



EUROPEAN CENTRAL BANK

EUROSYSTEM

# Macroprudential Stress Tests and Macroprudential Policy

## Calibration:

### A Consistent Approach

Carmelo Salleo, ECB



06/02/2019

Macroprudential Stress Testing Conference  
ECB, Frankfurt, 6 February 2020

# What is a macroprudential stress test?

- A projection of the most likely path of key macro-financial and financial institution-level variables (baseline scenario).
- A (set of) projection(s) of these variables when the system is hit by severe shocks (adverse scenario(s)).
- Ideally: financial institutions react to the shocks and these reactions feed back into the economy potentially amplifying negative outcomes.

# How to calibrate a macroprudential policy

A standard approach to policy making is a cost-benefits analysis.

For macroprudential policies this presents a few challenges:

- Costs are relatively straightforward:
  - Macroprudential policies restrict the demand or supply of credit, which in turn might cause a slowdown of the economy.
- Benefits pose a challenge:
  - In order to be comparable, benefits should be expressed in the same unit as costs, and systemic risk is an elusive concept.
  - One approach is to calculate the decrease in the probability of a systemic crisis and of its costs (MAG/LEI studies).
  - However measurement error is likely to be very large: crisis events are few and correlated, estimates of crisis costs vary widely from a few to hundreds of percentage points of GDP.

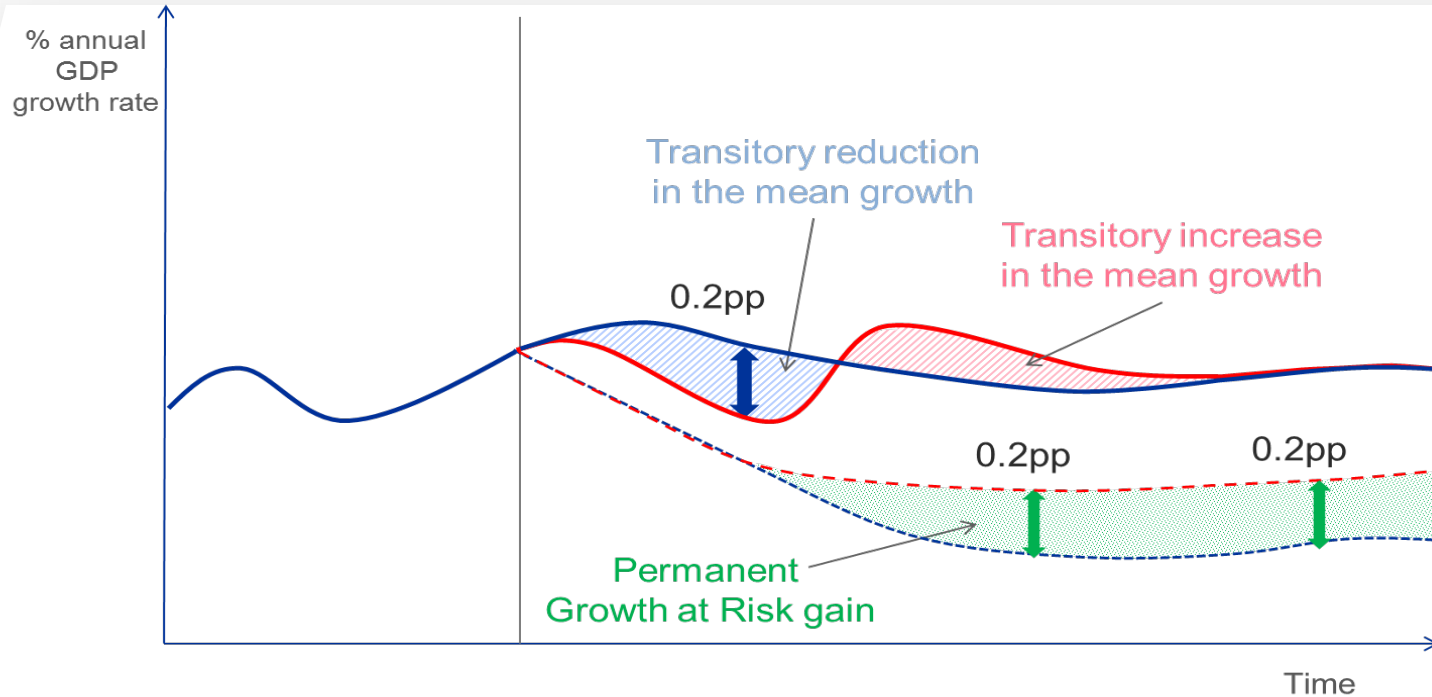
# An alternative approach to the benefits of macroprudential policy

- Benefits can also be assessed in terms of the increased resilience of the financial system to severe shocks:
  - If thanks to a macroprudential policy for a set of severe but plausible shocks the downturn is less severe,
  - the expected value of the loss in output that was thus avoided can be directly compared to the costs caused by the build-up of the measure.
- Comparing the results of a macroprudential stress test with and without the macroprudential measure in place for both the baseline and adverse scenarios we have a measure of costs (baseline) and benefits (adverse) which is consistent i.e. computed within the same framework, country-specific and “severe but plausible”.

# An extension of the consistent approach

- If instead of a single adverse scenario we have a distribution of scenarios and outcomes, we can compare the shape of the entire left tail of outcome variables with and without the macroprudential measure.
- This would provide a more robust and complete assessment of the impact of the measure and limit the need to assess the probability of the adverse scenario. Many adverse scenarios provide more general picture of policy effectiveness.
- Such an approach is the equivalent of a Growth-at-Risk perspective in the policy space: an event today (looser financial conditions/introduction of a policy measure) affects the distribution of output tomorrow.

# A GaR approach for macroprudential policy



## Pros:

- Whenever institution-level heterogeneity is relevant such a family of models captures it much better than standard macro models (DSGE, VAR).
- Compared to a reduced-form GaR it can describe transmission channels - the ECB framework uses a semi-structural VAR model for 19 countries and integrates 90 banks modelled individually.
- The stochastic simulation environment allows policy makers to experiment with many different environments and assumptions (e.g. parameters).
- Rich set of internally consistent outcomes: Growth-at-Risk, CET1-at-risk, lending-at-risk...

**Cons:** large investment, complexity.

# Conclusions:

- A macroprudential stress test framework is a natural candidate for policy evaluation in that it provides estimates of outcomes in a likely and in a bad outcome – and financial stability is especially concerned with the latter.
- If extended it can be mapped into a Growth-at-Risk framework which is conceptually and statistically more satisfying than the current approach.
- Technical challenges include the integration of system-wide considerations and communication of a relatively sophisticated concept.