Stress Testing at the Central Bank of Colombia (BR)

DANIEL OSORIO

FINANCIAL STABILITY DEPARTMENT, BANCO DE LA REPÚBLICA (CENTRAL BANK OF COLOMBIA)

Top-down Stress Tests at BR: Taxonomy and Features

▶ <u>Solvency Stress Test (SYSMO)</u>

- (relatively more relevant as a policy tool of the Financial Superintendency – financial supervisory authority).

▶ <u>Liquidity Stress Tests</u>

- (relatively more relevant as a policy tool of the Central Bank).

SYSMO: Bank solvency stress test

1. Building macroeconomic scenarios (2-yr horizon)
   - Challenge: Create consistent, persistent scenarios with feedback effects.
   - DSGE Model: Smets and Wouters (2007) + Extension: Caldara *et al* (2014).
2. Mapping macroeconomic scenarios to risk sources
   - Time series models (currently problematic).
3. Modelling bank behaviour under stress
   - Key assumption: pre-stress structure is optimal (currently problematic).

▶ Policy use
   - Central Bank: mostly informative.
   - Financial Supervisor: helps to structure supervisory strategy.

SYSMO: Results
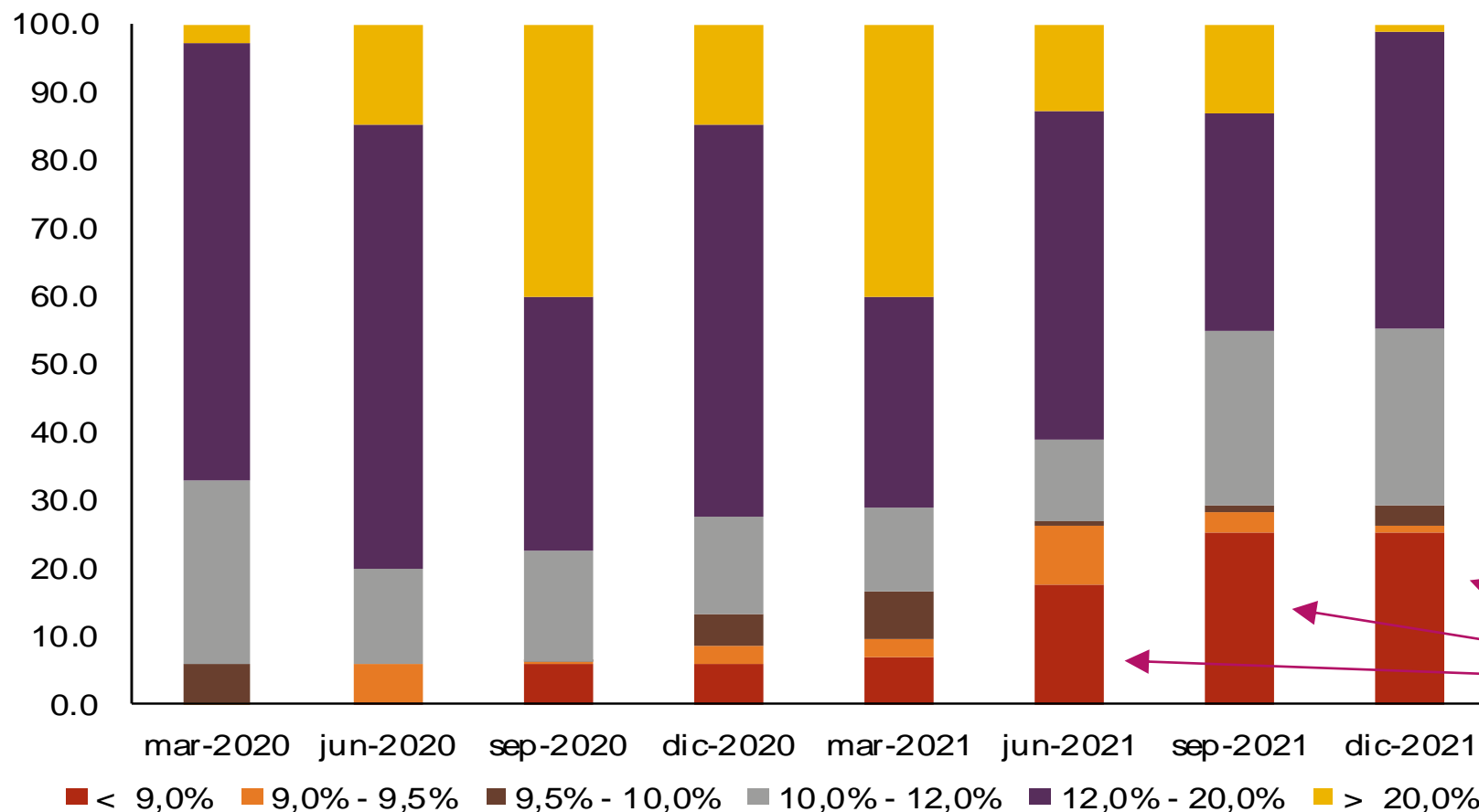
Distribution of total credit in solvency buckets

2020:I-2021:IV

Trouble in sight for 2021…

Legend: ■ < 9,0% ■ 9,0% - 9,5% ■ 9,5% - 10,0% ■ 10,0% - 12,0% ■ 12,0% - 20,0% ■ > 20,0%

Source: Financial Superintendency (March 2020), SYSMO calculations (jun-2020 to dec-2021).

Liquidity stress tests

1. Banks liquidity stress test:

    ▶ Calculation of stressed flows. Key assumption: fall of interest income.

2. Investment funds liquidity stress test:

    ▶ Calculation of stressed regulatory indicators for key investment funds. Key assumption: March-like withdrawals.

Challenges: Stress Testing in the Time of Coronavirus

▶ <u>Solvency Stress Test (SYSMO)</u>

- What is a stress scenario, in the face of the worst crisis ever?
- Some of the key financial and economic relationships we usually exploit for financial stability analysis are "broken"
  - Partial effect of supervisory response to the crisis (good example of Goodhart's Law).
- Possible solution: Reverse stress tests (Bank of England).

Example: reverse stress test using SYSMO

▶ Challenge: the true extent of credit risk is not observed with the same accuracy as before.

▶ Back of the envelope calculations suggest that the degree to which "alleviated" loans recover is the key to financial stability in the short term.

  ▶ 40% of total loans were "alleviated".

▶ Calculate the % of alleviated loans NOT recovering that would lead to:

  1. Aggregate solvency ratios below regulatory minima.

  2. One of the 3 largest banks falling below regulatory minima.

Challenges: Stress Testing in the Time of Coronavirus

▶ <u>Liquidity Stress Tests</u>

- There seems to be no major problem with the *level* of liquidity.

- There seem to be occasional problems with the *distribution* of liquidity.

- How to test for *distribution* shocks? How to create *distribution* scenarios?