Fiscal redistribution risk in Treasury markets

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These comments are personal views of the discussant and do not represent the views of the Eurosystem or the Banco de España.

How important is inflation risk for Treasury bond risk premia?

- This paper: Minimalist asset pricing model in a heterogeneous agent macroeconomy to show how policy regimes affect risk premia on Treasury bonds
- Safe debt regime (monetary dominance) makes bonds risk free, so it eliminates risk premium
- Risky debt regime (fiscal dominance) implies inflation rises when a spending shock hits, so it generates an inflation risk premium on nominal bonds
- Quantitative extension of the model generates realistic bond risk premium under fiscal dominance
- Innovative, elegant, tractable model points to fiscal dominance together with heterogeneous saving behavior as drivers of inflation risk premia on Treasuries

The model: Lucas tree + heterogeneous saving + Leeper (1999) monetary/fiscal regimes

- Endowment process
  - The tree pays $\bar{Y}$.
  - Spending shocks $x_t = \rho x_{t-1} + \sigma\epsilon$ affect surplus: $s_t = \tau_t - g_t = \tau_t - (g^* + x_t)$.
- Households
  - Saver households (fraction ζ) trade in complete markets and hold all assets. Pricing kernel reflects their Epstein-Zin (1989) preferences.
  - Hand-to-mouth households (fraction $1 - \zeta$) consume current income.
- Policy block
  - Monetary rule pays $i_t = i^* + \rho_\pi(\pi_t - \pi^*)$.
  - Fiscal rule affect surplus $\tau - g$.

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- Households
  - Saver households (fraction ζ) trade in complete markets and hold all assets. Pricing kernel reflects their Epstein-Zin (1989) preferences.
  - Hand-to-mouth households (fraction $1-\zeta$) consume current income.
- Market clearing:

$$C_{Ht} = \bar{Y} - s$$
$$C_{At} = \bar{Y} + \frac{1-\zeta}{\zeta} s$$

- Policy block
  - Monetary rule: $i_t = i^* + \rho_\pi(\pi_t - \pi^*)$.
  - Fiscal rule: $\tau_t = \tau^* + \delta_b(b_{t-1} - b^*)$.
- Policy regimes
  - Monetary dominance: $\rho_\pi > 1$ and $\delta_b > s^*$.
  - Fiscal dominance: $\rho_\pi < 1$ and $\delta_b < s^*$.

Approximately affine solution: monetary dominance

- **Monetary dominance**
  - $\rho_\pi > 1$: increased inflation implies rise in real rate
  - $\delta_b > s^*$: taxes rise enough to offset shocks to surplus

- Solving for equilibrium:
  - Unique non-explosive inflation path is $\pi_t = \pi^*$
  - Inflation stabilized $\rightarrow$ no risk premium on bonds
  - Solve for debt dynamics from fiscal rule
  - Use market clearing to solve for consumption levels C_{Ht} and C_{At}
  - Given consumption, calculate pricing kernel
  - Calculate bond prices

- Conclusions: inflation is stable and debt is riskless in spite of fiscal shocks

Approximately affine solution: fiscal dominance

- **Fiscal dominance**
  - $\rho_\pi < 1$: increased inflation reduces real rate
  - $\delta_b < s^*$: taxes fail to rise enough to stabilize debt

- Think of bonds as claims on the government's surplus. Log returns $r_{s,t+1}$ must be compatible with savers' Euler equation for bonds:

$$1 = E_t \exp\left(m_{t+1} + r_{s,t+1}\right)$$

- Think of savers' wealth as claims on the saver's consumption. Log returns $r_{c,t+1}$ must be compatible with savers' Euler equation for wealth:

$$1 = E_t \exp\left(m_{t+1} + r_{c,t+1}\right)$$

- Solve by method of undetermined coefficients, with affine approximations for equilibrium objects:
  - Stochastic discount factor is $m_{t+1} \approx \log\beta - \gamma\left(v_{c,t+1} - E_t v_{c,t+1}\right)$, where $v_{c,t+1}$ is log wealth
  - Returns on bonds $r_{s,t+1}$ calculated from dynamics of the fiscal shock, and the tax rule
  - Returns on bonds $r_{s,t+1}$ calculated from dynamics of the fiscal shock, and budget constraints and market clearing

Approximately affine solution: fiscal dominance

- **Conclusions.**
- Equilibrium real debt is $b_t \approx A_0 + A_1 x_t$, where

$$A_1 \;=\; \frac{\rho}{(\delta_b - s^*) + (\rho - 1)\exp b^*} \;<\; 0.$$

  - Higher spending x_t decreases the equilibrium stock of real debt

- The log value of savers' wealth is $p_{c,t} \approx D_0 + D_1 x_t$, where

$$D_1 \;=\; \frac{\alpha\left(\frac{1-\zeta}{\zeta}\right)(\rho - \delta_b A_1)}{\alpha_1 \rho - 1} \;<\; 0.$$

  - Higher spending x_t decreases savers' wealth

- Inflation is $\pi_t \approx i^* - \rho\pi^* - \bar{r}_s + \rho\pi_{t-1} + (\kappa_2 - \kappa_1 A_1)$, where $\kappa_2 - \kappa_1 A_1 \;>\; 0$.
  - A positive shock to spending ϵ_t increases inflation

Policy regimes and heterogeneity

- Monetary dominance with representative agent:
  - Inflation stabilized → debt is riskless → no risk premium
- Monetary dominance with heterogeneous savers:
  - Inflation stabilized → debt is riskless → no risk premium
- Fiscal dominance with representative agent:
  - Spending shocks cause inflation shocks → debt is risky
  - But transfers to the representative agent are offset by inflationary losses on bondholdings → wealth and consumption are riskless → no risk premium
- Fiscal dominance with heterogeneous savers:
  - Heterogeneity such that savers absorb the costs of transfers to H2M
  - Real bond returns are low when savers' consumption is low
  - This risk is priced → inflation risk premium

Quantitative extension

- New Keynesian framework.
  - Saver households supply labor, choose consumption and saving
  - Hand-to-mouth households supply labor, consume all income
  - Monopolistically-competitive firms hire labor, set prices, face nominal frictions
  - Government issues long-term bonds (nominal consols with decaying coupons)

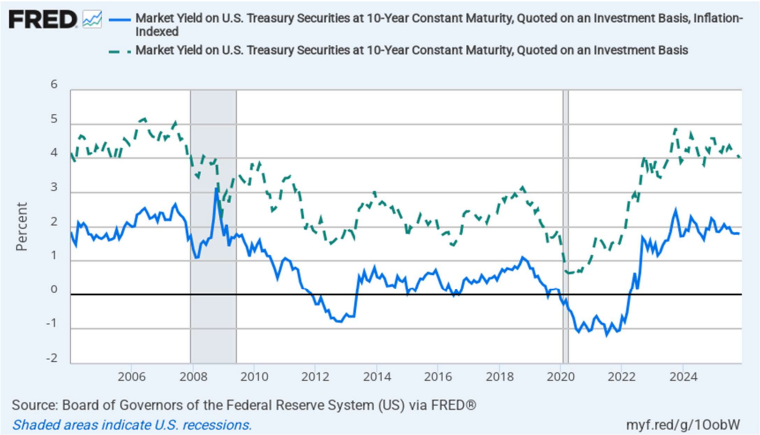
- Debt rule parameters calibrated to match average excess bond premium, 1961-2025
  - Calibrated relative risk aversion quite high ($\gamma = 10$)
  - Achieves reasonable fit to level and standard deviation of excess bond premium
  - Achieves reasonable fit to level and standard deviation of inflation

- Paper also documents term premia
  - Increased inflation in response to unfunded fiscal expansion affects real payoff of long bonds more than that of short bonds
  - Matches spread between 5-year and 1-quarter bonds in the data

Main comments: Take it to the data!!

- Paper suggests that fiscal dominance and inflation risk could be quantitatively important.
- But it doesn't try very hard (yet!) to address the data.
  - Model calibrated to average excess bond premium, 1961-2025
  - Achieves a reasonable fit to level and standard deviation of excess bond premium, and of inflation
  - Calibrated relative risk aversion quite high ($\gamma = 10$)
- Surely there has been time variation in risks over this period?
  - Anecdotally, Taylor parameter has varied
  - Anecdotally, seems that the proportion of unfunded fiscal shocks has varied over time
  - Why not allow for time variation in the policy rules?
- Since the paper focuses on inflation risk, why not compare returns on nominal bonds and inflation-compensated bonds (TIPS)?
  - How large is the Treasury premium over TIPS?
  - Does it vary over time?
  - Is it mostly a compensation for expected inflation, or for inflation risk?

Comparing nominal and inflation-indexed yields



- Shouldn't there be more time variation in the inflation premium than what we observe here?
- This looks a lot like compensation for 2% expected inflation, rather than a risk premium

Conclusions

- Shows that fiscal dominance could be a plausible quantitative explanation for bond risk premia, due to inflation risk
- Heterogeneous saving behavior is essential for this result
  - Fiscal transfers do not affect wealth or consumption in the case of a representative agent, because changes in portfolio value exactly offset the transfers.
  - Heterogeneity such that savers pay for transfers through the devaluation of their assets implies that low returns are correlated with low wealth and consumption, leading to a risk premium.
- Model may also help explain term premia
  - Increased inflation in response to unfunded fiscal expansion affects real payoff of long bonds more than that of short bonds
- **Great paper!** Keep building on the quantitative version.

THANKS FOR YOUR ATTENTION!