Volatility, Intermediaries, and Exchange Rates

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Discussion by

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THE PAPER IN A NUTSHELL

- Paper explores to what extent a general equilibrium model with financial intermediaries can account for classic exchange rate “puzzles"
- Builds on literature that emphasizes importance of financial intermediation for asset prices
  - Intermediary asset pricing (He and Krishnamurthy, 2017; . . .)
  - Open economy models with financially constrained intermediaries (Gabaix and Maggiori, 2017; . . .)
- Contribution: an estimated version of the model can account for behavior of exchange rates
  - Financial constraints generate a “wedge" in the standard interest rate parity condition of the model (Itskhoki and Mukhin, 2016)

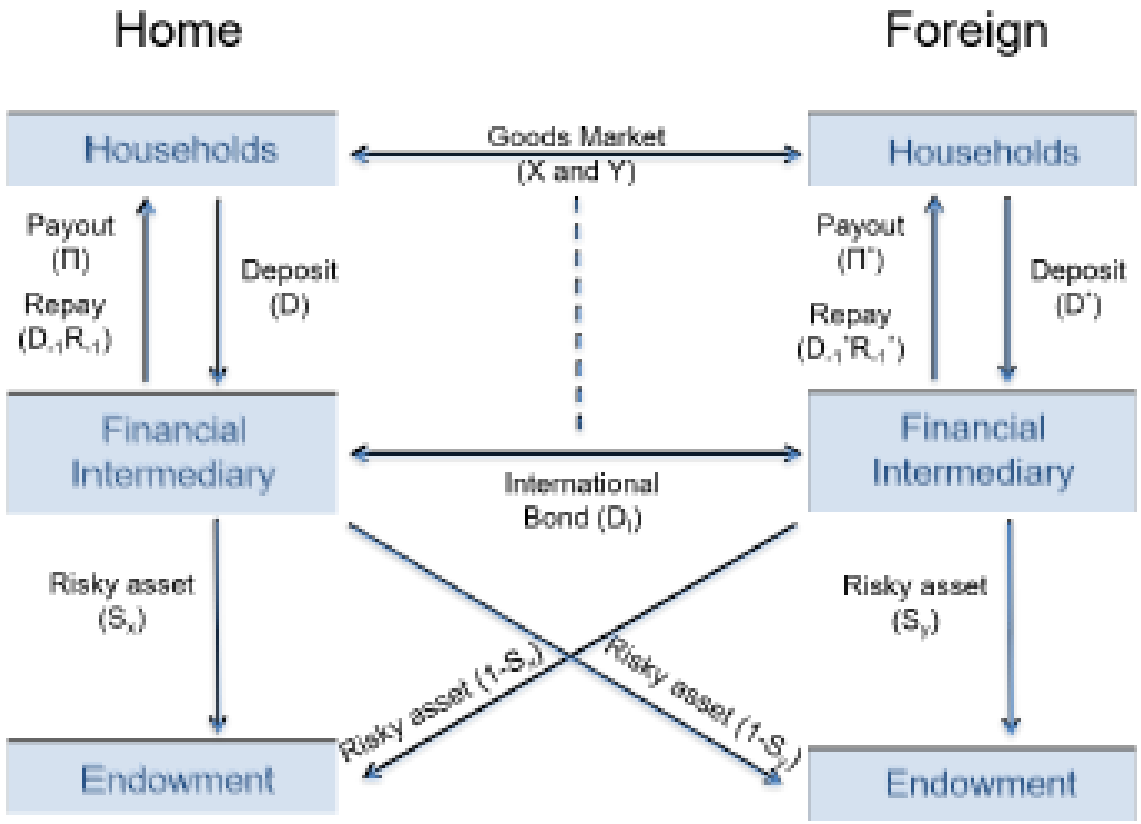
THIS DISCUSSION

Very nice paper, natural progression of the literature

This discussion: Review main mechanism and raise three questions

1. Plausibility of binding financial constraints?
2. Why muting time-varying risk bearing capacity of financial sector?
3. Role of volatility?

THE MODEL



Key ingredients:

- Intermediaries invest in domestic and foreign assets, subject to collateral constraints
- Shocks to collateral constraints

THE MODIFIED UIP

$$\max_{\{S_{xt},S_{yt},D_{It},D_t\}} \mathbb{E}_t \left[M_{t+1} \left(P_{xt} R_{xt+1} S_{xt} + Q_{t+1} P_{yt} R_{yt+1} S_{yt} + R_{It+1} D_{It} - D_t R_{ft} \right) \right]$$

$$P_{xt} S_{xt} + Q_t P_{yt} S_{yt} + D_{It} \leq N_t + D_t$$

$$\alpha_t N_t \geq \theta_t (P_{xt} S_{xt} + Q_{t+1} P_{yt} S_{yt} + D_{It})$$

Rearranging the FOC for foreign bonds, we obtain

$$\mathbb{E}_t \Delta q_{t+1} \approx (r_{ft} - r_{ft}^*) - \mathrm{Cov}_t \left(\frac{m_{t+1} + m_{t+1}^*}{2}, \Delta q_{t+1} \right) + [\theta_t \kappa_t - \theta_t^* \kappa_t^*]$$

Key mechanism: suppose financial constraints at home tighten ($\theta_t \uparrow$)

- Excess returns on assets held by home intermediaries needs to increase
- So, domestic currency needs to depreciate in expectation

THE MODEL AND THE PUZZLES

1. Backus-Smith puzzle: weak correlation between exchange rates and relative consumption growth
   - Model introduces a wedge in UIP
   - (Need at least two shocks because wedge is endogenous)

2. Forward premium puzzle: Low interest rate currencies expected to depreciate
   - When $\theta_t \uparrow$, consumption goes up (Barro-King effect), risk-free rate falls
   - Countries with tighter constraints expected to depreciate

3. Volatility puzzle: Quantitative models typically produce little volatility in exchange rates
   - Tightening of financial constraint additional source of variation

Model also generates deviations from CIP (limits to arbitrage)

COMMENT 1: PLAUSIBILITY OF BINDING FINANCIAL CONSTRAINTS

- All the action in the model comes from binding financial constraints
- Binding financial constraints $\rightarrow$ Violation of arbitrage in financial markets
- Evidence? Literature has looked at the various proxies: Ted spread (Garleanu and Pedersen, 2011; Bocola, 2016), CIP deviations (Du, Tepper and Verdhelan, 2018), ... Summary of literature:
  - Sizable deviations during financial crises
  - Small (or absent) in normal times
- Question: can you solve exchange rate puzzles while simultaneously matching this evidence?

COMMENT 2: LEVERAGE-BASED PRICING KERNELS

Models with financial intermediation and leverage constraints imply two main modifications of standard Euler equations

1. Introduce a wedge between risk-adjusted risky assets and risk-free rate
2. Modify properties of the stochastic discount factor. For example, in Gertler and Karadi (2011) we have

$$M_{t+1} = \left(\frac{C_{t+1}}{C_t}\right)^{-\sigma} [(1-\psi) + \psi\lambda \text{lev}_{t+1}]$$

Second ingredient critical for behavior of asset prices (Adrian, Etula and Muir, 2016; Bocola, 2016).

Question: Why focus on the case in which $\psi = 0$?

- Mutes time-varying risk-premia as drivers of exchange rates
- Mechanism present even if constraints are not binding today. Can reconcile evidence on small violation of arbitrage in normal times

COMMENT 3: ROLE OF VOLATILITY?

- Model assumes a correlation between θ_t and volatility,

$$\theta_t = \theta_0 + \theta_1 \log(\sigma_t)$$

- Question: Would you get similar results with no-volatility shocks and independent shocks to θ_t?

- My prior is that volatility shocks are not necessary to solve the puzzles. All is needed is independent variation in θ_t

- Paper needs to explain why volatility shocks are needed to solve the puzzles (if they are).

Conclusion

Very interesting paper. Three suggestions

1. Impose more discipline in quantitative exercise on violations of arbitrage
2. Introduce dynamic accumulation of net worth in model and quantify importance of time-varying risk-premia for exchange rate dynamics
3. Isolate independent role (if any) of volatility shocks