Exchange Rate Dynamics and US Dollar-denominated Sovereign Bond Prices in Emerging Markets

Cho-Hoi Hui

Hong Kong Monetary Authority

and

Chi-Fai Lo

The Chinese University of Hong Kong

and

Po-Hon Chau

The Chinese University of Hong Kong

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Summary

Based on an analogy between an economy's currency price and a firm's stock price, this paper studies the dynamic linkage between exchange rates and US dollar-denominated sovereign bonds in emerging markets. Using data on emerging markets including Brazil, Colombia, Mexico, the Philippines, Russia and Turkey, the empirical results support the view that the exchange rates of their currencies have adequate explanatory power for explaining their US dollar-denominated sovereign bond price, with stronger explanatory power in the post-crisis period than in the pre-crisis period. We develop a two-factor risky bond pricing model based on a semi-structural approach in which the stochastic exchange rates and US risk-free interest rates are the underlying factors. To incorporate forward looking market information into the model, the currency option-implied volatility is used as the associated

model parameter of the exchange rate. The closed-form solutions of risky bond prices are derived from the model with default at maturity and a default barrier (default prior to maturity) respectively.

Using US dollar-denominated sovereign bonds with different tenors, the numerical results from the closed-form solution with default prior to maturity show that the credit spreads generated from the pricing model broadly track changes in the market credit spreads in both pre- and post-crisis periods. The correlations between them are positively high when the calibrated default barriers are used for pricing the bonds. The corresponding absolute percentage errors vary among the bonds. The percentage errors show a marginal systematic negative (positive) bias of the model for the pricing of bond spreads (prices) particularly in the post-crisis period. The magnitude of the errors is lower than that of conventional structural models for the pricing of corporate bonds. Our numerical results are consistent with empirical findings that the exchange rate dynamics of emerging market currencies are significantly related to their sovereign credit spreads.

Our results support the findings of a strong relationship between emerging markets' sovereign risk and exchange rate stability in the literature on international finance and studies about twin sovereign debt and currency crises. This paper's findings suggest that dollar-denominated sovereign bonds are directly influenced by exchange rate dynamics. This suggests that both governments and investors might be better served by issuing debt in local currency, and letting investors hedge these risks in currency markets.