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# Small Business Insurance Product Management

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CAS Seminar on Predictive Modeling  
October 4-5, 2006



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# BOP Market Dynamics

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# Traditional BOP Rating Features

- Large, traditional territory definitions
- Clustering of occupations
- Clustering of fire protection classes
- Simple approach to amount of insurance (AOI)
- Significant U/W discretion (Schedule credits)
- Bundled (composite) class rate

# Businessowners Problems

- Market has disagreed on:
  - Which classes to cluster/target
  - Construction relativities
  - Territory definitions
  - Occupancy factors (Malls, Single Occupancies, Multiple Occupancies w/ Restaurants)
- Lots of information gathered on application, but not incorporated into rating
- **U/W Tiers & Schedule Credits Overwhelm Manual Rating**

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# Current BOP Dynamics

- Enhanced Rating Plan Accuracy
  - Territory Definitions
  - Class Factors
  - By Peril Rating
- Improved U/W Scoring/Tiering
  - Greater Use of Credit
  - Other “Who” Characteristics
- Changes in Evaluating “Competitiveness”

**THIS IS NOT A TEST! IT'S HERE. NOW.**

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# BOP Enhancements

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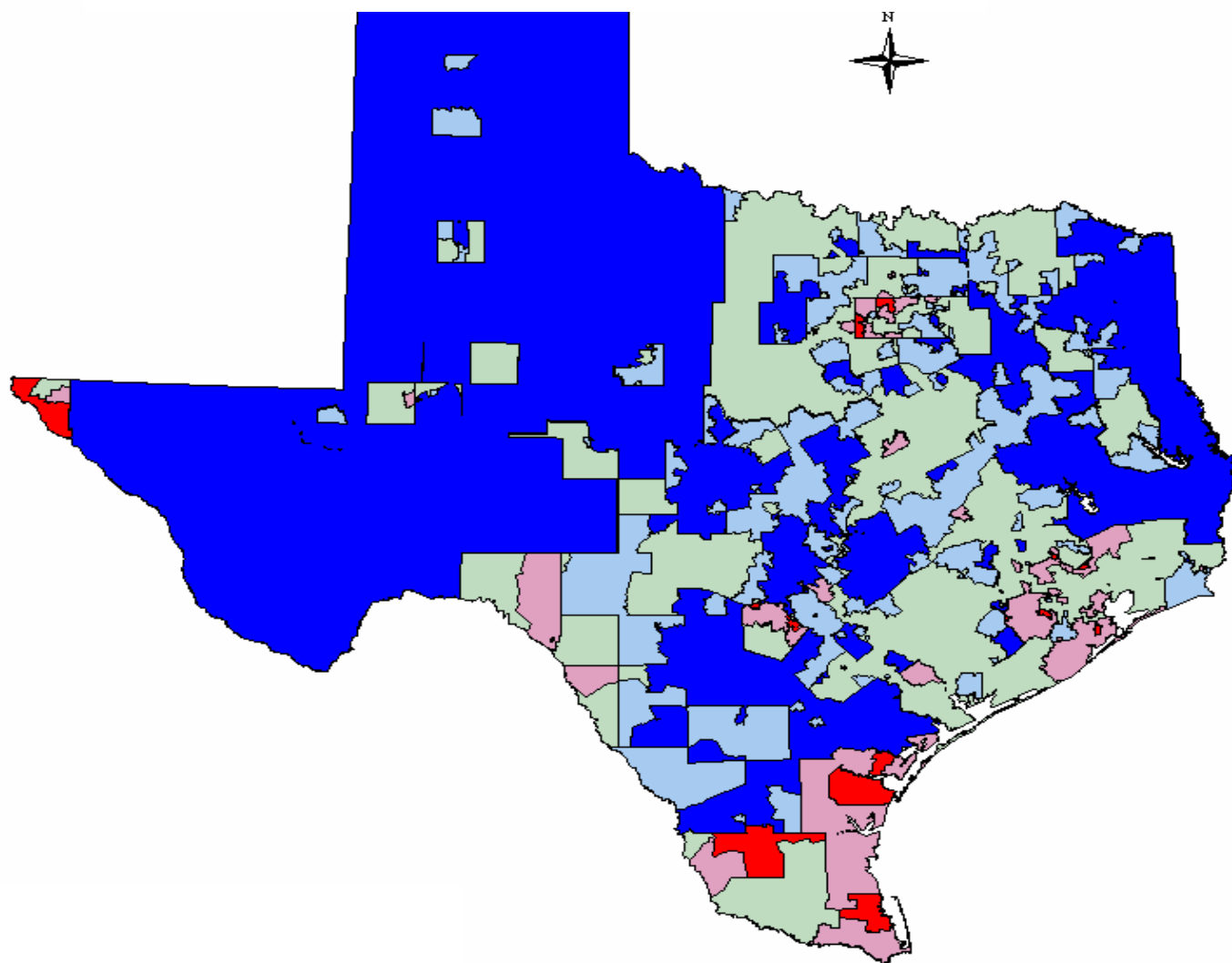
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# Rating Plan Opportunities

- Territory Definitions
- Class Factors
- By Peril Rating
- Construction Class
- Protection Class
- Amount of Insurance
- New Rating Factors

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# Territory Clustering





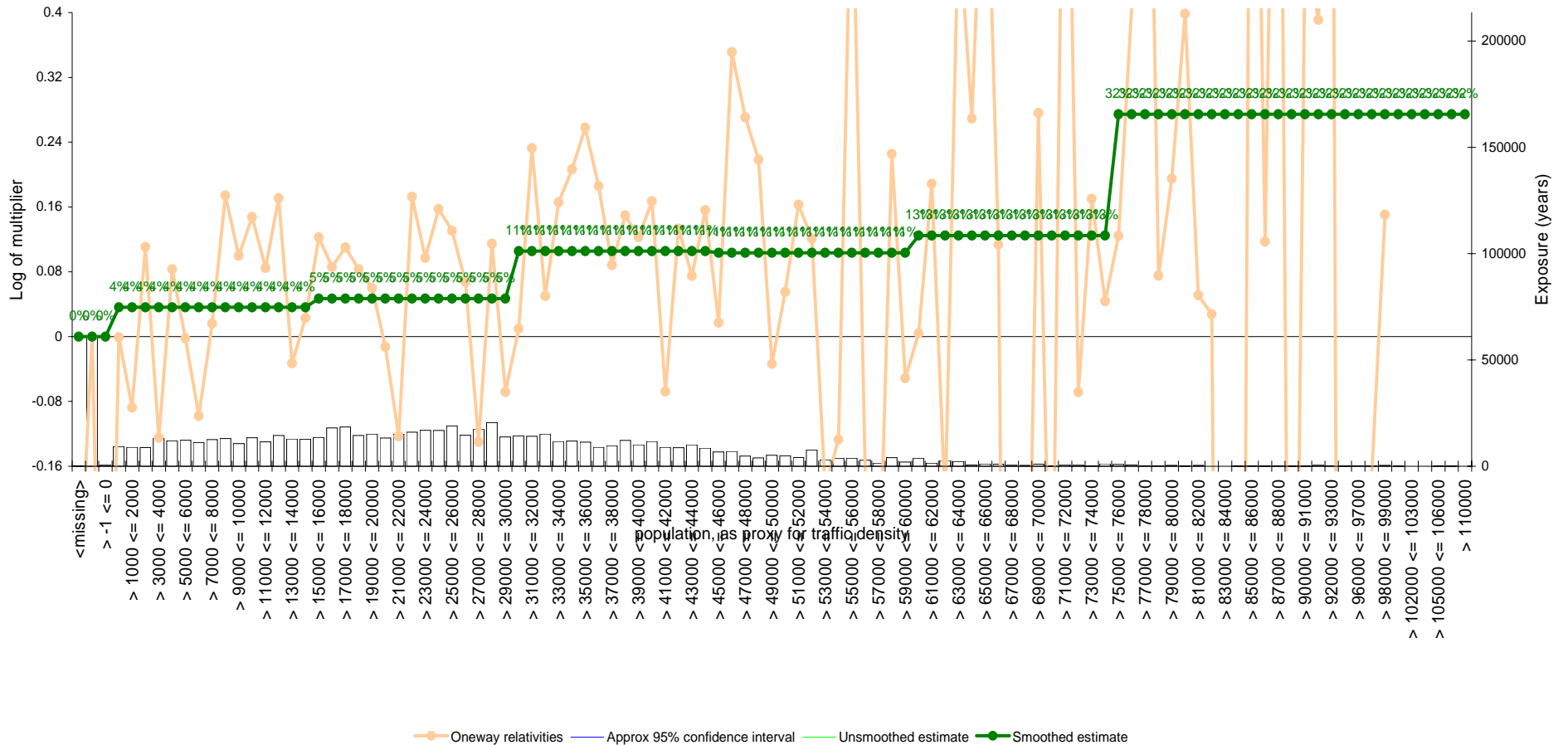
# Territorial Refinement

COUNTY by CITY	TERRITORY CODE	TOWN GROUP CODES			
		All Other	Food Service	Habitational	Auto Service
<b>ALAMEDA</b>					
Alameda	16	3	3	3	3
Albany	16	4	3	3	3
Berkeley	16	4	3	3	3
Emeryville	16	4	3	3	3
Fremont	20	4	3	3	3
Hayward	16	4	3	3	3
Oakland	15	5	3	3	3
Piedmont	16	5	3	3	3
San Leandro	16	3	3	3	3
San Lorenzo	16	3	3	3	3
Remainder of County	20	3	3	3	3

# Additional Geographic Data

## Sample Territory Analysis

Final run



# Indicated SIC Relativities

<b>SIC 3</b>	<b>Description</b>	<b>Exposure</b>	<b>On-Balance Relativity</b>
171X	Plumbing/HVAC	37,542	1.055
173X	Electrical Contractors	36,629	0.886
175X	Carpentry	32,404	0.969
179X	Misc. Contractors	23,829	0.982
27XX	Printing/Publishing	16,005	0.824
35XX (o/t 357)	Industrial Machinery	19,753	0.838
507X	Hardware Wholesaler	10,866	0.932
514X	Grocery Wholesaler	16,486	1.149
571X	Home Furnishings	11,795	0.918
581X	Restaurants	12,239	0.916
59XX	Misc. Retail	38,818	1.031
64XX	Insurance Agents	13,209	0.921
65XX	Real Estate	30,856	0.986
721X	Laundry/Dry Cleaning	13,341	1.373
734X	Building Services	19,012	1.145
737X	Computer Services	16,663	1.145
76XX	Misc. Repair Services	15,425	1.010
80XX	Health Services	18,607	1.068
87XX	Eng. & Mgt. Services	80,160	0.927

# Class Refinement

Sic Code	Description	Rate No.	Rate Grp	Suscep tibility
<b>DRY CLEANERS</b>				
7212	Agents, Retail: For Laundries and Dry Cleaners	33	2	H
7213	Apron Service Supply	6	2	H
7212	Bobtailers, Laundry and Dry Cleaning	33	2	H
7216	Cleaning and Dyeing Plants (Except Rug Cleaning)	6	2	H
7212	Cleaning and Laundry Pick Up Stations, not Owned by Laundries or Cleaners	33	2	H
7216	Collecting and Distributing Agencies Operated by Cleaning Plants	39	2	H
7219	Diaper Service	1	2	H

SIC Code	Description	Rate Groups			Class Factors				Susceptibility
		Bldg	BPP	Liab	Bldg	BPP	(1)	(2)	
2021	Creamery Butter	2	5	6	0.90	1.00	0.60	0.48	M
2022	Natural, processed and imitation Cheese	2	5	6	0.90	1.00	0.60	0.48	M
2023	Dry, Condensed and Evaporated Milk	2	5	6	0.90	1.00	0.60	0.48	H
2024	Ice Cream and Frozen Desserts	2	5	6	0.90	1.00	0.60	0.48	H
2032	Canned Specialties	2	5	6	0.90	1.00	1.10	0.88	M
2033	Canned Fruits, Vegetables, Preserves, Jams & Jellies	2	5	6	0.90	1.00	1.10	0.88	M
2034	Dried and Dehydrated Fruits, Vegetables Soup Mixes	2	5	6	0.90	1.00	1.10	0.88	H

# Class Refinement

<b>RISK CLASSIFICATION TABLE</b>							
<b>Class Description</b>	<b>Program</b>	<b>SIC Code</b>	<b>Class Code</b>	<b>Property Rate Group</b>	<b>Rate Base</b>	<b>Spoilage</b>	<b>EQ Index</b>
Accounting, Auditing or Bookkeeping Services	OFF	8721	65121A	OFF-3	A	4	3
Advertising Agency	OFF	7311	65121B	OFF-3	A	4	3
Air Conditioning Systems or Equipment – Dealers or Distributors - Installation, Servicing or Repair	WDS	1711	91111	WDS-2	P	4	3
Apartment Building – 1 to 3 Floors	APT	6513	65132A	APT	U	4	3
Apartment Building – 4 or more Floors	APT	6513	65132B	APT	U	4	3
Apartment Complex – 17-24 Units per Building	APT	6513	65141C	APT	U	4	3

<b>Eligible Occupancies</b>	<b>Classification Factors</b>			
The following are the eligible classes of business. No other types of business may be insured under this program. See also the Ineligibility List in the main section of this manual.	<b>Building Lessors</b>	<b>Building Occupants</b>	<b>Business Personal Property</b>	<b>Class Code</b>
<b>Air Conditioning Equipment Dealers</b>	1.314	1.150	0.806	00072
<b>Alterations – Clothing</b>	1.278	1.333	1.512	71961
<b>Animal Cemetery</b>	NA	0.526	0.619	00056
<b>Animal Cemetery – Lessors Risk</b>	0.604	NA	0.619	00056
<b>Animal Hospital</b>	NA	0.526	0.619	00057

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# Pricing By-Peril

- Why is small business insurance rating still done on all perils combined?
- Can rate accuracy be improved by looking at rating factors by individual risk?
- How many rating factors are specific to only one or two perils?
- How many rating variables have no apparent relation to one or more variables?

# By Peril Rating

Subject of Insurance	Base Rates
Building .....	\$0.321 Per \$100 Building Value
Business Personal Property .....	0.439 Per \$100 Business Personal Property Value
B.P.P. Special Increment.....	3.003 Per \$100 Business Personal Property Value
General Liability - Occupant .....	383.900 Per Employee
- Lessor's Risk.....	0.132 Per \$100 Building Value. (For buildings used solely for warehouse or storage purposes, use BPP value if no Building insurance)

# By Peril Rating

## Territory 1 (con't)

	<u>\$500,000</u>	<u>\$1,000,000</u>
<b>Manufacturer</b>		
Bags-Plastics, Laminated & Coated	0.75	0.82
Bags-Uncoated Paper, Multi Wall	0.75	0.82
Coated & Laminated Paper	0.70	0.77
Converted Paper & Paperboard Products	0.75	0.82
Corugated & Solid Fiber Boxes	0.44	0.48
Die-Cut Paper & Board	0.75	0.82
Envelopes	0.75	0.82
Fiber Cans, Drums & Similar	0.44	0.48
Folding Paperboard Boxes	0.44	0.48
Laminated Packaging Paper & Plastics Film	0.70	0.77
Sanitary Paper Products	0.75	0.82
Setup Paperboard Boxes	0.44	0.48

### Frame

### Protection Class

1-6      7-8      9-10

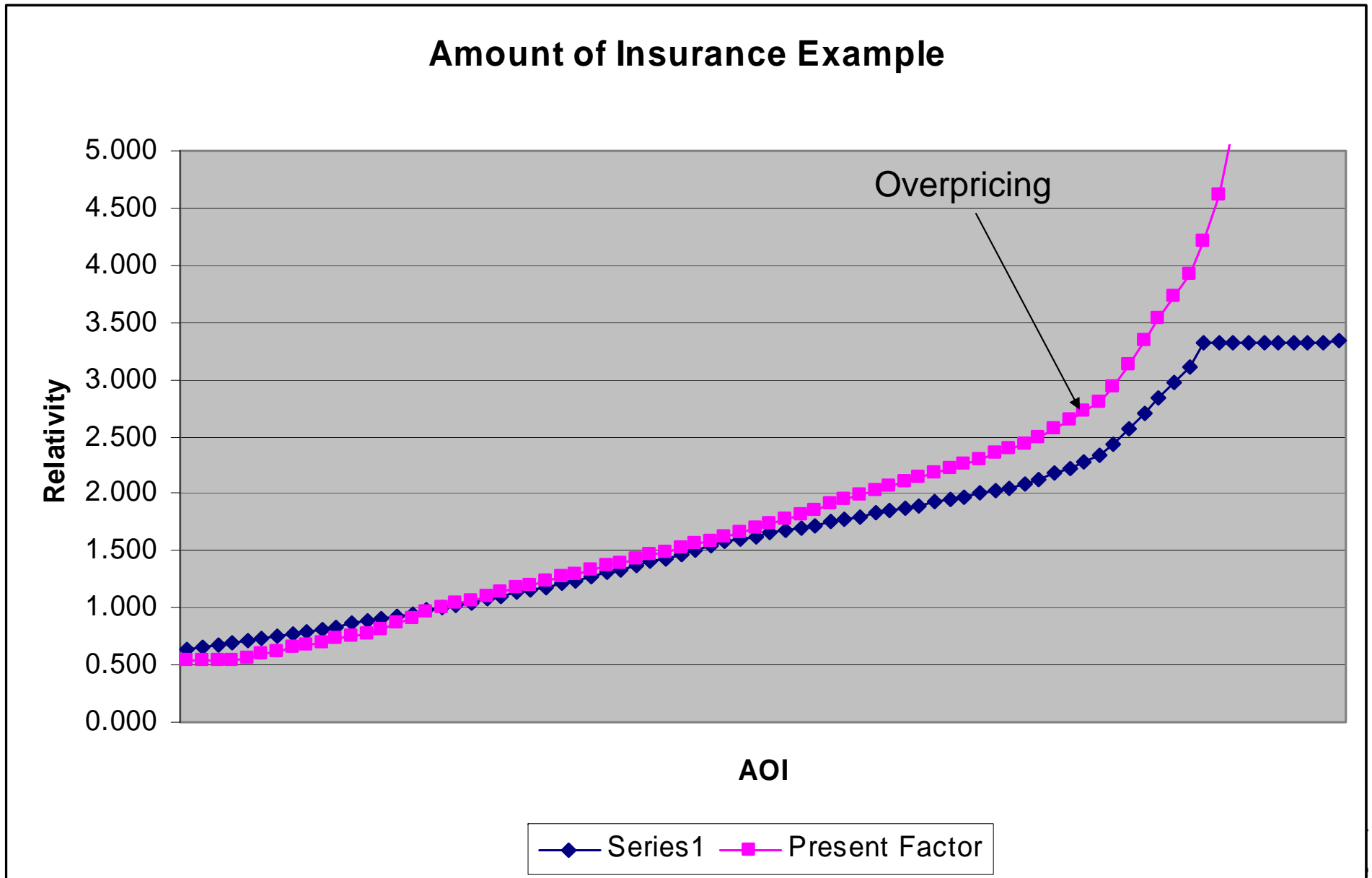
## Territory 1

### NOT OCCUPIED BY OWNER

Apartments 1-4 Units	3.67	4.89	6.58
Apartments 5-12 Units	4.07	5.21	7.32
Apartments 13+ Units	5.06	6.48	9.10
Apt/Merc 1-12 Units	9.73	14.20	18.89
Apt/Merc 13+ Units	11.03	16.65	22.57



# AOI Model Results



# Refined AOI Curves

- f. **Business Personal Property Special Increment Modifier.** Multiply the applicable rate for *B.P.P. Special Increment* by the appropriate *B.P.P. Increment Modifier* from the table below.

<b>Business Personal Property Value</b>	<b>B.P.P. Increment Modifier</b>	<b>Business Personal Property Value</b>	<b>B.P.P. Increment Modifier</b>
\$ 1 - 5,000	1.000	45,001 - 50,000	0.225
5,001 - 10,000	0.820	50,001 - 75,000	0.159
10,001 - 15,000	0.639	75,001 - 100,000	0.125
15,001 - 20,000	0.505	100,001 - 200,000	0.073
20,001 - 25,000	0.414	200,001 - 300,000	0.055
25,001 - 30,000	0.354	300,001 - 400,000	0.045
30,001 - 35,000	0.308	400,001 - 500,000	0.040
35,001 - 40,000	0.273	over 500,000	0.035
40,001 - 45,000	0.247		

# Refined AOI Curves

<b>Amount of Insurance Discount Factor:</b>	
<b>Amount of Insurance</b>	<b>Factor</b>
0 -- 39,999	1.00
40,000 -- 49,999	0.99
50,000 -- 59,999	0.97
60,000 -- 69,999	0.96
70,000 -- 79,999	0.95
80,000 -- 89,999	0.94
90,000 -- 99,999	0.91
100,000 -- 149,999	0.88
150,000 -- 199,999	0.83
200,000 -- 299,999	0.76
300,000 -- 499,999	0.71
500,000 -- 999,999	0.68
1,000,000 plus	0.64

# Premium Size Credits

## Premium Size Credit

The following credits apply based on the total premiums developed from this manual, excluding Earthquake, Machinery and Equipment Breakdown, Employers Liability and Automobile premiums.

<u>Premium Range</u>	<u>Credit</u>	<u>Premium Range</u>	<u>Credit</u>
\$ 0 to \$ 3,000	0.0%	\$ 5,501 to \$ 6,500	5.5%
3,001 to 3,500	1.0%	6,501 to 7,500	6.0%
3,501 to 4,000	2.0%	7,501 to 8,500	7.0%
4,001 to 4,500	3.0%	8,501 to 10,000	8.0%
4,501 to 5,000	4.0%	10,001 to 15,000	9.0%
5,001 to 5,500	5.0%	15,001 +	10.0%

# Multi-Policy Discounts

## CATEGORIES

## DISCOUNT applied to the Businessowners Policy

<u>Commercial Automobile Policies</u> .....	7%
Commercial Automobile Policies (excluding Garage Liability and Dealers Blanket).	

<u>Commercial Umbrella Policies</u> .....	4%
Commercial, Econ-O-Pak and Habitational Umbrella policies.	

<u>Life, Health or Annuity Policies</u> .....	2%
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- The following policies written on an owner, partner or corporate officer of the business:
  - Life policy (nongroup) with a face amount of \$100,000 or more or Simplified Issue Life policy with a face value of \$50,000 or more; or
  - Annuity policy with a combined cash value exceeding \$10,000 or more, or
  - Disability Income policy with a monthly benefit of \$1,000 or more; or
  - Long Term Care Policy.

# Industry Specific Rating Factors

- a. **Number of Units Factor.** Based upon the number of residential units at the premises, multiply the applicable rates for *General Liability* for that premises by:

Units	Factor
1 - 10	1.000
11 - 20	0.987
21 - 30	0.968
31 - 50	0.940
51 - 75	0.910
Over 75	0.885

- b. **Number of Stories Factor.** Based upon the number of stories of the building, multiply the applicable rates for *General Liability* for that premises by:

Number of Stories	Factor
1	0.850
2	0.950
3	1.000
4 or More	1.150

## Condominium Factor

% Rented	Factor
0% - 49%	0.57
50% - 74%	0.79
75% & Over	1.00

# New Rating Factors

Age of Building Credit Factors:		
Age	Original Construction	Significantly Renovated
0 -- 5	0.900	0.960
6 -- 10	0.950	0.980
11 -- 15	0.975	1.000

Franchise Factor:	Property	Liability
	0.950	0.975

Mail Credit	Property	Liability
	0.975	0.950

## Roof Factors

Factor	* Type of Roof			
	1	2	3	4
	1.15	0.95	1.10	1.00

# Other Refinements

## 2. Rate Modifiers

- a. **Years in Premises Modifier.** If the insured has conducted business for more than 36 months (3 years) at the current premises, multiply the applicable rates for *Building, Business Personal Property and General Liability* for that premises by:..... **0.975**
- b. **On Site Owner Modifier.** (Not applicable to Lessor's Risk) If the owner of the business is working at an insured premises during the daily prime or peak business hours actively managing the business, multiply the applicable rates for *Building, Business Personal Property and General Liability* for that premises only by:..... **0.975**

- k. **Building Age Modifier.** Determine the age of the building by subtracting the original year built from the inception year of the policy, then multiply the applicable rates for *Building and Business Personal Property* for that premises by:

Age of Building - Years	0 – 5	6 – 10	11 – 15	16 – 25	26 & Over
Building Age Modifier	0.900	0.950	1.000	1.100	1.150

- k. **Limited Cooking Modifier.** When the Classification Description includes the phrase "Limited Cooking", multiply the rates for *Building, Business Personal Property and Business Income* for that premises by:..... **0.850**
- l. **Mall Modifier.** When the insured is in an enclosed shopping center or mall and there is a public entrance in the interior of the mall directly to the insured occupancy, multiply the rates for *Building, Business Personal Property and Business Income* for that premises by:..... **0.950**



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# U/W Scoring/Tiering

- Lots of ways to incorporate new data:
  - Internal Data
  - “Who” Characteristics
  - External Data
  - Greater Use of Credit

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# Additional Internal Information

- Percent Occupied
- Years in Business
- Age of Building
- Alarms
- Computer Back Ups
- Building Height
- Swimming Pools
- Safety Program
- Elevators
- Years of Same Mgt.
- Updated Systems
- Sole Occupancy
- Hours of Operation
- Deliveries?
- Franchise?
- # of Employees/Leasing

***Not to mention – Billing history, account experience***

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# It's not “What” but “Who”

- Employees
  - Shifts
  - FT/PT
  - Outsourcing
  - Turnover
  - Drug Testing
  - Driving Records
- Organizational
  - Credit
  - Ownership
  - Yrs. In Business
- Safety
  - Return to Work Program
  - Equipment
  - Safety Committee

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# Additional External Information

- Credit Score
  - Commercial
  - Owner
- Lots of Operational Info
  - Niche Specific, too
    - Professional Credentials/Memberships
    - Tenant Information
  - Adjacent Properties/Tenants
- Driving Records
- Geographic Data
- Economic Data

# Underwriting Scorecard Example

<b>Credit Score</b>				
<b>Credit Score</b>	<b>Exposure</b>	<b>Indicated Relativity</b>	<b>On Balance Indicated</b>	<b>Score Points</b>
A	359,376	1.000	0.988	32
M	153,873	1.081	1.068	9
NS	90,760	1.045	1.032	19
S	106,681	0.902	0.891	62
U	26,131	1.114	1.101	0

# Underwriting Scorecard Example

Years of Current Control	Score Points	Percent Building Occupied	Score Points
>10	150	>95%	100
6-10	75	65-95%	50
0-5	0	<65%	0
Part Time/ Full Time	Score Points	Safety Program	Score Points
<33%	50	Formal	50
33% - 67%	25	Informal	25
>67%	0	None	0
Building < 25 Yrs Old	25 Pts	Owner on Premises	15 Pts
Central Alarm	25 Pts	Franchise	10 Pts
No Parking Lot	10 Pts	Closed by 9 pm	10 Pts
Offsite EDP Backup	5 pts	No Delivery	5 pts

# Underwriting Scorecards with Interactions

Multivariate analysis allows the modeling of interactions and facilitate implementing more complex tiering systems

Years of Current Control	Score Points					
	Contr.	Habit.	Off.	Rest.	Ret./Serv.	Wholes.
0-3	60	115	120	70	95	100
4-6	100	130	125	85	100	110
7-10	120	135	135	100	120	125
10+	150	150	150	150	150	150

# Underwriting Scorecard Example

Cumulative Point Range	Tiering Factor
0 - 99	1.00
100 - 199	0.92
200 - 299	0.84
300 - 399	0.76
400 - 499	0.68
500 - 599	0.60
600 - 700	0.52



# Underwriting Scorecard

Risk Characteristic Pricing Element	Response	Point Value
Years in Business at this Location	New in Business	5
	Less than 1 Year	4
	1-2 Years	3
	2-3 Years	1
	3-4 Years	0
	4-5 Years	-1
	5-6 Years	-2
	6 Years or More	-3
Responsible for Parking Lot	Yes	2
	No	0
Wiring Year	25 Years or More	4
	20-24 Years	0
	11-19 Years	-2
	10 Years or Less	-4

# Underwriting Scorecard

Location of Business	Attached to Habitational Structure	10
	Stand-alone Building	3
	Strip Shopping Center	0
	Enclosed Mall	-3
Hours of Operation Open to Public	21-24 Hours	10
	16-20 Hours	5
	12-15 Hours	0
	Less than 12 Hours	-5
Percentage of Sales from Catering Services	Over 10%	10
	1-10%	5
	None	0
Total Percent of Sales from Liquor Sales	More than 20%	5
	1-20%	2
	None	0
Drive Thru	Yes	0
	No	0
Credit Score	All Responses	0

# Underwriting Scorecard

## Debit or Credit Factors

Point Values				Debit or Credit Factors
Over	70	points		1.15
66	to	70	points	1.14
61	to	65	points	1.13
56	to	60	points	1.12
51	to	55	points	1.11
46	to	50	points	1.10
41	to	45	points	1.09
36	to	40	points	1.08
31	to	35	points	1.07

# Tiering Refinement

## ONE PAC PRICING TRACK

<u>Criteria</u>	<u>Supplemental</u>	<u>Standard</u>	<u>Preferred</u>
Desirability Grades	C	B	A
RII	N/A	8 to 10	1 to 7
3 year Claims History (Premium < \$5000 )	>1	1	0
3 Year Claims History (Premium \$5000 - \$10,000)	> 2	2	1
3 Year Claims History (Premium > \$10,000)	> 3	3	2
Years Business	< 3	3 to infinity	5 to infinity
Premium Size (adjusted)	N/A	\$500 to \$999	\$1,000 to infinity
Late Payment Pattern past twelve months (renewal & conversion only)	>1	1	0

# Tiering Refinement

Tier Relativities		
Discount	Standard	Surcharge
0.80	1.00	1.20

The standard tier with a relativity of 1.00 is our base tier, and risks assigned to this tier represent average risks. The two additional tiers broaden our pricing above and below this base level. The discount tier makes available a more competitive set of rates relative to the base for our most preferred risks. The surcharge tier will allow us to present higher rates to accommodate risks that would otherwise not qualify for our product due to risk characteristics.

New Business will be placed in a tier at inception; In-Force Business will be placed in a tier at renewal. No mid-year changes will be made.

## DISCOUNT TIER

- Years in business under current ownership is more than three years. Prior management experience may be combined with years in business to reflect above average experience and qualifications in managing hazards.
- Loss history will reflect an absence of loss frequency.
- Above average financial position. Financial characteristics include a demonstrated history of meeting financial obligations. One way to ascertain this is through a review of commercial trade transactions reported to organizations such as Dun and Bradstreet. The average risk falling into this tier will have a Dun and Bradstreet rating percentile greater than 70%. In addition to a D & B rating, we also take into account the business' premium payment history with Safeco. We do not use personal credit information.

# Customer Response Modeling

**Modeling competition directly is difficult at best**



**...so here's a bunny with a pancake on its head.**

...and now for something completely different...

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# Customer Response Metrics

- Retention
- Conversion
- Market Penetration

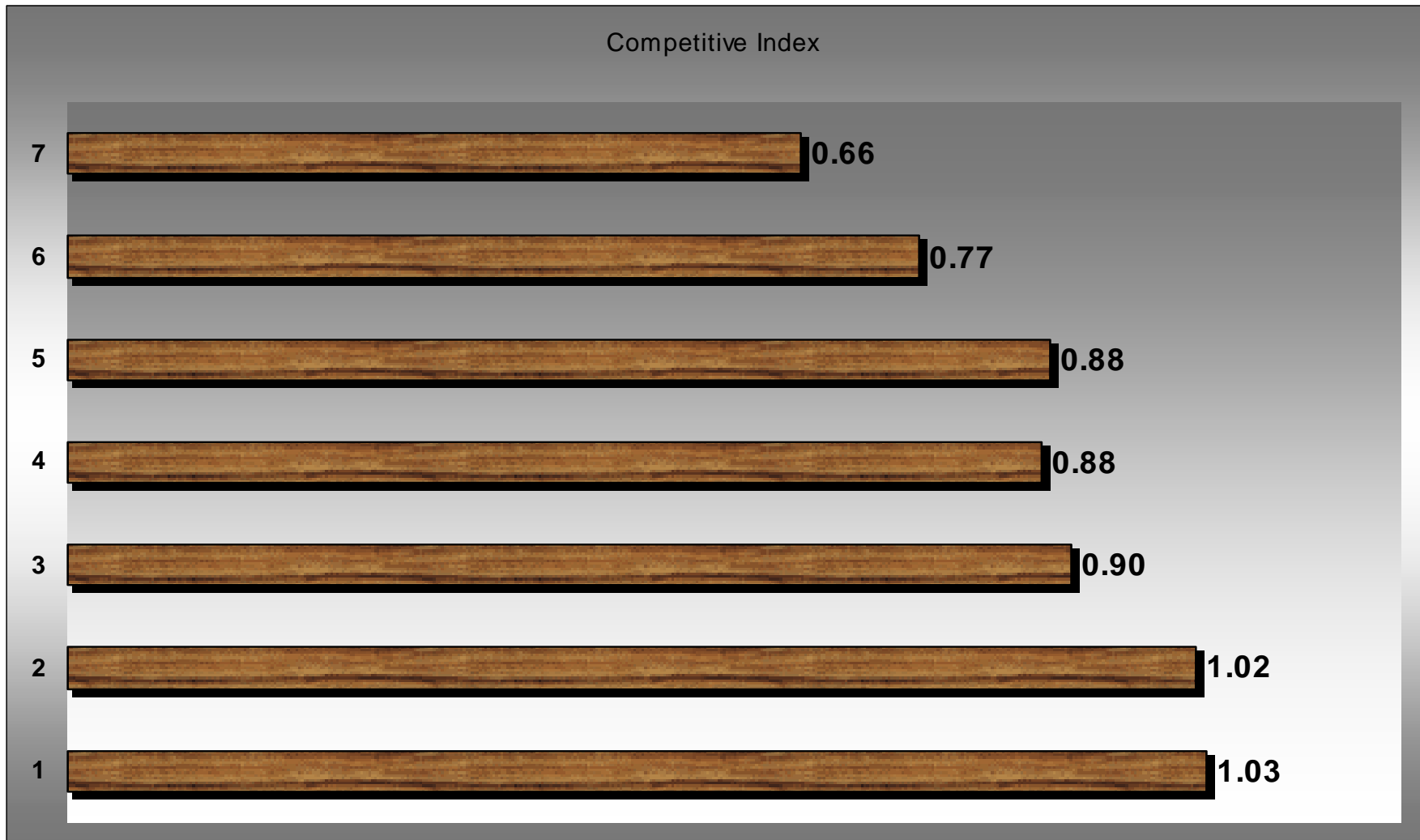
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# Customer Response Characteristics

- **Traditional Rating Factors**
  - Industry/Class, Territory, Purchase of Optionals
- **Account Characteristics**
  - # Years on Risk/ in Business
  - # of Policies, Account Size
  - Claims & Billing History, MVR History, WC Exp. Mod
- **Agent/Distribution Channel Issues**
  - Satisfaction with Agent/Service
  - Distance to Agent
- **Renewal Pricing Change (% or \$)**
- **Financial Underwriting Score (Credit, D&B)**



# Customer Response Monitoring

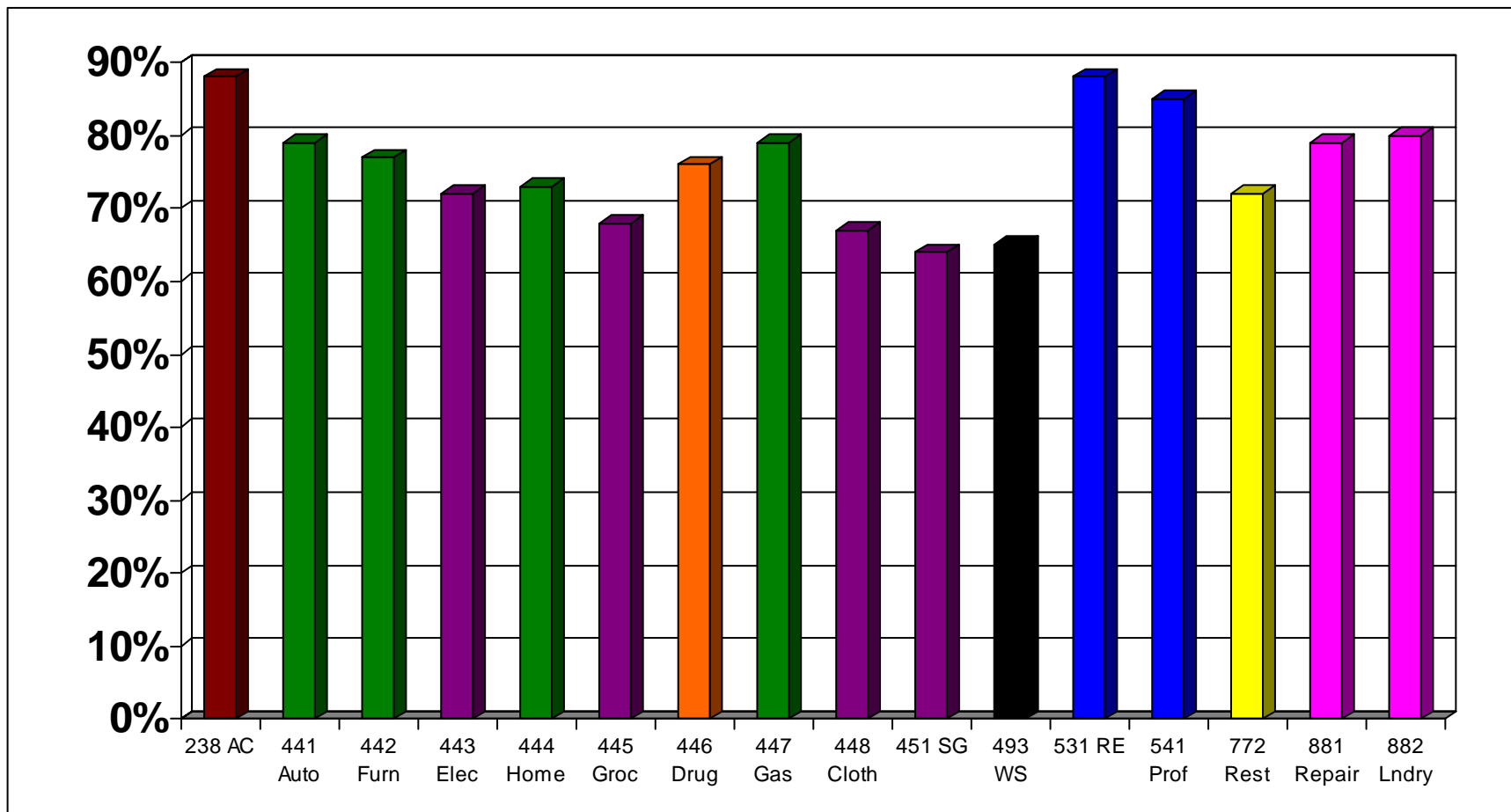


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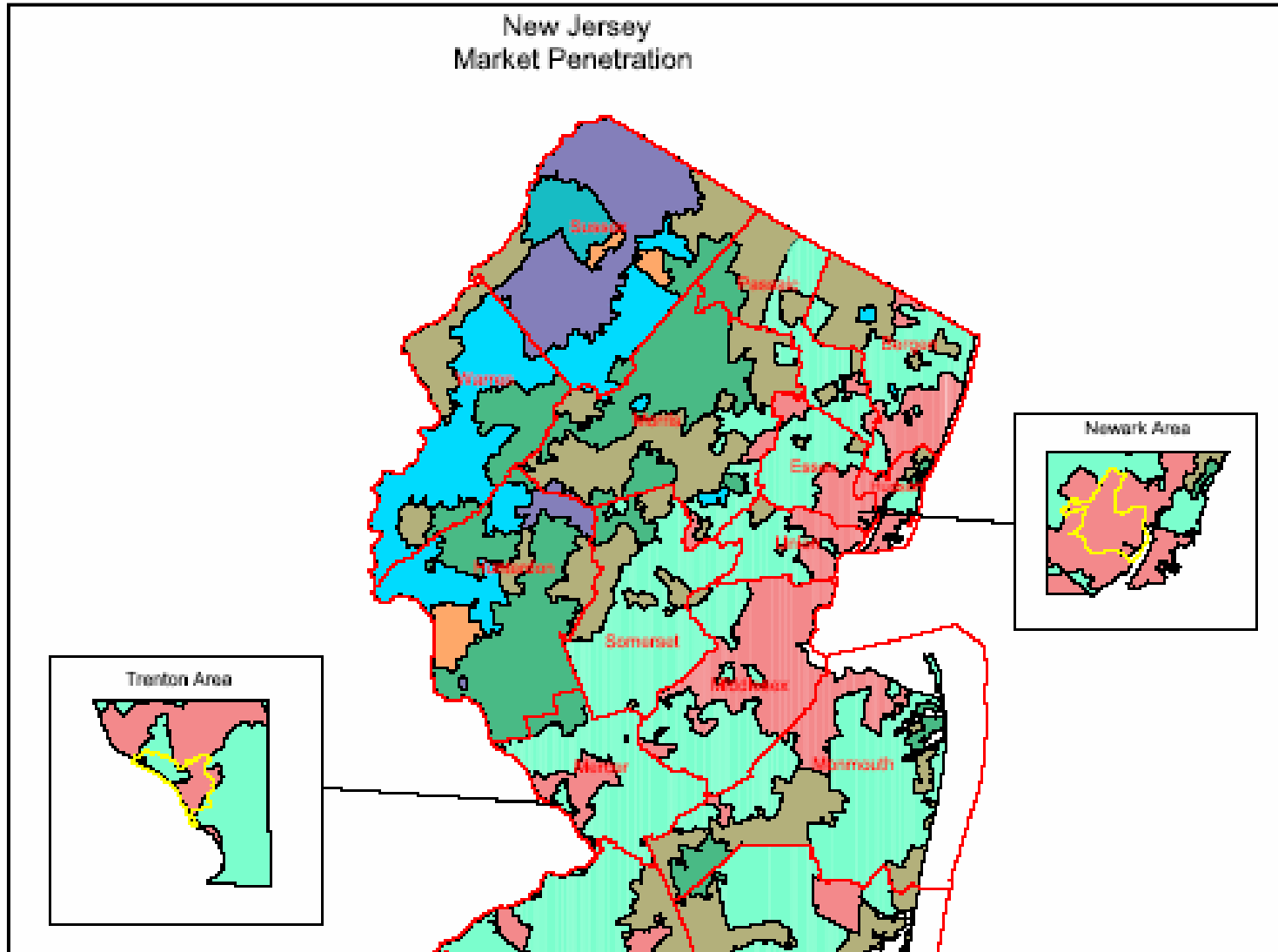
# Customer Response Monitoring

- **Premise:** Why not let your actual results speak for your products' competitiveness?
- If a **product** (rates, eligibility, underwriting, service, agents, claims) is competitive what should happen?
  - ❑ Higher hit ratio
  - ❑ Higher retention ratio
  - ❑ Higher market penetration

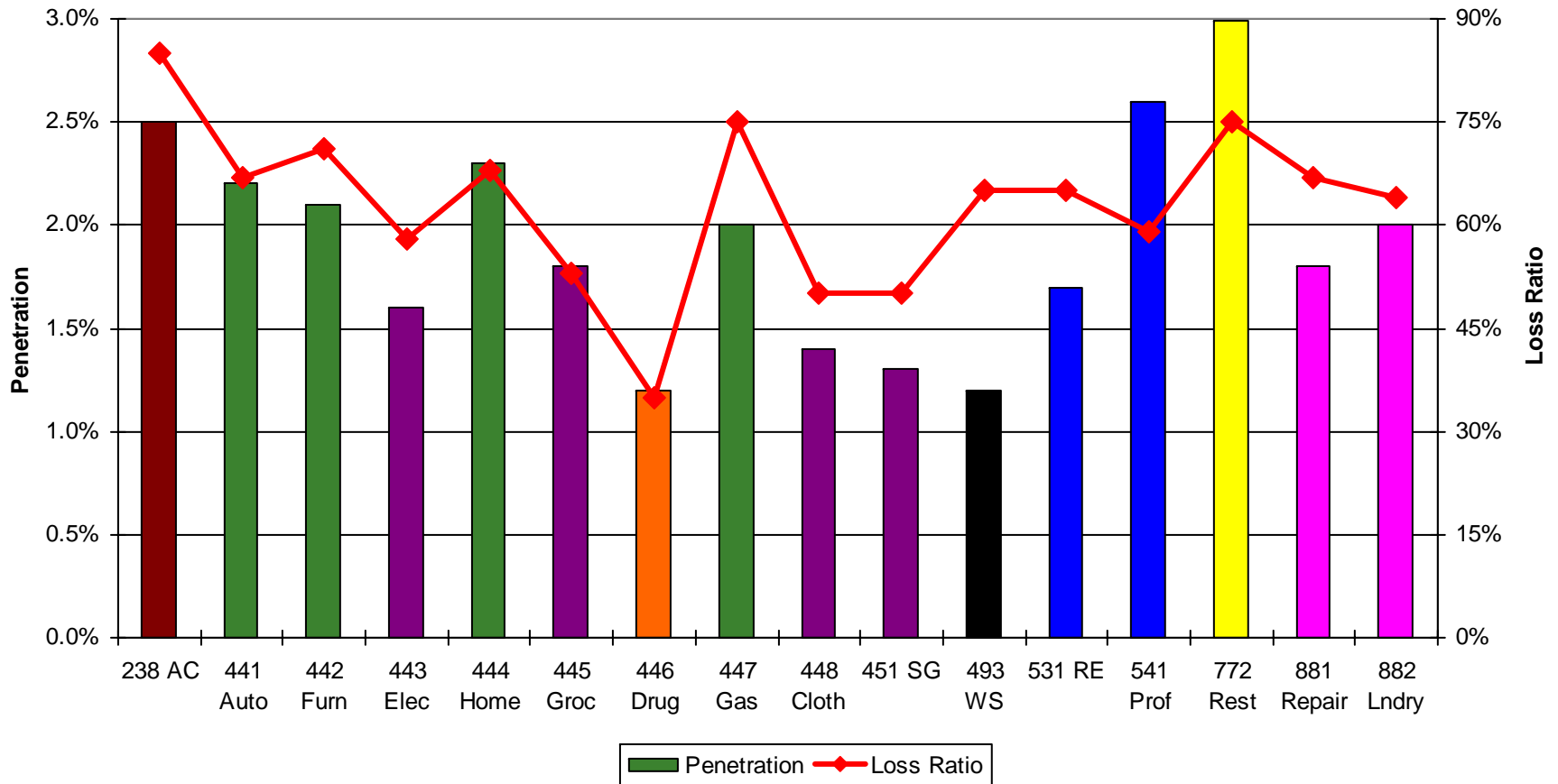
# Customer Response Monitoring



# Penetration by Territory



# Penetration by SIC Code



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# Benefits of Using GLM for BOP Pricing

- Improves Predictive Accuracy of Net Pricing
- Increases Underwriting Effectiveness
- Increases Use of “Who” Characteristics
- Creates Adverse Selection for Competitors
- Reflects Interactions
- Fast, cost-effective tool for U/W Decisions
  - Demonstrated Success Personal Lines
- Expand Your Markets
- Smarter Soft Market Reaction

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# Parting Thoughts

When asked to divulge the secret of his playing strategy, ice hockey great Wayne Gretzky used to say,

**"I skate where the puck is going to be,  
not where it's been."**

The data's ready,  
The technology's ready,  
**The industry's moving**

ARE YOU READY???