Drivers of Supervisory Capital Add-ons in Banking Supervision: Signal versus Noise in Internal Ratings-Based Models

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Motivation

- Model-based regulation on a rise again:
 - ► Risk management failures in 2023
 - ▶ Basel III endgame proposal by Fed: abandon internal models for credit risk in the US
- Are internal models that bad? What are the trade-offs?

Motivation

- Model-based regulation on a rise again:
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 - Basel III endgame proposal by Fed: abandon internal models for credit risk in the US
- Are internal models that bad? What are the trade-offs?
- Signal versus noise trade-off:
 - Signal: the severity of model imperfections
 - Noise: the number of model imperfections

Research question

 What dominates - signal versus noise - when banks use their internal models for credit risk and how it affects capital requirements?

This paper

- Uses hand-collected data on SSM banks' internal model inspections from supervisory reports between 2014 and 2020
- Explores whether specific non-compliances with capital regulation drive the results
- Analyses model performance post ECB's "Targeted Review of Internal Models" (TRIM) in 2016

Main results

- 1. The severity of model imperfections (signal) matters more for capital requirements than the number of model imperfections (noise)
- 2. There are non-compliances with capital regulation that are the main drivers:
 - (i) the initial application to use an IRB approach
 - (ii) the overall use of models
 - (iii) requirements for model estimation
 - (iv) requirements for own estimates of the Loss Given Default
- 3. Higher supervisory capital add-ons as a result of model inspections post-TRIM

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Better allocation of limited supervisory resources

Assessment

- The first paper that sheds light on how supervisors inspect banks' internal models
- Unique data
 - ► Supervisory capital add-ons (total RWA impact of model changes is publicly available)
 - Severity and the number of model imperfections
 - ► Reasons for imposing a capital add-on
 - Inspections that result in capital add-ons versus not
 - ► Timing of different stages in model inspections
 - ► The exact non-compliance categories with capital regulation
- Unique institutional knowledge of how model inspections work
- The current version does not use much of these unique features

Suggestion 1: elaborate on the trade-offs when banks ask for the internal model inspection

- Internal model inspection:
 - either initial approval or the existing model has been changed (?)
 - ▶ as a result, either all good, or if there are problems with the model, a supervisor may impose an add-on (only when problems are severe?)
- Trade-off for an opportunistic bank: change the model and try to game the system versus face the costs from the model inspection and possibly a capital add-on
- How likely is the detection of model imperfections and subsequent add-on? Are your results just a verification of the institutional setting? Also, what is the role of a voluntary add-on (Margin of Conservatism)?
- Important to better understand the benefits and costs from banks initiating an IMI for the optimal ex post response

Suggestion 2: elaborate on drivers of using a wrong model

- Mariathasan & Merrouche (JFI, 2014) highlight four possible alternatives for lower model-based capital requirements:
 - 1. Faulty model assumptions
 - 2. Strategic risk-modelling
 - 3. Portfolio reallocation
 - 4. Improved risk measurement
- Does considering signal versus noise trade-off allow for differentiating between these alternative explanations?
- Important to better understand the reasons for having model imperfections for setting the punishment
- Suggestion: include tests that distinguish between these alternatives, especially honest versus strategic mistakes (use data on different capital add-ons, total RWA impacts and differences in timing)

Suggestion 3: elaborate on contribution and policy implications

- The paper is unique and policy relevant, yet the policy discussion is limited
- "Our results show possible room for improvement with regard to banking supervisors' risk-sensitivity, when calibrating limitations."
- So what do we learn? Could the authors be more specific using the unique data?
- Having specific policy suggestions can be useful especially in light of Fed's Basel III endgame proposal questioning the future of internal models for credit risk

Minor suggestions

- Provide a timeline for the internal model inspection and exploit differences in timing, repeated cases and how add-ons get imposed in these cases
- Report more on the internal model inspections, e.g., its number over time, how much time it takes to resolve the issue (as long as data confidentiality allows)
- Could the SSM banks be fundamentally different from the other banks? Could you report more bank-level statistics (e.g., size)? Is it just a TRIM effect?
- Robustness test w/o 2020 (COVID-19 and capital regulation relief by the ECB)
- Extend the related literature:
 - Model-based regulation: Begley, Purnanandam, Zheng (RFS, 2017), Benetton et al. (JFI, 2021), Colliard (MS, 2019), Marshall & Prescott (2001, 2006), Prescott (2004), Anderson (WP, 2024), Fiordelisi et al. (2022), Fiordelisi et al. (2024), Jager (WP, 2024), Mariathasan, Merrouche, Sizova (WP, 2024), Sizova (WP, 2024)
 - ► Model monoculture: Böhnke et al. (JBF, 2023), Gandhi & Purnanandam (WP, 2024), Rhee & Dogra (JFE, 2024)
- Many technical terms (CRR, margin of conservatism, deficiency, limitations, findings) that sometimes make reading confusing

Conclusion

- Novel and relevant paper, outstanding data work!
- Comments for streamlining the paper:
 - 1. Trade-offs for banks when they ask for the internal model inspection
 - 2. Drivers of using a wrong internal model
 - 3. Contribution and policy implications