Session

Pass through and scenarios

Papers

Monetary Policy and Bank Distress: An Integrated Micro-Macro Approach

Macro Stress and Worst Case Analysis of Loan Portfolios

Monetary Policy and Bank Distress: An Integrated Micro-Macro Approach

by

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Contribution

Monetary Policy and Bank Distress: An Integrated Micro-Macro Approach

- Provides empirical evidence on the relation between monetary policy and bank distress

- Presents an integrated micro-macro approach with two core virtues:

  - Measures the probability of distress at the bank level

  - Integrates the microeconomic hazard model for bank distress with a standard macroeconomic model

    - Allows for general feedback effects between bank distress and the real economy

Content

Monetary Policy and Bank Distress: An Integrated Micro-Macro Approach

The models

- Estimates probabilities of bank distress (PDs) with a hazard rate model, which also includes the macro variables output growth, inflation and interest rates

- Specifies a VAR model for the macro variables. This macroeconomic model also includes the aggregate PD as an exogenous variable

- Combines both layers by augmenting the VAR model with a fourth equation capturing the PD based on bank-level data

Results

Monetary Policy and Bank Distress: An Integrated Micro-Macro Approach

- A monetary contraction by one standard deviation leads to a significant, but small, increase in the aggregate PD

- The significant response of bank PDs to monetary policy vanishes when disregarding the feedback effects

- The effect of monetary policy shocks on bank PDs is substantially larger if the capitalisation is low

- Significant relation between monetary policy and weak forms of bank distress, but no evidence of monetary policy igniting outright bank failure

Discussion

Monetary Policy and Bank Distress: An Integrated Micro-Macro Approach

$$\begin{bmatrix} Y \\ P \\ R \\ PD \end{bmatrix}_t = \begin{pmatrix} \Pi^{MM} \\ \Pi^{FM} \end{pmatrix} \begin{bmatrix} Y \\ P \\ R \end{bmatrix}_{t-1} + \begin{pmatrix} \Pi^{MF} \\ \Pi^{FF} \end{pmatrix} PD_{t-1} + \varepsilon_t \qquad (3)$$

- Identification of real economy variables and financial sector variables is important when studying feedback effects
- PD, which is a non-linear function of bank variables and macro variables, appears on both sides of equation (3)
  - Is this a problem when evaluating the feedback effects?
- Have you considered using the log odds ratio *ln[PD / (1 – PD)]* instead of PD in the equation?

Discussion

Monetary Policy and Bank Distress: An Integrated Micro-Macro Approach

- The bank distress events are divided into 4 categories of various severity

- In the case of simultaneous distress events, only the most severe event is registered

- Wouldn't you a priori expect the relation between monetary policy and strong forms of bank distress to be more significant than the relation between monetary policy and weak forms of bank distress?

Macro Stress and Worst Case Analysis of Loan Portfolios

by

Thomas Breuer   **(Fachhochschule Vorarlberg)**

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Klaus Rheinberger   (Fachhochschule Vorarlberg)

Martin Summer   (Oesterreichische Nationalbank)

Contribution

Macro Stress and Worst Case Analysis of Loan Portfolios

- ## What is the contribution of the paper?

  – Introduces the technique of worst case search to macro stress testing

    - Determines the scenario which result in the largest loss to the loan portfolio for a given set of stressed macro factors and for a given plausibility level

  – Proves that the plausibility of partial scenarios is maximised if the risk factors that are not stressed are set to their conditional expected value

Contribution

Macro Stress and Worst Case Analysis of Loan Portfolios

- Advantages of worst case analysis compared to traditional stress testing:
  - Systematic search process which ensures that the worst case scenario for the stressed macro factors is determined
  - The worst case search is linked to the plausibility of stress scenarios
  - Allows for a portfolio specific identification of key risk factors
    - The example in the paper illustrates that when several risk factors work together, the total effect might be much more harmful than the sum of each risk factor individually

Content

Macro Stress and Worst Case Analysis of Loan Portfolios

- The paper specifies a model for the profit/loss on a loan portfolio as a function of macro and idiosyncratic risk factors
  - Models the dynamics of the macroeconomic risk factors GDP, home and foreign interest rate and exchange rate by the use of a GVAR model
  - Models the payment ability of each borrower
    - A one-period structural model specifying *default frequencies* and *losses given default* endogenously

- The model is illustrated by an example
  - A total of 4 loan portfolios based on divisions of the loans into two rating classes, BBB+ and B+, and into both home currency and foreign currency loans

Discussion

Macro Stress and Worst Case Analysis of Loan Portfolios

- One topic which has been on the agenda in the RTF Stress Testing subgroup is the plausibility of stress scenarios

- This paper fits right into this discussion by establishing a systematic search procedure for a prescribed plausibility level

Discussion

Macro Stress and Worst Case Analysis of Loan Portfolios

A comment to the example

- The expected profit target for each loan is linked to a 20 % return on regulatory capital

- Do you take different risk weights for the BBB+ and B+ portfolios into consideration when calculating this expected profit target?