July 3, 2015

Rolf Poulsen, University of Copenhagen

rolf@math.ku.dk

Bangladesh (BDT) Currency Analysis

Gains from pegging to a basket

The analysis here follows the paper Hanke, Poulsen & Weissensteiner (2015)[1] with two new additions: (1) The estimation period is more recent, July 2014 to June 2015. (2) In the role of the pegged (or: basket) exchange rates from the paper, the G-rates published by CGU are used.

Trade and currency and weights used the analysis:

Currency	EUR (Euro zone)	CNY (China)	USD (US)	INR (India)	GBP (UK)	SGD (Singapore)	JPY (Japan)	CAD (Canada)
Normalized trade weight (%)	28.9	24.4	12.8	13.2	6.5	6.6	4.1	3.4
GCU weight (%)	31.2	24.6	15.1	16.6	7.5	6.0	0	0

These eight markets covered about 72% of Bangladesh's trade in 2014.

The volatilities against the trading partners are shown in Figure 1. The black lines indicate volatilities with the current exchange rate paradigm, the red lines show volatilities if the G-rates were used. There is a slight increase in volatility relative to the US and Chinese currencies, and a decrease in volatility against all other currencies, in particular the euro. Notice also the decrease in volatility for the currencies (CAN and JPY) that are not explicitly in the index for the construction of the G-rates. For that reason the normalized trade weights in the table can safely be used as representative for the total Bangladeshi trade.

[1]) Hanke, Poulsen & Weissensteiner (2015), "Currency Pegs: Cases for Baskets", working paper, University of Copenhagen.

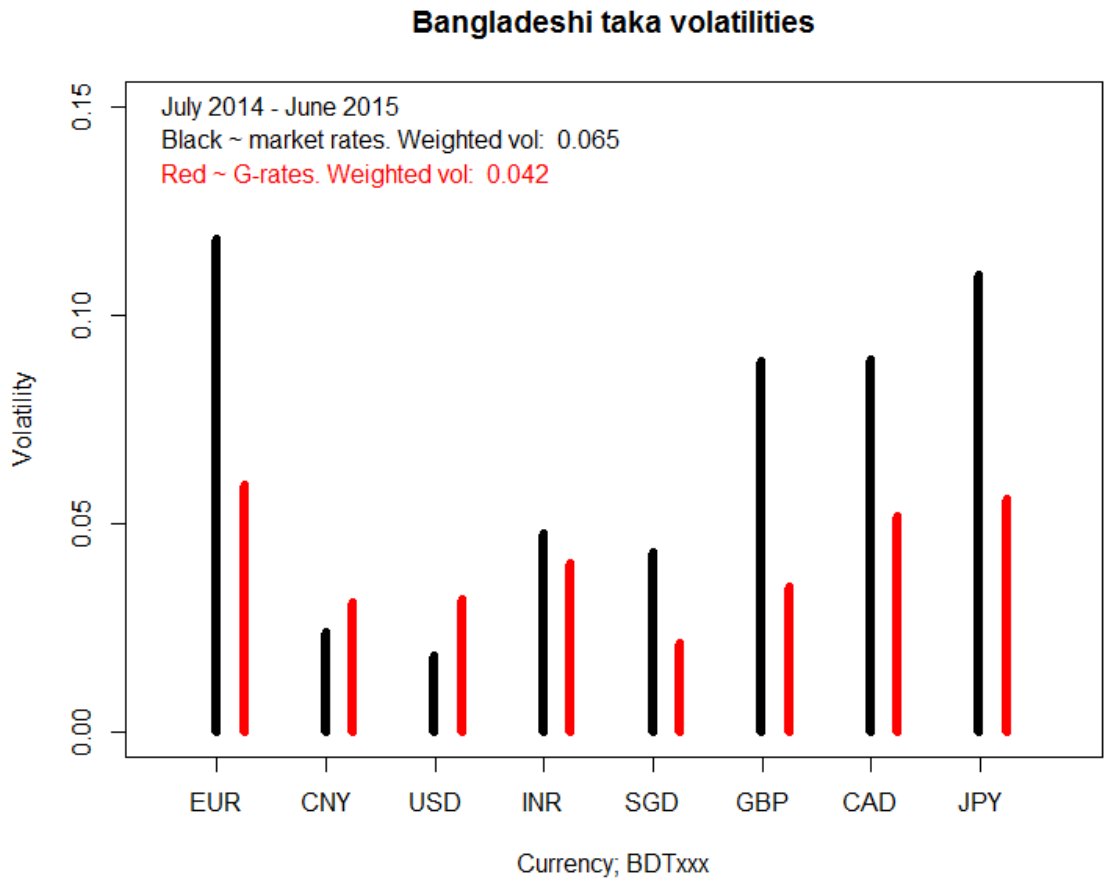

Figure 1 Volatilities of the Bangladeshi taka under the current exchange rate regime (black) and when G-rates are used (red).

The trade-weighted average (annualized) volatility decreases from 6.5% to 4.2%.

To put a monetary value on that decrease, let us assume that all Bangladeshi companies buy currency insurance by means of forward-at-the-money call or put options with a time to expiry of four months. The Garman-Kohlhagen formula with interest rates = 0 and spot=strike=1 will give a reasonable estimate of the per-currency-unit cost of such insurance. After some cancellations the formula for the calculation of the insurance price, say I, becomes

$$I = TT * \sum_{i \sim \text{currency}} w_i * \left(N\left(0.5 * \sigma_i * \left({}^{4}/_{12}\right)^{0.5}\right) - N\left(-0.5 * \sigma_i * \left({}^{4}/_{12}\right)^{0.5}\right)\right),$$

where TT is total trade (USD 71,735 million in 2014), the w's are the trade weights, N is the standard normal distribution function, and σ denotes volatility. We plug in the estimated

volatilities for the current currency paradigm and for the G-rates and subtract the two insurance costs. This leads to an estimated (yearly) saving of USD 380 million.

Using a moving basket

It is eminently possible to calculate basket-pegged exchange rates with respect to a time-varying basket. This was suggested as a theoretical possibility in Hanke et al. (2015) and following the argumentation in Sayed (2014)[i] it can be used to set targets that reflect interest rate differentials and expected inflation. It is currently not implemented in the calculation of G-rates, and as it corresponds to multiplying the G-rates by a smooth function it would not alter the volatilities and thus neither the estimated gains from using G-rates.

[i] Sayed (2014), "REER and Exchange Rate of Bangladesh", IISSIR, vol. 10 pp. 94-110.