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Consultants and Actuaries

Do the Math! An Actuarial View of Underwriting

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Topics

- The Cost of Being *Wrong*
- Underwriting Wear-off
- Making Refined Decisions

Opportunities to Miss

- Accept applicant who will claim early
- Decline someone who never claims
- Accept applicant that becomes a long claim
- Place in “wrong” risk class

A few Actuarial Basics

- Product pricing includes a three-part morbidity assumption
  - Frequency of claim
  - Dollars spent while on claim
  - Length of claim/stay (LOS)

  Referred to together as the “claim cost”
- Data is limited and “piece-meal”

Underwriting Impact

- Delay / eliminate claims → affects frequency
- Eliminate long claims → affects length of claim

Claims / 1000 for IA 62

Duration	"Ultimate" Frequency	"Tight" Underwriting
1	1.7	.4
2	1.9	.7
3	2.1	1.0
5	2.8	1.7
9	4.9	4.3
10	5.7	5.2
15	15.7	15.7
Premium	$ 2,092	$ 2,005

If Miss in Year 1

Duration	Original Underwriting	One Extra	Two Extra
1	.4	1.4	2.4
2	.7	.7	.7
3	1.0	1.0	1.0
5	1.7	1.7	1.7
9	4.3	4.3	4.3
10	5.2	5.2	5.2
15	15.7	15.7	15.7
Premium	$ 2,005	$ 2,022	$2,039

If Miss in Years 1 to 5

Duration	Original Underwriting	One Extra
1	.4	1.4
2	.7	1.7
3	1.0	2.0
4	1.4	2.4
5	1.7	2.7
9	4.3	4.3
10	5.2	5.2
Premium	$ 2,005	$ 2,063

“Make Up” for Miss

Can’t just be “right” to return to 18% IRR, must be BETTER than original frequency

“Make Up” Frequency

Duration	Original Underwriting	One Extra	“Make-up Frequency
1	.4	1.4	.2
2	.7	.7	.4
3	1.0	1.0	.7
4	1.4	1.4	1.1
5	1.7	1.7	1.4
9	4.3	4.3	4.3
		1 Extra	1.4 Fewer
Profit IRR	18.0%	17.5%	18.5%

Decline an Acceptable Risk

- Underwriting expense is incurred
- Slower growth to critical mass
- Opportunity cost

Accepting a "Long" Claim

Month on Claim	Original Continuance	With an Extra "Long" Claim
0	1,000	1,000
1	837	837
6	591	591
12	431	431
36	202	203
120	22	23
Average LOS	810	843

Risk Class Premium

- $2,005 is a “composite” premium
  - Assume have Standard & Preferred
  - 30% Issued Preferred w/ 20% discount

30% * 80% Std + 70% * Std = $2,005

Standard Rate = $ 2,133

Preferred Rate = $ 1,706

Impact of Misclassification

- Assume issue 1,000 lives
  - – 710 are Standard risk
  - – 290 are Preferred risk
- Misclassify 10 of Standard
  - – 700 classified as Standard
  - – 300 classified as Preferred

→ Premium Impact = $ 312,000 (.8%)

Underwriting Intensity

- Loose
- Moderate
- Tight

Sample Selection Factors

Duration	Loose	Moderate	Tight
1	.40	.30	.22
2	.60	.40	.36
3	.80	.50	.47
4	1.10	.60	.56
5	1.25	.80	.61
6	1.35	.90	.74
7	1.45	.95	.79
8	1.50	.98	.83
9	1.50	1.00	.87
15	1.50	1.00	1.00

Does Selection Wear Off?

Duration	Loose	Moderate	Tight
1	.40	.30	.22
2	.60	.40	.36
3	.80	.50	.47
4	1.10	.60	.56
5	1.25	.80	.61
6	1.35	.90	.74
7	1.45	.95	.79
8	1.50	.98	.83
9	1.50	1.00	.87
15	1.50	1.00	1.00

Refinements

- Making refined decisions
- Challenge – need better data
- Impact on risk classification