Systemic Real and Financial Risks: Measurement, Forecasting, and Stress Testing

Discussion
by
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30 September 2011

Summary

- Systemic risk indicator for real and financial risk constructed with 3 ingredients:
  - **Dynamic Factor Model (DFM)** for real (GDP) and financial (FS) variables estimated with PCA + BIC.
  - **Quintile auto-regression** with latent factor from DFM $\Rightarrow$ conditional density forecasts (very nice!)
  - **Expected shortfall** on density forecast as systemic risk indicator.
- 2 types of Stress Testing:
  - **reduced-form** with "historical" shocks
  - **structural** with shocks identified by sign matching with standard macro and banking theory.

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Main result

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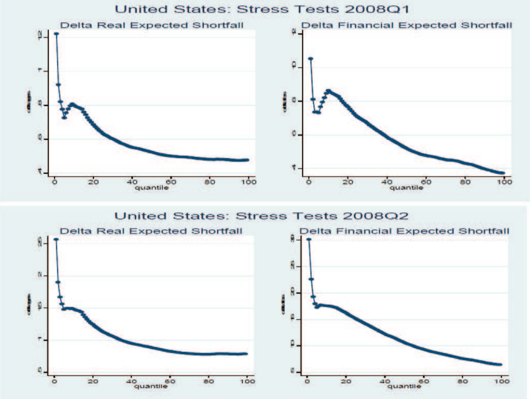
Expected Shortfall Stress-Test Deviation (ESSTD) for any $\tau \in (0,1)$:

$$\Delta GDPES_{T+H}(\tau) = SGDPES_{T+H}(\tau) - GDPES_{T}(\tau)$$

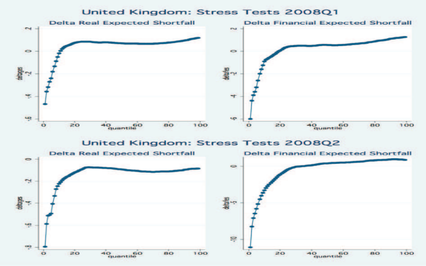
$$\Delta FSES_{T+H}(\tau) = SFSES_{T+H}(\tau) - FSES_{T}(\tau)$$

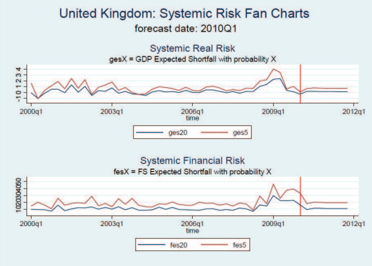


Comments on the empirical results I

- Given the importance and relevance of the main result it could be interesting to have some more economic intuition on what caused the sudden increase in the reduced-form stress test ESSTD from 2008Q1 to 2008Q2 which makes it able to anticipate 2008Q3-Q4 turmoils (while systemic risk indicator GDPES and FSES seem not),

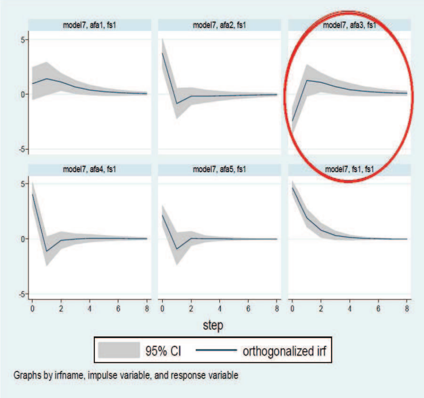
- this could also help clarifying why for UK (and Canada) ESSTD becomes more negative, i.e. more resilient, in 2008Q2 (while systemic risk indicators ES $\uparrow$):





Comments on the empirical results II

- Sensitivity of the ESSTD to the choice of the $S_\tau(\{\hat{\eta}_t^R(\tau)\}_{t=1}^T)$ function.
- Interpretation of the negative impact of aggregate demand and bank credit demand shocks on FSES(5), (inflation related?):



Comments on the theoretical part I

- Checks exclusion restrictions (of FS on GDPG and GDPG on FS)

$$X_{it} = \Lambda_i' F_t + \gamma_i(L) X_{it-1} + \delta_{ij}(L) X_{jt-1} + \ni_{it}$$

to test whether DFM actually holds.

- An alternative interpretation of the shocks identification: *Leverage*

Shocks	GDP Growth	Inflation	Bank Credit Growth	Change in Lending Rates
Leverage	+	+	+	+

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Comments on the theoretical part II

- Possible impact of GARCH dynamics in financial variables on Factor identification and estimates.

- Is it possible to identify shocks through Heteroskedasticity (Rigobon 2003)?

- Combination with the **“Nowcasting”** techniques (Evans 2005 and Giannone, Reichlin, and Small 2008) to build HF indicator.

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