

Operational Risk: Supervisory Models

- Supervisory Modeling Team's Objective
 - Forecast the CCAR firms' operational losses conditional on various realizations of the macroeconomic environment specified by the BoG.
- Main model – panel regression
 - Regress the log of the frequency parameter with a set of firm-specific and macro variables. Five Basel II Level 1 ETs are captured (DPA and BDSF are not modeled).
 - Pros: explicitly links losses with factors; simultaneously models all firms.
 - Cons: sensitive to variable choices; only frequency is modeled.
- Examples of the confirmed links
 - A prolonged negative economic growth can cause more frequent legal losses.
 - A riskier firm should have more frequent operational losses.
 - Stock market volatility leads to more frequent and larger legal losses.

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- To mitigate the model risk we developed two benchmark models
 - LDA
 - Poisson frequency and several severity models.
 - AIC is used to choose the best-fit severity model.
 - Pros: simple; severity of losses is modeled explicitly.
 - Cons: no explicit links between losses and factors; dependent of the choice of severity distribution and selection of percentiles.
 - Historical Simulations
 - Poisson frequency and empirical severity
 - Pros: simple; severity is modeled by historical experience.
 - Cons: no explicit links between losses and factors; may underestimate the tail of the true severity distribution.

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- Model selection vs. averaging
 - Some variations exist in the estimates by the three models
 - Model selection - experimented with several approaches including AIC and BIC
 - Model averaging – a simple average, Bayesian model averaging, etc.
 - The simple average of the three results were reported as the final estimates
- Research and development
 - More data are available on a larger panel of firms
 - Exploring the possibility of refining the existing models
 - Revising the risk factors
 - Exploring the possibility of modeling severity within the panel regression model
 - Refining the existing benchmark models
 - Exploring additional benchmarks