UNIVERSITEIT VAN AMSTERDAM

Debt-at-Risk

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Motivation/summary

The paper develops a “Debt-at-Risk” framework that uses quantile panel regressions to estimate the full probability distribution of future public debt-to-GDP ratios, linking macroeconomic, financial, and political conditions to potential debt outcomes.

It shows that under adverse scenarios, **global debt could be about 20 percentage points of GDP higher** than baseline projections, and that this **measure is a powerful predictor of fiscal crises**.

Three technical comments/questions, two policy questions/suggestions for future research

Technical comment/question #1

Debt-GDP ratios evolve according to (eq 1)

$$d_{+1} = \frac{1}{(1+g)(1+\pi)}[d(1+i) - pb]$$

You estimate the panel data location-scale model (eq 2)

$$d_{+1} = \alpha + X'\beta + (\delta + X'\gamma)\varepsilon$$

"Estimation of the location-scale model follows the three-step procedure proposed by Machado & Santos Silva (2019); first step: estimate α and β using a standard fixed effects estimator ..."

"We estimate the model for each predictor, including the initial debt-to-GDP ratio. There are two main reasons for estimating equation (2) for each predictor separately...."

"Figure 3 plots the estimated quantile regression coefficients (i.e. the $\beta_x + \gamma_x q(\tau)$ values)"

Technical comment/question #1

According to equation (1), real growth, inflation, nominal interest rate, primary balance, and the current debt-to-GDP ratio should have significant coefficients in a (panel) regression and they are correlated among each other.

Estimating equation (2) for each variable (plus current debt-to-GDP ratio) separately results in an omitted variable bias which enters the intercepts, the coefficients β_x, and the error term.

Question: how significant is this bias? And, does it affect the pooling procedure and the decomposition exercise?

Technical comment/question #2

Aggregation to global levels or country groups (following Adrian et al. 2022)

$$\hat{Q}^{m}_{d_{global,+1}}(\tau) = \sum_{i} \omega_i \, \hat{Q}^{m}_{d_{i,+1}}(\tau)$$

But, a quantile function is (in general) not linear, so quantile of (weighted) sum is not necessarily (weighted) sum of quantiles.

Question: is this relevant given your local-scale model? If so, how big is the error? If not, please show.

Technical comment/question #3

In extension 1, you use debt-at-risk to predict fiscal crises.

With Bayesian model averaging estimation and the Random Forest Model you assign weights to/select various indicators. But these indicators are composed of other indicators, which sometimes are composites themselves.

Question: is the predictive power of debt-at-risk truly so much higher or can a logit model with the underlying indicators perform similarly?

Policy questions/future research #1

You convinced me of a sizeable upward risk of debt-GDP ratios.

Question 1: it's only a problem if you have a solution... **(A. Kendrick, Up in the air)**

- Which tools do policymakers have to lower the debt-at-risk?
- Should they lower the debt-at-risk?

Policy questions/future research #2

Question 2: how does the debt-at-risk compare to the predicted changes of debt-to-GDP ratios?

- Climate change, ageing society, and defence spending will put upward pressure on debt-to-GDP ratios
- How do these deterministic (or expected, lack of better term...) processes compare to the debt-at-risk?