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