Bonds, Currencies and Expectational Errors

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Puzzle: return predictability in bond and currency markets

- UIP: high short term interest rates offset by currency depreciation
- Foundational condition widely utilised in open econ economy macroeconomic models
- Puzzle: high interest rate currencies rather appreciate
- Standard solution: high interest rate currencies are riskier
- New evidence (Lustig et al. 19, AER): same currencies offer low excess bond returns
- A type of negative correlation between bond and currency risk premia
- Hard to obtain in a risk based model

Proposed solution: sticky short rate expectations

- Aggregate survey expectations concerning short rates underreact to news
- Forecast revisions predict future expectational errors
- The resulting expectations process displays ”stickiness” (Coibion Gorodnichenko 15)
- Proposed explanations include: inattention, cognitive frictions, noisy information and ambiguity aversion
- No strong stance on the source though write down a noisy information model

Sticky expectations mathematically

- In the simplest case the "rational" forecast for short rate differential, $x_t = i_t - i_t^*$ (home-foreign), is:

  $E_t[x_{t+1}] = \lambda x_t$

- However, the agents perceive:

  $E_t^S[x_{t+1}] = k\lambda x_t + (1-k)\lambda E_{t-1}^S[x_t]$

- Where the S superscript denotes the subjective probability measure and k measures the degree of underreaction

Sticky expectations: a decomposition

$$\underbrace{\theta_t^{FX}}_{\text{Currency premium}} = \underbrace{\zeta_t^{FX}}_{\text{Risk premium differential}} +$$

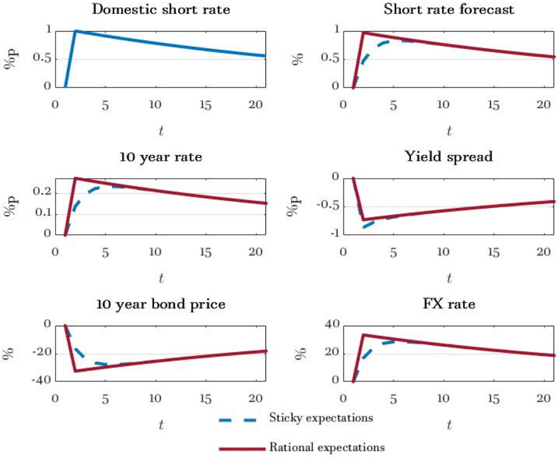
$$\underbrace{E_t\left[E_{t+1}^S \sum_{j=0}^{\infty} x_{t+1+j} - E_t^S \sum_{j=0}^{\infty} x_{t+1+j}\right]}_{\text{Interest rate misperception effect}}$$

$$\underbrace{- E_t\left[E_{t+1}^S \sum_{j=0}^{\infty} \zeta_{t+1+j}^{FX} - E_t^S \sum_{j=0}^{\infty} \zeta_{t+1+j}^{FX}\right]}_{\text{Risk premium misperception effect}} +$$

$$\underbrace{E_t[\lim_{j\to\infty} E_{t+1}^S[s_{t+j}] - \lim_{j\to\infty} E_t^S[s_{t+j}]]}_{\text{Permanent component misperception effect}}$$

- with s_t log-nominal exchange rate ($s_t \uparrow \Rightarrow$ appreciation of the domestic currency), ζ_t^{FX} the risk premium

Mechanism under constant subjective risk premia



To summarize

- Qualitatively and quantitatively consistent with the data
- Explain why high (relative) short rates predict high currency returns but low bond returns
- Also why high (relative) yield spread predicts low currency returns but high bond returns

Empirical Analysis

- Focus on G10 currencies
- Use Consensus Economics to obtain forecast for 3 month and 10 year bonds and FX rates
- Main time period: 1985-2019
- Calculate bond returns using monthly data on local currency government bonds
- Estimate the sticky expectations process directly from survey data

Empirics

- Find that the sticky expectations channel accounts for most of bond and currency predictability
- The remaining plausibly explained by a time-varying risk premium
- Confirm two other predictions of the model:
  - The same variables that predict returns predict expectational errors about interest and FX rates
  - Bond returns particularly low and currency returns high after recent positive short rate shocks

Affine Term Structure Model

- The intuition underlying the reduced form model carries to an affine term structure model
- Extend a standard affine term structure model:
  - include sticky short rate expectations
  - specify a particular form for the relevant stochastic discount factors
  - assume about the belief process that naturally gives rise to sticky short rate expectations
- Obtain the remaining parameters numerically
- Including sticky expectations helps in matching bond and currency predictability patterns

Policy Implications

- Monetary policy transmits to FX rates and yield curves with a lag
- These rates "drift" after announcements
- At odds with standard shock identification
- UIP and expectations hypothesis hold better under subjective beliefs
- Forward rates can be used to measure market expectations