Seasonality in Stock Markets: A Case Study of BSE & NSE Indices

ABSTRACT

Seasonality in stock markets implies some kind of regular and repetitive phenomenon occurring at some regular interval of time, which may generate abnormal or excess returns. Seasonality includes day-of-the-week effect, month-of-the-year effect, quarterly effects, monthly effects, weekly effects, holiday effects etc. The present study attempts to explore the existence of seasonality in Indian stock market in four forms namely day-of-the-week effect, month-of-the-year effect, quarterly effects, and monthly effects. It was also aimed the general awareness regarding seasonality.

For this purpose 18 indices of BSE & 19 of NSE were taken as sample. Their daily closing, opening, high and low prices were collected and averages were calculated. For stationarity, Graphical analysis, Correlogram and ADF tests were used. These tests confirmed non-stationarity for original series; therefore, returns were calculated by log differencing. These return series were stationary in nature, so for further analysis return series were used. Thereafter dummy variable regression was used for testing seasonality. The obtained results were having autocorrelation which was removed using ARIMA modeling whereas heteroskedasticity was taken care of by GARCH (p, q) model. Before estimating different AR and MA terms for ARIMA and p and q terms for GARCH, several diagnostic checkings were attempted and best terms were selected on the basis of AIC, SBC and adjusted $R^2$.

After analyzing all the four calendar effects namely day-of-the-week effect, month-of-the-year effect, quarterly effects and monthly effects, it was found that all the four effects are present in the Indian stock market. For most of the indices of both BSE and NSE, Monday was found to be most significant day; September and December were the two months providing significant returns as compared to other months. First quarter was emerged as the most significant quarter, when quarterly effects were tested while in case of monthly effects, returns of first-half of the month were found to be significant. Thus existence of seasonality in Indian stock markets was proved.
Further, it was tried to explore whether the pattern of seasonality has been changed over the years. For this purpose the whole time series was classified into three sub-time series. The change was confirmed for all the four effects tested for both SENSEX and Nifty. Surprisingly the changes were drastic from one period to next consecutive period. In addition to, it was also discovered that initially there was no similarity in the results of SENSEX and Nifty. But gradually with the passage of time and with more and more developments in the environment of stock markets all over the world, both SENSEX and Nifty showed co-movement in terms of significant returns generating days, months, quarters or halves of a month in their respective sub-time period, thereby depicting strong co-integration between them.

After confirmation of existence of seasonality in Indian stock market, it was also attempted to discover the general awareness regarding seasonality. For discovering investors’ perceptions regarding various trading strategies, an opinion survey was conducted and results were analyzed using z-test and ANOVA. Market participants’ perception was analyzed regarding various trading strategies proposed to them. It was found that investors were hardly interested in seasonality based strategies. Rather strategies based on company fundamentals were highly preferred. The biggest reason observed behind less inclination towards seasonality was less understandings of jargons.