Systemic Surveillance
and
Macro Prudential Indicators

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Part I

Introduction

Macro Indicators: Why?
Systemic Banking Crises

- High frequency: 117 crises in 93 countries between 1980 & 2002 (World Bank data)
- High costs
  - Fiscal costs in developing countries: about $1 trillion
  - Economic downturn/output loss: about the same
Predicting and Preventing Systemic Banking Crises

• Numerous and varied attempts
  • National level
  • International level
• Mixed results so far
• Looking into some current global efforts
  • Global institutions
  • Reliance on macro-indicators
Examples of Systemic Surveillance Indicators

• The IMF approach
  • Start in 2000 as “Macro-prudential indicators”
  • Now called: “Financial soundness indicators” (FSIs)

• Example of a private sector approach
  • Major rating agency: FitchRatings
  • “New product” – Start Summer 2005

• Prospects for the future
Part II

The IMF Approach:
Financial Soundness Indicators
IMF - FSIs

- What are the FSIs?                      List
- Where do we come from?                 Background
- Where do we stand now?                 FSIs produced
- What are the main issues?              Data issues
- How do we use the FSIs?                IMF practice
12 Core FSIs (banking sector)

Capital adequacy (3)
- Regulatory capital to RWA
- Regulatory Tier I capital to RWA
- (NPLs - provisions)/capital

Asset quality (2)
- NPLs/total loans
- Sector distribution of loans

Earnings and profitability (4)
- ROE, ROA, Expense ratio
- Interest margin

Liquidity (2)
- Liquid asset/total assets
- Liquid assets/short term liabilities

Sensitivity to market risk (1)
- FX net open position/capital

27 encouraged FSIs

Other banking sector FSIs
- Capital/assets (leverage ratio)
- Gross derivatives positions
- Trading income/income

Liquidity in securities market
- Bid-ask spread
- Average daily turnover

Non-financial sectors
- Corporate leverage ratio
- Corporate ROE
- Corporate FX exposure
- Real estate prices
Where do we come from? (1)

- Financial crises of the late 1990s
  - Reflection on how to prevent future crises
  - Identification of risks and vulnerabilities in the financial system
  - FSAP program
- Urge to develop a new body of statistics
Where do we come from? (2)

- **Macroprudential Indicators**
  - September 1999: Consultative meeting (IMF HQ)
  - January 2000: IMF Board discussion of a paper
  - April 2000: IMF Operational Paper Number 192 on MPI
Where do we come from? (3)

• Financial Soundness Indicators
  • June 2001: Sets of FSIs endorsed by the IMF Board as a “key tool” of financial sector surveillance
  • March 2003: Draft Guide posted on website for comments
  • Jan. 2004: Revised sets of FSIs endorsed by the Board
  • July 2004: finalized Guide posted on website
  • 2006: Paper version of the Guide issued
  • 2007: New IMF Board paper under preparation
Where do we stand now? (1)
Countries FSI Tables

• Data collected during IMF missions
• Reviewed and processed by MCM Department
• Incorporated into the GFSR
  • First time in March 2003 - 3 tables
  • Since April 2004, series of 6 tables
    • Solvency (2)
    • Loan quality (2)
    • Profitability (2)
  • Up to 98 countries in Sept. 2006 - April 2007: 91 countries
Where do we stand now? (2)
Coordinated Compilation Exercise

- June 03: IMF Board approval, as a one-time pilot
- March 04: Launch
  - 71 countries invited - 62 accepted – 55 actual participants
  - End 2005 data – Core set of 12 FSIs
- From January 2007: Results on the external website
  - 40 countries – Increased to 52 in February – eventually 57
- Follow-up in 2007
  - Meeting of reference group in May 2007
  - Paper for IMF Board under preparation
What are the Main Issues?

Pending Questions about the Data

• Informative value

• Quality and consistency
Informative Value - CAR

- Sample of 89 countries in April 2007 GFSR
- Below 8% - Only one country: Bangladesh - 7.3%
- Highest ratios
  - Above 30%: Armenia & Uruguay
  - Between 25% & 30%: Serria Leone – Serbia – Belarus
  - 2004 highest values: Zimbabwe (34.4%) & Sierra Leone (36.8%)
- Advanced countries – Converging levels
  - US: 13.0%
  - Germany & Japan: both 12.2%
Informative Value – Loan Quality

• NPL to total loans
  • Wide variations among countries
    • EUR/Advanced economies: Germany (4.0%) vs. Spain (0.7%)
    • EUR/Transition countries: Serbia (21.4%) vs. Belarus (2.0%)
    • MCD: Egypt (25.0%) vs. Armenia (1.9%)
  • Sudden changes in levels
  • Impact of NPL management practices

• Provisions to NPL
  • For 2005, 22 countries out of 72 above 100%
  • US: 148.4% vs. Canada: 55.3%
  • Spain: 251.8% vs. UK: 56.1%
Informative Value – Profitability

• **Return on assets**
  • Normal range for advanced countries: 0.5% - 1.5%
  • Loss makers: None in 2005, one in 2006 (Serbia)
  • Best performance:
    • Sierra Leone (2005): 7.9%
    • Zimbabwe (2004): 9.7%

• **Return on Equity**
  • Normal range for advanced countries: 12% - 20%
  • Best performance:
    • Sierra Leone (2005): 52.5%
    • Zimbabwe (2004): 125.8%
Data Quality and Consistency Issues

• Numbers sometimes sound implausible
• Lack of Consistency
  • Within same country
    • MCM database/CCE/OECD database
    • Inconsistent data for a given country
  • Between countries
• Complexity
  • Compilation Guide
  • Still limited understanding of FSI methodology among country authorities and IMF macro-economists
## April 2007 GFSR – FSIs Tables

### Capital to assets ratio — Internal consistency

<table>
<thead>
<tr>
<th>Reference country:</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States – declared:</td>
<td>9.0</td>
<td>9.2</td>
<td>9.2</td>
<td>10.3</td>
<td>10.3</td>
</tr>
<tr>
<td>ROA:</td>
<td>1.1</td>
<td>1.3</td>
<td>1.4</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>ROE:</td>
<td>13.0</td>
<td>14.1</td>
<td>15.0</td>
<td>13.2</td>
<td>12.7</td>
</tr>
<tr>
<td>Calculated ratio:</td>
<td>8.5</td>
<td>9.2</td>
<td>9.3</td>
<td>9.8</td>
<td>10.2</td>
</tr>
<tr>
<td>Calculated/declared:</td>
<td>94.0%</td>
<td>100.8%</td>
<td>101.4%</td>
<td>95.8%</td>
<td>99.2%</td>
</tr>
</tbody>
</table>
April 2007 GFSR – FSIs Tables

Capital to assets ratio — Internal consistency

<table>
<thead>
<tr>
<th>Unexplained swing:</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan – declared:</td>
<td>3.9</td>
<td>3.3</td>
<td>3.9</td>
<td>4.2</td>
<td>4.9</td>
</tr>
<tr>
<td>ROA:</td>
<td>-0.6</td>
<td>-0.7</td>
<td>-0.1</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>ROE:</td>
<td>-12.7</td>
<td>-17.9</td>
<td>-2.9</td>
<td>4.3</td>
<td>12.6</td>
</tr>
<tr>
<td>Calculated ratio:</td>
<td>4.7</td>
<td>3.6</td>
<td>3.4</td>
<td>7.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Calculated/declared</td>
<td>121.6%</td>
<td>109.0%</td>
<td>88.9%</td>
<td>165.9%</td>
<td>81.6%</td>
</tr>
</tbody>
</table>
April 2007 GFSR – FSIs Tables

Capital to assets ratio — Internal consistency

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unexplained swings:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany – declared:</td>
<td><strong>4.4</strong></td>
<td><strong>4.6</strong></td>
<td><strong>4.6</strong></td>
<td><strong>4.4</strong></td>
<td><strong>4.4</strong></td>
</tr>
<tr>
<td>ROA:</td>
<td>0.2</td>
<td>0.1</td>
<td>-0.1</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>ROE:</td>
<td>4.6</td>
<td>2.9</td>
<td>-1.5</td>
<td>1.9</td>
<td>9.0</td>
</tr>
<tr>
<td>Calculated ratio:</td>
<td><strong>4.3</strong></td>
<td><strong>3.4</strong></td>
<td><strong>6.7</strong></td>
<td><strong>5.3</strong></td>
<td><strong>3.3</strong></td>
</tr>
<tr>
<td>Calculated/declared</td>
<td>99.4%</td>
<td>75.8%</td>
<td>145.7%</td>
<td>120.9%</td>
<td>75.5%</td>
</tr>
</tbody>
</table>
### Unexplained swings:

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigeria – declared:</td>
<td>10.2</td>
<td>10.7</td>
<td>9.6</td>
<td>9.3</td>
<td>13.1</td>
</tr>
<tr>
<td>ROA:</td>
<td>3.3</td>
<td>2.4</td>
<td>1.7</td>
<td>3.1</td>
<td>0.5</td>
</tr>
<tr>
<td>ROE:</td>
<td>43.7</td>
<td>28.1</td>
<td>19.8</td>
<td>27.4</td>
<td>7.2</td>
</tr>
<tr>
<td>Calculated ratio:</td>
<td>7.6</td>
<td>8.5</td>
<td>8.6</td>
<td>11.3</td>
<td>6.9</td>
</tr>
<tr>
<td>Calculated/declared</td>
<td>74.2%</td>
<td>80.1%</td>
<td>89.8%</td>
<td>121.9%</td>
<td>53.0%</td>
</tr>
</tbody>
</table>
How are the FSIs Used?

• Impact of dissemination still difficult to measure

• Country authorities
  • Quick reactions to GFSR data
  • Less attention paid to internal IMF staff reports

• IMF macro-economists
  • Collection of data and basic quality controls during missions
  • Practical guidance from specialized departments
  • Reliance on the FSIs as a gateway to the assessment of financial systems in visited countries
Practical Guidance:

Three-step Process

- Review
- Elucidate
- Conclude
A Three-Step Process

- **Review**
  - Indications about the condition of the banking system
  - Clues about the quality of the indicators
  - Characterize data as:
    - Plausible
    - Intriguing, or
    - Anomalous
- **Elucidate**
- **Conclude**
A Three-Step Process

• Review

• **Elucidate**
  • Find out more based on time/resources available
  • Shortcut: single meeting – direct assessment of answers
  • Middle way: meeting #1 – requests – meeting #2
  • More in-depth: collection and review of underlying financial statements

• Conclude
A Three-Step Process

• Review
• Elucidate

**Conclude** - on two aspects

• Quality of the FSIs
• Meaning of the findings
A Three-Step Process

- Review
- Elucidate

**Conclude - Quality of the FSIs**

- Accuracy
- Internal consistency
- Consistency with:
  - Sound, established international standards and practices
  - The IMF’s *Compilation Guide on FSIs*
Focus on three sets of indicators

- The 3 sets of key indicators of banks’ health are closely connected
- Influence of the US “CAMELS” System
- Preferred sequencing
  - Loan quality
  - Profitability
  - Solvency
FSIs: Some Concluding Thoughts

- One of the most ambitious efforts to try to predict and prevent financial crises – Relies on the IMF universality
- Contributes to the emergence of a culture of financial sector data collection and analysis among macro-economists
- And to the banking supervisory community to focus on linkages with macro issues
- Unresolved data quality issues and excessive complexity
- Time will come for a new phase, and proper consideration should be given to other approaches
Part III

Example of a Private Sector Approach:

“Bank Systemic Risk Report”

By FitchRatings
FitchRatings

- Third largest worldwide rating agency
- Dual headquarters – New York and London
- 49 offices – 2,800 staff – 2,100 professionals
- Revenue: $ 600 million in last 9 months
Bank Systemic Risk - FitchRatings

- “Assessing Bank Systemic Risk: A New Product”
  - Report of July 26, 2005
  - Part of “Sovereigns” risk assessments
- Innovative and comprehensive approach
  - Brings together macro research work and micro financial analysis
  - Also relies on some IMF FSIs
Bank Systemic Risk - FitchRatings

- Banking System Indicator (BSI)
- Macro-prudential Indicator (MPI)
- Combination forms a Systemic Risk Matrix
Banking System Indicator (BSI)

- Starting point: System Average Individual Rating (SAIR)
  - Assets-weighted average rating for individual banks
  - Includes rated plus systematically important unrated banks
- Systemic Risk Analysis is added
  - Analysis of 9 specific factors of risk
  - Qualitative side of the approach
- Combination forms the BSI - 5 levels: A to E
BSI: The 5 Levels
Number of Countries in September 2007

- A Very High Quality: 7 countries
- B High Quality: 30 countries
- C Adequate Quality: 9 countries
- D Low Quality: 28 countries
- E Very Low Quality: 13 countries
Macro-Prudential Indicator (MPI)

- Analysis of key macro-prudential variables
- Identification of patterns preceding past systemic stress
- Relies on findings of a 2002 BIS research paper
December 2002 BIS Quarterly Review:
“Assessing the Risk of Banking Crises”
by C. Borio and P. Lowe

- Review of significant deviations from trend for:
  - Credit to the private sector
  - Real exchange rate
  - Equity prices
- Covers 34 countries between 1960 and 1999
- Led to a banking crisis within 3 years in 70% of cases
Macro-Prudential Indicator (MPI): FitchRatings Calibration for a Warning

- A ratio of private sector credit to GDP more than 5% above trend **AND**
- **EITHER** real equity prices more than 40% above trend
- **OR** real exchange rate more than 9% above trend
Macro-Prudential Indicator (MPI): Range of Outcomes (September 2007)

- MPI 1 - Low vulnerability
  - No warning - 34 countries
- MPI 2 – Moderate vulnerability
  - Close to a warning – 45 countries
- MPI 3 – High vulnerability
  - Warning triggered – 8 countries
Macro-Prudential Indicator (MPI): Predictive Power of the Fitch Model

- No warning for past crises: 1 out of 3
- False alarms: 40% of warnings
FitchRatings Bank Systemic Risk Assessment: Some Concluding Thoughts

- Creative approach – A valuable contribution to global efforts toward systemic financial analysis
- Integration of the findings of macro research and the detailed micro knowledge of a large in-house pool of bank analysts
- Only 2 years old – Largely untested
Part IV

To Conclude:
Prospects for the Future
Growing Worldwide Focus on Financial Stability will Continue

• Long-term trend based on economic realities
  • Core issue: critical importance of the complex linkages between the financial sector and the real economy
  • Globalization leading to growing economic integration
• We are still at an early stage
Multiplicity of Efforts is Welcome

- National and regional level
  - Multiplication of financial stability reports
  - National models for assessing systemic financial stability
- Global level
  - FSAP and stress-testing
  - OECD Bank Database
  - Balance sheet approach
There is a Future Role for More Macro Indicators

- Financial stability assessment should combine analytical, qualitative aspects and quantitative elements
- The IMF-sponsored FSIs are still a work in progress
- There is a potential for the development of new indicators similar to the FitchRatings MPI
Waiting for the Single Global Indicator

- A single global indicator of worldwide financial stability could be computed now
- Based on the IMF-sponsored FSIs
- Or on the FitchRatings stability assessment framework
Single Global Indicator:

Who Will Be The First One To Dare?