



## **Modeling Consumer Price Index in the USA under the COVID -19 Pandemic**

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### **ABSTRACT**

The Consumer Price Index (CPI) is a statistical composite indicator that measures the average change in prices over time that consumers pay for a basket of goods and services. The prices of goods and services are often changed due to the varied dynamic situations within the country. It depends on the effectiveness of economic policies and various other factors including natural disasters. There is an increasing trend of CPI in the USA. It shows an exponential growth behavior within the COVID-19 pandemic situation. It is very important to examine the future behavior of the CPI of the country under this situation. The objective of the study was to forecast CPI in the USA. The results of the study will be a lighthouse for revise or impose monetary and fiscal policies in the country. The monthly CPI data obtain from the International Monetary Fund (IMF) database for the period of January 2010 to August 2020. Auto-Correlation Functions (ACF) and Time Series Plots were used for pattern recognition of the data set. The model validation was done by using the Anderson Darling test, ACF, and Ljung-Box Q (LBQ)-test. The forecasting ability of the model was assessed by both relative and absolute measurements of errors. Linear and nonlinear trend models and Double Exponential Smoothing (DES) has been selected based on the behavior of the data series. The results of the study revealed that all four linear and nonlinear trend models do not satisfy the model validation criterion. DES was run after the trend models. The model DES satisfied the model validation criterion. The model was best fitted for Level ( $\alpha$ ) = 1.5 and Trend ( $\gamma$ ) = 0.025. Both relative and absolute measurements of errors were very low under the fitting and verification. It has been concluded that DES is a suitable model to forecast CPI in the USA. According the ACF of the data series, there could be some seasonal and cyclical behavior in CPI. Hence, it is recommended to capture such behaviors to gain optimum benefits to the USA.

**Keywords:** Consumer Price Index, Monetary, Fiscal, COVID-19, DES