



Is a Faulty Formula Wasting California's Cash?



Xueyin Bai, Michael Ieputra, Charles Tuan

Faculty Advisor: Janet Duncan, Company Sponsor: John Alltop

Department of Statistics and Applied Probability, University of California, Santa Barbara

Introduction

- California has the largest workers compensation self-insurance program in the nation.
- Most of California's public entities must obtain self-insured certificates from the California Office of Self-Insurance Plans (OSIP) (UC and CSU systems, fire, and school districts, local counties).
- As of June 30th, 2015, there are roughly 3,500 individual organizations certified with OSIP. OSIP requires each individual certified entity to set aside a reserve fund.
- The reserving methodology to determine reserves for Future Medical Payments: $FM Reserve = Average\ of\ last\ 3\ years' medical\ payments \times life\ expectancy\ of\ the\ claimant$
- This reserving methodology potentially overestimates the expected ultimate losses results in unused reserving funds that end up in a perpetual loop.
- With a more efficient methodology, the extra reserving funds could be used in other areas that require capital

Workers Compensation

- Workers compensation is no-fault insurance and a state-mandated program protected under legislation in which employers compensate said employer financially. In exchange, employees give up the right to sue their employer.
- Generally, workers compensation includes four types of benefits¹: Medical care benefits, which represents 55% of the workers compensation claims by amount. Workers compensation normally provides unlimited funds for medical care.
- Disability income benefits payable to the worker after a waiting period of 3 to 7 days, which can be classified as below.

	Partial	Total
Temporary	Temporary partial	Temporary total
Permanent	Permanent partial	Permanent total

 - Temporary means the injury will not last forever.
 - Permanent indicates a lifelong disability.
 - Partial determines an employee who is injured but is still able to work.
 - Total indicates an injury so severe the employee is unable to work
- Death benefits including a burial allowance plus cash-income payments to any eligible surviving dependents.
- Rehabilitation services and benefits including vocational evaluation and training.

Data

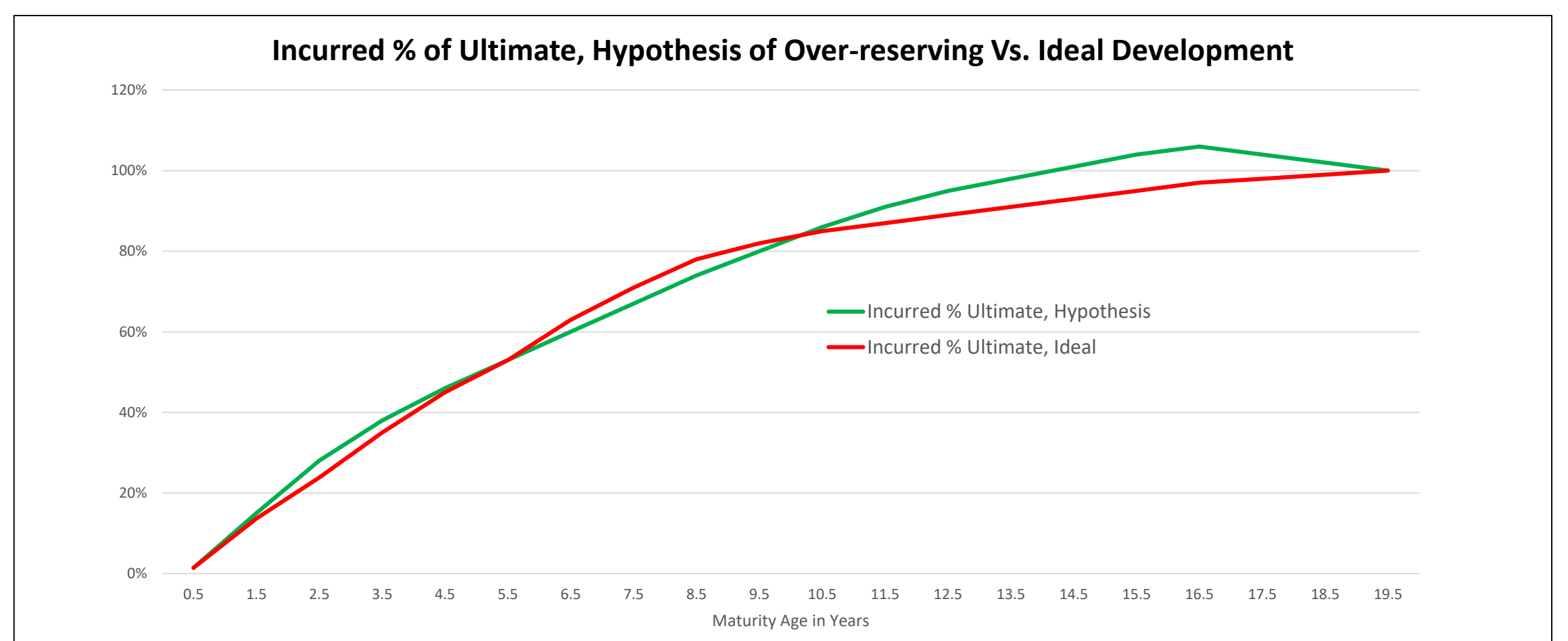
- Detailed loss runs for 28 OSIP members which are part of the CSAC Excess Insurance Authority (EIA).
- The EIA members follow the same methodology in terms of Future Medical Reserving.
- The data consisted of all workers compensation claims from 1995 to 2016 and a partial history from 1976 to 1995. The information gathered may have inconsistencies
- Each individual public entity may have their own unique information recorded and their own procedure when entering workers compensation claims into their records. This created the challenge of organizing the data in a manageable manner.
- The sheer size of the dataset, roughly 1.1 million entries, caused issues when working in Excel.
- The most important thing is research being conducted purely looks at the PD claims.

Method

The main method for our project is an actuary method loss development method.

A loss development triangle is a unique way of arranging the annual loss evaluations for past policy periods. By uniquely arranging the past annual loss evaluations, the change in losses from one evaluation year to the next can be analyzed. A loss development triangle is crucial to find a pattern in the development of paid and incurred medical throughout the years.

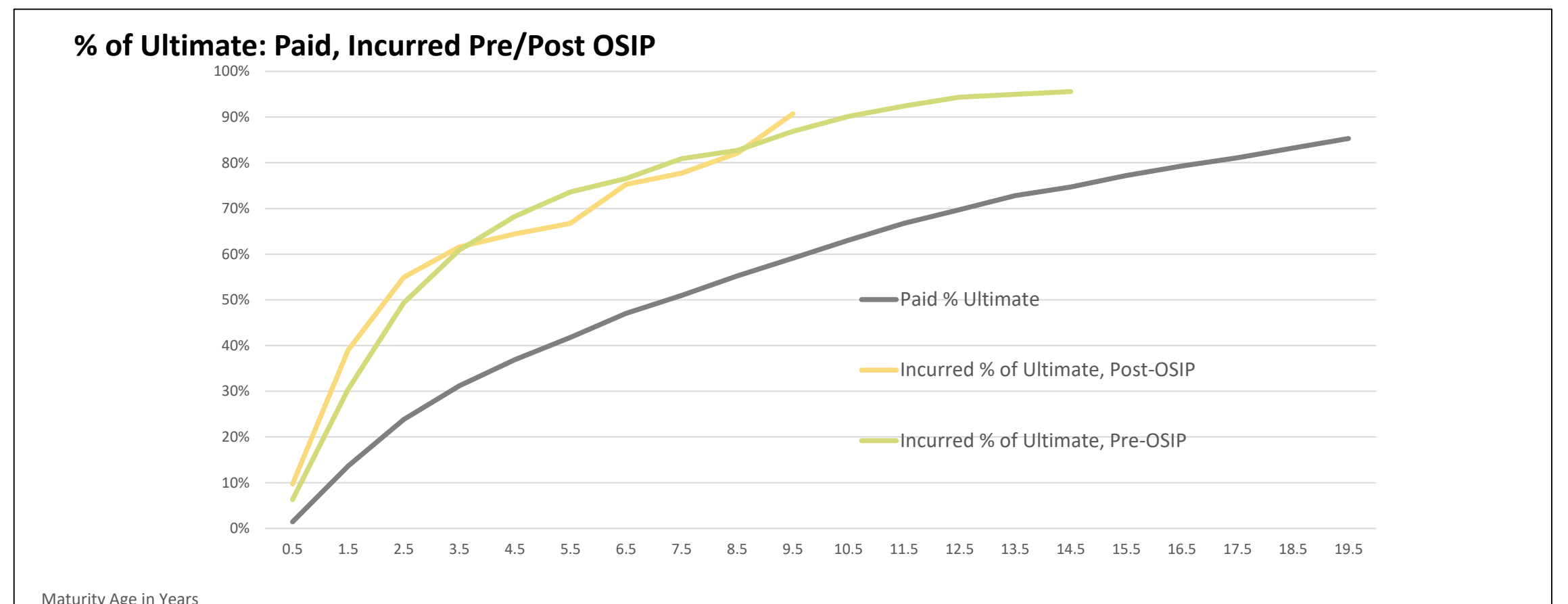
The two loss development triangle are constructed for both paid losses and Incurred loss. Then derive the link ratio for both paid and incurred losses. We use the paid data, which is more reliable due to unaffected by the reserving methodology, to estimate a pattern to testify the incurred losses. The incurred losses are divided into two portion, one is from pre-OSIP methodology which is data before 2003, one is Post-OSIP portion which is from 2007 to now.



Results

- Due to the OSIP formula being introduced in 2003 but not fully implemented until roughly 2006 or 2007, we decided to split the incurred data into "Pre-OSIP" (orange line) and "Post-OSIP" (blue line). This helps in distinguishing claims that are affected by the OSIP formula and those that are either not affected or partially affected. The Pre-OSIP incurred data develops as expected, with the claims almost hitting 100% of the ultimate. Within this line, there are dips at 6.5 years and 8.5 years. However, these are inconsequential as the development overall is consistent. On the other hand, the blue Post-OSIP data has significantly larger drops and spikes. This data also develops slightly quicker than the Pre-OSIP data. While the Post-OSIP data has erratic characteristics, we cannot attribute this to the OSIP formula. The claims in the Post-OSIP group are still too young to solidify any conclusions. However, monitoring Figure 5 over the next several years will provide insight into the behavior of the Post-OSIP claims.

- Table summarizes the difference in distribution and over-reservation for both claims aged < 3 years and claims aged > 3 years. As we can see from the summary, claims aged > 3 years seem to have a higher average over-reservation in the middle to high tiers. For that reason, we need to pay closer attention to these highlighted severity tiers, since the next five to ten years of their progress can tell us a lot about the OSIP formula and whether it over estimates the medical claim cost.



Discussion

Unfortunately, there is a relative lack of claims young enough to be affected by the OSIP formula. This can be seen in the ultimate graphs. However, we are able make some insights about the effectiveness of the formula. In observing the severity tiers, we recommend specifically looking at the development of claims that fall in the highlighted severity range of figure 14. Overall, in order to be confident in whether or not the OSIP formula causes over-reserving, we would require at least 3 to 5 more years of data.

Severity Tiers	< 3 Years			> 3 Years		
	Distribution	Difference between Max Incurred and Final Paid	Average Difference Per Claim	Distribution	Difference between Max Incurred and Final Paid	Average Difference Per Claim
\$500-\$5k	28%	\$ 6,880,122	\$ 11,681	8%	\$ 1,384,709	\$ 13,576
\$5k-\$10k	23%	\$ 7,499,353	\$ 15,956	14%	\$ 3,802,824	\$ 21,730
\$10k-\$20k	27%	\$ 10,377,833	\$ 18,239	26%	\$ 8,403,899	\$ 26,018
\$20k-\$50k	17%	\$ 9,880,237	\$ 27,144	30%	\$ 15,662,148	\$ 41,990
\$50k-\$100k	3%	\$ 3,645,675	\$ 50,634	15%	\$ 12,687,388	\$ 66,776
\$100k-\$250k	1%	\$ 1,886,001	\$ 94,300	6%	\$ 9,980,557	\$ 134,872
\$250k-\$2M	0%	\$ 5,421,436	\$ 1,355,359	2%	\$ 3,533,230	\$ 168,249
TOTAL	100%	\$ 45,590,657	\$ 21,835	100%	\$ 55,454,753	\$ 44,082

Literature Cited

Brown, Robert L., and W. Scott. Lennox. *Introduction to Ratemaking and Loss Reserving for Property and Casualty Insurance*. Winsted, CT: ACTEX Publications, 2015. 39-40

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For further information

Please contact mikeieputra@gmail.com, jessica951116@163.com or charlestuan74@gmail.com. More information about this and related projects is available at: general.lab.website.