1. Create a scatterplot of Unemployment, Inflation and GDP data

Chart, histogram

Description automatically generatedChart, line chart

Description automatically generated

Chart, histogram

Description automatically generated

From 1960 through 2021 inflation shows a steady growth. The unemployment trend is unable to be measured accurately, while the trend in GDP seems to be increasing since the 1980’s after a substantial decrease from the 1960’s.

1. Text

   Description automatically generatedTest for stationarity in Unemployment, Inflation and GDP data

All three categories (Inflation, GDP, Unemployment) show a negative dickey-fuller result. This indicates that the null values are rejected and the remaining nonstationary values are not rejected. With regards to KPSS, the unemployment rate trend shows it being stationary so the null values are rejected.

1. Chart

   Description automatically generatedCreate the correlograms of Unemployment, Inflation and GDP data

Chart

Description automatically generated

The above two models above for Unemployment are trending down. When these are trending down this indicates that the estimate of the autocorrelation function is improving as the prediction of the time series goes on.

Chart

Description automatically generated

Chart

Description automatically generated with medium confidence

As with the unemployment data on the previous page, both ACF and PACF show a declining autocorrelation estimate which indicates a better predictability as the model continues. The initial observation indicates the confidence of the model was not as good as when the model carries out through the time series.

Chart

Description automatically generated

Chart

Description automatically generated

As with the previous two models, the acf and pacf for GDP is consistent with the previous two models. Only around lag10 does the model cross over and start to become more accurate as the time series progresses.

1. Model Unemployment, Inflation and GDP data using an ARMA(p) process

Text

Description automatically generated

The model when performing the ARMA(p) process indicates that the nulls are being rejected and the model shows an accurate time series test. The p-values all show a significance of <0.001 which indicates they’re significant.

1. Make a prediction about these data in the future, using forecast

All of the models are shown with 3 year prediction’s for the time series.

Unemployment

Chart, line chart, histogram

Description automatically generated

Chart, histogram

Description automatically generatedInflation

GDP

Chart, line chart, histogram

Description automatically generated