
TUO Liabilities Estimate Report

Team: CCGZ

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Selected	1,000	1,000	1,000	1,000	1,000	1,000	Accident Year	Reported Severity	Selected LDPS	Ultimate Severity	Accident Year	Reported Severity	Selected LDPS	Ultimate Severity
Cumulative							2003	16,513	1.00	16,513	2003	17,187	1.00	17,187
2 Year	1,684	1,181	1,030	0.999	0.996		2004	17,717	1.00	17,717	2004	18,441	1.00	18,441
3 Year	1,676	1,162	1,023	0.991	0.990		2005	17,421	1.00	17,421	2005	19,640	1.00	19,640
4 Year	1,664	1,168	1,035	1.002	1.001		2006	17,933	1.00	17,933	2006	20,958	1.00	20,958
5 Year	1,630	1,163	1,000	1.035	1.000		2007	20,162	1.00	20,162	2007	21,793	1.00	21,793
All Year	1,600	1,162	1,035	1.001	1.000		2008	20,119	1.00	20,119	2008	21,602	1.00	21,602
Selected	1,000	1,000	1,000	1,000	1,000		2009	22,335	1.00	22,335	2009	23,828	1.00	23,828
							2010	22,279	1.00	22,279	2010	24,991	1.00	24,991
							2011	22,341	1.00	22,341	2011	25,252	1.00	25,252
							2012	24,716	1.00	24,716	2012	30,317	1.00	30,317
									1.00	21,328	2013	26,817	1.00	26,817
									1.00	19,900	2014	28,908	1.00	28,908
									1.00	20,750	2015	30,550	1.00	30,550

To estimate the liabilities associated with all workers' compensation policies that TUO has ever written.

Based on these data provided.

Step 1: Introduction

Step 2: (Part A) Analyze Reserving Loss Development

Step 3: (Part B) Analyze In-Depth Considerations

Step 4: Thinking and Conclusion

Introduction & Background

Workers' compensation insurance is carried by businesses to provide reimbursement to employees injured at work. One of the benefits of workers' compensation in some states is free **medical care** for treatments that result from an occupational injury. Another type of workers' compensation benefit is **indemnity**, which are income replacement benefits paid to the injured worker to cover a portion of lost income.

Part A

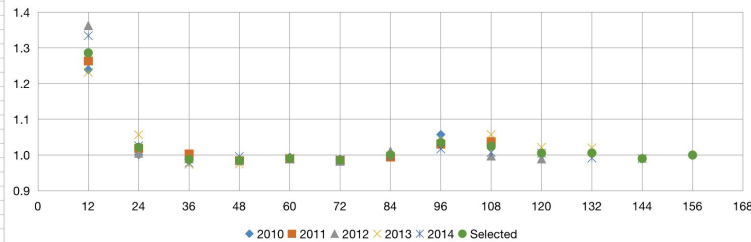
Introduction to Reserving (Loss Development)

Comparison Incurred & Paid LDF

Target - Direct Accident Year Case Reported Loss Development Factors

Calendar Year	INDEMNITY												
	12	24	36	48	60	72	84	96	108	120	132	144	156
	to 24	to 36	to 48	to 60	to 72	to 84	to 96	to 108	to 120	to 132	to 144	to 156	to Ultimate
2010	1.239	1.001	0.994	0.986	0.994	0.989	1.004	1.057					
2011	1.263	1.019	1.003	0.984	0.989	0.985	0.994	1.030	1.038				
2012	1.362	1.005	0.990	0.984	0.990	0.983	1.011	1.042	0.998	0.989			
2013	1.232	1.057	0.974	0.975	0.992	0.987	0.997	1.030	1.057	1.022	1.020		
2014	1.334	1.026	0.978	0.996	0.989	0.986	0.997	1.017	1.007	1.005	0.991	0.990	

Incurred Loss Development Factors



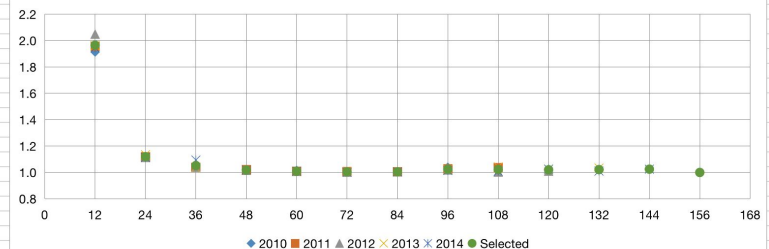
Incurred Loss Development Factors outlier from 2010 to 2014

Paid Loss Development Factors outlier from 2010 to 2014

Target - Direct Accident Year Paid Loss Development Factors

Calendar Year	INDEMNITY												
	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	120 to 132	132 to 144	144 to 156	156 to Ultimate
2010	1.913	1.118	1.049	1.022	1.016	1.005	1.003	1.039					
2011	1.957	1.118	1.039	1.021	1.009	1.006	1.005	1.026	1.037				
2012	2.048	1.114	1.041	1.016	1.002	1.008	1.003	1.008	1.019	1.003			
2013	1.961	1.135	1.037	1.015	1.006	1.006	1.003	1.021	1.042	1.025	1.034		
2014	1.944	1.113	1.094	1.018	1.009	1.002	1.004	1.016	1.009	1.026	1.010	1.025	

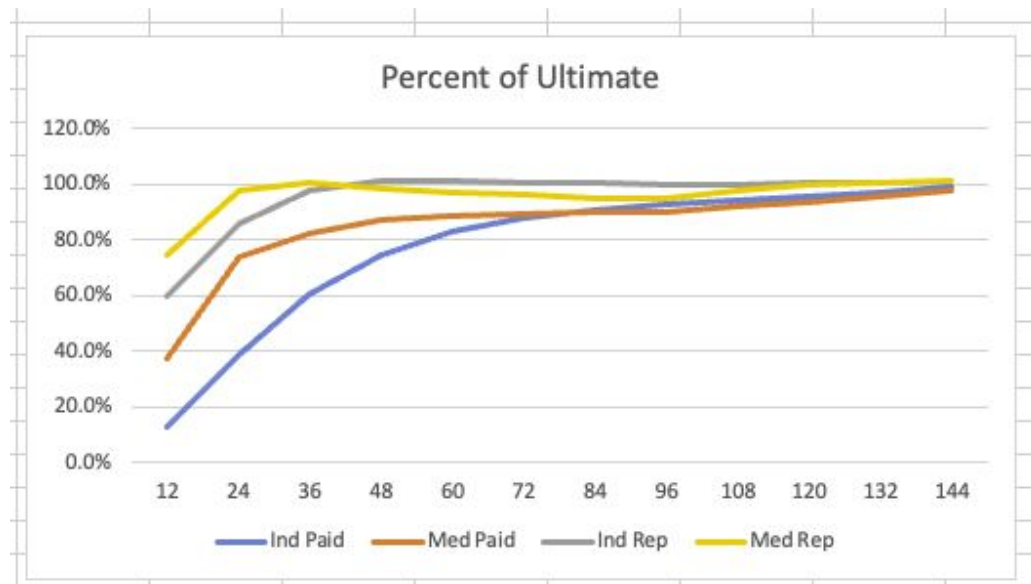
Paid Loss Development Factors



Comparison between the paid and incurred loss development method

Unpaid Claim Estimate			
IBNR		Total Unpaid	
Paid	Reported	Paid	Reported
(10)	(11)	(12)	(13)
-	-	-	-
(1,495)	(1,495)	2,365	2,365
(649)	(649)	5,426	5,426
(45)	(226)	7,883	7,702
2,508	2,218	10,916	10,627
5,496	5,769	14,167	14,440
5,279	5,752	16,577	17,050
3,938	4,170	18,357	18,589
3,048	3,206	23,461	23,618
6,999	2,364	36,411	31,775
4,859	3,105	42,852	41,098
12,860	12,159	65,162	64,460
50,524	48,737	117,131	115,344
93,323	85,110	360,706	352,494

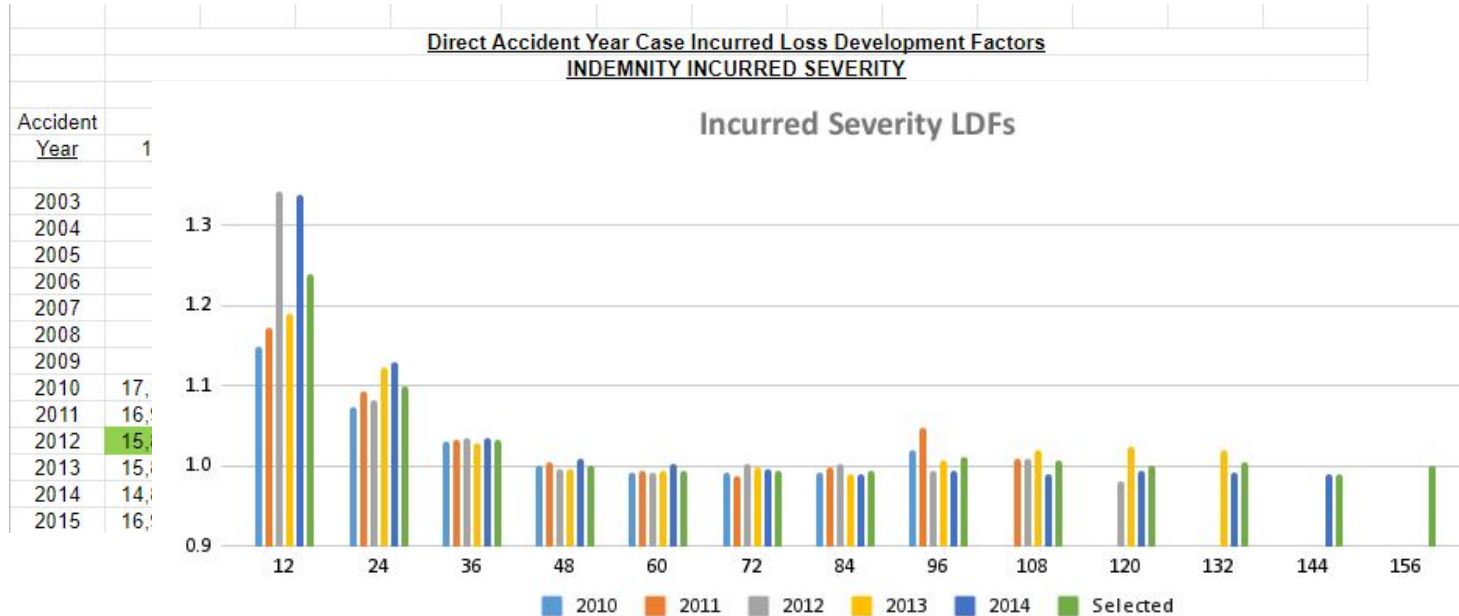
↪ 9.6%
 ↪ 2.3%



Part B

In-Depth Considerations
(Frequency/Severity, Catastrophe, and Tail Factor)

VISUAL of INDEMNITY

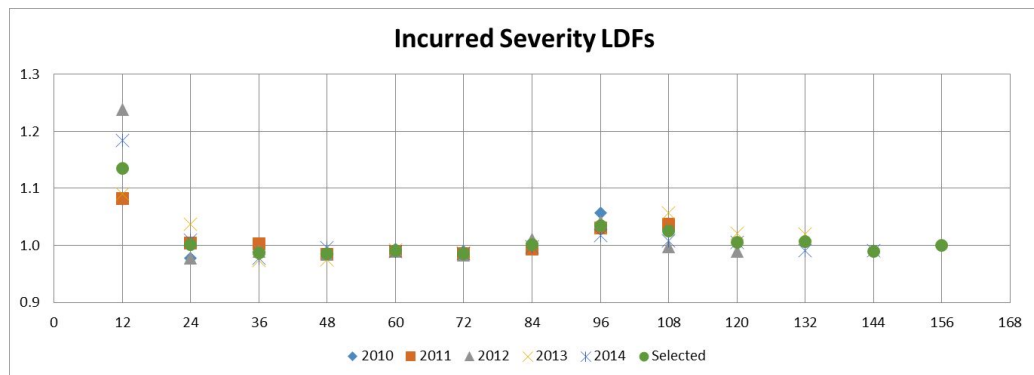


VISUAL of MEDICAL

Direct Accident Year Case Reported Loss Development Factors													
MEDICAL Reported SEVERITY													
Accident Year	12	24	36	48	60	72	84	96	108	120	132	144	156
2003								15,682	16,581	17,204	17,017	17,359	17,187
2004							17,644	17,714	18,255	18,210	18,602	18,441	
2005						18,057	17,858	17,751	18,490	19,547	19,640		
2006					20,408	20,285	19,981	20,201	20,807	20,958			
2007				22,426	22,112	21,868	21,497	21,432	21,793				
2008			22,782	22,535	22,175	21,953	21,667	21,602					
2009		25,238	24,684	24,758	24,362	24,167	23,829						
2010	24,141	26,076	26,172	25,911	25,263	24,991							
2011	24,608	26,642	26,031	25,354	25,252								
2012	24,143	29,904	30,997	30,317									
2013	24,376	26,568	26,817										
2014	24,407	28,908											
2015	26,050												

Indemnity
incurred severity
from previous
slide →

Accident Year	12	24	36	48
2003				
2004				
2005				
2006				
2007				19,381
2008			19,830	20,425
2009		20,400	21,905	22,628
2010	17,156	19,728	21,569	22,324
2011	16,974	19,905	21,538	22,141
2012	15,847	21,276	23,892	24,716
2013	15,857	18,868	21,328	
2014	14,873	19,900		
2015	16,948			



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Compare Indemnity and Medical

	Direct Accident Year Case Incurred Loss Development Factors												Direct Accident Year Case Reported Loss Development Factors													
	INDEMNITY INCURRED SEVERITY												MEDICAL Reported SEVERITY													
Accident Year	12	24	36	48	60	72	84	96	108	120	132	144	Accident Year	12	24	36	48	60	72	84	96	108	120	132	144	156
2003								16,205	16,522	16,680	16,364	16,678	2003								15,682	16,581	17,204	17,017	17,359	17,187
2004							16,598	16,481	17,259	17,426	17,865	17,717	2004							17,644	17,714	18,255	18,210	18,602	18,441	
2005						17,463	17,324	17,289	17,176	17,525	17,421		2005						18,057	17,858	17,751	18,490	19,547	19,640		
2006					18,347	18,182	17,945	17,999	18,115	17,933			2006					20,408	20,285	19,981	20,201	20,807	20,958			
2007				19,381	19,400	19,303	19,361	19,167	19,062				2007				22,426	22,112	21,868	21,497	21,432	21,793				
2008			19,830	20,425	20,506	20,363	20,322	20,119					2008			22,782	22,535	22,175	21,953	21,667	21,602					
2009		20,400	21,905	22,628	22,537	22,425	22,335						2009		25,238	24,684	24,758	24,362	24,167	23,829						
2010	17,156	19,728	21,569	22,324	22,235	22,279							2010	24,141	26,076	26,172	25,911	25,263	24,991							
2011	16,974	19,905	21,538	22,141	22,341								2011	24,608	26,642	26,031	25,354	25,252								
2012	15,847	21,276	23,892	24,716									2012	24,143	29,904	30,997	30,317									
2013	15,857	18,868	21,328										2013	24,376	26,568	26,817										
2014	14,873	19,900											2014	24,407	28,908											
2015	16,948												2015	26,050												
	Direct Accident Year Paid Loss Development Factors												Direct Accident Year Paid Loss Development Factors													
	INDEMNITY PAID SEVERITY												MEDICAL PAID SEVERITY													
Accident Year	12	24	36	48	60	72	84	96	108	120	132	144	Accident Year	12	24	36	48	60	72	84	84	84	84	84	84	96
2003								15,304	15,694	16,054	16,054	1	2003								14,906	15,490	16,057	16,224	16,769	17,187
2004							15,454	15,686	16,272	16,505	17,089	1	2004							16,650	16,700	17,139	17,197	17,634	17,814	
2005						15,390	15,852	16,201	16,257	16,686	16,878		2005						16,976	17,061	17,146	17,471	18,208	18,672		
2006					14,759	15,645	16,145	16,549	16,939	17,124			2006					18,522	18,818	18,931	19,082	19,488	19,656			
2007				14,137	15,763	16,803	17,475	17,772	17,980				2007				19,480	19,909	20,088	20,148	20,209	20,530				
2008			12,367	14,917	16,960	17,927	18,465	18,742					2008			18,898	19,728	20,142	20,303	20,425	20,507					
2009		9,148	13,479	16,660	18,626	19,762	20,295						2009		19,359	21,147	21,971	22,323	22,457	22,502						
2010	3,801	8,804	13,442	16,533	18,468	19,576							2010	11,838	19,743	21,740	22,632	22,971	23,178							
2011	3,799	8,907	13,387	16,546	18,449								2011	11,977	20,093	21,761	22,566	22,972								
2012	3,380	10,037	15,301	18,921									2012	11,963	22,275	24,794	27,142									
2013	3,464	8,841	13,342										2013	11,838	20,538	22,488										
2014	3,545	9,030											2014	12,718	21,952											
2015	3,800												2015	12,954												

Conclusion for Indemnity and Medical

Future Estimation: Inflation? Long-term vs Short-term?





THANK YOU !!!

