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 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

\[ \theta_t^{FX} = \zeta_t^{FX} + \]

\[ \left( \begin{array}{c}
\text{Currency premium} \\
\text{Risk premium differential}
\end{array} \right) \]

\[ E_t \left[ E_t^S \sum_{j=0}^{\infty} x_{t+1+j} - E_t^S \sum_{j=0}^{\infty} x_{t+1+j} \right] \]

Interest rate misperception effect

\[ E_t \left[ E_t^S \sum_{j=0}^{\infty} \zeta_{t+1+j}^{FX} - E_t^S \sum_{j=0}^{\infty} \zeta_{t+1+j}^{FX} \right] \]

Risk premium misperception effect

\[ E_t \left[ \lim_{j \to \infty} E_{t+1}^S [s_{t+j}] - \lim_{j \to \infty} E_t^S [s_{t+j}] \right] \]

Permanent component misperception effect

\[ \text{\textgreater} \quad \text{with } s_t \text{ log-nominal exchange rate} \quad (s_t \uparrow \Rightarrow \text{appreciation of the domestic currency}), \quad \zeta_t^{FX} \text{ the risk premium} \]
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
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