Underinsured Motorist Coverage Pricing Models

By Gary Grant

UNDERINSURED MOTORIST COVERAGE

PRICING MODELS

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Underinsured Motorist Coverage enables a person to have coverage for bodily injury in the event they are injured by an individual with liability limits inadequate to cover the damages. As recently as 15 years ago, Underinsured Motorist Coverage was relatively unknown. Now, 41 jurisdictions require some form of the coverage.

There are two basic types of coverage -- a difference in limits form of coverage that simply provides a limit of liability that is the difference between the underinsured coverage limit of liability and the tort-feasor's Bodily Injury liability limit. The second form is an excess form of coverage which provides a layer of coverage on top of the Bodily Injury liability limits of the tort-feasor. The two components that define the type of coverage are (1) when the coverage shall be provided or the "trigger" and (2) the limit of liability.

Underinsured Motorist Coverage is a long tail, low frequency, high average cost coverage for which little data is available for pricing. Depending on the form of coverage, the claim frequency can be as low as 1% of the BI liability frequency whereas the average cost may equal 5 to 6 times the BI liability average cost. The purchaser of Underinsured Motorist Coverage essentially buys a portion of the BI liability coverage for the tort-feasor. With this in mind, one approach to pricing the coverage is to use the BI liability coverage data. Individual company data may be used to determine the rates. However, since the tort-feasor could be anyone from the insured population, industry data may be more appropriate.

In the models that follow, the information needed to price the Underinsured Motorist Coverage is (1) the indicated BI liability rates, (2) the percent of the uninsured population, (3) the BI limits factors and (4) the BI limits distribution. For this type of information, industry data is at best difficult and in some cases impossible to obtain. It is generally necessary to use company data or a mixture of company and industry data. For example, the All Industry Research Advisory Committee study included bodily injury limits distributions. One option could be to use this distribution along with the available company data.

Following are four pricing models ranging from a simple difference in limits form of coverage to a rather complicated excess form of coverage. For each model, that portion of the law that defines the coverage is also shown. (It should be noted that these are not the only forms of coverage available. A careful reading of the law to determine the "trigger" and the limit of liability is necessary to determine the form of coverage.) I've chosen to show the Underinsured Motorist Coverage price in terms of dollars and cents rather than as a factor applied to some base premium. Either approach could be used.

UNDERINSURED MOTORIST COVERAGE LAWS
Standard Difference in Limits Model

Situation That Triggers The Coverage:

". . .Where the limits of coverage available for payment to the insured under all bodily injury liability bonds and insurance policies covering persons liable to the insured are less than the limits for the insured's uninsured (underinsured) motorists coverage at the time of the accident."

Limits of Liability

"The limits of liability for an insurer providing underinsured motorist coverage shall be the limits of such coverage, less those amounts actually recovered under all applicable bodily injury liability bonds and insurance policies covering persons liable to the insured."

UNDERINSURED MOTORIST COVERAGE PRICING
STANDARD DIFFERENCE IN LIMITS MODEL

Assume: 10% uninsured
Indicated 15/30 BI Rate = $50

(1) UIM Limit	(2) Industry BI Limits Dist.	(3) BI Limits Factors	(4) Average Limit Factor For Tortfeasor w/ Lower Limit	(5) Relative UIM Exposure	(6) Relative Average Cost	(7) Expo x Cost	(8) Indicated Additive
15/30	30%	1.00	0.000	.00	1.000	.000	$ 0.00
20/40	5	1.10	1.000	.30	.100	.030	1.35
25/50	20	1.20	1.014	.35	.186	.065	2.93
50/100	20	1.40	1.082	.55	.318	.175	7.88
100/300	25	1.60	1.167	.75	.433	.325	14.63

(4) = Average of Col (2) x Col (3) for all Lower Limits
(5) = Sum of Col (2) for all Lower Limits
(6) = Col (3)–Col (4)
(7) = Col (5) x Col (6)
(8) = Col (7) x Indicated BI Rate x (1–% Uninsured)

UNDERINSURED MOTORIST COVERAGE LAWS
Standard Excess Coverage Model

Situation That Triggers The Coverage:

". . .(When) an injured person . . . agrees to settle a claim with a liability insurer and its insured for the limits of liability, and such settlement would not fully satisfy the claim for personal injuries or wrongful death. . ."

Limits of Liability:

". . .And (uninsured motorist coverage) shall cover the difference, if any, between the sum of (all benefits available) and the damages sustained, up to the maximum amount of such coverage provided under this section. The amount of coverage available under this section shall not be reduced by a setoff against any coverage, including liability insurance."

UNDERINSURED MOTORIST COVERAGE PRICING
STANDARD EXCESS COVERAGE MODEL

Assume: 10% uninsured
Indicated 15/30 BI Rate = $50

(1)	(2) TORTFEASOR'S BI LIMIT AND DISTRIBUTION						(3)	(4)
	BI Limit:	15/30	20/40	25/50	50/100	100/300		
UIM	BI Lim Factor:	1.00	1.10	1.20	1.40	1.60	Weighted	Indicated
Limit	Ind. BI Dist:	30%	5%	20%	20%	25%	Average	Additive
15/30	Total Limit	30/60	35/70	40/80	65/130	115/330		
	BI Factor	1.25	1.30	1.35	1.45	1.65		
	Excess Cost	.25	.20	.15	.05	.05	.138	$ 6.21
20/40	Total Limit	35/70	40/80	45/90	70/140	120/340		
	BI Factor	1.30	1.35	1.35	1.50	1.65		
	Excess Cost	.30	.25	.15	.10	.05	.165	7.42
25/50	Total Limit	40/80	45/90	50/100	75/150	125/350		
	BI Factor	1.35	1.35	1.40	1.50	1.65		
	Excess Cost	.35	.25	.20	.10	.05	.190	8.55
50/100	Total Limit	65/130	70/140	75/150	100/200	150/400		
	BI Factor	1.45	1.50	1.50	1.60	1.70		
	Excess Cost	.45	.40	.30	.20	.10	.280	12.60
100/300	Total Limit	115/330	120/340	125/350	150/400	200/600		
	BI Factor	1.65	1.65	1.65	1.70	1.80		
	Excess Cost	.65	.55	.45	.30	.20	.423	19.04

(2) Ind. BI Dist = Industry BI Distribution
Total Limit = UIM Limit + Tortfeasor's BI Limit
Excess Cost = BI Factor–Tortfeasor's BI Limit Factor
(3) = Industry BI Distribution x Excess Cost
(4) = Col (3) x Indicated BI Rate x (1–% Uninsured)

UNDERINSURED MOTORIST COVERAGE LAWS
Special Excess Limits Model #1

Situation That Triggers The Coverage:

"An underinsured motor vehicle is one for which there may be bodily injury liability in effect, but the limits of bodily injury liability coverage under all bonds and insurance policies applicable at the time of the accident total less than the limits provided by the uninsured (underinsured) motorist coverage."

Limits of Liability:

"Acceptance of (higher limits uninsured and underinsured motorist) coverage shall operate to amend the policy's uninsured coverage to pay for bodily injury damage that the insured or his legal representative are legally entitled to recover from the driver of an underinsured motor vehicle."

UNDERINSURED MOTORIST COVERAGE PRICING
SPECIAL EXCESS COVERAGE MODEL #1

Assume: 10% uninsured
Indicated 15/30 BI Rate = $50

(1) UIM Limit	(2) Industry BI Limits Dist.	(3) BI Limits Factors	(4) Ave. Limit Factor For Tortfeasor w/ Lower Lim.	(5) Relative UIM Exposure	(6) Ave. Tot. Limits Factor	(7) Relative Average Cost	(8) Expo. x Cost	(9) Indicated Additive
15/30	30%	1.00	.000	.000	0.000	0.000	.000	$ 0.00
20/40	5	1.10	1.000	.300	1.300	.300	.090	4.05
25/50	20	1.20	1.014	.350	1.350	.336	.118	5.31
50/100	20	1.40	1.082	.550	1.473	.391	.215	9.68
100/300	25	1.60	1.167	.750	1.663	.496	.372	16.74

(4) = Average of Col (2) x Col (3) for all Lower Limits
(5) = Sum of Col (2) for all Lower Limits
(6) = Average Limit Factor for Sum of UIM Limit and all Lower Limits.
This is developed on the next exhibit.
(7) = Col (6)−Col (4)
(8) = Col (7) x Col (5)
(9) = Col (8) x Indicidated BI Rate x (1−% Uninsured)

UNDERINSURED MOTORIST COVERAGE PRICING
SPECIAL EXCESS MODEL #1
AVERAGE TOTAL LIMITS FACTOR

(1)	(6A)						(6)
	TORTFEASOR'S LIMIT AND DISTRIBUTION						
UIM Limit	BI Limit Industry BI Dist:	15/30 30%	20/40 5%	25/50 20%	50/100 20%	100/300 25%	Ave. Total Limits Factor
15/30	Total Limit	N/A	N/A	N/A	N/A	N/A	
	BI Factor						0.000
20/40	Total Limit	35/70	N/A	N/A	N/A	N/A	
	BI Factor	1.30					1.300
25/50	Total Limit	40/80	45/90	N/A	N/A	N/A	
	BI Factor	1.35	1.35				1.350
50/100	Total Limit	65/130	70/140	75/150	N/A	N/A	
	BI Factor	1.45	1.50	1.50			1.473
100/300	Total Limit	115/330	120/340	125/350	150/400	N/A	
	BI Factor	1.65	1.65	1.65	1.70		1.663

(6A) Total Limit = UIM Limit + Tortfeasor's BI Limit when UIM Limit is less than Tortfeasor's BI Limit.

(6) = Weighted Average of BI Factors and Industry BI Distribution.

UNDERINSURED MOTORIST COVERAGE LAWS
Special Excess Coverage Model #2

Situation That Triggers The Coverage:

"(Underinsured) motorists insurance shall provide coverage. . . if the limits of liability under all bodily injury liability bonds and insurance policies of another motor vehicle liable for damages are in a lesser amount than the bodily injury liability insurance limits of coverage provided by such policy."

Limits of Liability:

"Any such policy shall, at the option of the insured, also provide (underinsured) motorists insurance for bodily injury, in an amount up to the bodily injury liability insurance limits of coverage provided under such policy, subject to a maximum of (100/300)."

UNDERINSURED MOTORIST COVERAGE PRICING
SPECIAL EXCESS COVERAGE MODEL #2

Assume: 10% uninsured
Indicated 15/30 BI Rate = $50

(1)	(2) TORTFEASOR'S LIMIT						(4)	(5)
	BI Limit:	15/30	20/40	25/50	50/100	100/300	Average	
UIM	BI Lim Factor:	1.00	1.10	1.20	1.40	1.60	Cost X	Indicated
Limit	Ind. BI Dist:	30 %	05 %	20 %	20 %	25 %	Exposure	Additive
15/30	Total Limit	30/60	35/70	40/80	65/130	115/330	.108	$ 4.86
	BI Factor	1.25	1.30	1.35	1.45	1.65		
	Excess Cost	.25	.20	.15	.05	.05		
20/40	Total Limit	35/70	40/80	45/90	70/140	120/340	.137	6.17
	BI Factor	1.30	1.35	1.35	1.50	1.65		
	Excess Cost	.30	.25	.15	.10	.05		
25/50	Total Limit	40/80	45/90	50/100	75/150	125/350	.162	7.29
	BI Factor	1.35	1.35	1.40	1.50	1.65		
	Excess Cost	.35	.25	.20	.10	.05		
50/100	Total Limit	65/130	70/140	75/150	100/200	150/400	.242	10.89
	BI Factor	1.45	1.50	1.50	1.60	1.70		
	Excess Cost	.45	.40	.30	.20	.10		
100/300	Total Limit	115/330	120/340	125/350	150/400	200/600	.373	16.79
	BI Factor	1.65	1.65	1.65	1.70	1.80		
	Excess Cost	.65	.55	.45	.30	.20		

(2) Excess Cost = BI Factor–Tortfeasor's BI Limit Factor
(4) See Col (3) on next exhibit for calculation
(5) Col (4) x Indicated BI Rate x (1–% Uninsured)

UNDERINSURED MOTORIST COVERAGE PRICING
SPECIAL EXCESS COVERAGE MODEL #2
CALCULATION OF AVERAGE COST X EXPOSURE

(1)	(3) SELECTED BI LIMIT AND DISTRIBUTION						(4)
UIM Limit	BI Limit Co. BI Dist.	15/30 5%	20/40 5%	25/50 15%	50/100 25%	100/300 50%	Weighted Average
15/30		.000	.075	.085	.115	.125	.108
20/40		N/A	.090	.103	.133	.153	.137
25/50		N/A	N/A	.118	.158	.178	.162
50/100		N/A	N/A	N/A	.215	.255	.242
100/300		N/A	N/A	N/A	N/A	.373	.373

(3) BI Limit = BI Limit of Injured Party
Co. BI Dist. = BI Limits Distribution of Injured Party's Company
= Sum of: (Col (2) Excess Cost x Col (2) Industry BI Dist.) where Tortfeasor's Limit is less than Selected BI Limits

(4) = Weighted Average of each row with ~~selected~~ Co. BI Distribution

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FROM THE CASUALTY ACTUARIAL SOCIETY TEXTBOOK

The Textbook Steering Committee and individual authors have been in the process of drafting chapters for the Casualty Actuarial Society Textbook. We currently have in process a number of chapters. We expect that we will complete work on this during fiscal 1988.

In this issue of the CAS Forum, we are publishing the draft of the chapter on Credibility. This provides an opportunity to our membership to give the author comments on the chapter. It also provides an opportunity to get an idea of the level of material that will be in the Casualty Actuarial Society Textbook. We encourage you to provide substantive comments on the chapter to Gary Venter and format and other comments regarding the textbook to Irene Bass, Chairman of the Textbook Steering Committee.