement with the selections made by NCCI.

BYNAC also reviewed the selection of trend. The NCCI selected trend factors are equal to the currently approved factors. BYNAC believes the selected trend factors are reasonable.

BYNAC reviewed historical information for defense and cost containment expense (DCCE) and adjusting and other expense (AOE) separately and combined. BYNAC believes that an LAE allowance of 19.0% would be more appropriate than the 19.8% allowance proposed by NCCI. The selection of 19.0% would result in an overall indication of +1.6% (Appendix A).

The final NCCI adjustment is an offset needed to make the approved changes to the employers' liability increased limits percentages revenue neutral. The changes represent a significant decrease in the increased limits percentages which needs to be offset with an increase in the underlying loss costs. BYNAC has reviewed the calculation of the adjustment factor and finds it reasonable.

In the past two filings NCCI has removed most of the data underlying the filing from the technical supplement. While BYNAC appreciates the need to streamline the presentation, it is difficult to identify areas of concern when so little information is presented.

OVERVIEW OF FILING

SUMMARY OF PROPOSED LOSS COST CHANGES

NCCI is proposing an increase in loss costs based on premium and loss experience effective 3/1/13. The breakdown of the proposed changes by industry groups is as follows:

Industry Group	Loss Cost Change Eff 3/1/13
Manufacturing	3.4%
Contracting	1.5%
Office & Clerical	-0.5%
Goods & Services	2.2%
Miscellaneous	3.4%
Overall	2.3%

OTHER PROPOSED CHANGES

In addition to the loss cost changes, NCCI has included in the filing a number of class code changes, a change in the split point used in experience rating from \$5,000 to \$10,000, and updates to the loss elimination ratios and retrospective rating plan parameters. The calculation of the updates to the loss elimination ratios and retrospective rating plan parameters were not presented in the filing or technical supplement and were not reviewed for this report.

DATA

The data used for the statewide indication is premium and losses for policy years 2009 and 2010, evaluated as of 12/31/11. The use of policy year data provides a good match of losses to the underlying policy premium and the policy years selected are the most recent available. NCCI has indicated that all concerns that were raised during the data validation process were resolved

with the sending carriers. No individual carrier data was excluded from this report. Combined voluntary and assigned risk data is used. Assigned risk represents approximately 6.0% of the policy years 2009 and 2010 market share.

STATEWIDE INDICATION ANALYSIS

OVERVIEW

The statewide indicated change is based on premium and loss data for policy years 2009 and 2010. Standard earned premium is developed to ultimate to account for payroll audits that occur after the valuation date. Premium is then brought to the level of the current loss costs based on changes in loss costs since the experience period.

Limited indemnity and medical paid losses plus case reserves are developed to ultimate. An on-level factor is also applied to losses to reflect changes to statutory benefit levels since the experience period. In addition, a factor is applied to include loss based expenses in the cost ratio. A separate indemnity and medical limited cost ratio is calculated. A projected cost ratio for the proposed policy period is then calculated by applying factors for trend, to adjust the losses to an unlimited basis, and for proposed changes in benefit levels. The medical and indemnity cost ratios are added to arrive at a projected cost ratio for each policy year. The average of the projected cost ratio for the two policy years is selected by NCCI.

A change to the employers' liability increased limits percentages has been approved effective 1/1/13 (Item B-1425). An offset is included in this rate filing to make the approved changes revenue neutral. NCCI has calculated that an increase in loss costs of 0.7% is needed to offset the reductions in premium due to the decrease in the employers' liability increased limits percentages.

The final component of the proposed change is the change in loss adjustment expense. The indicated change based on experience, trend, and benefits is multiplied by the employers' liability change offset and the effect of the proposed change in loss based expenses to calculate the proposed overall change.

Indicated Change Based on Experience, Trend, and Benefits:

Policy Year	Projected Cost Ratio		
	Indemnity	Medical	Combined
2009	0.344	0.717	1.061
2010	0.336	0.633	0.969
Selected			1.015

Offset for Change in Employers' Liability Increased Limits Percentages:

1.007

Change in Loss Based Expenses:

	DCCE Ratio	AOE Ratio	LAE Ratio
Current	12.2%	7.5%	19.7%
Proposed	12.5%	7.3%	19.8%
Change			1.001
Overall Change			2.3%

ANALYSIS OF METHODOLOGY

The methodology used by NCCI to calculate the statewide indication is well accepted and reasonable. It is the same method used in last year's filing. Incurred loss development is the most widely used method of estimating ultimate incurred losses. However, many other methods do exist and BYNAC would like to see at least one other method of estimating ultimate losses presented in the report each year.

Inherent in the incurred loss development technique is the assumption that there are no changes in reserving practices. A paid loss development method would provide a check to this assumption. Paid loss development assumes that there are no changes in claims settlement practices. Tennessee has experienced changes to the rules regarding settlement of medical costs in 2004 and this year more changes have been enacted which have had an impact on the paid loss development.

NCCI has indicated that in their judgment, the incurred loss development provides the best estimate of ultimate. BYNAC has reviewed the paid development data and agrees that the 2004 changes had a significant impact on the medical paid development.

The use of on-level factors to bring premium to the current loss cost level is also a well accepted technique. The best method would be to recalculate the premium using current loss costs but this would be overly complicated for a statewide indication based on all voluntary and assigned risk experience. The use of a Tennessee specific distribution of policy effective dates increases the accuracy of the on-level factor calculation. As a matter of simplicity, the most recent distribution is used for all policy years. This distribution was updated with the 3/1/13 filing which resulted in changes to the policy year 2009 weights.

In selecting trend factors, NCCI examines claim frequency and severity separately and adjusts the severity to the current statutory benefit level and also removes the impact of the growth in payroll over the experience period. NCCI then combines the historical frequency with the adjusted severity to produce loss ratio trend experience. Policy year trend is used as the basis for

the selection. The selection of trend factors involves a great deal of judgment and is subject to a wide range of opinion concerning the appropriate factor.

Five accident years of countrywide LAE data is presented as the basis for the LAE allowance. A relativity of Tennessee DCCE to countrywide DCCE is calculated based on the latest five calendar years paid data (2007 – 2011). Although the standard procedure is to apply the state relativity to the countrywide DCCE ratio, NCCI is proposing using the countrywide ratio without adjustment. NCCI believes that changes in the loss payout pattern since the 2004 reforms have led to increases in the relativity factor that are not due to expense increases. Countrywide AOE is also used. The selected countrywide factors are an average of the two most recent years. A consistent pattern has been noted in which the developed accident year expense ratios decrease over time.

The methodology to limit losses in the development and trend calculations and adjust the limited cost ratio to an unlimited basis is the same as that used in the prior filing. This methodology was implemented in 2004 to temper the impact of one large claim on the overall statewide indication. The loss limitation threshold is based on pure premium and changes from year to year. In previous filings the loss limitation threshold has increased, for example it went from \$9,607,000 in the 3/1/11 filing to \$10,257,311 in the 3/1/12 filing. The threshold for this filing is a decrease to \$9,234,014. The selected statewide excess factor of 0.027 is larger than the ratios used in the prior two filings of 0.023 and 0.021. This is consistent with the decrease in threshold but a corresponding decrease in limited losses and development factors was not observed.

A comparison of the adjustment factors in the current and prior filings is presented below:

	Most Recent Policy Year		Older Policy Year	
	Eff 3/1/13	Eff 3/1/12	Eff 3/1/13	Eff 3/1/12
Premium Development Factor	0.994	0.997	0.998	0.999
Indemnity Paid+Case Development Factor	1.277	1.278	1.096	1.095
Medical Paid+Case Development Factor	1.470	1.449	1.403	1.387
Indemnity Trend	0.907	0.906	0.880	0.879
Medical Trend	1.016	1.016	1.021	1.021
Loss Adjustment Expense	1.198	1.197	1.198	1.197
Excess Loss Loading	1.028	1.024	1.028	1.024

DEVELOPMENT

The ultimate cost of claims incurred for a specific time period is usually not known until several years after the close of that period. Loss development factors project the additional cost expected on claims. The calculation and selection of development factors to be applied to incurred indemnity losses are shown in Table 1, beginning with Tennessee's limited incurred policy year losses excluding LAE. The historical and expected loss development patterns are graphically illustrated in Figure 1 by thick and thin lines, respectively. Medical incurred loss development for the 1st through 7th reports is shown in Table 2 and Figure 2. For both indemnity and medical losses, NCCI selected 5 year average factors. The NCCI selections are reasonable. Also shown on Tables 1 and 2 are the BYNAC selections. BYNAC selections matched NCCI after the 6th report. In Table 3, ultimate incurred indemnity and medical losses are estimated by using the BYNAC selections.

The standard earned premium also needs to be developed to ultimate to account for changes to earned premium such as payroll audits that are completed after the 1st report. Table 4 shows the premium development with the NCCI and BYNAC selections. Table 5 shows the estimated ultimate earned premium.

Table 1

**STATE OF TENNESSEE
WORKERS COMPENSATION**

INDEMNITY INCURRED LOSS DEVELOPMENT

A. LIMITED PAID + CASE INDEMNITY LOSSES FOR MATCHING COMPANIES

Policy Year	1st Report	2nd Report	2nd Report	3rd Report	3rd Report	4th Report	4th Report	5th Report	5th Report	6th Report	6th Report	7th Report
2000											179,961,579	180,613,212
2001									184,070,593	184,487,796	183,406,980	182,671,374
2002							177,662,185	179,408,350	179,408,349	179,550,563	178,682,477	178,578,584
2003					184,691,923	188,177,166	188,177,168	189,956,096	189,956,096	190,439,421	187,103,079	187,109,125
2004			155,086,326	165,215,126	165,215,127	168,859,171	168,859,171	169,696,743	169,464,491	170,142,923	167,036,934	167,027,772
2005	128,983,193	152,141,573	152,141,573	161,451,666	161,451,666	165,386,241	165,386,241	166,678,112	166,678,112	166,545,998		
2006	146,771,654	174,215,601	174,215,601	186,303,562	186,303,562	189,238,317	189,238,317	192,416,046				
2007	150,038,379	175,652,999	175,652,999	185,326,065	185,326,065	188,993,972						
2008	138,278,701	155,452,238	155,452,238	162,726,488								
2009	124,935,070	145,380,349										

B. AGE-TO-AGE FACTORS

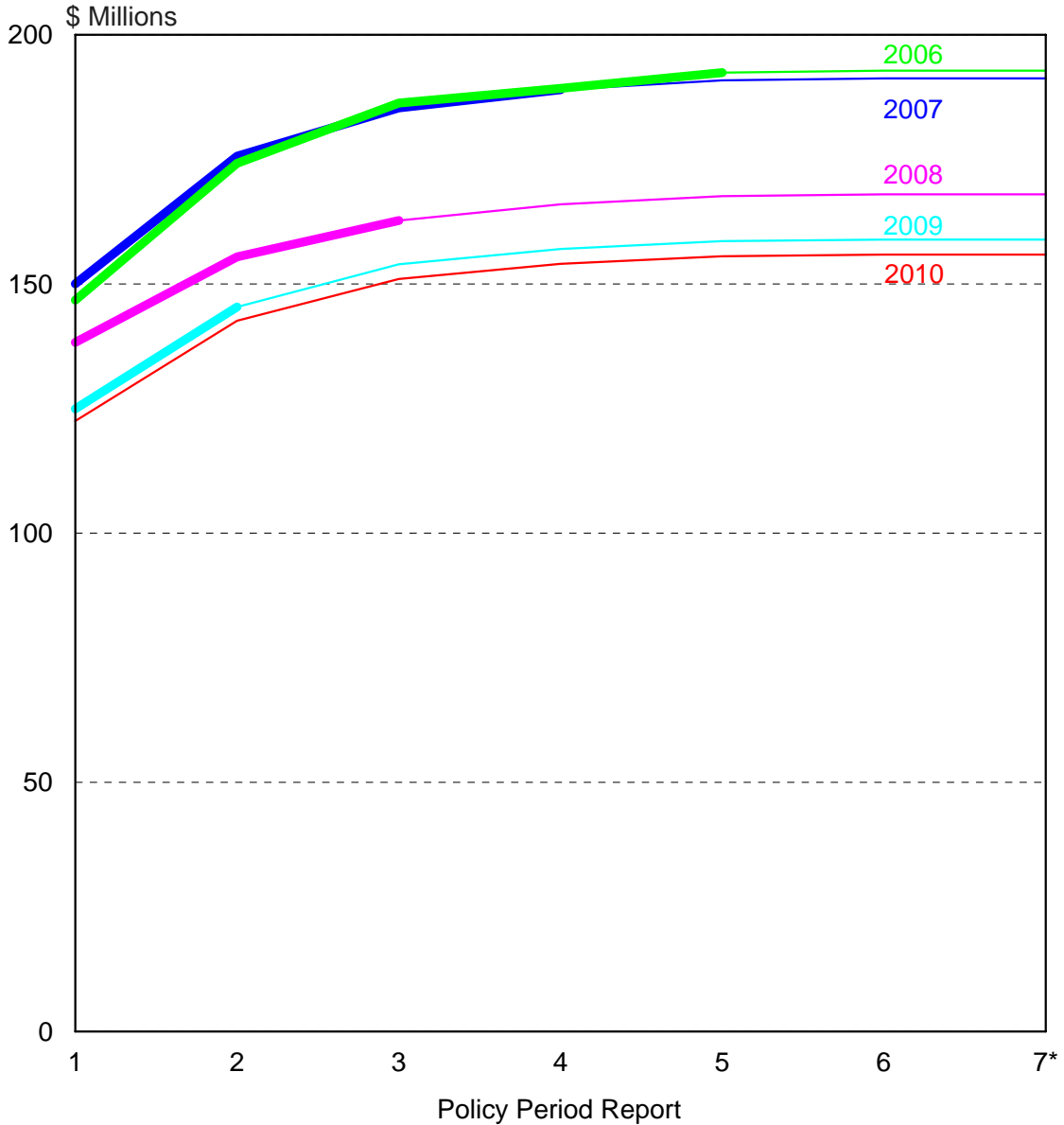
Policy Year	1st to 2nd Report	2nd to 3rd Report	3rd to 4th Report	4th to 5th Report	5th to 6th Report	6th to 7th Report
1999						1.004
2000					1.002	0.996
2001				1.010	1.001	0.999
2002			1.019	1.009	1.003	1.000
2003		1.065	1.022	1.005	1.004	1.000
2004	1.180	1.061	1.024	1.008	0.999	
2005	1.187	1.069	1.016	1.017		
2006	1.171	1.055	1.020			
2007	1.124	1.047				
2008	1.164					
Average	1.165	1.059	1.020	1.010	1.002	1.000
Wtd Avg	1.165	1.060	1.020	1.010	1.002	1.000
3 Yr Avg	1.153	1.057	1.020	1.010	1.002	1.000
5 Yr Mid Avg	1.172	1.060	1.020	1.009	1.002	1.000
Prior NCCI	1.167	1.060	1.018	1.009	1.003	0.998
NCCI	1.165	1.059	1.020	1.010	1.002	1.000
BYNAC	1.164	1.059	1.020	1.010	1.002	1.000

C. INDEMNITY INCURRED LOSS DEVELOPMENT FACTOR

1st Report to Ultimate	2nd Report to Ultimate	3rd Report to Ultimate	4th Report to Ultimate	5th Report to Ultimate	6th Report to Ultimate	7th Report to Ultimate
1.276	1.096	1.035	1.015	1.005	1.003	1.003

Figure 1

STATE OF TENNESSEE WORKERS COMPENSATION
HISTORICAL AND EXPECTED DEVELOPMENT OF INDEMNITY INCURRED LOSSES
(Limited Losses Excluding LAE)



* Additional development of 0.3% is expected after 7th report.

Table 2

**STATE OF TENNESSEE
WORKERS COMPENSATION**

MEDICAL INCURRED LOSS DEVELOPMENT

A. LIMITED PAID + CASE MEDICAL LOSSES FOR MATCHING COMPANIES

Policy Year	1st Report	2nd Report	2nd Report	3rd Report	3rd Report	4th Report	4th Report	5th Report	5th Report	6th Report	6th Report	7th Report
2000											184,395,257	190,740,338
2001									192,917,413	199,144,547	198,142,581	198,779,632
2002							195,416,387	200,745,175	200,745,176	213,213,325	211,893,843	216,783,286
2003					205,934,665	211,251,664	211,251,665	217,883,549	217,883,444	220,743,771	218,051,752	221,938,574
2004			203,382,047	209,170,804	209,170,804	219,709,286	219,709,286	229,587,566	230,559,779	238,184,784	234,539,861	239,472,506
2005	175,316,379	180,225,441	180,225,442	187,911,574	187,911,574	200,929,805	201,050,605	208,982,188	208,982,188	216,231,114		
2006	192,004,717	197,552,868	197,552,868	206,468,664	206,537,599	216,488,954	216,488,954	228,425,717				
2007	208,202,330	220,916,442	220,916,442	227,978,973	227,978,973	237,878,973						
2008	186,385,255	193,917,425	193,917,425	198,052,465								
2009	194,061,203	210,196,006										

B. AGE-TO-AGE FACTORS

Policy Year	1st to 2nd Report	2nd to 3rd Report	3rd to 4th Report	4th to 5th Report	5th to 6th Report	6th to 7th Report
1999						1.034
2000					1.032	1.003
2001				1.027	1.062	1.023
2002			1.026	1.031	1.013	1.018
2003		1.028	1.050	1.045	1.033	1.021
2004	1.028	1.043	1.069	1.039	1.035	
2005	1.029	1.045	1.048	1.055		
2006	1.061	1.032	1.043			
2007	1.040	1.021				
2008	1.083					
Average	1.048	1.034	1.047	1.039	1.035	1.020
Wtd Avg	1.049	1.034	1.047	1.040	1.035	1.020
3 Yr Avg	1.061	1.033	1.053	1.046	1.027	1.021
5 Yr Mid Avg	1.043	1.034	1.047	1.038	1.033	1.021
Prior NCCI	1.045	1.028	1.047	1.035	1.033	1.019
NCCI	1.048	1.034	1.047	1.039	1.035	1.020
BYNAC	1.050	1.034	1.049	1.041	1.033	1.021

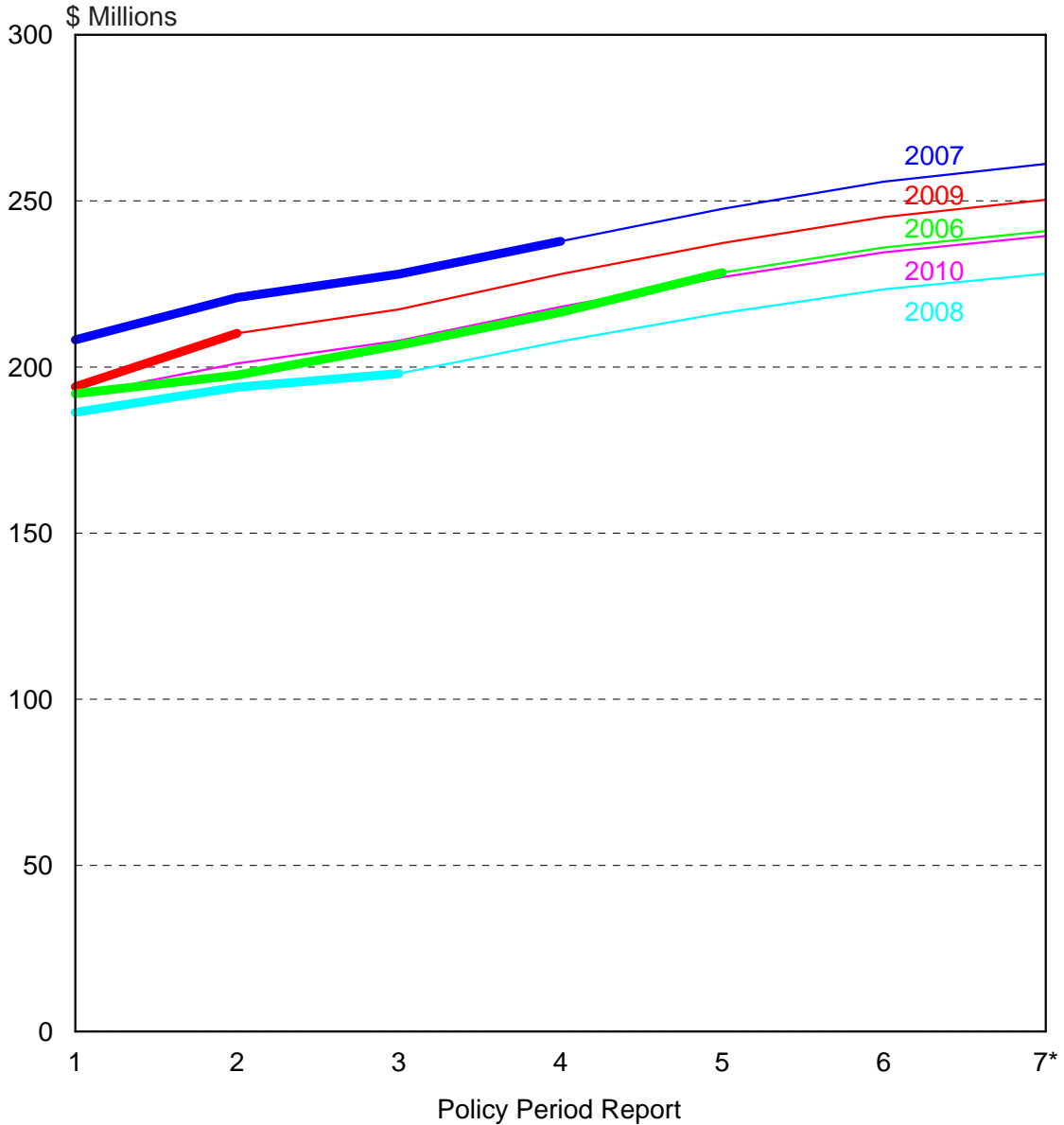
C. MEDICAL INCURRED LOSS DEVELOPMENT FACTOR

1st Report to Ultimate	2nd Report to Ultimate	3rd Report to Ultimate	4th Report to Ultimate	5th Report to Ultimate	6th Report to Ultimate	7th Report to Ultimate
1.477	1.407	1.361	1.297	1.246	1.206	1.181

Figure 2

STATE OF TENNESSEE WORKERS COMPENSATION

HISTORICAL AND EXPECTED DEVELOPMENT OF MEDICAL INCURRED LOSSES
(Limited Losses Excluding LAE)



* Additional development of 18.1% is expected after 7th report.

Table 3

**STATE OF TENNESSEE
WORKERS COMPENSATION**

ESTIMATED ULTIMATE INCURRED LOSSES

A. INDEMNITY

Policy Period	Limited Incurred Losses as of 12/31/11	Incurred Loss Development Factor	Estimated Ultimate Incurred Losses
1/1-12/31/06	\$192,416,046	1.005	\$193,378,126
1/1-12/31/07	188,993,972	1.015	191,828,882
1/1-12/31/08	162,726,488	1.035	168,421,915
1/1-12/31/09	145,380,349	1.096	159,336,863
1/1-12/31/10	<u>122,521,051</u>	1.276	<u>156,336,861</u>
Total	\$812,037,906		\$869,302,647

B. MEDICAL

Policy Period	Limited Incurred Losses as of 12/31/11	Incurred Loss Development Factor	Estimated Ultimate Incurred Losses
1/1-12/31/06	\$ 228,425,717	1.246	\$ 284,618,443
1/1-12/31/07	237,878,973	1.297	308,529,028
1/1-12/31/08	198,052,465	1.361	269,549,405
1/1-12/31/09	210,196,006	1.407	295,745,780
1/1-12/31/10	<u>191,511,046</u>	1.477	<u>282,861,815</u>
Total	\$1,066,064,207		\$1,441,304,471

Table 4

**STATE OF TENNESSEE
WORKERS COMPENSATION**

PREMIUM DEVELOPMENT FACTORS

A. STANDARD PREMIUM FOR MATCHING COMPANIES

Policy Year	1st Report	2nd Report	2nd Report	3rd Report	3rd Report	4th Report	4th Report	5th Report
2004							636,924,041	637,082,362
2005					649,420,474	649,066,502	649,066,502	648,887,063
2006			664,933,021	663,819,110	662,661,718	663,050,651	664,176,950	663,470,428
2007	694,986,961	696,187,385	693,770,673	692,926,519	695,248,530	695,329,673		
2008	629,573,408	620,620,284	623,259,108	621,387,430				
2009	548,597,086	549,327,050						

B. AGE-TO-AGE FACTORS

Policy Year	1st to 2nd Report	2nd to 3rd Report	3rd to 4th Report	4th to 5th Report
2002				1.000
2003			0.999	1.001
2004		1.000	1.001	1.000
2005	1.015	0.999	0.999	1.000
2006	1.007	0.998	1.001	0.999
2007	1.002	0.999	1.000	
2008	0.986	0.997		
2009	1.001			
3 yr Average	0.996	0.998	1.000	1.000
3 yr Wtd Avg	0.996	0.998	1.000	1.000
5 yr Mid	1.003	0.999	1.000	1.000
Prior NCCI	0.998	0.999	1.000	1.000
NCCI	0.996	0.998	1.000	1.000
BYNAC	0.998	0.998	1.000	1.000

C. PREMIUM DEVELOPMENT FACTOR

1st Report to Ultimate	2nd Report to Ultimate	3rd Report to Ultimate	4th Report to Ultimate	5th Report to Ultimate
0.996	0.998	1.000	1.000	1.000

Table 5

**STATE OF TENNESSEE
WORKERS COMPENSATION**

ESTIMATED ULTIMATE STANDARD EARNED PREMIUM

<u>Policy Period</u>	<u>Standard Earned Premium of 12/31/11</u>	<u>Premium Development Factor</u>	<u>Estimated Ultimate Standard Earned Prem</u>
1/1-12/31/06	\$ 663,470,428	1.000	\$ 663,470,428
1/1-12/31/07	695,329,673	1.000	695,329,673
1/1-12/31/08	621,387,430	1.000	621,387,430
1/1-12/31/09	549,327,050	0.998	548,228,396
1/1-12/31/10	<u>573,700,085</u>	0.996	<u>571,405,285</u>
Total	\$3,103,214,666		\$3,099,821,212

Table 6 shows the calculation of projected cost ratios using BYNAC's estimated ultimate losses and standard earned premium and the selected trend factors described below. Figure 3 presents the BYNAC projected cost ratios by policy year compared to the BYNAC and NCCI selected cost ratios.

TREND

An exponential regression model is used to measure the trend and is presented in Table 7 and Figures 4 and 5. The NCCI selected trend factors are similar to the 15 year exponential fit.

BYNAC agrees with the use of the 15 year period and the selected trend factors of 0.970 for indemnity and 1.005 for medical. These proposed factors are the same as the current approved factors.

LOSS ADJUSTMENT EXPENSE

When comparing the accident year developed expense ratios in this filing to the ratios shown in previous filings there is a clear pattern of reductions in the ratios over time. While it is not unusual for estimates of ultimate to change, ideally the changes would be more random with both increases and decreases. BYNAC has examined both the DCCE and AOE changes and the DCCE ratios in particular show consistent decreases over time. BYNAC believes that an adjustment should be made for this pattern. The decreases in DCCE have been somewhat offset by increases in AOE but the total LAE ratios also show the consistent downward trend. Table 8 shows the calculation of a development factor based on the changes over time in the developed accident year LAE ratios. Table 9 shows the calculation of adjusted ultimate LAE ratios. As shown, after adjustment the developed LAE ratios for the past five years are all within a close range of 18.9% to 19.4%. The adjusted DCCE ratios underlying this total average 11.1% which

Table 6

**STATE OF TENNESSEE
WORKERS COMPENSATION**

HISTORICAL AND PROJECTED COST RATIOS

A. INDEMNITY

Policy Period	Estimated Ultimate Limited Losses	Factor to Include LAE	Factor to Adjust Losses to Unlimited	Estimated Ultimate Loss + LAE	On Level Factor*	Trend Factor~	Projected Ultimate Loss + LAE^
1/1-12/31/06	\$193,378,126	1.190	1.028	\$ 236,563,329	1.030	0.803	\$196,810,100
1/1-12/31/07	191,828,882	1.191	1.028	234,865,308	1.021	0.828	199,552,577
1/1-12/31/08	168,421,915	1.192	1.028	206,380,173	1.013	0.853	179,078,869
1/1-12/31/09	159,336,863	1.193	1.028	195,411,366	1.015	0.880	175,126,651
1/1-12/31/10	156,336,861	1.190	1.028	191,250,009	1.013	0.907	176,752,427
Total	\$869,302,647			\$1,064,470,185			\$927,320,624

B. MEDICAL

Policy Period	Estimated Ultimate Limited Losses	Factor to Include LAE	Factor to Adjust Losses to Unlimited	Estimated Ultimate Loss + LAE	On Level Factor*	Trend Factor~	Projected Ultimate Loss + LAE^
1/1-12/31/06	\$ 284,618,443	1.190	1.028	\$ 348,179,434	1.093	1.037	\$ 396,962,263
1/1-12/31/07	308,529,028	1.191	1.028	377,746,898	1.078	1.031	421,949,738
1/1-12/31/08	269,549,405	1.192	1.028	330,299,372	1.105	1.026	376,041,072
1/1-12/31/09	295,745,780	1.193	1.028	362,703,808	0.983	1.021	365,245,675
1/1-12/31/10	282,861,815	1.190	1.028	346,030,516	0.945	1.016	334,185,118
Total	\$1,441,304,471			\$1,764,960,028			\$1,894,383,866

C. EARNED PREMIUM AND COST RATIO

Policy Period	Estimated Ultimate Standard Earned Prem	On Level Factor	Estimated On Level Standard Earned Prem	Projected Cost Ratio
1/1-12/31/06	\$ 663,470,428	0.828	\$ 549,353,514	1.081
1/1-12/31/07	695,329,673	0.829	576,428,299	1.078
1/1-12/31/08	621,387,430	0.882	548,063,713	1.013
1/1-12/31/09	548,228,396	0.927	508,207,723	1.063
1/1-12/31/10	571,405,285	0.922	526,835,673	0.970
Total	\$3,099,821,212		\$2,708,888,922	
				Weighted 5 Year Average
				Weighted 2 Year Average
				NCCI Selected
				BYNAC Selected
				1.042
				1.016
				1.015
				1.015

* Weights for policy years 2006 through 2008 based on prior filings includes factor to reflect proposed changes in benefits.

~ Using selected trend of 0.970 for indemnity and 1.005 for medical.

^ LAE adjusted from historical to current Tennessee factor of 1.197 for projected cost.

Figure 3

STATE OF TENNESSEE WORKERS COMPENSATION

PROJECTED COST RATIO INCLUDING BENEFIT CHANGES

■ Projected Cost Ratio ■ NCCI Selected ■ BYNAC Selected

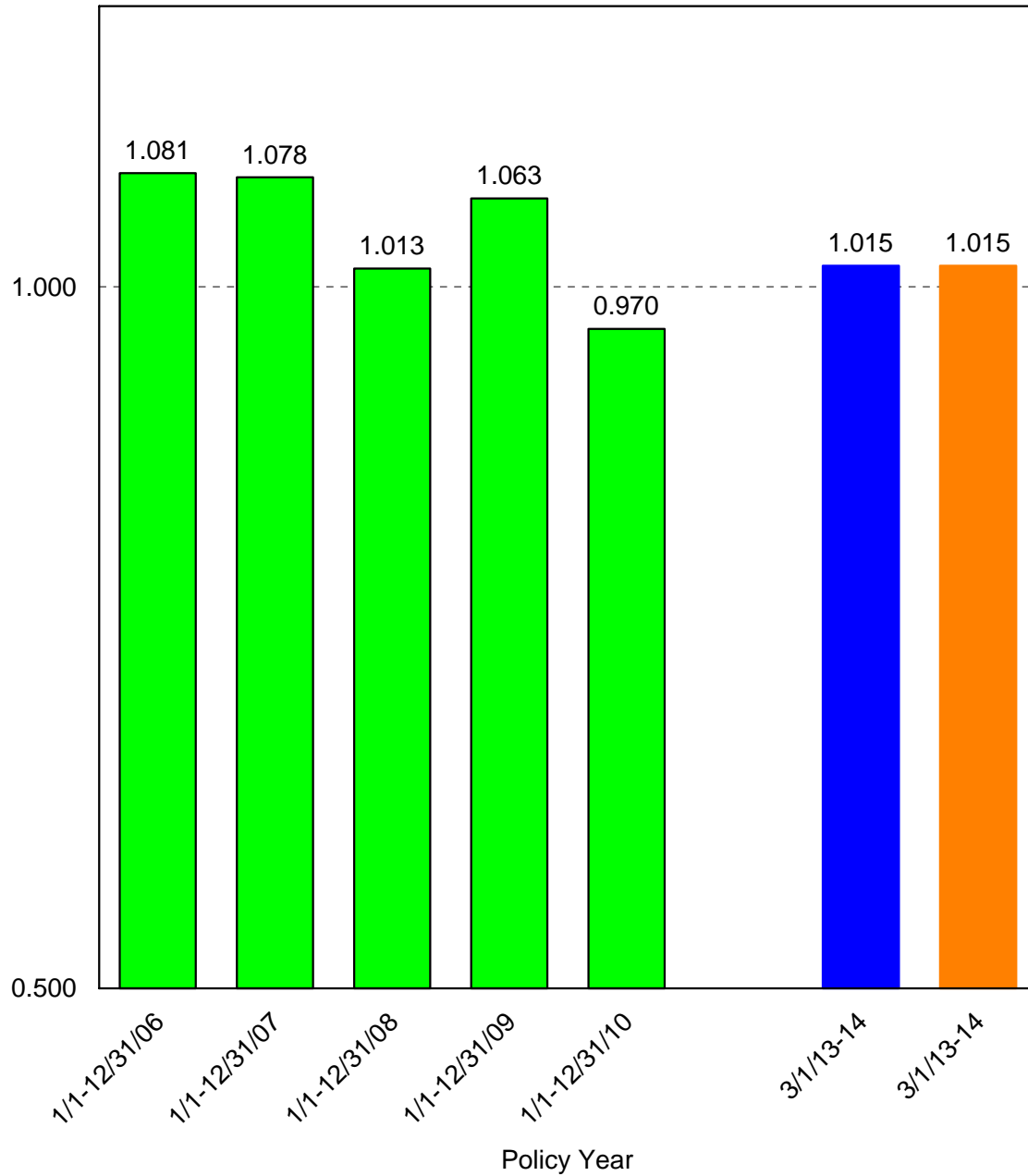


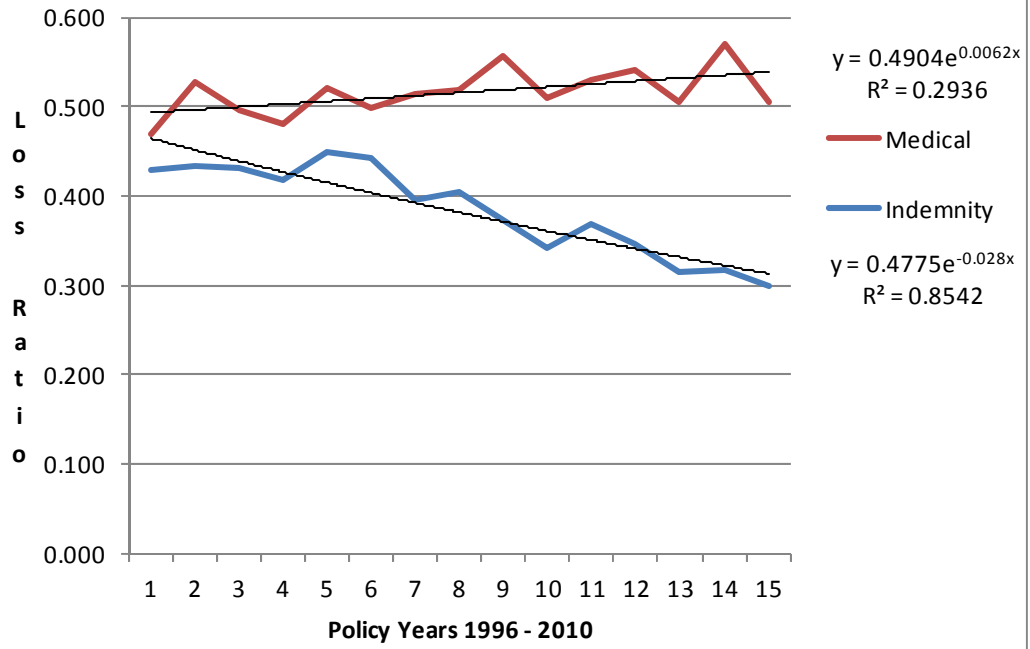
Table 7

**STATE OF TENNESSEE
WORKERS COMPENSATION**

TREND		
<u>Policy Year</u>	<u>Indemnity Loss Ratio</u>	<u>Medical Loss Ratio</u>
1996	0.430	0.469
1997	0.433	0.528
1998	0.431	0.496
1999	0.418	0.480
2000	0.450	0.521
2001	0.443	0.498
2002	0.396	0.513
2003	0.405	0.519
2004	0.374	0.556
2005	0.342	0.510
2006	0.369	0.530
2007	0.347	0.541
2008	0.316	0.506
2009	0.317	0.570
2010	0.300	0.506
5 year Exponential	0.951	0.996
8 year Exponential	0.962	0.999
15 year Exponential	0.972	1.006
Current Approved	0.970	1.005
NCCI Prior Selected	0.970	1.010
NCCI Selected	0.970	1.005
BYNAC Selected	0.970	1.005

Figure 4

STATE OF TENNESSEE WORKERS COMPENSATION
15 Year Exponential Fit of Loss Ratio Trend Data



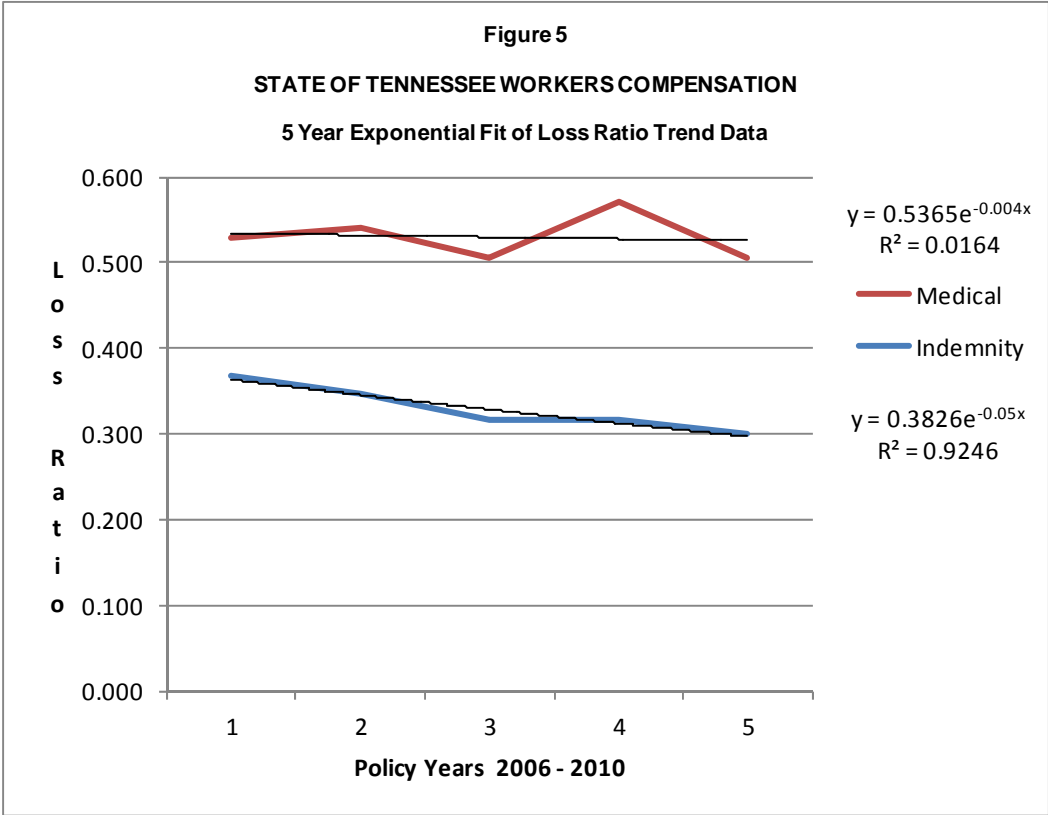


Table 8

**STATE OF TENNESSEE
WORKERS COMPENSATION**

LAE DEVELOPMENT FACTORS

A. ACCIDENT YEAR DEVELOPED LAE RATIOS

Accident Year	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months
1997										0.160
1998									0.159	0.159
1999								0.154	0.153	0.154
2000							0.159	0.158	0.157	0.160
2001						0.164	0.165	0.164	0.166	0.163
2002					0.171	0.171	0.172	0.172	0.169	0.169
2003				0.182	0.182	0.181	0.181	0.178	0.179	
2004			0.176	0.177	0.177	0.178	0.174	0.174		
2005		0.193	0.188	0.187	0.187	0.182	0.183			
2006	0.198	0.194	0.192	0.189	0.186	0.187				
2007	0.204	0.199	0.196	0.191	0.192					
2008	0.201	0.194	0.190	0.189						
2009	0.212	0.196	0.196							
2010	0.197	0.196								
2011	0.199									

B. AGE-TO-AGE FACTORS

Accident Year	12 to 24	24 to 36	36 to 48	48 to 60	60 to 72	72 to 84	84 to 96	96 to 108	108 to 120
1997									
1998									1.000
1999								0.994	1.007
2000							0.994	0.994	1.019
2001						1.006	0.994	1.012	0.982
2002					1.000	1.006	1.000	0.983	1.000
2003				1.000	0.995	1.000	0.983	1.006	
2004			1.006	1.000	1.006	0.978	1.000		
2005		0.974	0.995	1.000	0.973	1.005			
2006	0.980	0.990	0.984	0.984	1.005				
2007	0.975	0.985	0.974	1.005					
2008	0.965	0.979	0.995						
2009	0.925	1.000							
2010	0.995								
Average	0.968	0.986	0.991	0.998	0.996	0.999	0.994	0.998	1.002
3 Yr Avg	0.962	0.988	0.984	0.996	0.995	0.994	0.994	1.000	1.000
5 Yr Mid Avg	0.973	0.985	0.991	1.000	1.000	1.004	0.996	0.998	1.002
Selected	0.973	0.986	0.991	0.998	1.000	1.000	1.000	1.000	1.000

C. LAE DEVELOPMENT FACTOR

	12 Months to Ultimate	24 Months to Ultimate	36 Months to Ultimate	48 Months to Ultimate	60 Months to Ultimate	72 Months to Ultimate	84 Months to Ultimate	96 Months to Ultimate	108 Months to Ultimate	120 Months to Ultimate
	0.949	0.975	0.989	0.998	1.000	1.000	1.000	1.000	1.000	1.000

Table 9

**STATE OF TENNESSEE
WORKERS COMPENSATION**

LOSS ADJUSTMENT EXPENSE

Accident Year	NCCI Accident Year Developed LAE Ratio	BYNAC LAE Development Factor	BYNAC Accident Year Developed LAE Ratio
2002	16.9%	1.000	16.9%
2003	17.9%	1.000	17.9%
2004	17.4%	1.000	17.4%
2005	18.3%	1.000	18.3%
2006	18.7%	1.000	18.7%
2007	19.2%	1.000	19.2%
2008	18.9%	0.998	18.9%
2009	19.6%	0.989	19.4%
2010	19.6%	0.975	19.1%
2011	19.9%	0.949	18.9%
5 Year Average	19.4%		19.1%
2 Year Average	19.8%		19.0%
NCCI Selected	19.8%		
BYNAC Selected			19.0%
BYNAC Proposed Change in LAE Allowance			
	Current Tennessee LAE Allowance		19.7%
	BYNAC Proposed LAE Allowance		19.0%
	Proposed Change in LAE		-0.6%

is consistent with the countrywide paid DCCE to paid loss ratio of 11.4%. BYNAC believes that an LAE ratio of 19.0% would be more appropriate. This results in a decrease of 0.6% to the LAE allowance. The overall change using the BYNAC proposed LAE ratio is an increase of 1.6% as shown in Appendix A.

QUALIFICATIONS AND LIMITATIONS

The estimates contained in this report depend upon the following:

- The actuarial assumptions, quantitative analysis, and professional judgment expressed in this report.
- The reliability of loss experience to serve as an indicator of future losses.
- The completeness and accuracy of data provided by NCCI.

Material changes in any of the assumptions or information upon which the findings are based will require a re-evaluation of the results of this report and a possible revision of those findings.

This report is intended for the use of the Tennessee Advisory Council on Workers'

Compensation. If the report is released to any third party, it should be released in its entirety.

Please advise BYNAC if this report is distributed to any other third party.

CONSULTATION

The professional opinion given in this report is based on the judgment and experience of BYNAC. An analysis by another actuary may not arrive at the same conclusion. In the event that another actuary is consulted regarding the findings of this report, both actuaries should make themselves available for supplemental advice and consultation.

TENNESSEE ADVISORY COUNCIL ON WORKERS' COMPENSATION

APPENDIX A

SUPPORT EXHIBIT

Appendix A

**STATE OF TENNESSEE
WORKERS COMPENSATION**

INDICATED LOSS COST LEVEL CHANGE USING BYNAC LAE SELECTION

Indicated Change Based on Experience, Trend, and Benefits:

	Policy Year		NCCI	BYNAC
	2010	2009		
Projected Indemnity Cost Ratio including Benefit Changes	0.336	0.344		
Projected Medical Cost Ratio including Benefit Changes	0.633	0.717		
Total Benefit Cost	0.969	1.061		
Selected			1.015	1.015
Offset for Change in Employers' Liability Increased Limits Percentages:				
Selected			1.007	1.007
Change in Loss Based Expenses:				
Current Tennessee LAE Allowance			19.7%	19.7%
Proposed Tennessee LAE Allowance			19.8%	19.0%
Selected			1.001	0.994
Overall			2.3%	1.6%

TENNESSEE ADVISORY COUNCIL ON WORKERS' COMPENSATION

APPENDIX B

BYNAC QUESTIONS AND RESPONSES FROM NCCI

**National Council On Compensation Insurance (NCCI)
Tennessee Loss Cost Filing Effective 03/01/2013**

**Data Requests from By the Numbers Actuarial Consulting,
on behalf of Tennessee Advisory Council on Workers' Compensation**

- 1) **Please provide standard earned premium , limited paid losses (showing indemnity and medical separately), and limited paid + case losses (indemnity and medical separate) for Policy Years 2006 – 2010 valued as of 12/31/11.**

Response:

Please see the attached file "BYNAC Q1.pdf". Please note that the premium and limited losses are reported values as of 12/31/11 and do not reflect adjustments to bring the data to the ultimate, on-level projected values.

- 2) **Please provide exhibits similar to Appendix A-II Sections A and B from the 3/1/12 filing showing the dollar amounts used in the calculation of the premium and paid+case development factors. I would also like an exhibit similar to the attached from last year showing paid development. Why was the information shown in this Appendix removed from the report?**

Response:

Please see the attached file "BYNAC Q2.pdf". The underlying premium and loss dollars were removed from the Technical Supplement simply to streamline the presentation of the premium and loss development factors utilized in the filing.

- 3) **Please provide the countrywide accident year developed DCCE and AOE ratios for accident years 2001 – 2005 as of 12/31/10 and 2002 – 2006 ratios as of 12/31/11. I would also like to have the 1997 – 2006 ratios as of 12/31/06 if this information is available – or a copy of the 3/1/08 technical supplement which I think would have the information I need.**

Response:

Please see the attached file "BYNAC Q3.pdf".

- 4) **Have there been any changes in the methods used to calculate the indicated loss costs in this filing compared to the 3/1/12 filing?**

Response:

The 3/1/2013 loss cost filing reflects the following changes compared to the 3/1/2012 filing:

- The methodology used to determine the 19th-to-ultimate loss development factor (i.e., the tail factor) has been modified as a result of NCCI's elimination of the reporting of bulk and IBNR reserves from the financial data calls. This change is described in an explanatory memorandum in the Technical Supplement to the filing.

**National Council On Compensation Insurance (NCCI)
Tennessee Loss Cost Filing Effective 03/01/2013**

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- The filing includes an adjustment due to changes in the employers' liability increased limits percentages. This adjustment is also described in an explanatory memorandum in the Technical Supplement to the filing.
- The final modification relates to the projection of the State Average Weekly Wage (SAWW) for the purpose of measuring resulting changes to the minimum and maximum weekly benefits. In this filing, NCCI has incorporated the impact of the actual 7/1/2012 SAWW and updated our estimate of the change in the 7/1/2013 SAWW. We have not, however, included an estimate of the impact of the 7/1/2014 change in the SAWW.

5) Were any concerns raised in the NCCI internal data validation process for the data used in this filing?

Response:

Within NCCI, both the Data and Actuarial divisions employ various processes and programs to ensure that data is reported accurately and in accordance with the Workers Compensation Statistical Plan (for data used in the class ratemaking analysis) and the Financial Call Reporting Guidebook (for data used in the aggregate loss cost level indication). The extensive processes used by NCCI to verify data used in the filing include identifying outliers for further scrutiny and modifying the data when appropriate and necessary.

The data contained in the proposed 3/1/2013 Tennessee filing has been carefully edited using actuarial edits and judgment. Any significant issues that NCCI identified within the data have been communicated and confirmed with the data providers in order to make the data fit for use in the filing. There are no outstanding concerns of material impact.

**National Council On Compensation Insurance (NCCI)
Tennessee Loss Cost Filing Effective 03/01/2013**

**Data Requests Set 2, from By the Numbers Actuarial Consulting,
on behalf of Tennessee Advisory Council on Workers' Compensation**

- 1) I noticed what seems like a large change in the Policy Year Detrended Thresholds for this filing. For example, in last year's filing the 2009 threshold was \$9,078,184 in this year's filing the threshold is \$7,801,023. Could you explain the reason for the change? Also, just doing a spot check of the limited paid + case losses from the loss development exhibits I was surprised that so many match exactly last year's values. Could you confirm that the new thresholds were used in limiting the losses?

Response: The reduction in the thresholds is largely attributable to a recalibration of the base threshold (that is, the threshold at the midpoint of the loss cost effective period). In this year's filing, we calculated the threshold to be 1% of the pure premium in the experience period from the 3/1/2012 Tennessee filing. We then detrended the base threshold to determine the thresholds for individual accident years. (Thresholds for policy years are calculated to be weighted averages of the applicable accident years.) This recalibration of the base threshold resulted in a reduction in the thresholds for all years.

In last year's filing, the thresholds for accident years 2009 and prior were held unchanged from the prior filing, while thresholds for accident years 2010 and forward were calculated by applying the calendar year QCEW wage change to the threshold for the prior accident year.

The dollar thresholds shown in Appendix A-II, Section H were used to limit the losses in this year's filing. Limited loss amounts that are unchanged from last year's filing may be explained by an absence of losses in excess of the threshold for that year. For example, in the data evaluated as of 12/31/2011, there are no excess losses in policy years 1998 and subsequent.

- 2) Despite the use of ten years development instead of five years, the 19th to Ultimate factors have decreased. Is this something you are observing countrywide with the change in the calculation procedure?

Response: Yes, we are generally seeing that the tail factors this year are slightly lower than in prior years.

- 3) Last year a change was made to the experience rating off-balance procedure using a target off-balance of 0.986, this year the target off-balance is 0.977. What ratio are you ultimately working towards? It is my understanding that this adjustment is being made in order to make a more equitable loss ratio distribution across all premium sizes. Do you think that the change in split point in the

**National Council On Compensation Insurance (NCCI)
Tennessee Loss Cost Filing Effective 03/01/2013**

**Data Requests Set 2, from By the Numbers Actuarial Consulting,
on behalf of Tennessee Advisory Council on Workers' Compensation**

experience rating plan will also lead to more equitable loss ratios by premium size? Is it possible that you are going to over correct for this problem? In last year's technical supplement it was mentioned that an off-setting adjustment would be made in the pure premium calculation – could you point out where this adjustment is made? Is any change needed to the off-balance factor for the change in the split point from \$5,000 to \$10,000?

Response: As you have noted, the targeting of a lower off-balance is intended to help move toward a more equitable loss ratio distribution across premium sizes. Each year, NCCI will review the experience of small risks in order to determine whether a further reduction in the intrastate experience rating off-balance is warranted. We do not have a specific off-balance that we are working toward, however, at this time we do not envision targeting an intrastate off-balance that is lower than 0.950.

The change in the split point will make the experience rating plan more responsive to the experience of individual employers, which may have some impact on loss ratios by premium size. Because many smaller risks do not meet the premium threshold for experience rating, and smaller employers who are eligible for experience rating have lower credibility (and therefore, less weight applied to their actual excess losses), the impact would be expected to be limited. As previously noted, NCCI will review the small risk experience each year and will only reduce the target off-balance if a reduction is warranted.

The impact of adjusting for the target off-balance is shown in Appendix A-I in the filing's Technical Supplement. The adjustment appears in a footnote for each individual year in the experience period. For example, Appendix A-I, Section A shows the calculation of the on-level factor for Policy Year 2010. The off-balance adjustment factor of .984 is calculated by dividing .977 (the target off-balance) by .993 (the actual off-balance underlying the Policy Year 2010 data.)

A change to the off-balance factor is not needed for the change in the split point. The experience rating values in the filing, with d-ratios that contemplate the new split point, are expected to produce the selected target off-balance.

- 4) Could you provide more detail concerning the calculation of the offset for change in EL factors shown in Exhibit I-D (2)? I would hope to see the employers liability premium separately from the statutory workers compensation premium before and after the change in increased limits factors.**

**National Council On Compensation Insurance (NCCI)
Tennessee Loss Cost Filing Effective 03/01/2013**

**Data Requests Set 2, from By the Numbers Actuarial Consulting,
on behalf of Tennessee Advisory Council on Workers' Compensation**

Response: Please see the attached file "BYNAC Set2 Q4.pdf". The file contains a Tennessee-specific premium distribution for basic limits policies and the various increased limits captured in NCCI's WCSP statistical codes. This premium distribution was used to derive the 0.7% offset for Tennessee.

Tennessee
Impact of Change in Employers Liability Increased Limits Percentages

	(1)	(2)	(3)	(4)
Policy Limits	Total Modified Premium	Employers Liability Modified Premium	Mod Prem Distribution by Limit	Difference in Increased Limits Percentage
> 1,000,000/10,000,000	2,587,891	123,472	0.2%	-2.1%
1,000,000/1,000,000	564,213,280	16,116,481	36.9%	-1.4%
1,000,000/10,000,000	83,053	2,374	0.0%	-2.1%
1,000,000/5,000,000	40,359	2,201	0.0%	-2.5%
100,000/1,000,000	56,484	861	0.0%	-0.4%
500,000/1,000,000	2,916,352	67,579	0.2%	-1.0%
500,000/5,000,000	38,138	648	0.0%	-2.1%
500,000/500,000	560,825,713	9,631,869	36.7%	-0.6%
All Other Limits	26,200,400	1,173,529	1.7%	-0.2%
Basic Limit	372,759,640	-	24.4%	0.0%
Grand Total	1,529,721,310	27,119,014	100.0%	
Change in EL (weighted avg. as % of column 1 prem)				-0.7%
Col 1 prem as % of Grand Total premium ((1)/ ((1)+(2)))				98.3%
Change in EL as % of Grand Total				-0.7%
Offset to Include in Loss Cost Filing (1/0.993)				1.007

Notes:

Impact based on WCSP data for policy years 2008, 2009

Column 1 includes modified (i.e. standard) premium for statutory WC coverage and basic limits coverage for EL

Column 2 includes modified (i.e. standard) premium for EL increased limits only

Column 4 impacts by limit are weighted using column 1 as weights