

Homework on Exchange Rate Forecast  
Winter Camp of Quantitative Economics @ PHBS  
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Note: For this homework, you should form pairs of groups. Each group should do the homework independently. But after the homework is done, you should get together with your partner group to check if your answers are the same. If not, find out why and make necessary correction. In this way, each group is doing an independent replication of the work of another group. Comparing your results will reveal errors that are so very common in the early stage of doing empirical research.

- I. Comparing root mean squared errors is not the only criterion to judge the goodness of exchange rate models. Some argue that in practice, it is more important that the forecasted *direction* of change in the exchange rate is correct. That is to say, if exchange rate depreciated 1% in a given period, the forecast that it would depreciates 4% is better than the forecast that it would appreciate 1%, even though the later forecast is closer to the actual change in *magnitude*. Use the *percentage of correct directional forecast* as the criterion to re-examine the UIP model, the Taylor Rule model, and the random walk model. Which model performs best in terms of producing the correct direction of change? Does any model beat the random walk model?
  
- II. Engel and West (2005) builds a Taylor Rule model in which one of the countries sets monetary policy rate taking into consideration the level of real effective exchange rate (REER). The idea is that the country may be heavily externally dependent, and the monetary authority cares about the relative price of its exports. Assume that the (trade weighted) real effective exchange rate is a policy concern for the Chinese central bank. Re-estimate the Taylor rule model assuming that:
  - the US central bank sets interest rate targeting inflation and output gap as before
  - the Chinese central bank targets REER *in addition*
  - a) Check a credible online source for the definition of REER.
  - b) Estimate the Taylor Rule model with REER using Chinese data. What's the sign of the coefficient of REER? Is it significant? Is the sign consistent with your intuition?
  - c) Re-do the out-of-sample forecast using Taylor Rule model with REER. Does the model produce smaller or larger RMSE than the original Taylor Rule model?