Forecasting Performance of Logistic STAR Exchange Rate Model: The Original and Reparameterised Versions

Liew Khim Sen[a] and Ahmad Zubaidi Baharumshah[a]

[a] *Department of Economics, Faculty of Economics and Management, Universiti Putra Malaysia,43400 Serdang, Selangor D. E., Malaysia.*

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Abstract

Exponential Smooth Transition Autoregressive (ESTAR) model is widely adopted in the exchange rate study as its symmetrical distribution matches that of the symmetrical exchange rate adjustment behaviour. In contrast, another specification of STAR model, namely the LSTAR (logistic STAR) model is discard by most researchers *in priori* in their exchange rate modeling exercises due to its undesired property of being asymmetry. This study is the first of its kind in examining the validity of this hypothesis that the ESTAR exchange rate model is superior to LSTAR exchange rate model on the basis of forecasting accuracy. Based on the experience of the adjustment process of two nominal exchange rates, we find that the hypothesis is merely theoretical since we fail to provide consistent empirical evidence in favour of the null hypothesis. This warrants us that we need not be too pessimistic on the usage of LSTAR model in exchange rate study. In our effort to rekindle the usage of LSTAR model, we further reparameterized the original version into the so-called absolute version, which has symmetrical distribution properties, in accordance with the well-known symmetrical adjustment process of exchange rate. The resulting ALSTAR model has proven to be a more promising model in the sense that it has improved significantly from its original version as well as the ESTAR model, which has thus far been deemed the most appropriate nonlinear exchange rate model.

JEL Classification: F31, C53

Keywords: LSTAR, ESTAR, forecasting accuracy, nonlinear, exchange rate

1. Introduction

A number of empirical studies have documented that exchange rate behavior may be well characterized by the Smooth Transition Autoregressive (STAR) process (Taylor and Sarno, 1998; Sarantis, 1999; Taylor and Peel, 2000; Sarno, 2000; Baum et al., 2001; Guerra, 2001; Liew et al., 2002). STAR model is a nonlinear econometric model that is able to capture the movement of exchange rate, which adjusts every moment but the speed of adjustment varies with the size of