

Trading Emerging Markets FX Volatility

Research question

Do foreign exchange options markets efficiently price in future volatility or can the zoo of different volatility forecasting models add value in terms of profitable trading strategies?

Economic relevance and motivation

We are interested in testing a trading strategy consisting of long and short FX option straddles in emerging markets FX. If FX options markets are efficient, they should accurately, given the information, price future volatility, and one should therefore not be able to profit by pricing a different level of volatility.

Inspired by Pilbeam and Langeland (2014), we therefore aim to test different GARCH specifications in terms of volatility forecasting ability. Subsequently, following the approach by Dunis and Huang (2002), we construct a trading strategy which should create positive returns if the GARCH volatility forecasts are more accurate than what the market prices into options. This allows us to investigate the predictive power of our models from a statistical as well as economic point of view.

Intended approach

Our intended approach is based on the following procedure, which follows the exposition in Dunis and Huang, 2002:

1. Fit (various) GARCH models to a sample period of emerging markets FX returns
2. Forecast the future volatility for different time horizons based on the GARCH models
3. Compare the out-of-sample forecasted volatility with the current market pricing of at-the-money forward options (in terms of volatility). If the GARCH model predicts a higher volatility than the market, enter a long straddle (long call and put option). If the GARCH model predicts a lower volatility, enter a short straddle (short call and put option). Else, do nothing.

Based on the approach outlined above, we aim at evaluating historical performance of the trading strategy, also taking transaction costs into account. Our contribution is therefore to shed light on the trading strategy performance in emerging markets FX rather than developed markets, as well as test the strategy based on other numerous GARCH specifications.

Implementation

Implementing and backtesting the option trading strategy in emerging markets FX (USDRUB, USDZAR, USDBRL), which requires historical data on exchange rates as well as at-the-money implied volatilities for options on the currencies. This data is available via Bloomberg and has already been collected.

For the practical implementation, we will rely on GARCH modelling of FX returns in Python using the `arch` library.

References

- Dunis, C. L., & Huang, X. (2002). Forecasting and trading currency volatility: an application of recurrent neural regression and model combination. *Journal of Forecasting*, 21(5), 317–354. <https://doi.org/10.1002/for.833>
- Pilbeam, K., & Langeland, K. N. (2014). Forecasting exchange rate volatility: GARCH models versus implied volatility forecasts. *International Economics and Economic Policy* 2014 12:1, 12(1), 127–142. <https://doi.org/10.1007/S10368-014-0289-4>