



EUROPEAN CENTRAL BANK

EUROSYSTEM

ECB-UNRESTRICTED

ESCB Sovereign Debt Sustainability Analysis: a methodological framework

Cristina Checherita-Westphal
ECB, Fiscal Policies Division

ESM workshop on
Debt sustainability: current practice and future perspectives
Luxembourg, 11-12 December 2018

The views expressed in this presentation and the follow-up discussion are mine and do not necessarily reflect those of the ECB or the Eurosystem

Outline

- 1 Motivation and overview of DSA framework
- 2 The DSA Benchmark scenario
- 3 Adverse shock scenarios
- 4 Additional indicators and cross-checking tools
- 5 Conclusions

1. MOTIVATION and OVERVIEW

Comprehensive framework assessing *risks* to sovereign debt sustainability in the euro area

- No simple rule for determining whether a government's debt is in practice sustainable or not.
- Traditionally, DSA has been about debt stabilisation, but:
 - ✓ at which level?
 - ✓ with how much fiscal effort?
 - ✓ what is the resilience to adverse shocks?
 - ✓ surrounded by which degree of uncertainty?
 - ✓ which other vulnerabilities matter? (Debt structure? Institutions?...)
- Robust DSA assessment requires an encompassing set of information
 - ✓ Ensure that as much relevant information as possible is taken into account
 - ✓ Limit sensitivity with respect to individual pieces of information
 - ✓ Summarise information in a DSA heatmap and provide for an overall quantitative indicator (sustainability risk score)

- ECB OP 185/2017: basis for a sustainability framework used in fiscal surveillance in E(S)CB since 2015

Bouabdallah, O., Checherita-Westphal, C., Warmedinger, T., de Stefani, R., Drudi, F., Setzer, R. and Westphal, A. (2017), "Debt sustainability analysis for euro area sovereigns: a methodological framework", Occasional Paper Series no. 185, April, ECB, Frankfurt am Main.

- Regular review in the ESCB DSA Working Team and the Working Group on Public Finance (WGPF)
- A series of enhancements to the tool compared to the OP just implemented
- Regular input to internal notes and reports (e.g., Fiscal Policy Note and Surveillance Report).

ECB OP 185/2017

Harmonised methodology; ensure consistency + transparency



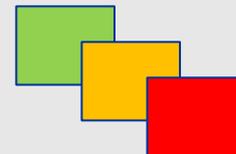
Basis for further qualitative experts' assessment in policy papers



Include elements of DSA in other international institutions, especially EC and IMF



Can derive explicit overall quantitative indicator: DSA heat map/ sustainability score



ESCB DSA framework, OP 185/2017 and revisions

Deterministic DSA

Debt projection scenarios (10-year horizon)

Benchmark

- Central scenario
- Mechanical and plausible
- Based on ESCB internal forecast (incl. potential output)
- SGP-based fiscal rule (slightly amended)

Adverse scenarios

- Narrative shocks around benchmark:
 1. Historical scenario
 2. NFPC with ageing
 3. Macro (bank) stress
 4. Interest rate shock
 5. NFPC and potential growth shock

Other indicators

(refinements)

Stochastic DSA

Liquidity risk

Market uncertainty and political risk

Debt structure

Net financial position

Contingent liabilities

Institutions & governance

Evaluation of all components: Heat map

- Level
- Dynamics
- Fiscal fatigue (only in benchmark)

- Dispersion
- Prob. of
 - debt > 90
 - debt not stable

- Thresholds
- Percentiles

Weighting scheme / aggregation / sustainability score

2. The Benchmark

The BENCHMARK – main assumptions

Main challenge: Provide for a harmonised (mechanical) approach across countries, but keep it realistic and prudent

- 10-year horizon for DSA simulations (currently, 2018-2027)
- Stylised model for driving variables

Real GDP growth path

Internal forecast for the short-to-medium run; beyond, GDP growth path converges to potential growth (ESCB country-specific estimates) following a stylised equation:

- ✓ Takes into account persistence effects
- ✓ Impact of fiscal policy via the multiplier
- ✓ Plausible business cycle pattern: gradual closure of the output gap.

GDP deflator

Gradual convergence to 1.9% in line with the ECB objective for price stability.

Financial assumptions

- In line with market expectations
- Interest rate equation takes into account the structure of government debt and, where relevant, official loan schedule and financial conditions

Fiscal policy assumptions

- Aim: construct most likely norm, consistent with other assumptions (financial)
- Many governments likely to take some additional consolidation over the medium-to-long term ⇔ No fiscal policy change is seen as a risk scenario
- Use assumption that governments comply with **minimum requirements to avoid** significant deviations and, potentially, **sanctions** under the SGP
- **Beyond the ESCB fiscal forecasting horizon** ($\sim T+3$), use fiscal rule **broadly in line with the SGP requirements for convergence towards the MTO** (EC flexibility matrix, with a margin of deviation of 0.25% of GDP and **overall fiscal effort capped at 0.5 p.a.**)
- For fiscal projections: use disaggregation between cyclical component (automatic stabilisers) and structural position, based on the EC's methodology.

Deficit-debt adjustment (DDA)

- Generally assumed to be zero beyond the projection horizon (agreed country-specific assumptions where relevant).

3. Adverse shock scenarios

- **Standardised shocks** gauge sensitivity to same-sized shock.
 - ✓ Used as additional tests, but not very informative for the likelihood of vulnerabilities.
- Need for narrative scenarios:
 - ✓ designed and calibrated on country-specific basis,
 - ✓ capturing country specific risks,
 - ✓ resulting from commonly applied rules.
- **Narrative scenarios considered:**
 - i. No-fiscal policy change, including ageing costs (NFPC)
 - ii. **NFPC and country-specific structural shock (shock to potential growth path)**
 - iii. Country-specific **interest rate** shock
 - iv. Historical scenario
 - v. Combined stress test scenario (country-specific calibrated as per latest EBA EU-wide bank stress test)

Heatmap criteria (revisions)

Aim: Mitigate cliff effects and improvement in the DSA scoring

- a) **Debt level criterion**: continuous scheme with non-linear smoothing around the existing thresholds: 60%, 90% and penalties for higher debt levels (120% and 150%).
- b) **Dynamic criterion**: better accounting for both year of stabilisation and slope effect
 - Year of stabilisation: more gradual impact on the score
 - Slope effect: slope of the projected debt path better taken into account in the score (a flatter debt path more risky than a steeply downward path); debt ratio changes in the shorter-term higher weight compared to longer-term (ESCB forecast horizon more informative)
 - No penalty in the dynamic criterion if debt level $< 30\%$ of GDP (instead of 20% before)

4. Additional indicators and cross-checking tools

Methodology:

- VAR approach (**revised to BVAR**) to assess the **uncertainty** around the joint path of future macroeconomic developments (growth, interest rates, prices).
- Richer specification and a more precise shock identification scheme
- Uncertainty around fiscal position captured through:
 - ✓ cyclical component and
 - ✓ the rule-embedded reaction of SPB to cyclical conditions
- No uncertainty regarding (extra) reaction of fiscal authority

Cross-checking tool, providing for additional indicators

- Empirical rather than narrative analysis of macroeconomic uncertainty
- Attaching probability to alternative scenarios
- Three indicators to assess sustainability risk based on the probabilistic approach:

Indicators	Criteria (lower-upper bounds)
Stochastic DSA	
Indicator 1 (debt dispersion or simulated difference 95th-5th percentiles of debt ratio distribution in T+5)	33rd and 66th Percentiles EA sample
Indicator 2 (Probability of debt above 90% in T+5)	Threshold probability (33% - 66%)
Indicator 3 (Probability of debt not stabilizing by T+5)	Threshold probability (33% - 66%)

Short-term

Liquidity indicator

- Net financing needs (T+1) = Gross financing needs (GFN, government securities only) – liquid assets

Market uncertainty and political risk

- Government bond spreads
- Current ratings
- Political risk indicator

Medium and longer-term

Debt structure

- Share of short-term debt
- Change in the share of ST debt
- Share of public debt in foreign currency
- Share of debt with variable interest rate

Governance and quality of institutions

- WB Governance Indicators
(Voice and Accountability, Government Effectiveness, Regulatory Quality and Rule of Law)
- Corruption Perceptions Index

Scope for contingent liabilities

- LT ageing cost indicator (including EC S2 indicator)
- Eurostat Synthetic indicator
- Assessment of risks from financial sector (internal report)

Financial position of the economy

- Net international invest. position
- Private debt (MIP)
- Other Indicators under MIP external position

5. Conclusions

Enhanced ESCB DSA tool:

Comprehensive analysis and more in-depth reporting on sovereign debt risks:

- ✓ Regular input to assess fiscal vulnerabilities
- ✓ Broad risk assessment, but also risk summary in explicit overall quantitative indicator (DSA heat map/sustainability score)
- ✓ Rich set of alternative scenarios
- ✓ Large set of additional indicators (including for illustration purposes and to feed into expert judgement)
- ✓ Allow for expert assessment in country specific write-ups