

Conducting the Analyses

As per the pre-registered research design¹, the application of a linear model, specifically Ordinary Least Squares (OLS), was initially considered for appropriate modeling of the available data. However, the analysis of the data revealed violations of some fundamental assumptions of the model. A Durbin-Watson value of 1.121 suggests possible autocorrelation in the data. Furthermore, a significant Jarque-Bera value of 103.991 ($p < .001$) indicates that the residuals are not normally distributed. To effectively address the identified autocorrelation, an AutoRegressive Integrated Moving Average (ARIMA) model was chosen for data fitting, implementing the planned structural break analysis.

ARIMA models are statistical models used in time series analysis to predict data trends. They incorporate AutoRegression (AR), Integration (I), and Moving Average (MA) components to capture past patterns and trends in the data and thus estimate future values. Especially in situations where other modeling approaches reach their limits, ARIMA models prove to be useful tools for assessing the impact of large interventions. They can account for underlying trends, autocorrelation, and seasonal effects, allowing flexible modeling of different types of effects (Schaffer et al., 2021).

It is important to note that ARIMA models, although more robust to violations of the model assumptions, also have specific requirements for the data, including homoscedasticity and the assumption of a normal distribution of the residuals. In this case, these requirements were not fully met, as evident from a heteroscedasticity value of 3.02 ($p < .001$) and a Jarque-Bera value of 237.93 ($p < .001$). Therefore, a bootstrapping approach was applied to generate reliable statistical estimates and confidence intervals, enhancing the interpretability of the present data. Specifically, *block bootstrapping* was used to preserve the time series structure of the data (Li & Maddala, 1996). In block bootstrapping, blocks of consecutive

¹ link will be included after review

data points are randomly selected from the time series and used to create bootstrap samples.

This approach allows robust estimation of parameters and confidence intervals, even in cases where the assumptions of ARIMA models are not fully met. As the chosen method is a univariate procedure, separate analyses were conducted for positive and negative sentiments.