Sama Circular Model and ARIMA on Forecasting Unemployment of Australia

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ABSTRACT

The unemployment is defined as the incapability of getting a paid employment or self-employment, when the labor is readily available. It might occur due to various reasons, such as; recession, weakness of economic policies, competition in the job market due to globalization and international trade, replacing human labor by new technologies and inventions. The unemployment would damage the financial instability, happiness and self-esteem of an individual. It creates economic distress as well as social distress. Australia is one of the developed countries, yet not escaped from the unemployment. The Australian Bureau of Statistics (ABS) closely monitors the situation, conduct a monthly Labor Force Survey and reveal unemployment data to the public. However, advanced scientific forecasting techniques were not much applied in forecasting unemployment. Hence the study was focused on forecasting unemployment of the country. Monthly unemployment in Australia from year 2005 to 2019 was obtained from the official website of International Monetary Fund (IMF). The pattern recognition part of the analysis suggested the; trend, seasonal and/or cyclical variation in unemployment. Therefore Seasonal Auto Regressive Moving Average (SARIMA) method and the Sama Circular Model (SCM) were tested for the purpose. Goodness of fit tests and measurements of errors were used in model validation. The Auto Correlation Functions (ACF) of residuals and Ljung-Box Q statistics (LBQ) were used to test the independence of residuals. The Probability plot and the Anderson Darling test were used to test the normality of residuals. Forecasting ability of models was assessed by Mean Absolute Percentage Error (MAPE), Mean Square Error (MSE) and Mean Absolute Deviation (MAD). The SARIMA as well as SCM satisfied the model validation criterion. Measurement of errors of both models were satisfactorily small, but the SARIMA forecasts were under estimates and not in line with the actual series. It was concluded that the SARIMA and SCM are suitable whilst SCM is superior to SARIMA in forecasting Australian unemployment.

Keywords: SARIMA, Sama Circular Model, Unemployment

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