The Signaling Effects of Sovereign Borrowing

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Abstract

We provide empirical evidence for the signaling effects of sovereign borrowing on a country's default risk. Using the S&P sovereign rating as a proxy for default risk, we find significant state-contingent effects of sovereign debt growth on the country's rating, with the state being the country's recent fiscal performance measured by its government operating balance. Conditional on a good fiscal state, higher sovereign debt growth significantly improves the sovereign rating, indicating a positive signaling effect of sovereign borrowing that more than compensates for its direct effect of increasing a country's debt burden. Conditional on a poor fiscal state, higher debt growth significantly reduces the sovereign rating, even after the lagged rating, current government operating balance, sovereign bond yield, and other common determinants of sovereign rating are controlled for, which suggests a negative signaling effect of sovereign borrowing.

Introduction

Ample empirical evidence for signaling effects of sovereign default history has led to fruitful theoretical literature on default as a primary signal of country's default risk. Can sovereign borrowing be an informative signal too?

Empirical research on signaling effects of sovereign borrowing is limited.
Three challenges in identifying signaling effects of sovereign borrowing:

1) Need to control for the direct effect of borrowing on default risk.
2) Signaling effect could be state contingent, and identifying the right state is key to avoid pooling the positive signaling effect with the negative one.
3) Need a proxy for the default risk that does not directly affect borrowing cost.

How we address these challenges?
First, we use S&P sovereign credit rating as the proxy for a country's default risk. S&P sovereign credit rating reflects a government's ability and willingness to repay debt and is not directly tied to the country's borrowing cost.
Second, we identify a key economic state -- a country's lagged government operating balance -- that can differentiate the positive and negative signaling effects of sovereign borrowing.
Third, we control for the lagged sovereign rating, current government operating balance, sovereign bond yield, and other common controls for default risk.

Empirical Specifications and Data

- Data: Quarterly panel, 2000q2 and 2020q3, 22 advanced economies:
  Australia, Austria, Belgium, Canada, Czech, Denmark, Finland, France, HKSAR, Hungary, Ireland, Israel, Italy, Luxembourg, Netherlands, New Zealand, Portugal, Singapore, Spain, Sweden, UK and US.

- Main Regression:

$$R_{i,t} = \lambda \times R_{i,t-1} + \alpha \times d_{i,t} + \sum_{j=P,N,G} \beta_j \times g_{i,t} \times 1^j_{i,t-1} + \sum_{j=P,N,G} \theta_j \times 1^j_{i,t-1} + Z_{i,t}\gamma' + \delta_t + \mu_i + \varepsilon_{i,t},$$

$R_{i,t}$: end-of-period-t sovereign rating score;
$d_{i,t}$: period-t debt-to-GDP ratio;
$g_{i,t}$: debt growth since last period;
$1^j_{i,t-1}, j \in \{P, N, G\}$: fiscal state dummy: Poor, Normal, Good;

- Rating score = Category + Outlook, from S&P,
  - Category:{[D (Default),..., AAA (Prime)} maps to [0, 20],
  - Outlook: {Positive, Stable, Negative} maps to {0.5, 0, -0.5}.
- Debt: nominal value of consolidated general gov debt in local currency.
  - Debt breakdown: long-term bond and loan, short-term bond and loan.
- **Fiscal states are defined based on lagged gov net operational balance (NOB).**
  - Good fiscal state: if NOB is above its mean+.95×std;
  - Poor fiscal state: if NOB is below its mean-.95×std;
  - Normal fiscal state: otherwise.
  - NOB is seasonally adjusted using Census X12 method.
- Controls: gov current NOB, real GDP growth, current account balance, fiscal reserve, inflation rate, long-term and short-term gov bond yield.

Results

- **Positive Signaling in Good fiscal state:**
- 1% higher debt growth ⇒ improves rating by 0.002
  working against canonical channel
- **Negative Signaling in Poor fiscal state**:
- 1% higher debt growth ⇒ reduces rating by 0.013
  same direction as canonical channel.
- **Debt structure**
  - No signal debt instrument drives positive signaling effects.
  - Long-term loan drives negative signaling effects.

Rating FE on:	Debt	ST Bond	LT Bond	ST Loan	LT Loan
L(rating)	0.952***	0.951***	0.950***	0.952***	0.951***
	(0.008)	(0.011)	(0.011)	(0.010)	(0.010)
Debt	−0.000	0.000	−0.000	−0.000	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
L(gdfiscal)*Growth	0.002**	0.000	0.000	0.000	0.002
	(0.001)	(0.000)	(0.003)	(0.000)	(0.003)
L(nmlfiscal)*Growth	−0.001	−0.000	−0.001	−0.000	−0.001
	(0.002)	(0.000)	(0.001)	(0.000)	(0.001)
L(prfiscal)*Growth	−0.013**	0.001	−0.006	−0.001	−0.024***
	(0.006)	(0.001)	(0.008)	(0.001)	(0.008)
Operating Balance	0.007*	0.011**	0.010**	0.013***	0.004
	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)
Real GDP Growth	0.004	0.007	0.008*	0.006	0.006
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
Current Account Balance	−0.001	0.002	0.001	0.001	0.002
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)
Fiscal Reserve	0.000	−0.000	−0.000	−0.000	0.000
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Inflation	0.003	0.005	0.006	0.004	0.015
	(0.016)	(0.018)	(0.018)	(0.018)	(0.017)
LT Rate	−0.081***	−0.101***	−0.101***	−0.109***	−0.102***
	(0.019)	(0.025)	(0.025)	(0.030)	(0.026)

Discussion

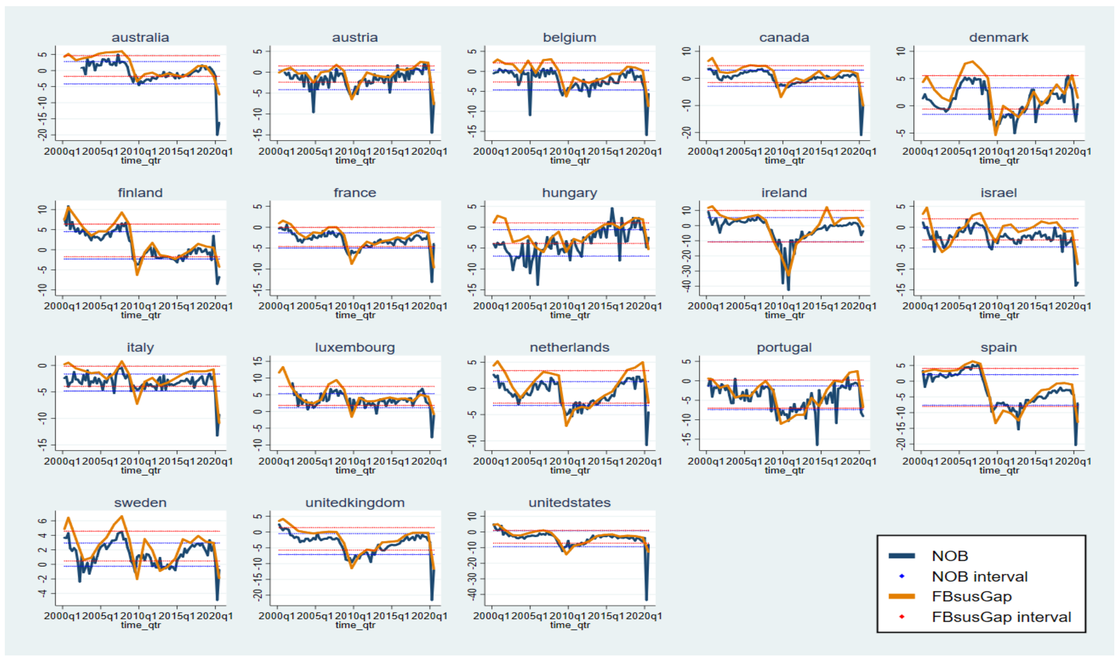
How do we address the reverse causality?

- Period-t rating is the end-of-quarter rating;
- Control for lagged rating;
- Endogeneity tests for debt growth, debt level, operational balance,
- Reject debt growth and operational balance,
- Cannot reject debt level as endogenous regressor;
- IV estimates: lags of debt level as IV.

How to interpret the fiscal states?

- Following figure shows a close co-movement between NOB (to GDP) and the fiscal sustainable gap (to GDP) constructed by Kose, et. al (2022).
- Fiscal state is an indicator for sustainability of a country sovereign debt growth.

Kose, et al (2022) A cross-country database of fiscal space, Journal of International Money and Finance, Volume 128



Conclusions

We found supporting evidence for Conditional Signaling Effects of Sovereign Borrowing. Conditional on good fiscal state, sovereign borrowing has positive signaling effect, improving the sovereign credit rating. Conditional on poor fiscal state, sovereign borrowing has negative signaling effect, reducing the sovereign credit rating. We interpret the fiscal state as an indicator for how sustainable a country's debt growth is, and we provide a simple two-period model to rationalize the conditional signaling effect of sovereign borrowing.

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