Historical policy reaction functions

- We run 25Y rolling windows of MP and FP reaction functions from 1950 to 2019.

Monetary and fiscal policy interactions

- We extend the FP and MP reaction functions as follows:

\[ r_{it} = \rho r_{i,t-1} + (1 - \rho)(\alpha + \beta_i \pi_{it} + \beta_d \text{Debt}_i + \beta_2 \pi_{it} \times \text{Debt}_i + \beta_3 \pi_{it} + \beta_4 X_{it} + \xi_{it}) \]

where \( \text{Debt}_i \) is the sovereign debt to GDP in country \( i \) in year \( t \).

FP:

\[ pb_{it} = \alpha_0 + \alpha_1 \pi_{it-1} + \alpha_2 \text{Debt}_i + \alpha_3 X_{it} + \alpha_4 \pi_{it} + \alpha_5 \pi_{it} \times \text{Debt}_i + \alpha_6 \pi_{it} + \alpha_7 X_{it} + \epsilon_{it} \]

where \( \pi_{it} \) is the effective interest rate paid on sovereign debt by country \( i \) in year \( t \).

- We plot the conditional reaction of MP for different levels of debt.

- We plot the conditional reaction FP for different levels of interest rates.

Conclusions

- Limited policy tool firepower leads to increased difficulties in restoring economic stability, preventing debt distress, and averting potential economic crises.

- Stronger policy sensitivity to economic cycles, coupled with asymmetric responses, amplifies the drift of policy instruments amid successive negative economic shocks.

- Even if debt service costs revert to pre-tightening cycle levels, there are limited opportunities for further rate decreases to extend fiscal space.

- In the ST, Policy tools must work (better) together to restore economic stability.

- In the LT, MP and FP should revert to a position with sufficient space to maneuver economic fluctuations.

Motivation

- Sustained decline in interest rates and concurrent rise in debt levels since the 1980s.
- Reduced firepower of policy tools.
- Have systematic patterns in policy responses contributed to these trends?

Baseline specification

- Baseline MP reaction function follows Taylor (1999):

\[ r_{it} = \rho r_{i,t-1} + (1 - \rho)(\alpha + \beta_i \pi_{it} + \beta_d \text{Debt}_i + \xi_{it}) \]

where:

- \( r_{it} \): Policy rate in country \( i \) in year \( t \) (promised by shadow rate after 2008)
- \( \pi_{it} \): Headline inflation in country \( i \) in year \( t \)
- \( \text{Debt}_i \): Output gap in country \( i \) in year \( t \)
- Baseline FP reaction function follows Bohn (1998):

\[ pb_{it} = \alpha_0 + \alpha_1 \pi_{it-1} + \alpha_2 \text{Debt}_i + \alpha_3 X_{it} + \epsilon_{it} \]

where:

- \( pb_{it} \): Primary balance of country \( i \) in year \( t \)
- \( \pi_{it-1} \): Lagged level of sovereign debt relative to GDP.
- \( \text{Debt}_i \): Output gap
- \( X_{it} \): Vector of control variables