FORECASTING RETAIL PRICES OF THE MOST COMMONLY USED RICE IN SRI LANKA

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Declaration

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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Abstract

This thesis focuses on Modeling and forecasting Maximum Retail Price (MRP) of Samba, Nadu, Kekulu White and Kekulu Red rice in Sri Lanka using Univariate and Multivariate Time Series approaches. Sri Lanka is a developing country with population of 21.4 million as estimated in 2020. Rice is the most commonly used food in Sri Lanka. Thus, the finding a model for the forecasting prices is most economical advantage for Sri Lankan government. The fluctuations of the prices of rice making a great risk of investing, buffer stock maintaining, international trade and other associated actions. Thus, it is vital to forecast future prices for decision making purposes.

Our objective is to forecast the average weekly prices of selected four products. In this study, we consider weekly average retail prices of Samba, Nadu, Kekulu White and Kekulu Red from September 2017 to March 2019. Thus, each series consists of 93 data points. The missing values are estimated using expectation maximization algorithm. Data is collecting from Central Bank of Sri Lanka. First 83 data points are used to build the model and remaining 10 data points are used to validate the forecasting model. To select the best model, selection criteria based on the Akaike information criterion (AIC).

We observe that the best model for the Samba prices is exponential smoothing. Nadu price is ARIMA (2,1,0) and best model for Kekulu White and Kekulu Red are ARIMA (1,1,0) and ARIMA (1,1,0) respectively. Then, the testing data set is used to validate the prediction. Since there is a strong correlation between prices, we consider vector auto regression (VAR) model to improve the forecasts. Among several plausible models VAR of order 2 results in the best model. Nadu prices is independent of other three prices. VAR models provides better forecasts for prices of Nadu, Kekulu White, Kekulu Red.

Keywords: ADF, KPSS, PP, ARIMA, VAR, Cross correlation

TABLE OF CONTENTS

List of Figures Page

List of Tables

Page

List of Abbreviations

ACF	Autocorrelation function
ADF	Augmented Dickey-Fuller
AIC	Akaike information criterion
AR	Autoregressive
ARIMA	Autoregressive integrated moving average
BIC	Bayesian information criterion
CBSL	Central bank of Sri Lanka
HQIC	Hannan–Quinn information criterion
KPSS	Kwiatkowski–Phillips–Schmidt–Shin
MA	Moving average
MAE	Mean absolute error
MAPE	Mean absolute percentage error
PACF	Partial autocorrelation function
PP	Phillips Perron
RMSE	Root Mean Squared Error
VAR	Vector Auto Regression
VECM	Vector Error Correction Model