EUROPEAN CENTRAL BANK

EUROSYSTEM

Public debt level: why and how it matters

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***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.**

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Public debt level: why and how it matters?

Main conclusions of the presentation:

- ***High public debt burden poses economic risks*** as it makes an economy less resilient to shocks and may lower longer-run growth
  - *Important to distinguish between different debt levels ("prudent"; "optimal"; "steady-state"; "debt limit")*
- ***Debt level*** - not only its stabilisation - ***should remain an important ingredient in DSA and fiscal surveillance***
- ***Debt-bearing capacity is country-specific and difficult to estimate***
  - *Estimates are rather volatile, state- and policy-dependent dependent (fiscal-monetary policy interactions and institutional arrangements matters);*
  - *Much less empirical evidence available for the Member States that adopted the euro more recently*
  - *Common debt thresholds generally used as indicative benchmarks*
- ***For countries with low public debt levels, greater scope for debt-financed productive investment***

Review of the literature

Public debt level: Theoretical literature

While in most macroeconomic models, public debt is considered "safe" and its level does not matter (mostly assumed to be financed through lump-sum taxes), in models with debt:

- High government debt may be undesirable even in the absence of sovereign risk as it fosters higher taxation risk in the future (Adam, 2011)

- In **models with sovereign default risk**, there are non-linearities induced by high debt levels

  ➢ *Burriel et al. (2020), following Corsetti et al. (2012), find that high debt economies:*

  1. can lose more output in a crisis,
  2. may spend more time at the zero-lower bound,
  3. have less scope for counter-cyclical fiscal policy,
  4. are more heavily affected by spillover effects,
  5. face a crowding out of private debt in the short and long run,
  6. are adversely affected in terms of potential (long-term) output, with a significant impairment in case of large sovereign risk premia reaction and use of most distortionary type of taxation to finance the additional debt burden in the future.

  ➢ *J. Bianchi, Ottonello, Presno (2023): (undesirable) Fiscal stimulus under sovereign risk*

  Keynesian model of optimal fiscal policy response to a recession when the government is subject to sovereign risk ⇔ strong state-dependence in the level of debt - when the stock of debt is:

  – Relatively low: government spending can expand in recessions (Keynesian benefits > sovereign risk).
  – Very high: optimal for the government to default and redirect resources toward spending rather than repaying debt.
  – Intermediate: optimal response is fiscal austerity (lower spending to mitigate rise in borrowing costs and probability of debt crisis)

- In **models with risks of sovereign default and fiscal dominance**, high debt can complicate economic stabilization policy, including central bank's tasks to achieve price stability

  ➢ *F. Bianchi and Melosi (2022): (undesirable, persistent) Inflation as a fiscal limit*

Public debt level: Empirical literature

Debt overhangs can exert adverse pressure on the economy by: (i) making the economy more vulnerable to macroeconomic shocks; (ii) ultimately impede long-term growth, esp. when:

- Debt is contracted to finance unproductive expenses or beyond optimal levels of public capital stock (Checherita-Westphal, Hughes-Hallett, Rother, 2014).

- The quality of a country's institutions is weak (Masuch, Moshammer, Pierluigi, 2016)

High public debt can adversely affect growth through the channels of:

- higher ***sovereign yields/interest rates*** (Laubach, 2009; Baum, Checherita-Westphal and Rother, 2012), and, in particular, heightened ***sovereign spreads/confidence effects*** (Codogno et al., 2003, Attinasi, Checherita-Westphal and Nickel, 2010; Corsetti et al., 2013)

- higher ***future distortionary taxation***, increased ***uncertainty*** ⇔ ***crowding-out of private investment*** (Woo and Kumar, 2015)

- ***lower scope for counter-cyclical fiscal policy***, including *lower effectiveness of short-term fiscal stimulus* (Ilzetzki et al., 2013; Corsetti et al., 2012) and reduced capacity to finance ***public investment*** (Chalk and Tanzi, 2004; Checherita and Rother, 2012)

- heightened risks to ***financial intermediation*** (De Bonis and Stacchini, 2013), trigger for longer and deeper recessions after ***financial crises*** (Jordà et al., 2016; Romer and Romer, 2018, 2019).
  - Qualifier: In Romer and Romer (2019): the result is found to be driven by both market pressure and policy-makers' choices/attitudes that high debt is risky (counter-cyclical fiscal policy is not implemented in recessions) ⇔ Call for a more flexible approach: (i) need to keep debt low as an insurance against future crises; (ii) assess the situation for high debt countries without market pressures. Overall, "run responsible fiscal policy in ordinary times, and undertake aggressive fiscal expansion, if at all possible, in response to a financial crisis".

Public debt level: Debt thresholds

While there is relatively strong consensus that public debt overhangs are detrimental, the ***exact level considered risky is subject to high estimation uncertainty and likely to be country-, state- and time- dependent***

- ***Conceptual differences between debt levels***:
  i. prudent (ensuring sufficient buffer/fiscal space against default);
  ii. optimal (debt-maximising growth or welfare);
  iii. steady-state debt (debt ratio to which the economy would tend to convergence in the long run);
  iv. (iv) debt limits (thresholds beyond which government defaults or its ability to honour its debt obligations is seriously in doubt).

- The empirical literature on debt thresholds mostly along two main workstreams:
  A. debt limits
  B. debt and growth

Public debt level: Debt limits

- **In the structural/DSGE model approaches**, the debt limit is essentially linked to the ***government ability to raise revenue*** (or to its position on the Laffer curve). It is calculated as a ***probability distribution*** since the maximum primary surplus and the discount rates vary over time and over states of the economy.
  - These approaches yield vastly different debt limits, depending on the model used and the chosen calibration (e.g., Bi and Traum (2014) derives debt limits of 50-200% for Greece)
- **Natural debt limits (maximum-sustainable debt limits)** (Mendoza and Oviedo, 2009): model that incorporates *uncertainty with respect to fiscal revenue to derive sustainable debt ratios*, assuming that the government is credibly committed to servicing its debt in all circumstances.
  - The model was developed having in mind the situation of developing countries, in particular with respect to the high volatility of their budget revenues and relatively low capacity of tax revenue collection; NDL found between 33 and 56% of GDP for 6 Latin-American countries in scenarios with sovereign risks
- ***Empirical debt limits combining fiscal fatigue and spread reaction (Gosh et al., 2013)***: "debt limit" coined as the point at which fiscal fatigue impedes a further adjustment in the primary balance in response to higher debt. ⇔ *i-g* differential becomes explosive given an endogenous risk premium and high default probability.
  - Based on this definition, the paper estimates empirically rather generous "fiscal space" (to the debt limits) for a panel of 23 advanced economies over the period 1970(1985) – 2007 (116-119% of GDP on average for the whole panel and 88-98% for the euro area; countries like GR, PT and IT were found to have "no fiscal space" at the time).
  - Only EA-11 (more mature, advanced euro area economies) included in the estimated sample
  - Updates form Moody's Analytics (est. in May 2014) found even higher fiscal space (142% of GDP on average for whole sample, 116% for the euro area sample, ranging from zero for GR and IT to 172% in Finland,
    - but the paper recommends that "based on historical experience, it is wise for national governments to maintain at least 125 percentage points of fiscal space".

Public debt level: Debt and growth thresholds

- ***Negative relationship between government debt and real GDP growth beyond a certain threshold, often estimated, on average, for advanced economies at around 90% of GDP (85-100%)*** (Reinhart and Rogoff, 2010; Kumar and Woo, 2010; Cecchetti et al., 2011). In our analysis:
  - Checherita-Westphal and Rother (2010/2012) ⇔ growth debt threshold of 90-100% of GDP for EA-12 sample over 1970-2009, with confidence interval starting at 70% of GDP
  - Baum, Checherita-Westphal, Rother (2013): short-term impact of debt on growth in EA-12 over 1990-2012 with 2 thresholds: 67% and 95%
  - Checherita-Westphal, Hughes-Hallett, Rother (2014): assuming a golden fiscal rule over the cycle (debt is used to finance only public investment), the ***optimal debt level (d*)*** depends on the output elasticity of public capital. d* estimated at around 66% for OECD-22, 64% for EU-14 and 50% for EA-11.
- Several other studies conclude that **there is no universally valid threshold in the debt-growth relationship** (Bentour, 2021)
  - ***Some find a continuous negative impact of public debt build-up on long-term growth*** (Chudik et al., 2017; Gomez-Puig and Sosvilla-Rivero, 2017)
  - ***Others find low and/or country-specific thresholds beyond which debt is associated with lower growth for AEs*** *(and in general, lower estimates for developing countries)*:
    i. above 20% of GDP, median growth falls for the R&R (2010) dataset of 20 AEs in Lee et al. (2017);
    ii. above 40%, with more severe impact above 133% for EA-12 over 1998-2011 (Sharpe, 2013);
    iii. country and time-specific ***short-term*** debt thresholds ranging from 22% to 113% of GDP for EA-11 over 1960-2013, with generally higher structural breaks from 2007, but with thresholds of around or below 60% of GDP in 8 out of 11 EA countries studied (Gomez-Puig and Sosvilla-Rivero, 2017)
  - ***Some critics do not find evidence of a threshold effect or a negative impact of debt on growth*** (Panizza and Presbitero, 2012, Pescatori et al., 2014)

Debt level: one essential input into sovereign sustainability assessment

ESCB DSA framework, OP 185/2017 and further refinements

Deterministic DSA

Debt projection scenarios (10-year horizon)

Benchmark

- Central scenario
- Mechanical and plausible
- Based on ESCB internal forecast
- SGP-based fiscal rule

Adverse scenarios

- Narrative shocks around benchmark:

1. Historical scenario
2. No fiscal policy change (NFPC) with ageing
3. Macro (bank) stress
4. Interest rate shock
5. NFPC and potential growth shock

Other indicators

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 of debt:** scoring scheme with non-linear smoothing around thresholds: 60%, 90% and penalties for very high levels (120% and 150%)
- Dynamics
- Fiscal fatigue (only in benchmark)

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

- Thresholds
- Percentiles

Weighting scheme / aggregation / sustainability score

Some stylised facts for the euro area countries

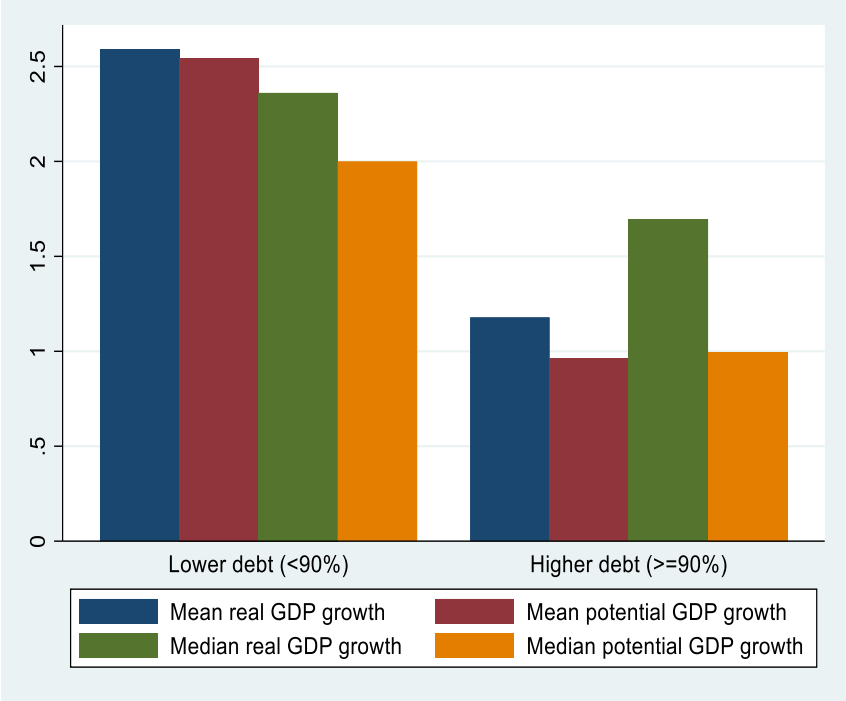
Debt and growth

- High debt (above 90% of GDP) associated with lower long-term growth, including potential growth in the euro area (EA-12, more matured economies)
  - Differences are larger for the EA-19 sample

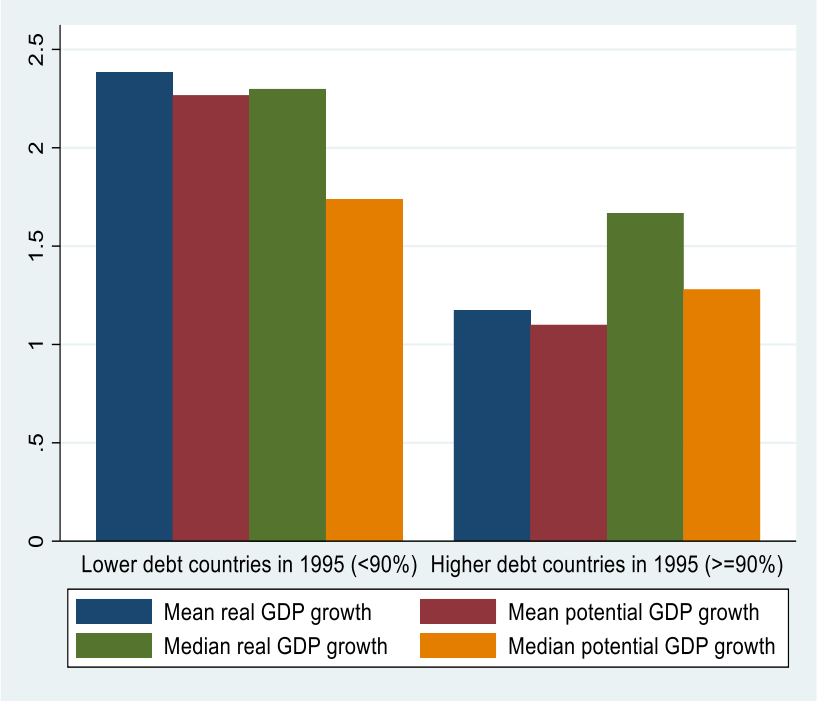
Growth by public debt categories (below and above 90% of GDP)

(percent, EA-12 sample, mean and median over 1995-2022)

All instances of high debt vs. lower debt



High debt vs. lower debt countries in 1995

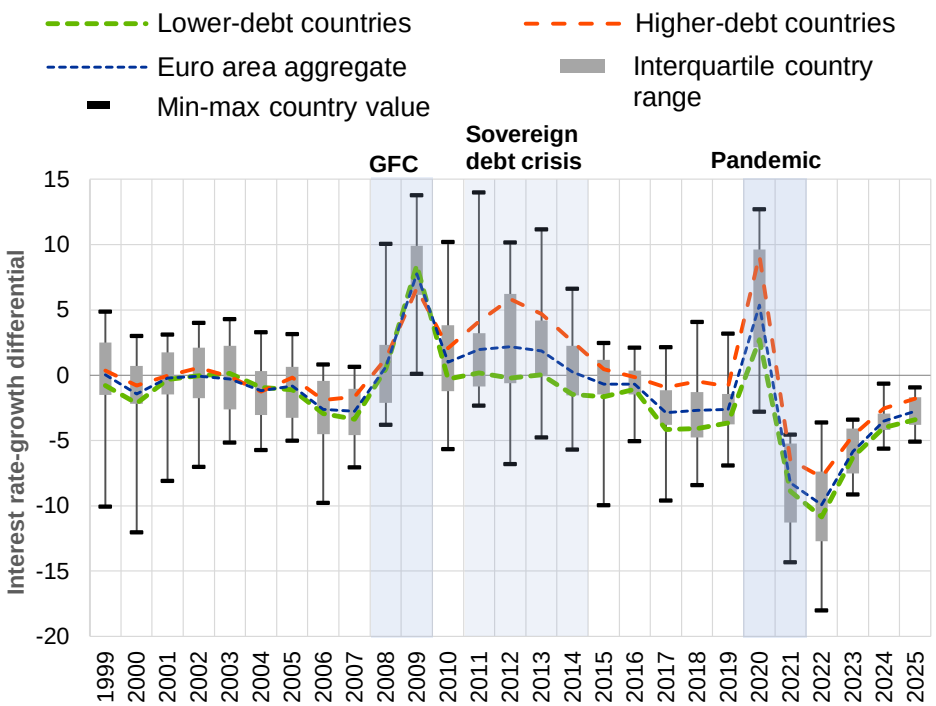


Source: Ameco data (Autumn 2022 vintage) and own calculations.
Notes: LHS chart: Higher debt category captures all observations with annual debt-to-GDP ratio higher than (or equal with) 90% during the period 1995-2022. RHS chart: higher debt countries in 1995 captures countries with debt higher than 90% of GDP in 1995 (Belgium, Italy and Greece).

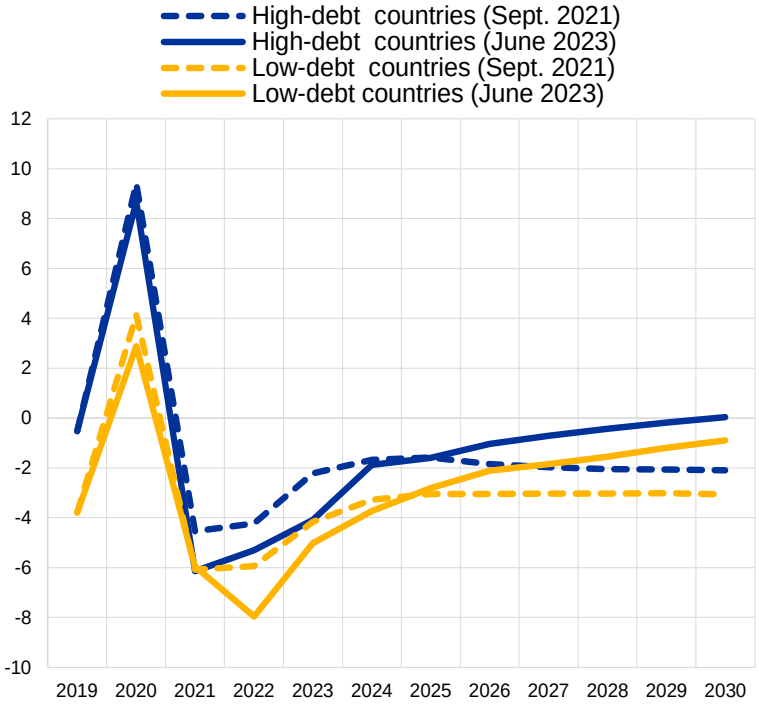
Debt and i-g

- High debt economies tend to face higher interest rate-growth differentials, esp. in crisis times

Historical and forecast distribution of *i-g* across euro area countries
(percentage points)



Recent revisions in *i-g* across high- and low-debt euro area countries
(percentage points)



Source: Calculations and updates based on Box 1 Sensitivity of sovereign debt in the euro area to an interest rate-growth differential shock, Financial Stability Review Issue 2, 2021. See also an empirical analysis on the determinants of *i-g* for the euro area in Checherita-Westphal and Domingues Semeano (2020).
Notes: Both charts show interest rate – growth differentials on government debt for EA-19 sample. Updates for the forecast period based on ESCB June 2023 Broad Macroeconomic projections (BMPE) and the ESCB DSA tool. LHS chart: in the country ranges, outliers EE, LV and LT excluded until 2012 and IE in 2015. High debt countries defined as countries with the 2019 debt-to-GDP ratio above 90%: BE, GR, ES, FR, IT, CY, PT (seven countries). EA aggregate in LHS chart and RHS chart shows GDP-weighted averages.

Debt stabilisation and debt level

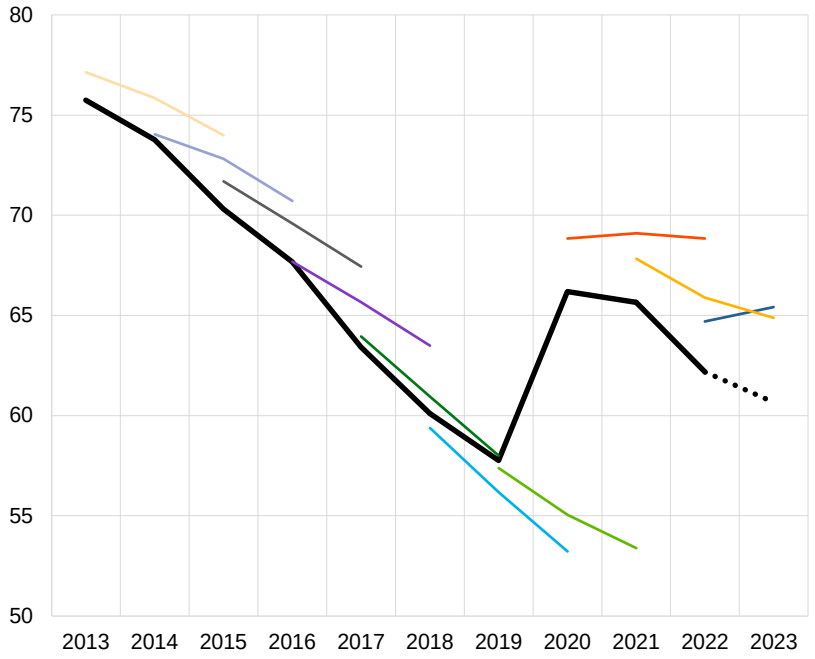
- High debt EA countries seem to take longer, on average, to stabilise debt despite negative *i-g*
- Debt underperformance compared to forecasts in high debt EA countries up to 2019
- High debt countries affected more in times of crises

⇔ DSA decisions on dynamics only tend to be incomplete and more prone to errors

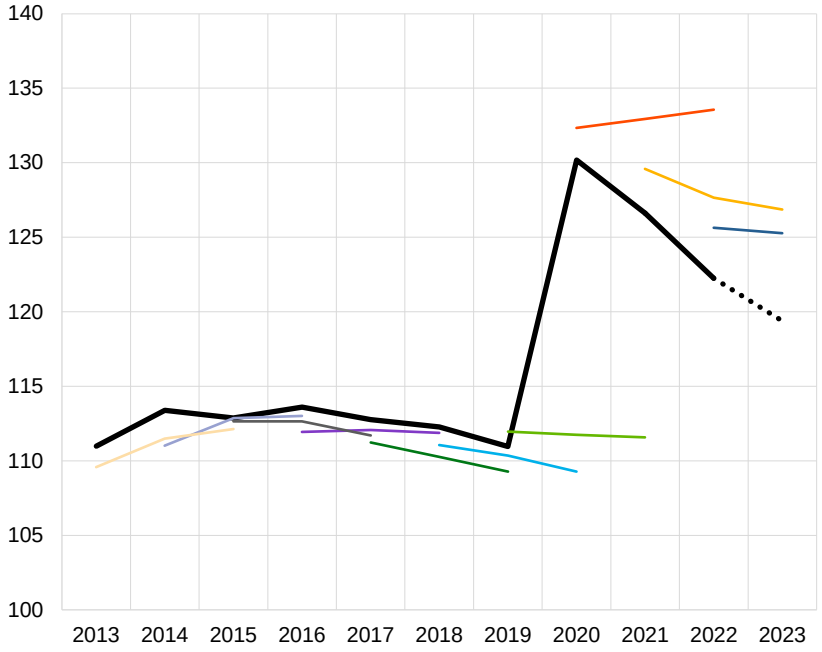
Debt paths: forecasts and outcomes

(percent of GDP)

Lower debt EA countries



High debt EA countries

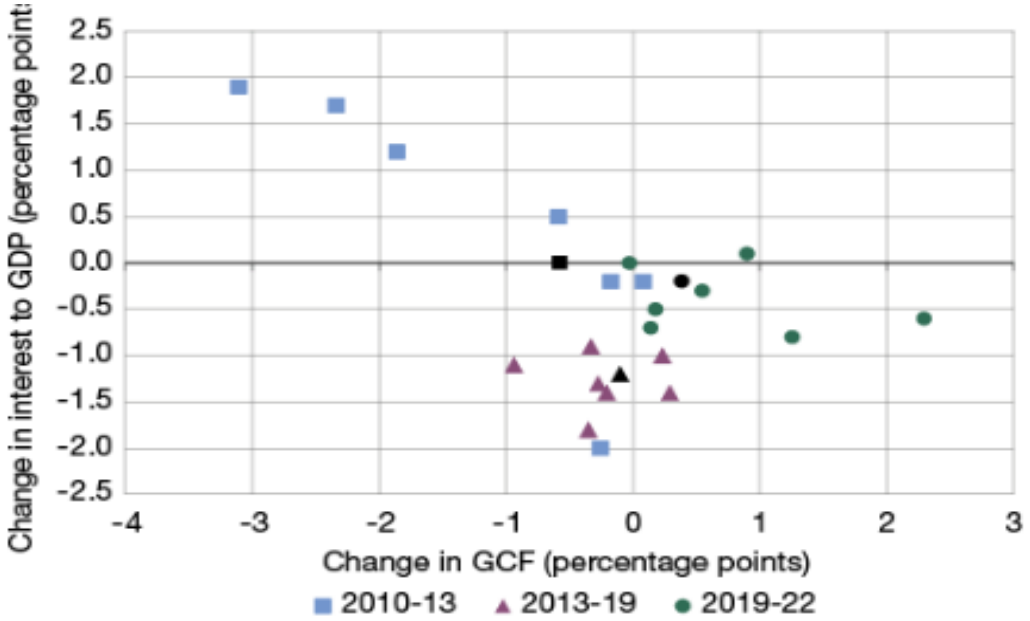


Source: Calculations based on European Commission's data and forecast.
Notes: The debt outcome (black line) and forecast for 2023 taken from latest EC forecast (Spring 2023). The thin coloured lines represent debt path as forecast in the EC autumn vintages of the respective year for T; T+2. The (GDP-weighted) aggregate of high-debt EA countries includes countries with the 2019 debt-to-GDP ratio above 90%: BE, GR, ES, FR, IT, CY, PT. The (GDP-weighted) low debt aggregate includes the remaining EA countries.

High debt, interest payment and government investment

- Public investment generally cut in high debt euro area countries, esp. during the sovereign debt crisis;
- Most recent (and welcome) increases, also thanks to NGEU
- Higher interest payments associated with higher debt tend to crowd-out public investment
- …while the space created by the reduction in interest rates and interest payments during 2013-19 was not generally used to increase public investment in high debt counties

Change in interest payment and gross public capital formation in the euro area high debt countries
(percentage points)



Source: Checherita-Westphal, Hauptmeier, Leiner-Killinger (2022), "The Euro Area in Between Crises? Considerations on Fiscal Policies and Rules", Intereconomics, Volume 57 (5).
Notes: Authors' calculations based on European Commission's data and forecast. The figures show countries with public debt-to-GDP ratios above 90% in 2019 (BE, GR, ES, FR, IT, CY, PT). The black points refer to the euro area aggregate (all points denote average values over the periods shown in the legend). GCF stands for public sector's gross capital formation.

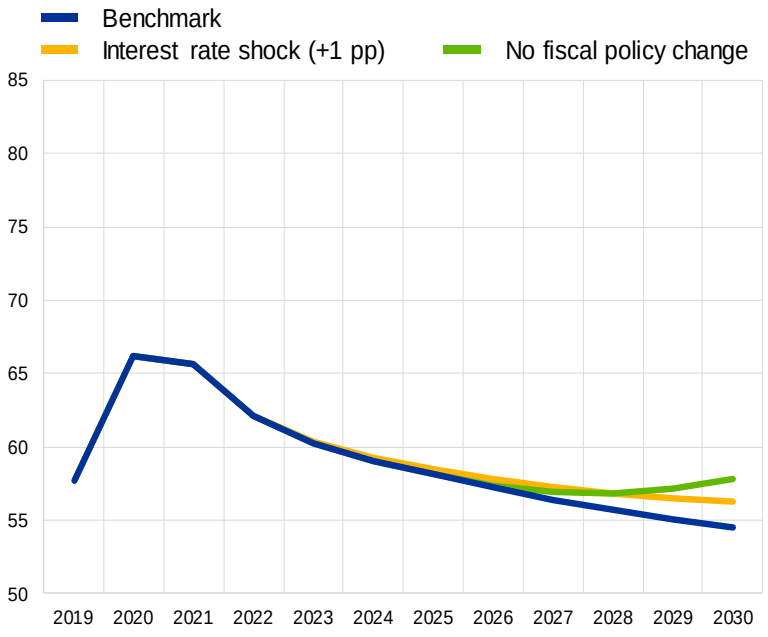
High debt countries less resilient to shocks, but for both groups further fiscal effort and stronger potential growth essential

- Counter-cyclical fiscal adjustment over medium run needed to prevent debt from rising
- Given currently loosened structural fiscal positions and ageing costs, further fiscal effort and stronger potential growth can help in both groups of countries

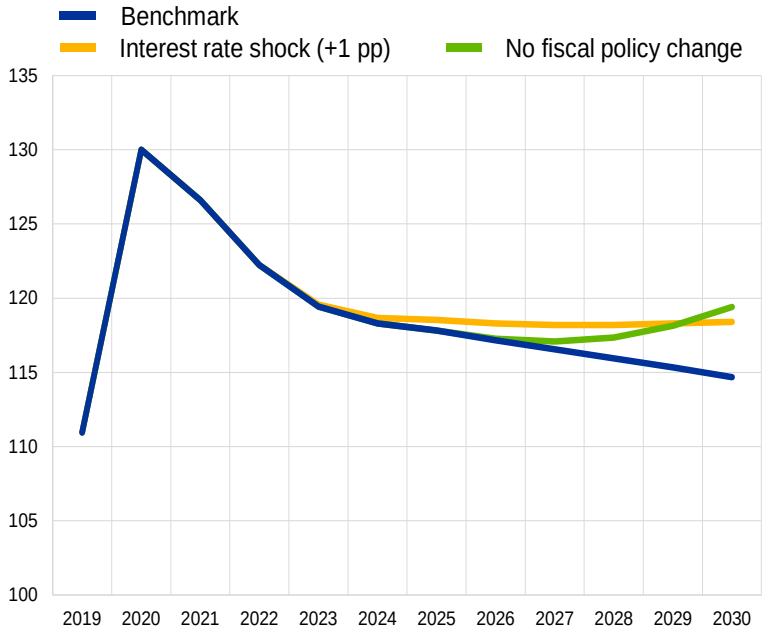
Debt paths in the benchmark and two shock scenarios

(percent of GDP)

Lower debt EA countries



High debt EA countries



Source: Calculations based on ESCB DSA tool and using the ESCB June 2023 macroeconomic projections
Notes: The shock scenario No fiscal policy change assumes no additional fiscal consolidation in line with minimum SGP requirements beyond the BMPE forecast horizon (constant structural primary balance as in 2024) and additional costs of ageing. The interest rate shock scenario assumes a +1 pp shock to the marginal interest rate assumptions in benchmark as of 2023.

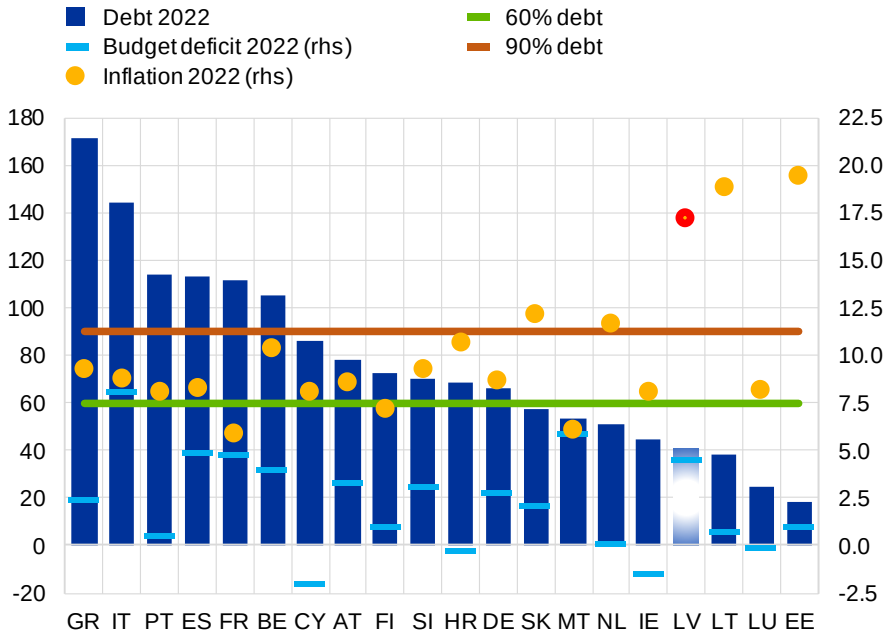
PS: low public debt helps, other vulnerabilities to be reviewed

Before major fiscal policy decisions…

- While low public debt is important in shielding the economy against shocks, other vulnerabilities and economic conditions need to be reviewed before major fiscal policy decisions.
- Government investment important to boost potential growth ⇔ in areas where returns to capital (incl. complementarity to private capital) are high

Fiscal position and inflation heterogeneity across euro area countries

(percentage points)



Source: European Commission, Ameco dataset

Latvia, low public debt among EA countries…

- Low medium-term sustainability risk (EC)
- Low interest payments (though increasing)
- Relatively low ageing costs
- Relatively low private debt and gross external debt

But also:

- Relatively high budget deficit in 2022, 5th highest in EA (-4.4% of GDP)
- Very high inflation in 2022, 3rd highest in EA (17%)
- Wide scope for improvement in institutional and governance indicators (esp. WB “Voice and accountability” and “Government effectiveness”)
- Rather high economic volatility, including in tax revenue

Thank you for your attention!

Background slides

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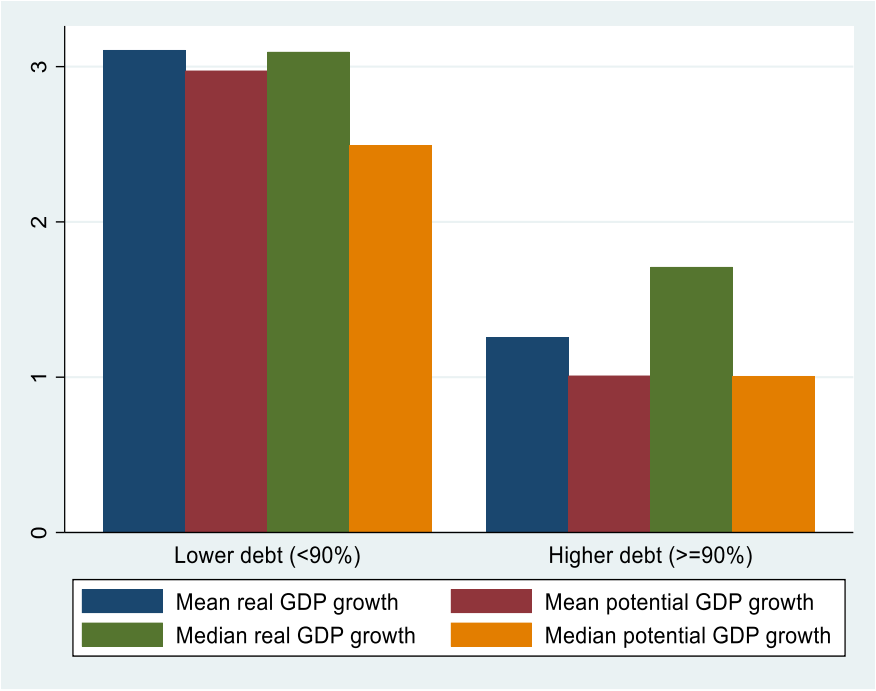
Debt and growth

- Higher debt (above 90% of GDP) associated with lower growth (for both EA-19 and the more mature EA economies, first twelve EA members, EA-12)

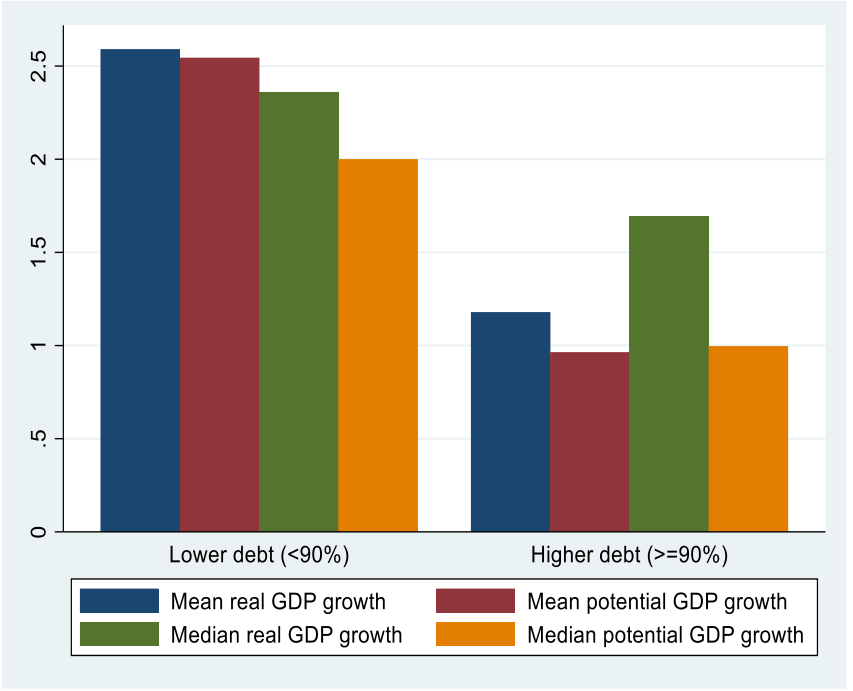
Growth by public debt categories (below and above 90% of GDP)

(percent, EA-19 sample, mean and median over 1995-2022)

EA-19



EA-12



Source: Calculations based on European Commission's data and forecast.
Notes: The debt outcome (black line) and forecast for 2022-23 taken from EC Spring 2022 forecast. The thin coloured lines represent debt path as forecast in the EC autumn vintages of the respective year for T; T+2. The (GDP-weighted) aggregate of high-debt EA countries includes countries with the 2019 debt-to-GDP ratio above 90%: BE, GR, ES, FR, IT, CY, PT. The (GDP-weighted) low debt aggregate includes the remaining EA countries.

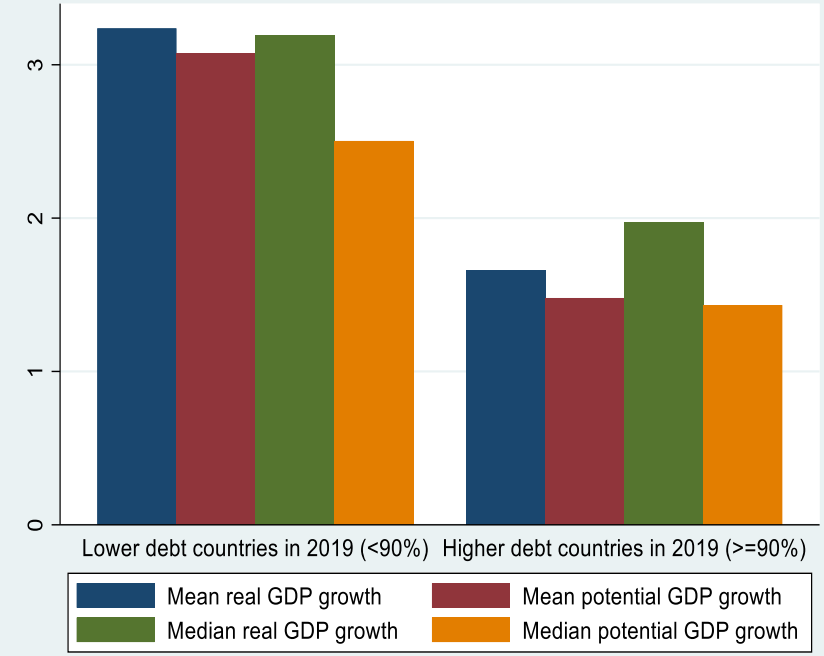
Debt and growth

- Higher debt EA ***countries*** tend to have lower long-term growth, including potential growth, on average (also lower growth induce higher debt)

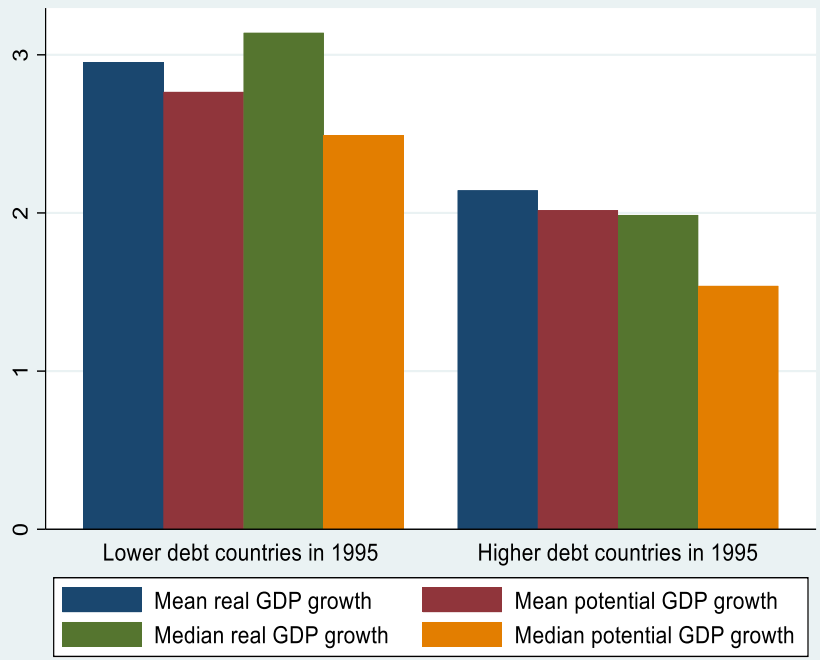
Long-term growth by group of countries (EA-19)

(percent, EA-19 sample, mean and median over 1995-2022)

by debt level in 2019



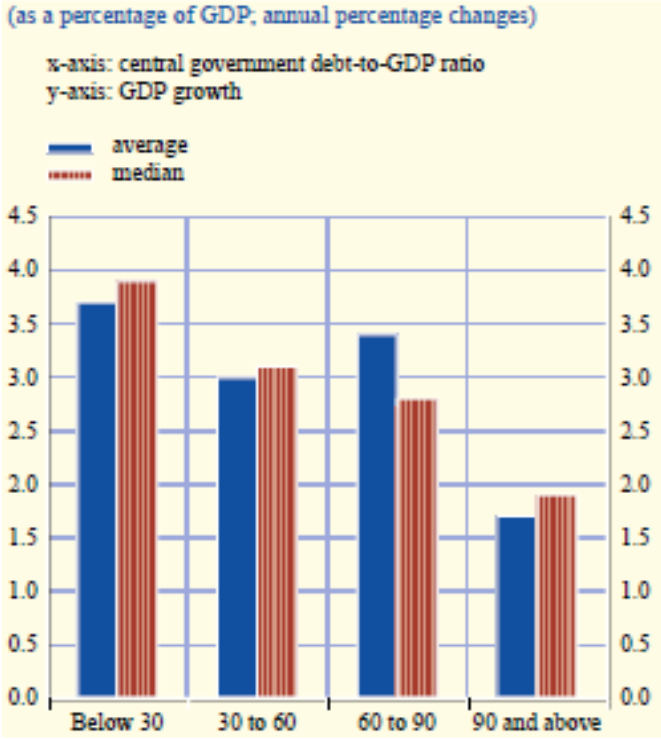
by debt level in 1995



Source: Ameco data (Autumn 2022 vintage) and own calculations.
Notes: LHS chart: Higher debt countries in 2019 defined as countries with the 2019 debt-to-GDP ratio above 90%: BE, GR, ES, FR, IT, CY, PT (seven countries). RHS chart: Higher debt countries in 1995 defined as the first seven countries with largest debt-to-GDP ratio in 1995: BE, IT, GR, IE, MT, NL, PT.

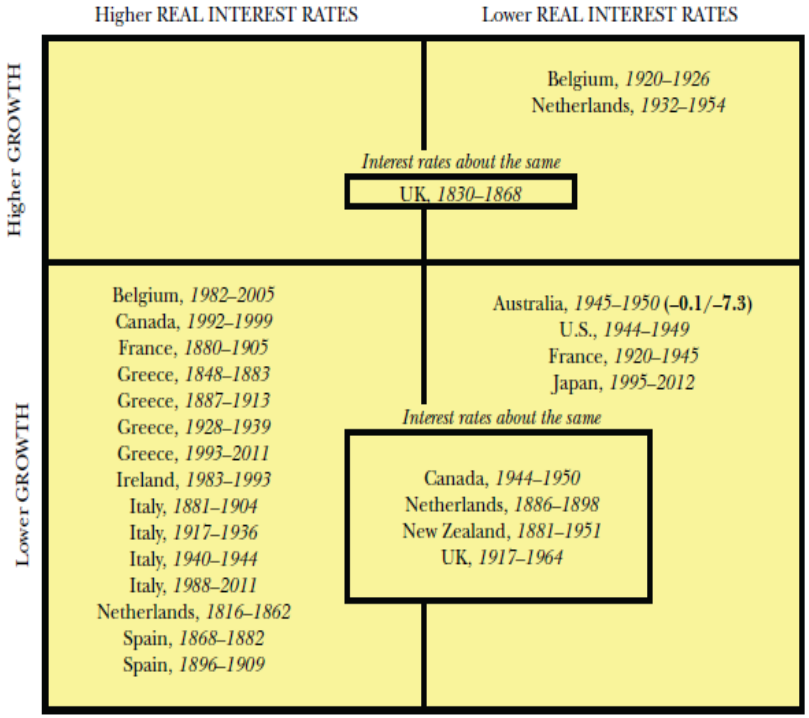
Debt and growth: in a broader set of advanced economies

a) Real GDP growth and central government debt, selected advanced economies, 1790-2009



Source: Reinhart and Rogoff (2010)

b) Real growth and real interest rates for 26 high debt (long) episodes in advanced economies (1800-2011)



Source: Reinhart, Reinhart and Rogoff (2012)

ESCB DSA tool:

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 Team of the Working Group on Public Finance

Comprehensive analysis on sovereign debt risks:

- ✓ Harmonised ex-ante methodology to ensure country consistency and transparency
- ✓ Rich set of alternative scenarios and indicators testing the resilience of public debt to country-specific shocks and conditions
- ✓ Broad risk assessment, but also risk summary in explicit overall quantitative indicator (DSA heat map/sustainability score)
- ✓ Free of judgment in a first stage; allows for additional analysis and expert assessment in policy papers.