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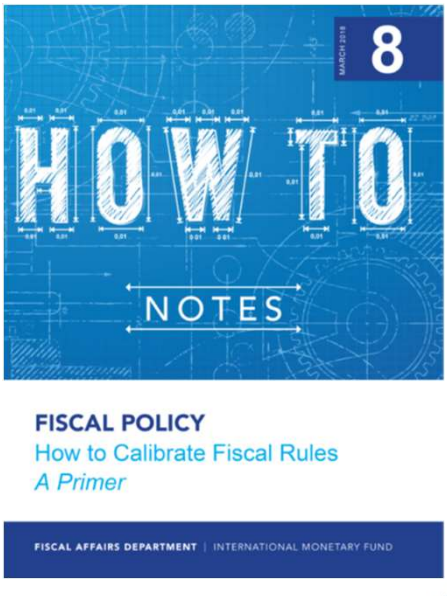
Disclaimer

- Own personal views, not necessarily those of NBB, Eurosystem, or European Fiscal Board.
- Joint work with Mariusz Jarmuzek (ECB) and Anna Shabunina (IMF).
- Work developed while all 3 authors at IMF; framework recommended by IMF for the calibration of fiscal rules.



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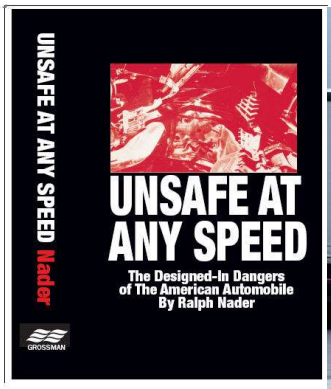
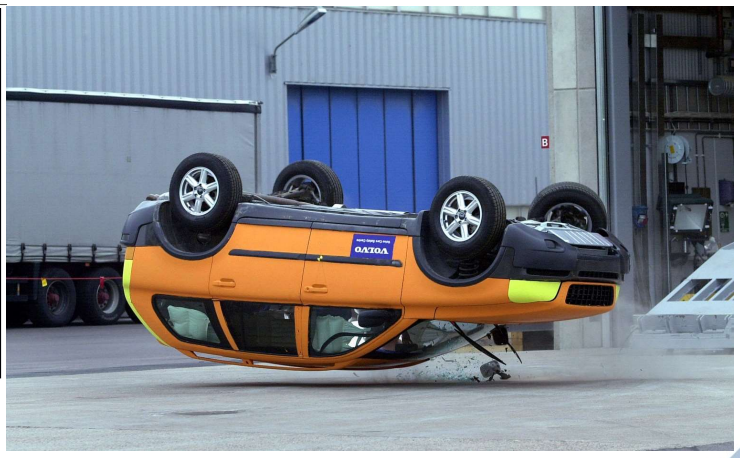
Safe at any speed????

- In bad conditions, a debt rollover can end up as badly as a car rollover. Why? You lose control!





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Goal and Motivation

- Build a framework, not find a magic number.
- Framework = consistency exercise to discipline judgment → link number to hypotheses → debate on hypotheses.
- Answer to : Is there a level of public debt beyond which it is unsafe to venture?
- Useful to know:
  - Long-term: what anchor for fiscal policy? → credibility → fiscal rule calibration.
  - Short-term: how much fiscal space can I safely use? → put fiscal policy to good use (build up public capital, "relance")
  - Explicitly incorporate risk in policy design → risk-management approach to fiscal policy?

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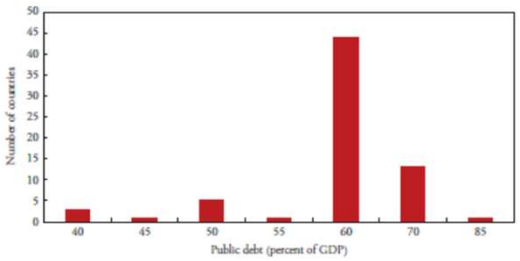
Goal and motivation: need a richer debate on safe debt levels

- Historically high public debt :
  - Some worry (in the past, signal accident)
  - Others do not worry (Blanchard, 2019,)
  - Consensus: (1) there are LIMITS and (2) no economic theory can rationalize current debt levels.
- Strange obsession with 60% debt ratio as a desirable ceiling… baseless!

Figure 1. Distribution of Public Debt Ceilings



Source: IMF Fiscal Rules Database.

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What is a safe debt level?

- Public debt is safe as long as it is plausible to expect the government to stabilize or reduce it even under persistently adverse conditions for debt dynamics, using fiscal policy.
- Two highly country-specific elements:
  - Risks to debt dynamics,
  - Capacity to generate and sustain primary surpluses.
- A safe debt level → G bond is a safe asset:
  - Pays a return even in very bad states of the world.

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Conceptual framework: government solvency

- Traditional view of public debt sustainability: public sector solvency.
- Government's period *t* budget constraint:

$$G_t + (1 + r_t)D_{t-1} = T_t + D_t$$

- Defining the primary surplus $P_t \equiv T_t - G_t$:

$$D_t = (1 + r_t)D_{t-1} - P_t \Leftrightarrow D_t = \frac{1}{1 + r_{t+1}}(D_{t+1} + P_{t+1}) \ (1)$$

- Solving (1) forward over indefinite future:

$$D_t = \sum_{j=0}^{\infty} \prod_{k=0}^{j} \frac{1}{1 + r_{t+1+k}} P_{t+1+j} + \lim_{T \to \infty} \prod_{j=0}^{T} \frac{1}{1 + r_{t+1+j}} D_{t+1+T}$$

No-Ponzi condition

Conceptual framework: sustainability

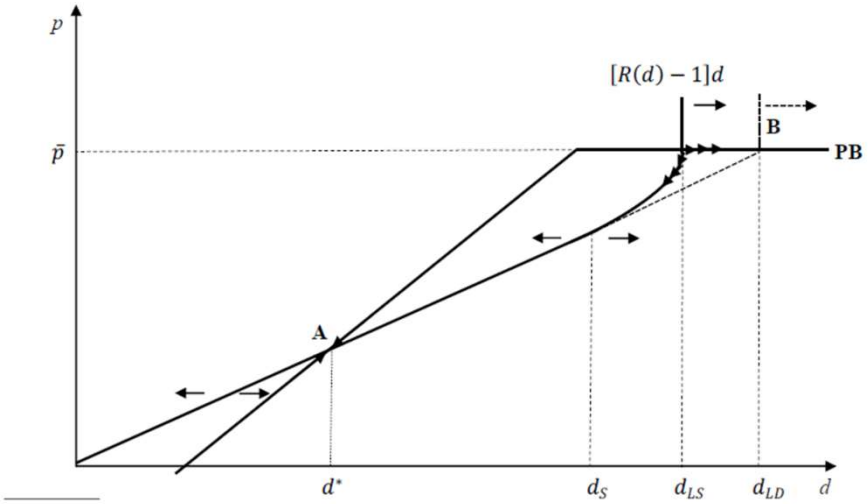
- Solvency condition (in % of GDP): $d_t = \sum_{j=0}^{\infty} \prod_{k=0}^{j} R_{t+1+k}^{-1} p_{t+1+j}$, with $R_{t+1} = \frac{1+r_{t+1}}{1+g_{t+1}}$.
- How to keep control of debt dynamics? $p_{t+1} = \kappa + \rho d_t$ (policy rule)
- Since $\Delta d_{t+1} = (R_{t+1} - 1)d_t - p_{t+1}$, substituting for p_{t+1} yields:

$$\Delta d_{t+1} = \left(\frac{r_{t+1} - g_{t+1}}{1+g_{t+1}} - \rho\right) d_t - \kappa$$

- If $\frac{r_{t+1} - g_{t+1}}{1+g_{t+1}} < \rho$, the debt-to-GDP ratio will be on a trajectory converging to a finite level (mean-reversion).
- Let's look at simple diagrams.

Public debt: stable or unstable?

Public debt dynamics: a simple diagram



Source: Authors' calculations.

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Operational options

- Two alternative approaches:
  - Debt limit is known → estimate buffer below the limit → stochastic methods, stress tests, or both.
  - Debt limit is unknown → Mendoza-Oviedo (2004): confront maximal fiscal capacity with worst macro-financial conditions.
- Techniques:
  - Stochastic simulations → probabilistic analysis.
  - Stress tests.
  - Hybrid.
- Limitation: Lucas critique! Past is not a good guide for the future… especially relevant now (are we in a brave new world?)

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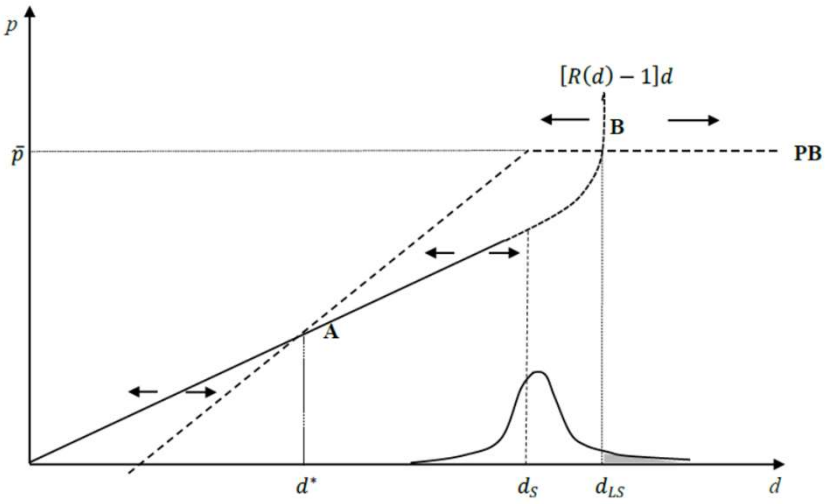
Known limit, stochastic approach: principle

Determination of d_S when d_{LS} is known



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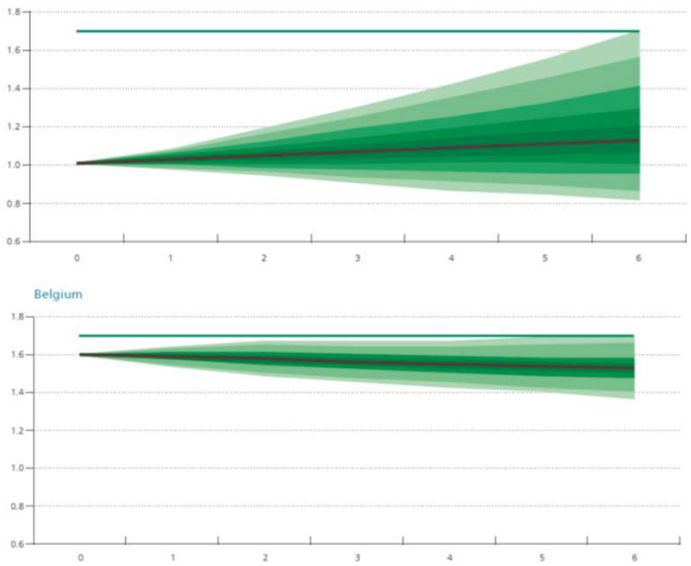
Known limit, stochastic approach: implementation

Shocks to debt dynamics (growth, interest rate and fiscal shocks)



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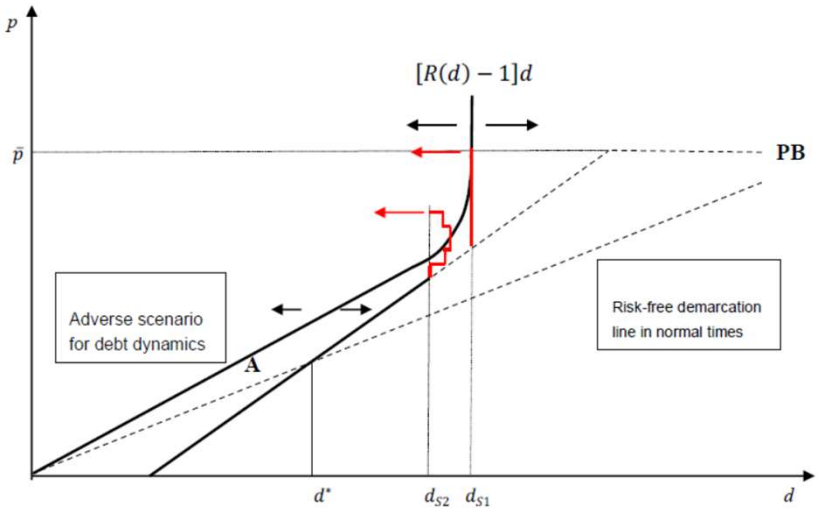
Unknown debt limit, deterministic approach: principle

Determination of d_S when d_{LS} is unknown: deterministic case



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Unknown debt limit, deterministic approach: implementation

1. Estimate / assume a density function for $r - g$.
2. Take 75th (or higher) percentile of $r - g$.
3. Find the highest debt level such that the emergence and persistence of bad $r - g$ does not prevent the government from stabilizing the debt ratio:
   a) Cold turkey: government can always commit to jump to $\bar{p}$. Then, $d_{S,1}$ is the debt limit under best p and worst $r - g$.

$$d_{S,1} = \frac{\bar{p}}{f(d_{S,1})}$$

   a) Gradual: the safe debt upper bound is the highest debt level the government can credibly commit to return to within a given time frame (e.g. 5 years) after the occurrence of worst $r - g$. (Yearly consolidation = largest credible consolidation).

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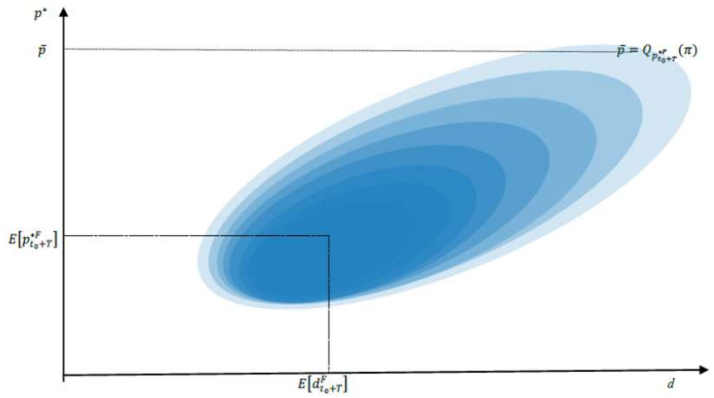
Unknown debt limit, stochastic approach: principle

- Focus on feasibility of debt stabilizing primary balance p^*, where $p^* = \left(\frac{r-g}{1+g}\right) d$.
- Safe debt upper bound is such that the probability for p^* to exceed $\bar{p}$ over the forecasting horizon is low (e.g. 5%).

Determination of d_S when d_{LS} is unknown: stochastic case



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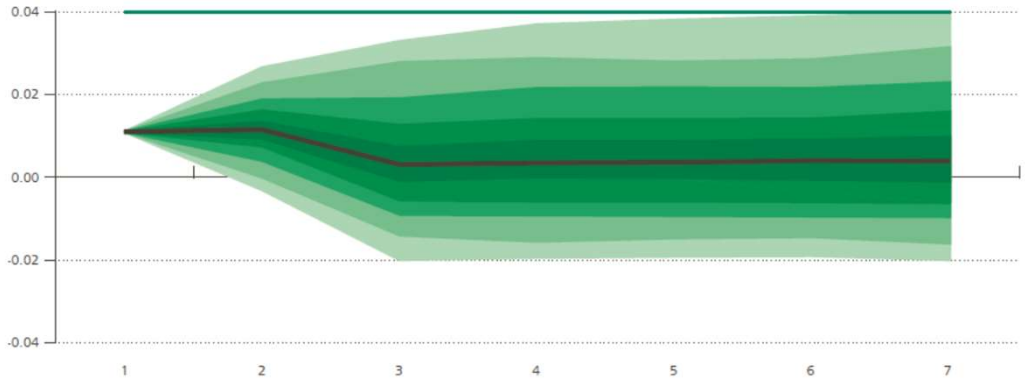
Unknown debt limit, stochastic approach: implementation

Spain: Fan charts for the debt-stabilising primary balance



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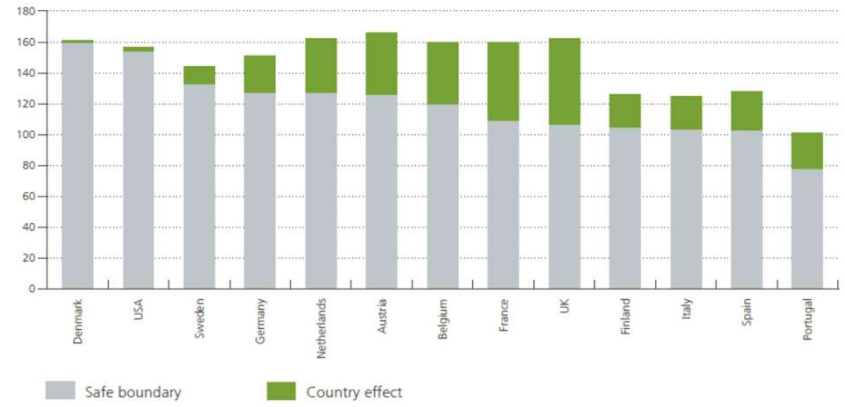
Selected results

- **Known debt limit:** stochastic approach + stress test on financial sector

Safe debt boundaries considering country-specific limits and contingent liabilities
(in % of GDP)



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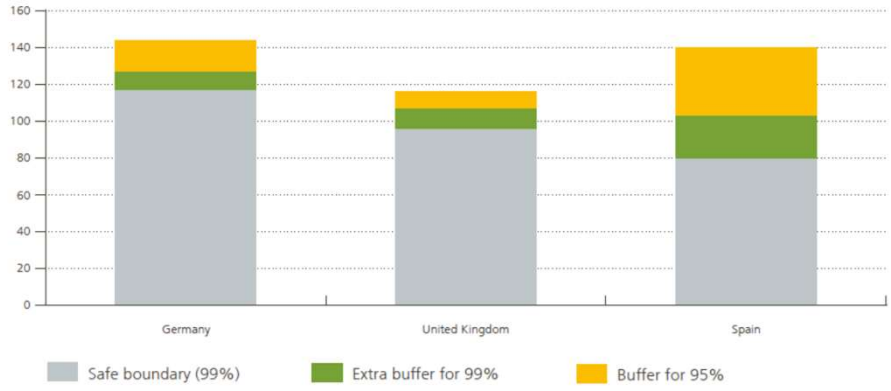
Selected results

- **Known debt limit:** how much risk are you ready to tolerate? 5% or 1%

Extra buffers to secure a higher probability of not exceeding the debt ceiling
(in % of GDP)



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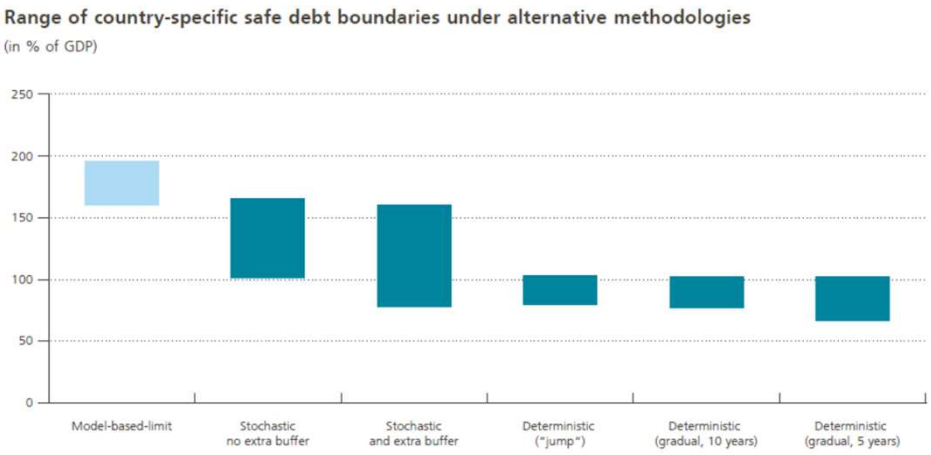
Selected results

- All else equal, some methods appear more conservative than others → use judgment.



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Conclusions and issues for discussion

- Public debts are historically high and interest rates historically low; yet, larger debt is usually riskier.
- Conventional debt threholds are arbitrary, ignoring the intrinsic risk profile of a country (economy + fiscal behavior/politics).
- There is value in methodologies that estimates meaningful, country-specific thresholds.
- Debt sustainability is entirely about an unknowable future:
  - Judgment is inevitable,
  - Judgment must be disciplined by the plausibility of assumptions underpinning any given number.
- Known unknowns:
  - What debt? Add hidden debt due to ageing, implicit liabilities,...
  - Monetary-fiscal coordination: a very low r for how long?
  - Political economy of excessive debt.

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