
Predictive Model Impact through the UW Cycle

CAS In Focus Seminar:
The Underwriting Cycle
Oct 5th, 6th 2009

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Predictive Model Impact through the UW Cycle

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Agenda

- Implementation Framework
- Communication
- Monitor
- Results over the UW cycle
- Conclusions

Implementation Framework

Score to Action

- Implementation on renewal business
- The score is not a price indication, it is a ranking
- The score needs to be translated into an action
- Worst scores immediately recommended for non-renewal action
- Otherwise scores are related to a target pricing factor
 - Target is measured relative to the base price
 - Base price defined as the middle underwriting company with 0% credit / debit
 - Goal is to leverage available discretionary pricing tools
 - Underwriting Company (Tier)
 - Discretionary credit/debit (IRPM or schedule credit)
 - No new filings required

Implementation Framework:

Relate Score to “Target Price Change Index”

- Determine a target pricing factor
 - Target Company Deviation: assign a range of scores to a target underwriting company
 - Target Credit or Debit Factor: within each company assign scores to a target credit or debit factor
 - Express both as a factor relative to the base price level
 - Target pricing factor = target company deviation * target credit or debit factor
- Determine expiring pricing factor = expiring company deviation * expiring credit or debit factor
- *Target Price Change Index* =
 - target pricing factor / expiring pricing factor

Implementation Framework:

Underwriting Recommendation

- *Non-Renew*
 - Worst Scores, > 96 on a scale of 1 to 100
 - Worst % of Scores: > X, where X varies by state
- *Significant Up-Price*
 - **Target Price Change Index > 1.5** (values for illustration only, actual varies by state)
 - Policy is inadequately priced
 - Requires underwriting review prior to renewal
- *Base Rate / New Money*
 - **Target Price Change Index from 1.0 to 1.5**
 - Business is approximately “right-priced”
 - Allow automatic renewal with filed base rate change
 - New Money
 - Internal measure of the price change on a renewing policy
 - = renewal premium – expiring premium
- *Retain*
 - **Target Price Change Index < 1.0**
 - Policy is redundantly priced
 - Requires underwriting review prior to renewal

Implementation Framework

Messaging the Underwriting Recommendation

- **Non Renew**
 - No pricing recommendation given
 - Exception % expected to be less than 35%
- **Significant Up-Price and Retain**
 - Underwriter to review prior to renewal
 - Associated with a target price change range
 - Target price change range varies by underwriting recommendation and state
 - Agreed upon with regional vice presidents
 - Incorporated into business planning
 - Provides the underwriter with some latitude on the final decision
- **Base Rate / New Money**
 - Allow automatic renewal
 - Desire to be a high percentage of business

Implementation Framework

Underwriting Exceptions

- What is the company underwriting philosophy?
- Hanover relatively early adoption, 2006
- **Goal: Underwriter still controls the decision**
 - Requires provision for exceptions
 - Set expectation: exception % < 35% of policies
 - Exception protocol ... referral to manager
- **Alternative: Machine Implementation**
 - Limited authority to deviate from recommendation
 - Referral protocol
 - More common with our competitors today

Communication

Introducing the Model

- Key messaging
 - The underwriter still makes the decision
 - Optimizes their time, focus underwriters on best / worst risks
 - Backed up by “English” reasons
 - Good risks that are under-priced could still be significant up-price
- Not an actuarial exercise
- Not a black box
- It is an underwriting tool
- Does not eliminate underwriting jobs
- Will increase underwriting and processing efficiency
- Not a “silver bullet” to cure loss ratio problems
- Will improve the loss ratio and retention over time
- Only as accurate as the data we capture

Communication

What’s in it for me (Underwriter)?

- Consistency in Underwriting Evaluation and Execution
 - Underwriting outcomes based upon objective evaluation of individual risk characteristics
 - English reasons for the underwriting actions we want to take
 - Leverage third party data – More information on individual risks (Credit Score, Years in Business, NAICS)
- New Agency Management Capabilities
 - Unbiased measure of underwriting quality of the agent’s book
 - Evaluate price adequacy and target specific new money goals
 - Focus retention efforts on the best business
 - Quantify the value of an exception to leverage appropriately

Predictive Model Impact through the UW Cycle

Presentation of Model Result

Policy Detail Screen

Pricing Info:
Expiring Company = 06 (Citizens Insurance Company of America)
Expiring Average Discretionary Credit/Debit = 0.600
Umbrella Limit = \$0
Estimated Annualized Expiring Umbrella Premium = \$0
Estimated Annualized Expiring BOP Premium = \$9,513
Estimated Annualized Expiring Premium as of 08/22/2009 = \$9,513
Expected renewal base rate and inflationary change = 1.0%

Cat Losses Excluded = \$0 (0 claims)

Coastal Action Required: No

Exposure Information:

Loc #	State	County	Zip	Coastal Expo. Ind.	Building Limit	Contents Limit	Wind Deduct.	Wind Excl?
001	MA	WORCESTER	01504	None	\$0	\$15,600	\$0	No

Underwriting Outcome:
Significant Up-Price

Recommended Underwriting Action:
Direct Intervention Required = Significant Up-Price
Default Total Change = 11.5%

Accept Recommended Intervention?

Examples of Actions that aren't exceptions
Do not change company
Change Credit/Debit Mod from 0.600 to a value from 0.656 through 0.709
Total Change from 0.1% to 14.9%

Underwriting Action Decision Entry:
Desired Action Type:

Company for Prevailing State (now 06):

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Presentation of Model Result

Policy Reasons Screen

Claim Variable Detail Reasons:

- #1. Fifth Prior Year Claim Freq No Pay = 0.000 - Good - Clean History
- #2. Fourth Prior Year Claim Freq No Pay = 0.000 - Good - Clean History
- #3. Fifth Prior Year Loss Ratio = 0.0% - Clean History
- #4. Third Prior Year Claim Freq No Pay = 0.000 - Good - Clean History
- #5. Fifth Prior Year Claim Frequency = 0.000 (0 claims) - Clean History
- #6. Fourth Prior Year Loss Ratio = 0.0% - Clean History
- #7. First Prior Year Claim Freq No Pay = 0.000 - Good - Clean History
- #8. Second Prior Year Claim Freq No Pay = 0.000 - Good - Clean History
- #9. Fourth Prior Year Claim Frequency = 0.000 (0 claims) - Clean History
- #10. Third Prior Year Loss Ratio = 0.0% - Clean History
- #11. Third Prior Year Claim Frequency = 0.000 (0 claims) - Clean History
- #12. Second Prior Year Loss Ratio = 0.0% - Clean History
- #13. Second Prior Year Claim Frequency = 0.000 (0 claims) - Clean History
- #14. First Prior Year Loss Ratio = 0.0% - Clean History
- #15. First Prior Year Claim Frequency = 0.000 (0 claims) - Clean History

Billing Variable Detail Reasons:

- #1. Second Prior Year Late Pay = 1 - Poor - Number of Counts = 1
- #2. First Prior Year Reinstatement = 0 - Good - Clean History
- #3. First Prior Year Cancellation = 0 - Good - Clean History
- #4. First Prior Year Late Pay = 0 - Good - Clean History

Relationship Variable Detail Reasons:

- #1. Agent Age = 3 - Agent Age 2 to 3
- #2. Policy Age = 1 - Policy Age 1
- #3. Size of Agency -
- #4. Agent Distance = 24 - Distance 16 to 25
- #5. Rank of Agency 3 Year Loss Ratio = 1 - Much Better than Average

Location Variable Detail Reasons:

- #1. Rank of Hill Likelihood - Average
- #2. Demographic Characteristics of the Prevailing Zip Code on the Policy - Average

Building Variable Detail Reasons:

- #1. Max Construction Code = 4 - Masonry Non-Combustible - Worse than Average
- #2. Newest Building Age = 0 - Building Age 6 to 10
- #3. Fire Alarm Indicator - No - Better than Average
- #4. Max Protection Code = 06 - Better than Average
- #5. Prevailing Protection Code = 06 - Better than Average

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Presentation to the Underwriter

Why? English Reasons: Detailed

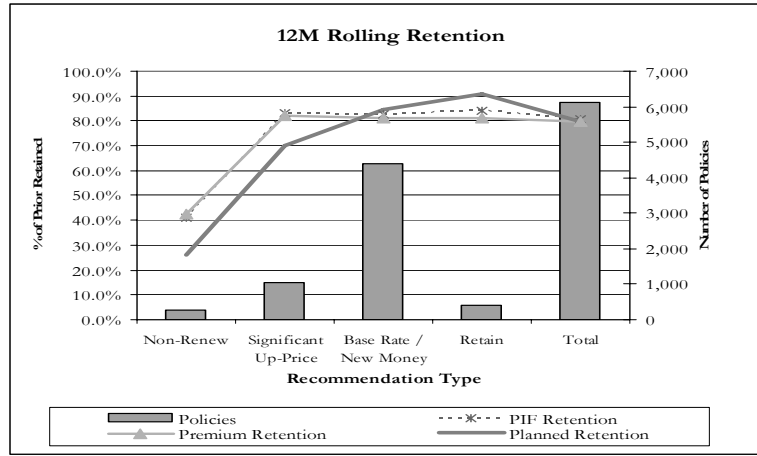
- **Building Variable Detail Reasons:**
 - #1. Max Construction Code = 4: Masonry Non-Combustible - Worse than Average
 - #2. Prevailing Protection Code = 02: Worse than Average
 - #3. Max Protection Code = 02: Much Worse than Average
 - #4. Newest Building Age = 11: Building Age 11 to 15
 - #5. Fire Alarm Indicator: No - Better than Average
- **Counter-intuitive Relationships:**
 - Common in loss ratio models
 - Good underwriting characteristics that are deficiently priced in the rate structure
 - Training needs to help underwriters understand that the context for the model result is the exiting rate structure

Monitoring Institutionalize the Model

- They (underwriters) don't believe it (the model) right away.
- You have to reinforce the behavior you want.
- You have to make someone accountable for the result
- You have to regularly inform them on the progress toward that result
- Leverage the model
 - Develop targets in the business plan for:
 - Retention by underwriting recommendation
 - "New Money" by underwriting recommendation
 - Premium and PIF distribution by underwriting recommendation
 - Loss Ratio Improvement
 - Optimize pricing ... even in a soft market
 - Shift in mix toward more adequately priced business

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Monitoring: Retention



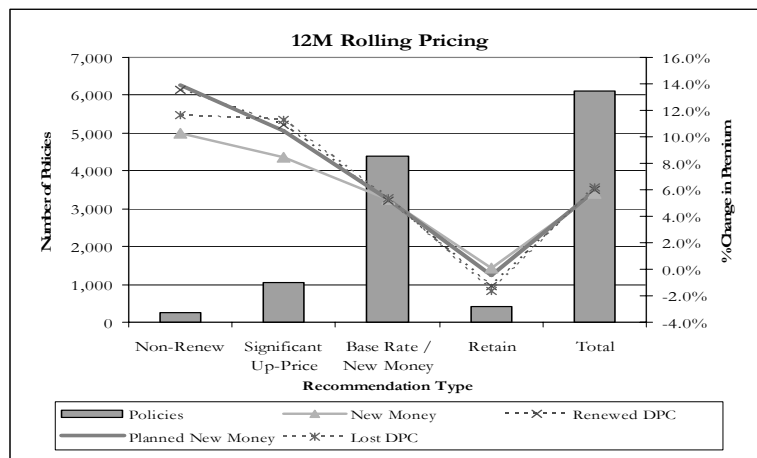
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Monitoring: Price Change



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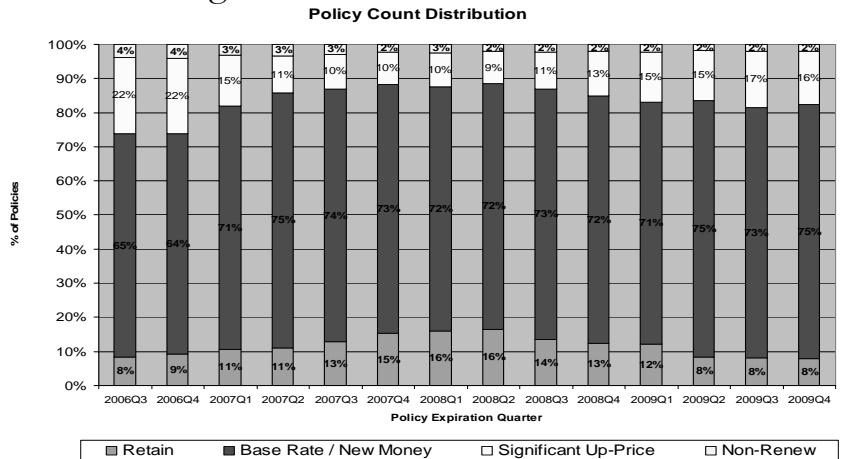
Monitoring

- Frequency
 - Passive: Monthly Reports
 - Active: Quarterly web-ex meetings with management
 - Quarterly meetings ran for two years before we could transition to monthly reports
- Consistency
 - In format; charts; reports; common key performance indicators
 - In message; performance; actual versus plan; clear goals
 - Accountability; action steps; follow-up
- Senior Leadership Commitment
 - Continual validation
 - Immediate response to critique
 - "All my new business becomes significant up-price upon renewal"
 - Evaluate the actual statistics
 - Jointly determine plan to adjust as necessary

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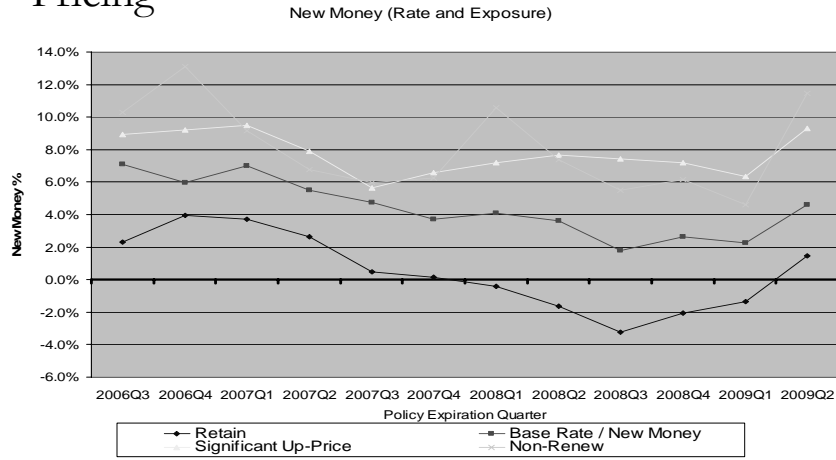
Over the UW Cycle

Underwriting Recommendation Distribution



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Over the UW Cycle
Pricing



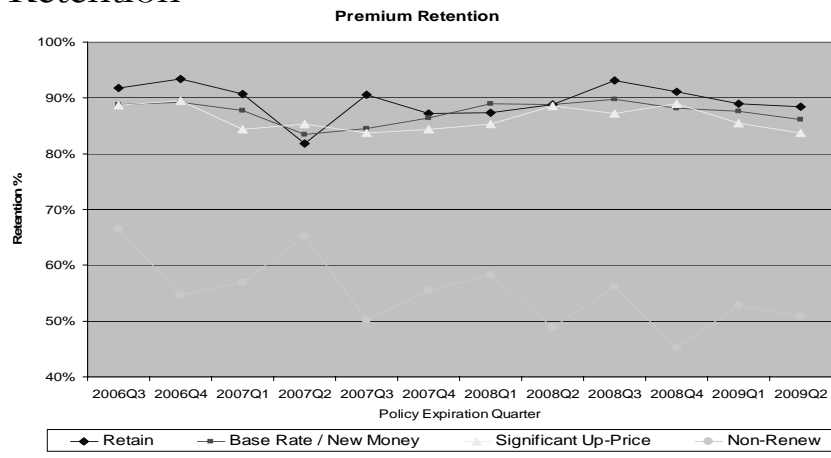
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Over the UW Cycle
Retention



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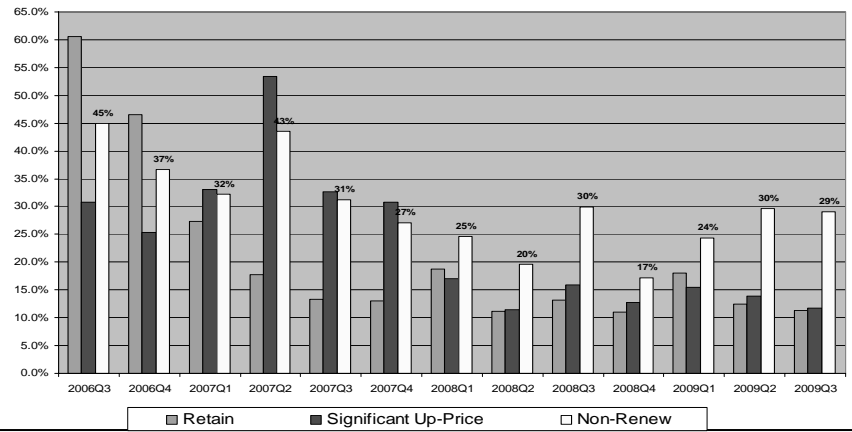
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Over the UW Cycle

Exception %

Underwriting Exception %



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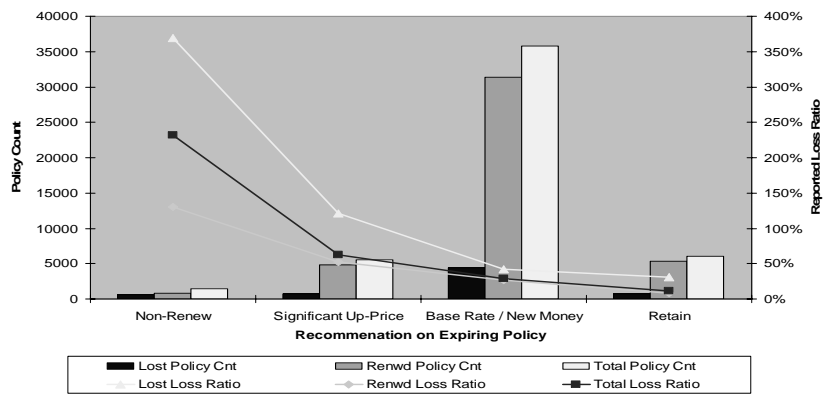
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Over the UW Cycle

Loss Ratio on Expiring Policy

2007 Expiration Year Reported Incurred Loss Ratio @Aug-09



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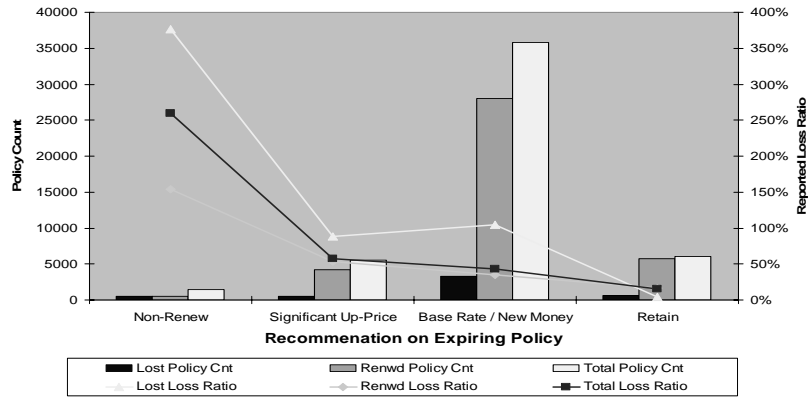
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Over the UW Cycle Loss Ratio on Expiring Policy

2008 Expiration Year Reported Incurred Loss Ratio @Aug-09



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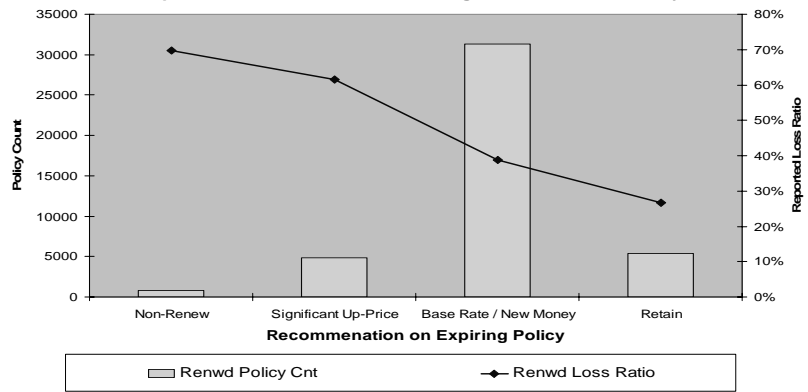
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Over the UW Cycle Loss Ratio on Renewal Policy

2007 Expiration Year Recommendations
Reported Incurred Loss Ratio @Aug-09 on Renewed Policy



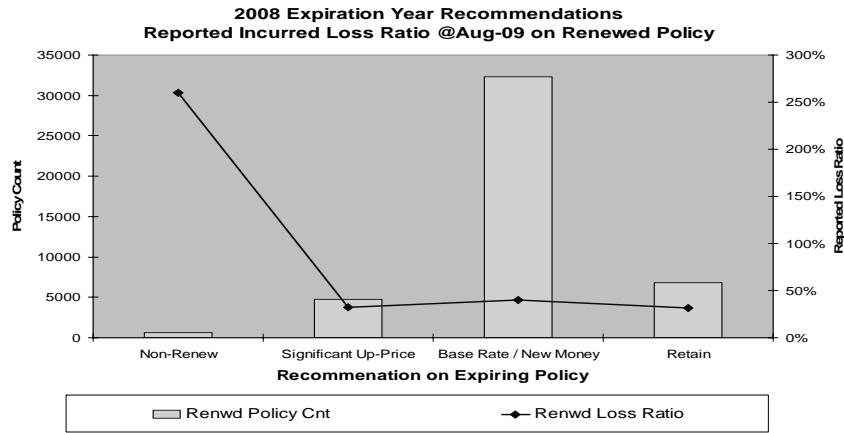
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Over the UW Cycle Loss Ratio on Renewal Policy



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Conclusions

- Early Adopter: New business is a gap
- Implementation successful
 - Managed pricing
 - Shifted mix to more adequately price business
 - Informed underwriting decision making
- Underwriting Cycle
 - Pricing dipped for base rate/new money and retain
 - Pricing stayed relatively stable for significant up-price
 - Reduction in % of distribution in retain
 - Helped manage pricing
 - Renewed loss ratio better than lost

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