

Modeling and Forecasting on Foreign Exchange Rates

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Foreign currency exchange is a rapidly growing trade around the world, known as FOREX. Despite the high risk involved in FOREX trading, the fact remains that the traders are always fascinated by FOREX market. This research was carried out to understand the behavior of currency exchange rates, to identify adequate models for exchange rates and to forecast exchange rates for a future time period. The dataset was considered as four sections which were EUR/USD, USD/CHF, GBP/USD and USD/JPY from 1999 to 2015. According to the literature, there is a low accuracy of the forecast using fitted models for daily exchange rates. To overcome the problem, monthly average of daily exchange rates were considered for the analysis. Time series analysis was used to identify models and Akaike Information Criteria was used to identify the best fitting models. Unit Root Test recognized the existence of the stationary while Ljung-Box Test and Box-Pierce Test recognized adequacy of fitted models. Existences of ARCH effects were tested and ARCH models were fitted with relevant orders. Ljung-Box Test was used to check the adequacy of ARCH models. Decisions were made under p-value of 0.05 throughout the study. The formats of the fitted models for log-transformed EUR/USD, USD/CHF, GBP/USD and USD/JPY were ARIMA (1,1,0) with ARCH (1), ARIMA (0,1,0), ARIMA (3,1,2) with ARCH (1) and ARIMA (2,2,1) respectively. Forecasting was done using adequate models for a time period of six months. According to the results, the actual values are within the forecasted 95% confidence interval. For a short time period, obtained methods can be used, but forecasting for a long time may lead to an aberration. In conclusion, the developed models and the calculated confidence limits can be successfully used to buy currency without losses.

Keywords: ARCH, ARIMA, Exchange rates, FOREX, Time series analysis