

How Well the Ringgit-Yen Rate Fits the Non-linear Smooth Transition Autoregressive and Linear Autoregressive Models

Liew Khim Sen

&

Ahmad Zubaidi Baharumshah

*Department of Economic,
Faculty of Economics and Management,
Universiti Putra Malaysia,
Serdang, Selangor, Malaysia.*

ABSTRAK

Kajian ini membandingkan prestasi peramalan di antara model ketaklinearan Autoregrasi Berperalihan Licin (*Smooth Transition Autoregressive* atau STAR) dengan model linear siri masa iaitu model Autoregrasi (*Autoregressive* atau AR), berdasarkan model rawak mudah (*simple random walk* atau SRW) sebagai piawai perbandingan. Untuk mencapai objektif tersebut, kajian ini menggunakan data suku masa pertukaran asing, di mana penylarasannya ke arah keseimbangan pariti kuasa beli (*purchasing power parity*) adalah secara tidak linear. Keputusan empirik menunjukkan bahawa model STAR dan AR mempunyai purata mutlak ralat ramalan (*mean absolute forecast error* atau MAFE), purata mutlak peratus ralat ramalan (*mean absolute percentage forecast error* atau MAPFE) dan purata punca kuasa dua ralat ramalan (*mean square forecast error* atau RMSFE) yang lebih kecil jika dibanding dengan model SRW. Keputusan yang diperolehi juga menunjukkan ramalan model STAR lebih tepat jika dibandingkan dengan pesaing linearnya, iaitu model AR. Hasil kajian ini adalah konsisten dengan penyelidikan yang memberi penekanan kepentingan membenarkan pelarasan yang tidak linear bagi kadar pertukaran asing ke arah keseimbangan jangka panjang.

ABSTRACT

This study compares the forecasting performance between Smooth Transition Autoregressive (STAR) non-linear model and the conventional linear Autoregressive (AR) time series model using the simple random walk (SRW) model as the standard reference model. To accomplish this objective, quarterly frequency exchange rate data, which is well known for its non-linear adjustment towards purchasing power parity equilibrium path is employed. The empirical results suggest that both the STAR and AR models exceed or match the performance of SRW model based mean absolute forecast error (MAFE) mean absolute percentage forecast error (MAPFE) and mean square forecast error (RMSFE). The results also show that the STAR model outperform the AR model, its linear competitor. This is consistent with the emerging line of research that emphasised the importance of allowing non-linearity in the adjustment of exchange rate toward its long run equilibrium.

Keywords: Autoregressive, Smooth Transition Autoregressive, non-linear time series, forecasting accuracy

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