FSAP stress testing: Denmarks experience

Jakob W Lund (Danmarks Nationalbank) Presentation on 8 November 2007 to Bank of Canada Economic Conference
FSAP Stress test experience

Subjective personal experience of local central bank stress-test co-ordinator.

For FSAP stress test methodology and results, see: *Denmark: FSAP – Technical Note – stress testing*, IMF country paper 07/125 and other FSAP papers (all published)

For our planned future stress-test work, see Danmarks Nationalbank *Financial stability 2007*
IMF FSAP balancing act

IMF perspective
- Global FS issues
- Cross-country comparability
- IMF policy
- IMF stress-test models

Local perspective
- Local FS issues
- Local financial structure, data
- Local policy
- Local stress-test models
What would IMF want?

Quick survey of IMF FSAP stress tests:
- Big differences in scope of FSAP stress tests
- But rising standards, especially since 2003

IMF ‘ideal specification’ FSAP macro stress test:
- Coverage of all systemically important FIs
  - Banks, Insurers, Pensions, Conglomerates
- Top-down and bottom-up estimates
- Of credit, market and contagion risks
- For short (1yr) and medium (3yr) term
- For single- and multi-factor scenarios of
  - External & internal, demand & supply shocks
What is special about Denmark?

- Welfare state
  - Flexsecurity stabilisers + tax incentives
- Mortgage credit system
  - balance principle, no default in 200+ yrs
- Banking system
  - Highly concentrated: CR5 = 70-80%, but 150+ banks
  - Internationalised: 30% foreign banks, incl 2 of top 5
- Fixed exchange rate since 1982
  - No (need for) central bank macro projections
- Bureaucratic restraint/constraints
  - Tax freeze
  - Burden-conscious, given overlap with Basel II, IFRS
  - Financial stability profile and resources
  - Data limitations, eg. confidentiality issues
Timeline for IMF FSAP stress test

Aug-2005: 2-day preparatory visit
Nov-2005: 1st mission (2 weeks)
   Lots of meetings covering
   - data for stress test: banks, borrowers, OFIs
   - existing analyses, systemic risk
   - FSAP stress test: scope, methods, scenarios
Dec-2005 to Feb-2006: local homework
   - Calculation of stress test results
May-2006: 2nd mission (1 week)
   - Reconciling the stress-test results
IMF FSAP stress-tests

Stress test scenarios:
- Single factor shocks:
  - yield curve +250/-100bp
  - stock market -30%
  - exchange rate +/-40%
  - property prices -30%
- 3 Macro risk scenarios:
  - Domestic shock: fall in houseprices
  - External shock: DKK↑, competitiveness and external demand↓
  - Full shock: domestic shock + ECB interest rate rise

Estimation methods/scope:
- Bottom-up estimates:
  - 5 biggest banks estimate impact with own models
  - 5 biggest insurance & pension firms
- Top-down estimates
  - IMF portfolio credit risk model (Segoviano), with input of PDs from DN failure rate model
  - DN simple reduced-form equation for losses
IMF portfolio credit risk model

PoD’s Nationalbank

Provisions, NPL’s Finanstilsynet

Macro/Financial variables

CoPoD Step 1

Estimates of PoD’s f (Macro/Fin Variables)

CIDO Step 2

Exposures Nationalbank Finanstilsynet

LGD Nationalbank Finanstilsynet

CIMDO

Step 3

Economic Capital (VaR)

Simulation
IMF FSAP stress-test results

- Differences in estimated impact:
  - Banks’ bottom-up < DN top-down < IMF
  - Banks: stable earnings, LGD only on unsecured EAD
  - IMF: 50% LGD, focus stressed ULs
  - Banks wary of read-across to Basel pillar II

- IMF FSAP recommendations:
  - Strengthen stress test capabilities at DFSA
  - Cooperation with DN, major banks

- Local follow up:
  - DFSA stress-test: rating banks, risk-based supervision
  - DN development of models for macro stress testing the financial system
Evolution of our stress test models

Evolutionary development of stress-test models was accelerated by 'shock' of IMF FSAP

- Future FS

IMF FSAP
Aug-05 to Sep-06

- Stress test results
- Architecture + building blocks
- Macro scenarios
- Interbank exposures
- Stressed failure rate model
- Corporate failure rate (PD) model
- "Turn up voltage" chart
- "What if?" stress test table
- Relevant charts of buffers, exposures, etc.

Monetary Review 2001
2000

FS-2001
FS-2002
FS-2003
FS-2004
FS-2005
FS-2006
FS-2007

August 2005 to September 2006