Macro Financial Modeling
Research Challenges Faced by Regulators

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THE VIEWS EXPRESSED ARE OF THE PRESENTER AND NOT THOSE OF THE COMPTROLLER OF THE CURRENCY
Preliminaries

Research challenges at regulatory agencies

Differences amongst regulators
  Systemic risk or not
  Safety and Soundness versus Enforcement

Idiosyncratic

Function of my experience and interests.
Preliminaries

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Idiosyncratic

Function of my experience and interests.
Preliminaries: My Experience

- **Onsite supervision at banks**
  - Writing referee reports

- **Policy making, especially around capital rules**
  - “Technician” rather than as an “Engineer”
  - Counterparty credit risk, credit risk, stress testing.

- **Attempts at research satisfying two criteria**
  - Interesting to me – Easy
  - Interesting to others – hard
• Research interesting to others
  - Other regulators – internal as well as external
  - Broader research community
  - Examiners – generalists with broad deep experience
  - Very strong heuristics
  - Sometimes skeptical of complex models
Challenges

- **Data confidentiality**
  - Confidentiality of banks
  - Presence of PII
  - Restrictions because of confidential data

- **Perception of official imprimatur**
  - Risk of false attribution of authority
Challenges

- Multiperiod optimization problem
  - Not clear what value function to optimize
  - Regulators closer to bondholders but not entirely

- Institutional features matter a lot

- Very significant agency problems

- Asymmetric information

- Macroprudential vs. microprudential
Research questions inspired by supervision activity.

- **Business As Usual Supervision:** The safety and soundness examinations.

- **Post Financial Crisis,** especially by activities such as stress testing.
Research questions inspired by regulations

- **New Rules and changes in existing regulatory rules**
  - Liquidity Coverage Ratio
  - Net Stable Funding Ratio
  - Volcker Rule
  - Basel III to Basel IV
  - Margin rules
  - Central clearing mandates
  - Conventional wisdom?

- **Post Financial Crisis, especially by activities such as stress testing.**
Research questions inspired by regulatory data.

- The traditional call report data
- The very large data collected by the regulators post financial crisis
Research questions around supervision

Models and model validation

- Very substantial applied research
- Especially for the trading book
Research questions around supervision

- Valuation models [trading book]
  - Great complexity
  - Calibrated models [models work and then stop working]
  - A view: sophisticated extrapolation

- Risk management models
  - Value at Risk Methodologies

- Significantly less work on validation.
Modeling Challenges Around Stress Tests

- Appropriateness of conventional econometrics and time series models for stress testing

- For example, impact of autocorrelation when the impact of macroeconomic variables are of greater concern.
Modeling Challenges Around Stress Tests

- Forecasting when the independent variables are significantly outside their usual values.
- Forecasting when very few scenarios are to be used.
- Assessing model outcomes with agency problems.
Research Questions: Regulations

- An example
  - Stressed versus unstressed calibration of capital models
  - Basel III -> Stressed calibration

![Graph: VaR & Stressed VaR with 180 days history and Short Vol Portfolio]
Research Questions: Big Data

- Ability to link micro data to macro questions
- So far largely empirical
- Lacking much theory