

A Time-Varying Parameter Vector Autoregression Model for Forecasting Emerging Market Exchange Rates

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Abstract

In this study, a vector autoregression (VAR) model with time-varying parameters (TVP) to predict the daily Indian rupee (INR)/US dollar (USD) exchange rates for the Indian economy is developed. The method is based on characterization of the TVP as an optimal control problem. The methodology is a blend of the flexible least squares and Kalman filter techniques. The out-of-sample forecasting performance of the TVP-VAR model is evaluated against the simple VAR and ARIMA models, by employing a cross-validation process and metrics such as mean absolute error, root mean square error, and directional accuracy. Out-of-sample results in terms of conventional forecast evaluation statistics and directional accuracy show TVP-VAR model consistently outperforms the simple VAR and ARIMA models.

Keywords: Stock Prices, Exchange Rates, Bivariate Causality, Forecasting

JEL Classification: C22, C52, C53, F31, G10

1. Introduction

Various significant structural transformations between 1960 and early 1970s led to the dramatic end of the Breton-Woods system of pegged exchange rates. Numerous efforts to bring back the fixed exchange rate system proved futile and by March 1973, the regime of floating currencies began. Collapse of Breton-Woods and rapid expansion of global trading markets has altered the dynamics of foreign exchange market dramatically. This market is considered the largest and most liquid of the financial markets, with an estimated \$1 trillion traded every day.

So, in such an environment where exchange rate fluctuates, policymakers strive to understand the exchange rate movements and their implications on interest rates and inflation. The interest rate is set on the basis of an overall assessment of the inflation outlook. Moreover, exchange rate movements affect consumer price inflation through

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