Credit Risk Modeling and Decisioning
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The Last Ten Years

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Overview – The Last 10 years in Scoring

- Increasing use of “Generic” scores by banks and other industries
- Increased “in house” score development
- New techniques
- Multiple score models
- Sub-optimal score use by less sophisticated financial institutions
- Proliferation of products influences scores
Increasing Use of Common Scores by Banks and Other Industries

- **Generic and Consortium Scores**
  - Great for common problem - Fraud
  - Great for common delivery vehicle - Credit Bureau
  - Provides large sample and lots of examples of bad credit or fraud
  - Segmentation is meaningful and easily done
    - By industry
    - By major product types
    - By data availability – thin files

- **Other industries can use the scores**
Increased “In House” Score Development

- Dissemination of scoring technologies
  - Young professionals no longer learn “best of breed”
  - New ideas, technology and procedures tend not to spread as rapidly

- Accuracy and process control
  - Changes in personnel may disrupt modeling procedures and process
  - Internally developed models may not include the same rigorous process control and auditing
New Techniques – Neural Networks

- Generally accepted - statistical techniques
- Are an advanced form of regression
- Can do the same things as traditional techniques
- Statistical performance is same or better
- Are sometimes criticized because some neural network tools do not perform the same functions as traditional techniques
- Are capable of providing reject reasons
- Impossible to “reverse engineer”
- Model complex, non-linear data and interactions
New Techniques – Transaction Scoring

- **Transaction Scoring**
  - New information
  - Scoring an account at every transaction
  - Decisions can be made real time
  - The latest information is used
  - Helps find patterns in data that were previously missed - bankruptcy issue
  - Better score performance
  - High CPU and system resource demands
  - Transaction data provides additional information typically lost in summarization
Transaction Scoring – Detailed Information

John Doe - Behavior Score Two Month Trend

Summary

Data

Transaction Based Scoring

This Month

Last Month

Conclusion

<table>
<thead>
<tr>
<th>This Month</th>
<th>Last Month</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance $1000</td>
<td>Balance $1000</td>
<td>No change in Score</td>
</tr>
</tbody>
</table>

7995-Gambling Charges $200
6011-Cash Advance $300
6011-Cash Advance $150
5411-Grocery Store $150
7361-Employment Service $100
6011-Cash Advance $100

Summary

unemployment, live on charges

Summary

work, family, stable

Change to higher risk from 1 month ago

Balance $1000
Balance $1000

Summary

unemployment, live on charges

Summary

work, family, stable

Balance $1000
Balance $1000
New Techniques – Text Data

- Using text data in scoring models
  - Until now, scoring used structured, numeric or symbolic, record-oriented data
  - Much of data in real-world is text
  - Most organizations have text data that goes largely unanalyzed
  - Objective is to convert information in text data for use in scoring
  - Technology in early stage – simplistic applications
New Techniques – Text Data

- Current techniques are based on grouping or clustering “similar” text information
- Collections example
  - Group accounts with similar “text discussions” in collector notes
  - Include the clusters in scoring model as symbolic categories
  - Using this technique increases predictive performance of models by 50%
New Techniques – Text Data

- Fraud detection potential
  - Group retail merchants into similar categories based on text descriptions of products sold
  - Include the merchant groups in scoring model as symbolic categories based on fraud risk of separate groups
Multiple Scoring Models

- More kinds of models
  - Risk, revenue, attrition, profitability, bankruptcy, line increase, propensity to pay
- Multiple models developed during different economic conditions
- More products, more models - balance transfers, “0%” for 6 months
  - Impact scores because perceived performance may be different from actual
  - Require different modeling thinking – longer observation time period for 0% pricing
  - Shorter delinquency peak with balance transfers.
Multiple Scoring Models

- Multiple models to predict the same thing
  - Combine all data to build a “Super” score
  - Use existing scores as inputs for new score
  - Combine existing scores for a “Super” Score

- Combine all data alternative is generally accepted as best potential performer

- Using existing scores as inputs and creating a super score have some logistical and regulatory issues
  - Can’t get there from here with the data
  - Turndown reasons
Sub-optimal Score Use

- Less sophisticated users adopting scoring
  - Same cut-off for seven years
  - Poor monitoring
- Outguessing the score
  - Multiple strategies and policy overlays
  - High number of policy and human overrides
  - Deteriorates performance - fraud example
  - Bad model - bad strategies?, Good model - bad strategies? Bad model - Good strategies? Good model - good strategies?

- Model building industry is consolidating!