Macroprudential Approach to Banking Regulation: A New Perspective

Haibin Zhu

Financial Supervisory Service, Seoul, Korea
25 November 2009

Disclaimer:

The views presented here are solely those of the author and do not necessarily represent those of the Bank for International Settlements.
● Responses to the Global Financial Crisis

● “We will amend our regulatory systems to ensure authorities are able to identify and take account of macro-prudential risks across the financial system”

-- G20 declaration on strengthening the financial system, 2 April 2009
What is Macroprudential?

- Where does it come from?
  - Used at the BIS since late 1970s
  - More systemically since 2000 (Crocket, 2000)

- What does it mean?
  - Focus on the financial system as a whole (externality)
    - Too big to fail
    - Too connected to fail
    - Concentration
  - Treat risk as endogenous, i.e. dependent on the collective behavior of financial institutions (endogeneity)
    - Feedback between FS and the real economy

On the operational side

- Cross-section dimension: systemic risk
  - Additional tax (e.g. capital surcharge) for systemic banks / markets / instruments

- Time dimension: procyclicality
  - Countercyclical capital buffer
  - Dynamic provisioning
Status quo

- Point 1: Need holistic approach; Depend on a broad range of policies
  - Capital is just one prudential tool
    - Liquidity, underwriting standards, LTV…
  - Monetary policy; fiscal policy
  - Deposit insurance and resolution procedures
  - Accounting
  - Market infrastructure

- Point 2: rules vs. discretion
  - Macropurudential is not new in Asia
    - Most recently: China, Hong Kong, Korea
    - Mainly discretionary
  - Rules
    - Act as pre-commitment devices: transparency and accountability
    - Facilitate international coordination
    - But fool-proof rules may be hard to design
  - Discretion can be better tailored to changing circumstances
  - Combination of rules and discretion might be unavoidable
Recent developments: operational framework of macroprudential approach

Cross-section dimension: Systemic risk

- Principles
  - Focus on the joint failure of financial institutions
  - Systemic banks receive more attention from regulators

- Main challenges
  - Measuring systemic risk
  - Allocating systemic risk to individual banks
  - Connect systemic risk contribution to regulatory measures
  - Understanding endogenous behavior of banks
Measuring systemic risk

- 1. Balance-sheet based indicators: FSIs (IMF)
  - Backward-looking
  - Lags
- 2. Supervisory assessment: US SCAP
  - Based on confidential data
  - Macro stress-testing
- 3. Network analysis
  - Detailed information on bilateral exposures

Figure 10. Network Analysis: A Diagrammatic Representation of Systemic Interbank Exposures

Source: IMF. See Márquez and Martínez (2009) for similar diagrammatic network illustrations.
Measuring systemic risk

- 1. Balance-sheet based indicators: FSIs (IMF)
- 2. Supervisory assessment: US SCAP
- 3. Network analysis
- 4. Market-based indicators
  - Forward-looking
  - Public data
  - Up to date

Market-based indicators: examples
- Probability of joint failure (IMF)
- CoVaR (Adrian and Brunnermeier 2009)
- Distress insurance premium (Huang, Zhou and Zhu 2009)
  - The market price (insurance premium) to protect against distress losses in a banking system
  - Distress: based on losses in the whole banking system rather than of an individual bank
Allocating systemic risk

- Huang, Zhou and Zhu (2009): marginal contribution of each bank to the risk of the system
  - In the case of distress insurance premium, marginal contribution equals expected losses on each bank conditional on the occurrence of financial distress

- Tarashev, Borio and Tsatsaronis (2009): Shapley value
  - Average of bank's marginal contribution to the risk of all sub-systems
Systemic risk analysis vs. SCAP results

By comparison: individual loss approach
What factors drive systemic importance?
- Size
- Unsubstitutability (concentration)
- Interconnectedness
- Correlations / Common exposures
- Complexity
- Leverage

An experiment: effects of size, PD and correlations
Connect systemic risk contribution to regulatory measures
- Capital surcharge for systemically important banks.
  How?

Time dimension: Procyclicality

- Self-reinforcing mechanisms within the financial system as well as between the financial system and the real economy
- Risks
  - Build up (but hidden) in expansion phase
  - Materialize in downward phase
- Most notably
  - Excessive credit growth and asset price inflation and unusually low risk premia during the expansion period
**Credit and asset price behaviour around banking crises**

The historical dispersion of the relevant variable is taken at the specific quarter across all crisis countries. Gaps are estimated using a one-sided rolling Hodrick-Prescott filter with lambda set to 1600. Weighted average of real residential and commercial property prices with weights corresponding to estimates of their share in overall property wealth, the gap is in per cent relative to trend. Equity prices are measured in real terms, the gap is in per cent relative to trend.

Source: National data, BIS calculations.

**Graph 1**

Borio and Drehmann (2009)

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**Graph A.1**

**Estimated gaps for the United States**

Gaps are estimated using a rolling Hodrick-Prescott filter with lambda set to 1900. The horizontal dashed lines refer to the threshold values that define the existence of a boom: 6% for Credit/GDP gap; 16% for real property price gap.

1. In percentage points.
2. In per cent; refers to combined residential and commercial property prices.
3. Refers to the residential property price component.

Source: BIS calculations.

Borio and Drehmann (2009)
• Procyclicality: why does it arise?
  – Limitations in risk perception
  – Limitations in incentives
    • Coordination failure, prisoner’s dilemma, herding
    • “As long as the music is playing, you’ve got to get up and dance” (Charles Prince, Financial Times, 9 July 2007)

How to address procyclicality

• Dynamic provisioning
• Leverage ratios
• Capital insurance (Kashyap et al., 2008)
• Counter-cyclical capital buffers
  – Build up capital buffers at good times: restrain risk-taking
  – Allow buffers to be run down at bad times
Counter-cyclical capital buffers

- Smooth IRB inputs
  - Use through-the-cycle PDs: Europe
- Smooth IRB outputs: adjustment factors
  - Choice of conditioning variables
    - Credit, earnings, credit spreads, asset prices
  - Functional link between conditional variable and buffers
  - No “one-size-fit-all” formula: discretion is still important

Smoothing IRB outputs

- Challenge: measuring state of financial cycle can be problematic
- Two critical components
  - Choice of conditioning variable
  - Functional link between conditioning variable and buffer
The vertical shaded areas indicate the starting years of system-wide banking distress. 1 Four-quarter average real growth minus its 15-year rolling average, in percentage points. 2 Loans and leases removed from the books and charged against loss reserves as a percentage of average total loans. Deviations from their 15-year rolling average.

The vertical shaded areas indicate the starting years of system-wide banking distress. 1 Deviation of each variable from its one-sided long-term trend (that is, a trend determined only from information available at the time assessments are made) using a very high value of the smoothing parameter; credit/GDP ratio in percentage points; property prices in per cent. 2 Loans and leases removed from the books and charged against loss reserves as a percentage of average total loans. Deviations from their 15-year rolling average.
The vertical shaded areas indicate the starting years of system-wide banking distress. ¹ Loans and leases removed from the books and charged against loss reserves as a percentage of average total loans. Deviations from their 15-year rolling average.

Linking conditioning variables to buffers

- Multiplicative factor: many functional forms possible
Challenges

- To analyze the effectiveness, it is crucial to model endogenous behavior of banks and investors
  - Heterogeneous agents
  - Endogenous risk
  - Feedback between FS and the real economy
  - Impact of defaults: externality

- Existing models not up to these challenges

Conclusion

- Wide recognition on the need to adopt macroprudential perspective of banking regulation
- Challenges remain to define the operational toolbox
- Challenges for both policymakers and researchers
Question or Comments?

Haibin Zhu
Bank for International Settlements
Representative Office in Asia and the Pacific
78th Floor, Two IFC, Central, Hong Kong
Haibin.zhu@bis.org

References