Macroprudential Analysis
Technical Assistance

FinSAC technical advisory services are available to client countries to support the development of effective and appropriate macroprudential analytical toolkits that can be used to help assess, understand and manage systemic financial risk.

Systemic Risk & Macroprudential Policymaking

Systemic risk refers to the risk of a cascading failure in the financial sector which leads to the breakdown of the system (not just the failure of parts of the system). Systemic financial crises result in extensive, real economic costs. To be better able to operationalize systemic risk, it is useful to be thought of as an expected value, that is, probability of a crisis multiplied by the size of crisis if it materializes. Closely related to crisis probability and size, systemic risk has a time series dimension (current position in the financial cycle, affecting crisis probability) and a cross-sectional dimension (concentration, potential contagion and resilience, affecting crisis size).

\[
\text{SYSTEMIC RISK} = \text{PROBABILITY OF CRISIS} \times \text{SIZE OF CRISIS}
\]
**Macroprudential policy** seeks to manage systemic risk by trying to influence both crisis probability (by leaning against the financial cycle) and the crisis size (by increasing the resilience of the financial system). It does so through the deployment/withdrawal of various macroprudential policy instruments (MPIs) thus effectively tightening/easing the macroprudential stance.

In doing so, macroprudential policy faces important trade-offs (at least in the short-run) between systemic risk and the activity in financial intermediation (ultimately, economic growth). The mechanism of these trade-offs is currently not well understood, let alone modelled. But they exist and have to be taken into account when conducting macroprudential policy: it should avoid excessive financial repression through regulatory “overkill”. In other words, macroprudential policy should aim at managing systemic risk rather than eliminating it completely (which is probably impossible to do anyway). Some of the recently established macroprudential mandates seem to acknowledge this trade-off explicitly (ESRB, BoE).

Making appropriate macroprudential policy decisions requires information and in-depth analysis. **Macroprudential analysis** has to cover both the time-series and the cross-sectional dimensions of systemic risk. Systemic risk needs to be measured, in terms of crisis probability (using various indicators and composite stress indices) and crisis size - addressing potential contagion/spillover (SIFI identification, network analysis) and resilience (macro stress tests). It also needs to be forecast, or assessed in a forward-looking way using, for example, early warning systems. Finally, policy simulation is needed to form a view on the transmission mechanism of macroprudential policy and assess the short-term impacts of macroprudential policy on credit supply and the real economy.

**Key questions macroprudential decision-makers have to face:**

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<td>Questions</td>
<td>When to tighten/ease?</td>
<td>Which policy tool(s) to use?</td>
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**MACROPRUDENTIAL ANALYSIS**
FinSAC helping clients build effective macroprudential analytical toolkits

The development of global good practice in macroprudential analytic tools is underway, but no “gold standard” yet exists. To help client countries create a toolkit best suited to their needs, FinSAC has developed a modular framework – the COmpact MacroPrudential Analysis and Simulation System (COMPASS) – which covers all the necessary aspects of macroprudential analysis. COMPASS can be thought of as a menu of macroprudential analytic tools on offer by FinSAC technical assistance. The modular nature of COMPASS allows clients to choose modules or individual elements of COMPASS which are necessary to complement their existing analytic systems and work together with FinSAC experts to implement and customize them to best fit their local environment.

FinSAC’s COmpact MacroPrudential Analysis and Simulation System (COMPASS)

- A macroprudential analytical framework built around existing knowledge in the client institution, using the stress testing framework as a central element.
- Based on quantitative models but flexible enough to fill existing data gaps and statistical difficulties with, for example borrowing results/parameter estimates from international empirical evidence; or expert judgment.
- Modular, to facilitate parallel development and retain flexibility. Allows clients to pick elements that are missing from their framework.
- Adjustable to best meet the individual needs of different clients, according to data/resource availability, or structural features.
- Features information compressing: composite indices for more conclusive policy advice.
The 5 COMPASS modules, cover all the necessary aspects of macroprudential analysis:

**COMPASS Module 1: Baseline Financial Forecasting**

- Projections for key financial stability variables that are typically not covered by standard macroeconomic forecasting models (for example: credit growth; the NPL ratio).
- Possible in a corporate/retail breakdown.
- Uses a combination of univariate statistical methods (e.g. ARIMA)…
- …and simple forecasting models (vector autoregressions, distributed lags models) incorporating key drivers of credit supply/demand and portfolio quality.

**COMPASS Module 2: Systemic Risk Monitoring**

- Time series dimension: 3 composite indices:
### FSI: Financial Stress Index (contemporaneous “degree” of crisis)

| Making use of available high-frequency domestic financial market data (various liquidity measures of interbank market, FX market, government securities market, equity market) | Time-varying correlation to capture “systemic” co-movements of markets | Calibrating thresholds levels for “systemic” stress |

### EWI: Early Warning Indicator (measuring the “probability” of a future banking crisis)

| In the absence of a sufficiently long time series data, the construction of the EWI and the calibration of signal thresholds is likely to be based on findings of relevant cross-country studies | Key ingredients (indicators that proved robust in cross-country studies): |

- Credit/GDP compared to its trend (or estimated equilibrium level)
- Credit dynamics
- Asset prices (mostly real estate) compared to their trend
- Debt Service Ratio

### FCI: Financial Conditions Index (measure of financial repression)

| Making use of both price- and non-price indicators of credit conditions | Otherwise based on: |

- Interest rate spreads on new loans (measure of price conditions)
- Loan-to-value ratio or similar proxy for non-price conditions |

Calibrating thresholds levels for “systemic” stress

- Cross-sectional dimension:
  - Method to identify domestic SIFIs
  - Network effects.

### COMPASS Module 3: Assessment of systemic resilience (stress-testing)

- Takes existing credit risk stress testing framework as a starting point.

- Potential extensions include:
  - Making the calibration of credit risk parameters model-based, using credit registry data and estimates from econometric models
  - Using existing macro forecast models to generate consistent baseline and stress scenarios
  - Extension to liquidity risk (using scenarios consistent with the credit risk scenario)
  - Incorporating credit growth forecasts (output from Module 1)
  - Taking into account the interconnectedness of banks.

- An alternative use is for reverse stress tests (to address the question: What are the macro paths that create systemic stress?).
**COMPASS Module 4: Bank Behavior**

- Assesses how the banking sector reacts to macro and regulatory shocks in i) credit growth and ii) interest rate spreads.

- Builds on the stress testing module’s results in terms of the effect of a macro or regulatory shock on the capital adequacy ratio. From that point on, it assumes target capital adequacy ratios (similarly to the BoE’s RAMSI). Balance sheet adjustment takes places according to the deviation of the projected capital ratio from the target, resulting in a deviation from the baseline credit growth forecast.

- Calibrates interest rate spreads under different scenarios, making use of:
  - Loan-to-deposit ratio
  - Projection of foreign funding cost (including the sovereign risk premium)
  - Projection of NPL ratio (output from Module 1).

**COMPASS Module 5: Macro Feedback**

- Completes the policy simulation toolkit by assessing how economic activity is affected by changes in credit and interest rate spreads.

- Should utilize the existing macroeconomic modeling/forecasting knowledge of the client authority.

- If necessary, it can be combined with, or based on, the results from multi-country empirical exercises (for example, estimates by the FSB-BCBS Macroeconomic Assessment Group of the impact of stronger Basel III capital requirements on the real economy).

**FinSAC technical assistance going beyond macroprudential analysis**

FinSAC helps client countries develop their preparedness and ability to respond effectively to potential systemic events. FinSAC experts, with wide-ranging and detailed understandings of macroprudential policymaking, offer technical assistance not only on macroprudential analytical toolkits, but on macroprudential institutional arrangements as well. This includes assistance on the alignment of analytical capacities with the available policy instruments (preparing for the introduction of instruments stipulated in the EU’s CRD IV, such as the countercyclical capital buffer); governance arrangements for macroprudential committees within central banks; governance arrangements for National Financial Stability Councils and similar issues regarding the macroprudential institutional set-up.