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Volatility Clustering in NIFTY using ARIMA

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Abstract: Financial time series often exhibit a behaviour that is known as volatility clustering: the volatility changes over time and its degree shows a tendency to persist, i.e., there are periods of low volatility and periods where volatility is high. Econometricians call this autoregressive conditional heteroskedasticity. Conditional heteroskedasticity is an interesting property because it can be exploited for forecasting the variance of future periods. Using Autoregressive Integrated Moving Average (ARIMA) model to empirically show that ARIMA models do not capture the autoregressive conditional heteroskedasticity and predicting/forecasting the evolution of NIFTY movement over time using ARIMA modelling. ARIMA model results indicate a good model fit for short term forecasts. The forecasting errors get very high as we try to project our forecasts into a distant future. These results are analogous to the outcome of other similar researches done in the past on this model on different stock market indices. Volatility clustering during meltdown is seen empirically in the data itself.

Keywords: Stock Market, NIFTY, ARIMA, Volatility, Forecast

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