

**Boire Filler Group**



# Case Study Library

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## Property & Casualty Insurance Claims Risk Scoring Model

**Date:** March 2009

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## Company profile

This Company offers Home and Auto insurance products to Members of a national consumer advocacy organization.

## Business challenge/situation

In recent years, this Client's Home insurance portfolio had become unprofitable. Simply "raising rates" was not feasible due to the loss of market share that would result in this highly competitive industry and the negative impact that such a move would have on the Company's relationship with existing Members. The Client needed to offer competitive prices *and* improve rating accuracy to ensure that the rates it charges were better matched to the risk it was insuring.

Management had become aware that a number of its competitors had evolved Property insurance pricing beyond traditional actuarial rating factors and engaged Boire Filler Group to explore a new rating methodology.

## Solution

The solution proposed to meet this challenge was the development of a "Claims Risk Scoring" model that calculated a score representing the claim loss amount that could be expected for each individual Homeowners policy in the portfolio. Table 1 below summarizes the results produced in a validation of the model. The higher the score, the higher the expected losses:

**Table 1 – Policies Ranked by Score**

% of Policies in Interval	Minimum Score in Interval	Loss Ratio	Total Actual Claims	% of Total Claims	Avg. Claim Amount /Policy	Total Actual Premium	% of Premium	Average Premium /Policy	# of Policies
0-10%	558	182%	\$ 3,248,103	29.5%	\$ 1,443	\$ 1,782,745	12.57	\$ 792	2,251
10%-20%	346	90%	\$ 1,768,070	16.1%	\$ 785	\$ 1,955,297	13.79	\$ 869	2,251
20%-30%	257	46%	\$ 817,679	7.4%	\$ 363	\$ 1,772,540	12.50	\$ 787	2,252
30%-40%	202	50%	\$ 760,028	6.9%	\$ 338	\$ 1,523,112	10.74	\$ 677	2,251
40%-50%	165	97%	\$ 1,339,332	12.2%	\$ 595	\$ 1,383,804	9.76	\$ 614	2,252
50%-60%	135	45%	\$ 573,105	5.2%	\$ 255	\$ 1,277,064	9.01	\$ 567	2,251
60%-70%	107	86%	\$ 1,039,309	9.4%	\$ 462	\$ 1,208,199	8.52	\$ 537	2,251
70%-80%	75	69%	\$ 800,518	7.3%	\$ 355	\$ 1,163,440	8.20	\$ 517	2,252
80%-90%	33	27%	\$ 300,981	2.7%	\$ 134	\$ 1,112,399	7.84	\$ 494	2,251
90%-100%	0	36%	\$ 361,581	3.3%	\$ 161	\$ 1,001,149	7.06	\$ 445	2,252
		78%	\$ 11,008,706	100.0%	\$ 489	\$ 14,179,751	100.0	\$ 630	22,514

The model was able to predict nearly 53% of the portfolio's total losses among only 30% of the policies. At the same time, there is a close relationship between each policy's score and the losses it produces (see "Loss Ratio" – claim losses as a percentage of collected premium).

**Table 2 – Policies Ranked by Premium**

% of Policies in Interval	Avg Premium /Policy in Interval	Loss Ratio	Total Claim Amount	% of Total Claim Amount	Avg Claim Amount /Policy	% of Premium in Interval	# of Policies in Interval
0-10%	\$ 1,370	79%	\$ 2,426,353	22.04%	\$ 1,078	21.75	2,251
10%-20%	\$ 848	60%	\$ 1,138,691	10.34%	\$ 506	13.47	2,251
20%-30%	\$ 716	64%	\$ 1,036,235	9.41%	\$ 460	11.37	2,252
30%-40%	\$ 636	67%	\$ 958,453	8.71%	\$ 426	10.09	2,251
40%-50%	\$ 580	102%	\$ 1,326,270	12.05%	\$ 589	9.20	2,252
50%-60%	\$ 531	78%	\$ 936,484	8.51%	\$ 416	8.42	2,251
60%-70%	\$ 485	55%	\$ 605,451	5.50%	\$ 269	7.70	2,251
70%-80%	\$ 441	91%	\$ 908,434	8.25%	\$ 403	7.01	2,252
80%-90%	\$ 392	107%	\$ 941,256	8.55%	\$ 418	6.22	2,251
90%-100%	\$ 300	108%	\$ 731,067	6.64%	\$ 325	4.76	2,252
	\$ 630	78%	\$ 11,008,694	100.0%	\$ 489	100.0	22,514

When the policies are ranked by the premium currently being charged for the policy (Table 2 above), only 41% of claim losses are identified in the top 30% of policies, and there is much less consistency between the losses being incurred by each policy in relation to the premium being charged (see Loss Ratio column).

The Claim Risk Model was a more accurate predictor of the claim losses that would be incurred on each policy.

### Key Benefits

- Improved pricing accuracy
  - Assign rates that more accurately match the risk
  - Ability to out-select competitors
- Improved the effectiveness of underwriting activities
  - Better assignment of underwriting resources
    - Use scores to determine which policies to underwrite/re-underwrite
    - Use scores to determine the intensity of underwriting efforts for each policies
      - What reports to order?
      - How much time should be allocated to each policy
- Improve the efficiency of marketing efforts
  - Use scoring to identify the profile/characteristics of profitable business segments
    - New business acquisition
    - Renewal communications
    - Up-selling/Cross-Selling efforts