Model Validation – Seconds Anyone? (Modeler's Perspective)

Kevin Mahoney

Travelers Insurance

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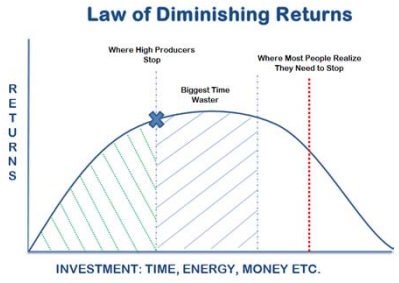
The Modeler's Challenge

Why Building the Next Model Iteration is Like Designing the Next iPhone

- Diminishing Returns
- Comparison to something that was already pretty good
- More difficult to explain the improvements
- More difficult to prove that new model is better
- Shorter timeframe
- Fewer resources (and different ones)
- The competition

The Biggest Challenge



Source: http://mbainexperience.com/2012/01/18/law_of_diminishing_return/

The First Time Around. . .

- Comparison to non-statistical answers
- Multivariate solution
- Best modelers, large team
- Capacity to investigate and innovate
- Introduction of new data sources
- 80% of the answer
- Data and implementation are the biggest hurdles

The Second Time Around. . .

- More data
- Additional data sources?
- More sophisticated modeling techniques?
- Lessons learned from first time around
- Opportunities to simplify?
- Refreshing coefficients

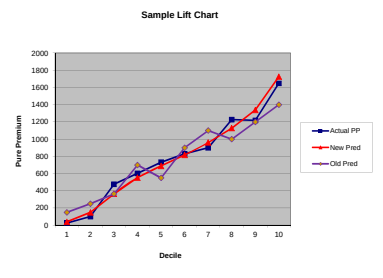
Potential Time Wasters

- Rebucketing variables
- Complex techniques (e.g. multiple imputation of minimally missing data)
- Different distributions (e.g. gamma vs. lognormal for pricing data)
- Second system effect (from *The Mythical Man-Month* by Fred Brooks)

Complexities of Comparing Model Iterations

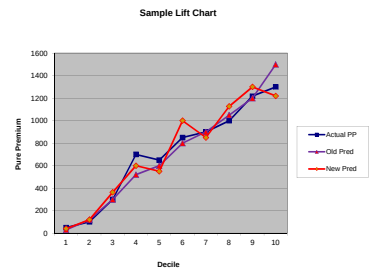
- Is it even worth comparing if you are just refreshing coefficients?
- How do you isolate confounding elements? (new data, data sources, variables, modelers, structure, etc.)
- What exposure / premium do you use?
- What is the fairest data set to use for comparison? (out of time sample?)

Using A Lift Chart to Compare Models



- Compare lift and fit
- Balance predictions to the same level?
- This approach might be easier to explain than some other options
- Only one side of the story

Checking the Converse

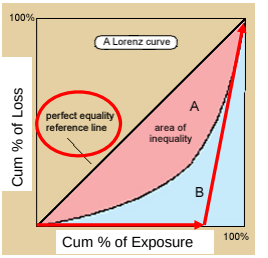


- Lines will likely lie relatively close to one another if old and new model are reasonable
- Probably wouldn't show this

The GINI Index

$$Gini = \frac{A}{A+B}$$

- Commonly used to assess income inequality across countries
- More granular assessment of model fit
- Gives information on model segmentation
- -1 ≤ Gini ≤ 1 (1 = more segmentation, better fit)



Sort Predictions Low -> High

Reference: http://en.wikipedia.org/wiki/Gini_index

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Other Methods of Comparison

- Mean Squared Error
- Lorenz Curves
- Disruption Analysis