Density Forecasts of Emerging Markets' Exchange Rates Using Monte Carlo Simulation with Regime Switching

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Point Forecasts

- The point forecasting models are generally disappointing as a random walk is the best forecasting model
- Density Forecasts
 - The random walk can be beaten regarding the accuracy out-of-sample density
 - It is useful for market participants, such as calculating Value at Risk
- The paper proposes a simple and effective method to provide one month ahead density forecasts of emerging markets' exchange rates

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- Three Regimes: neutral, risk-on, risk-off
 - determined by the VIX quantiles
 - 3×3 Transition Matrix using historical data up to the forecast date
 - Divide 3 groups of historical returns corresponding to the regimes
- This framework is flexible for more regimes and other regime indicators
- Forecasting Algorithm
 - Determine the regime on the first day
 - Randomly select a daily return corresponding to the regime
 - Calculate the returns and prices on the 2-20 days, recursively
 - Using Monte-Carlo, repeat the 20-step ahead forecast N times and get a simulated distribution
- The algorithm is easy to apply for other forecasting dimensions and on other objects

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- Rolling forecasts for 22 emerging countries from 2010 to 2015 (full sample: 1990-2015)
- Density Forecasts
 - Coverage rates
 - Knuppel (2015) test
 - Log predictive density scores and Amisano and Giacomini (2007) test
 - VaR backtesting
 - Kupiec test
 - Christoffersen test
 - VQR test

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Point Forecasting Accuracy

- Diebold-Mariano-West test shows the point forecasts from the proposed model are inferior to random walk
- It is as expected as the proposed method is aiming at density forecasting
- Density Forecasting Accuracy
 - The coverage rates and Knuppel (2015) test show that the proposed method is good to provide density forecasts for more countries than a random walk, while the relative fitness against other approaches is examined by the log predictive density scores and Amisano and Giacomini (2007) test. The latter shows the performance of the proposed model is not statistically superior to the benchmarks

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Density Forecasting Accuracy

- The benchmarks are random walks and AR(1)-GARCH(1,1) model with normal and student-t distributions. Perhaps skewed distributions should also be employed
- Is there any alternative method to provide density forecasts of FX rates? How does the proposed method perform against alternatives?

VaR Backtests

- The proposed method can capture tail effects for 7 countries fails to pass all tests in 3 countries
- How about the historical simulation approach? How well does the proposed method perform in VaR backtests and other tests comparing to the density from traditional historical simulation?

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