



Stress Testing: Financial Sector Assessment Program (FSAP) Experience

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Paper presented at the Expert Forum on Advanced Techniques on Stress Testing: Applications for Supervisors
Hosted by the International Monetary Fund
Washington, DC– May 2-3, 2006

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International Monetary Fund

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Expert Forum on Stress Testing

IMF

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Outline

- **Overview of the FSAP**
- **Stress Testing in FSAPs**
 - general
 - specific experience
- **Issues Going Forward**



Overview of the FSAP



FSAP Objectives

To strengthen and deepen financial systems and enhance their resilience

- Reducing the potential for systemic crises
- Limiting the severity of crises
- Addressing structural weaknesses



Analytical Tools and Methodology

Risks and vulnerabilities are identified using both quantitative tools and qualitative assessments



- Financial Soundness Indicators
- **Stress Tests**
- Early Warning Systems

- Standards and Codes
- Arrangements for Crisis Prevention and Management



Stress Testing in FSAPs: General



Stress Testing in FSAPs

- A key quantitative tool in financial stability assessments.
- Tailored to country-specific circumstances.
- Identification of “good practices” ongoing.
- Learning experience / tool for dialogue.
- Complemented by assessments and FSIs.



Stress Testing Approaches

- **Bottom up**
 - Based on individual bank portfolios
- **Top down**
 - Aggregate system wide model



Stress Testing in FSAPs: Specific Experience



FSAP Experience with Stress Testing

- Most FSAPs conduct single-factor sensitivity analysis
- Recent FSAPs:
 - Macroeconomic scenario analysis
 - Involve the authorities
 - Involve financial institutions
 - bank-by-bank implementation
 - Include interbank contagion
 - Include nonbank financial institutions



Coverage in FSAPs

Stress tests became more sophisticated over time:

(percent of all FSAPs initiated in the period)

	<u>2000–2002</u>	<u>2003–04</u>
• Scenario analysis	64	94
• Interbank contagion taken into account	11	35
• Insurance sector stress tested	25	35



Risks Addressed in FSAP Stress Tests

- Credit Risk
- Market Risk
 - Interest rate
 - Exchange Rate
- Liquidity Risk
- Contagion/Operational Risk



Credit Risk

- The most significant source of risk
- The most in need of strengthening



Credit Risk (Continued)

- Single equation models for household and corporate sectors
- Credit quality as function of macroeconomic variables

Examples:

- Hong Kong: Single equation aggregate estimate and panel estimates using bank-by-bank data
- Denmark: Robust VaR over business cycle in data-restricted environment



Credit Risk Scenarios

Depending on specific (macroeconomic) circumstances of the country, and data availability:

- NPL & loan provisioning (most countries), e.g. NPL migration analysis / loan reclassification.
- Sophisticated analysis on PDs and LGDs, (including effect from macro factors).
- Specific: Cross-border lending (e.g. Austria), Foreign exchange lending (e.g. Jamaica), Loan concentration (e.g. Netherlands, Russia).



Market Risk

- Relatively well addressed through prudential supervision--often implemented using internal models
- Correlation of market and credit risk through indirect credit risk often not covered well.



Market Risk: Type of Analysis

Interest rate risk analysis:

- Repricing / Maturity Gap (e.g. Hungary)
- Duration (e.g. Czech Rep, Israel)
- Value at Risk (e.g. Belgium, Italy)

Exchange rate risk analysis:

- Net open position (e.g. Bulgaria, Sweden)
- Value at Risk (e.g. France, Germany)



Market Risk: Scenarios

- Ad hoc, hypothetical, or historical interest rate increase:
 - Parallel shift in yield curve
 - Steepening / Flattening yield curve
- Ad hoc, hypothetical, or historical devaluation / depreciation / appreciation
- Basel Committee Amendment to Capital Accord to incorporate market risk



Liquidity Risk and Equity, Real Estate Price Shocks

Liquidity Risk:

- Change liquidity ratio, either ad-hoc (Austria, UAE), or based on historical data (France, Croatia)

Equity / Real Estate Risk:

- Shock to stock market (e.g. Finland, South Africa)
- Housing Price Shock (e.g. Hong Kong, Ireland)
- LTV ratios, mortgage PDs (e.g. Belgium, Australia)



Other Risks

- Commodity prices (e.g. Finland, South Africa)
- Country exposure risk (e.g. Luxembourg)
- Shocks to specific sectors (e.g. Belarus: Agriculture, Finland: ICT)
- Interbank contagion (next slide)



Contagion Risk

- Complementary to stress tests of individual institutions
- May highlight some vulnerabilities of the systems (e.g. payment systems)
- Methodology: Matrix of institution-to-institution exposures
 - Typically net uncollateralized interbank lending (Example: Belgium. Paper Degryse & Nguyen 2004)
 - Could also be constructed for liquidity contagion based on experience from past runs



Issues Going Forward



Going Forward

- Balance between uniformity of exercise versus case-by-case approach
- Identify good practices
 - “Template” for small, less complex financial systems
 - Dialogue with core group of people at supervisory agencies and central banks (e.g. at this forum)
- Better integrate stress tests and analysis of FSIs
 - Improving availability and quality of FSIs (coordinated compilation exercise)
 - “Benchmarking” of FSIs
 - Links among FSIs and to other indicators



Going Forward (Continued)

Advance methodologies:

- Credit risk analysis
- Correlation market – credit risk
- Cross-border issues
- Contagion
- Conglomerates / Insurance Companies
- Operational risk

Many of these issues will be discussed in the course of this meeting.