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Seasonality and Long-Term Nature of Equity Markets: Empirical Evidence from India

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Abstract

The research paper endeavors to investigate the presence of seasonal anomalies in the Indian equity market. It also aims to verify the notion that equity markets are for long-term investors. The study employs daily index data of Sensex, Bombay Stock Exchange, to understand its volatility for the period ranging from January 2001 to August 2020. To analyze the seasonal effects in the stock market of India, multiple regression techniques along with descriptive analysis, graphical analysis and various statistical tests are used. The study also employs the rolling returns at different time intervals in order to understand the underlying risks and volatility involved in equity returns. The results from the analysis reveal that daily and monthly seasonality is not present in Sensex returns i.e., investors cannot earn abnormal returns by timing their investment decisions. Hence, the major finding of this study is that the Indian stock market performance is random, and the returns are efficient. The other major conclusion of the research is that the equity returns are profitable in the long run providing investors a hope that they can make gains and compensate for the loss in one period by a superior performance in some other periods.

Keywords: Stock Market Returns, Seasonal Anomalies, Efficient Market Hypothesis, Equity Long Term Returns, Abnormal Returns

JEL Classification Code: C22, G10, G11, G14, G17

1. Introduction

A large part of financial planning entails allocating assets suitable for an investor. This depends upon the investor's appetite for and capacity to bear the risk. The examination of the investor's needs and goals is called Asset Allocation. Asset allocation is a strategy of investing across assets or various classes of assets, which will help to meet the investor's goals and objectives. Those investors who pursue high returns and are ready to expose their investment to an eminent amount of risk will dispense their funds to equity (ownership) investments. Investors seeking stability and continuous income will put their money in debt investments. However, most of the investors want to invest in the mixture of equity and debt investments, which most nearly meet their needs. This helps them to mitigate the risk. These returns also depend on various other factors.

The other important and widely researched area in finance to be understood is Capital Market Efficiency. This also plays an integral role in financial planning. It is considered that capital markets are efficient and have perfect information. An efficient market refers to markets that change as soon as the market information changes. Fama (1970) stated, 'a market is said to be efficient when its prices reflect the available information fully'. So when the markets are efficient, the investors can never expect abnormal returns even if they strategize their investment. The essence of the efficient market hypothesis (EMH) is also given by Bachelier (1990), who tried to explain that predicted prices fluctuate randomly. Samuelson (1965) elucidated that a well-functioning market can offer randomness in prices. Herein, it should be noted that efficiency refers to the market's informational efficiency and not to the operational efficiency.

The efficiency of the market in terms of information is of three forms depending upon the information simulated by

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the prices of securities. First, the principle of a weak form of efficient market hypothesis is that there exist randomness in the price of the stock, and price patterns are impossible to find. Therefore, the future prices of the stock can never be predicted on the basis of current or past stock prices trend ruling out the usage of technical analysis or financial advisors and then taking advantage of price movements.

Second is the semi-strong form of efficient market hypothesis, which is a step further and, thus, inculcates the information that is available publically. The investors have a profusion of information of their interest including the past stock prices, the economic reports, brokerage firms' recommendations, advisory investment letters, etc. Also, in the semi-strong system of EMH, the current stock prices depend upon all the publically available information. Since the market prices quickly adjust to all the market news as soon as they are revealed, whether good or awful, hence in order to earn abnormal returns one cannot only depend upon the annual or published reports.

The third form of EMH is the strong form mentions that the current market price reflects all the public as well as remote information. Herein the markets are so perfect even the insiders cannot earn abnormal returns. Sometimes it can also be seen that a few stocks are priced more efficiently than others making it evident that there exists the semi-efficient market hypothesis. In order to understand the presence of this phenomenon, it is better to use the index and not individual securities because it can predict the entire market movements and has liquidity in most stocks.

As stated above that in the weak form of market efficiency it is not likely to predict the price of securities and movements in its returns using the past trends. However, lately, the researchers have collected evidence inconsistent with the efficient market hypothesis. They have ascertained systematic variations in stock prices and its returns. The significant inconsistencies are the effect of the small firm and the seasonal nature of the market. This weak form of market efficiency hypothesis denies seasonal impact and entails inefficiency in the market. In such a market, abnormal returns can be earned by the investors, the returns that are not proportionate with risk. If the equity market returns are seasonal, one can earn profit by studying the security's past pricing behavior. Hence, one can make gains through technical analysis. The theory of efficient market thus is violated if returns of the stock market are seasonal.

The seasonality effects in stock markets also called as seasonal anomalies will be present only when the mean returns are not same in all epochs, i.e., the returns in some periods are higher than the other. Further the question arises as to why stock returns in the market would be seasonal. Based on various empirical studies, it is found that the year-end impact and the tax-loss selling effect are present in stock markets. This means that at year-end, the investors start selling their shares at a loss, which leads to a fall in stock prices. At the beginning of next month, these investors again start buying shares, which push up the stock market, and hence higher returns are there.

Looking at the USA market, such a seasonal impact can be seen, which is called the January effect. It means that, compared to other months, January reports higher returns. In December, investors sell stocks on which they have incurred notional losses to show losses in accounts' books. By booking losses, they have to pay lower taxes. This is done in December because the USA's financial year is the same as the calendar year. This causes the prices of those securities to fall in December. In January, those securities are repurchased, which puts pressure on prices to rise. Hence, the month of January presents a prospect for earning higher returns. Also, markets tend to give higher returns on Fridays and lower returns on Mondays, known as the Monday effect. In India, there are chances that we might observe abnormal returns in the month of April as the final tallies are prepared in the financial year starting from April 1 and ending on March 31.

2. Literature Review

For a long time now, various developed and developing nations are making an effort to understand the seasonality or anomalies, for instance, Day-of-the-week effects and monthly effect. Thus, this has become an interest of research. Few of the research papers have been mentioned and their work has been admired.

The first time the seasonality in equity returns was reported was by Wachtel (1942). The January effect was recognized by Rozeff and Kinney (1976) on the Stock Exchange of New York from 1904 to 1974. The researchers found that the mean return for January was greater than the rest of the months, inferring a pattern in returns on equity. Reinganum (1983) explained the impact of the 'tax-loss-selling' hypothesis and the 'information' hypothesis. The research established that the hypothesis could not find the seasonality effect. Gultekin and Gultekin (1983) explored seasonality of stock markets in 17 different manufacturing countries having differences in their tax laws. The results of the study explained that January effect is present in these countries. Berges, McConnell, and Schlarbaum (1984) concluded that seasonality exists in Canada's equity market. Smirlock and Starks (1986) testified the week effect of the stock market return in the U.S. Jaffe and Westerfield (1989) considered stock markets of Australia, Japan, Canada and the U.K. and related the effect of a day of the week. It was elucidated that in U.K. and Canada, the returns were least on Monday. However, in Japan and Australia, the returns in the stock market were least on Tuesday.

Lewis (1989) found seasonality of returns of the stock market in the U.K.; and Aggarwal, Rao, and Hiraki (1990) reported the presence of stock market seasonality in Japan. Boudreaux (1995) analyzed the effect in stock markets of three-nation viz. Denmark, Germany, and Norway to understand the monthly seasonal anomalies. Kumar and Singh (2008) examined the risk premium, seasonality and volatility in the risk-return relation of the stock markets and commodity markets of India. It was concluded that there exist persistence and clustering in both the markets. The risk-return relation was found to be insignificant in the Stock market and significant in the commodity market. Also, as per the research, there exists a negative correlation between return and volatility.

Tripathy (2010) has analyzed data from November 2007 to 2009 and scrutinized the expiration day and week impacts on futures listed on National Stock Exchange of India by using numerous parametric and non-parametric tests. The study also tries to elucidate the effect on a day in a week, in phases of Bear and Bull, to find out if there exists the effect on a day in a week in these explicit phases of the market. The research concluded that there isn't any effect of Day-of-the-week found in any of the market phases. Also, it is established from the research that as the date of expiration moves nearer, the volume of trading for the NIFTY index future increases. This is highest at about 10–15 days preceding the expiry date and decreasing as the expiration approaches.

Dash, Dutta, and Sabharwal (2011) in the research used dummies to testify the interaction between the crash in the stock markets on monthly returns and month-of-the-year effect in India. As per the study, there is a positive impact in the months of August, November and December and a negative impact in March. Also, the study mentioned that market crashes reduce the seasonal impacts in the stock markets. Selvam and Nageswari (2011) examined seasonality effects on the stock returns of the BSE Index. The research concluded that there was a maximum return on Wednesday and a negative on Monday. The results also showed that there are neither any seasonal return and nor any week or month effect that is present in the stock markets of India. Siddhartha, Sengupta, and Sarkar (2012) analyzed the Day-of-the-week effect. They established that there was not any influence of the weekdays on return spawned on NSE, and also, the Day-of-the-week effect does not hold. Debasish (2012) tried to examine the presence of seasonality in the stock prices of I.T firms in India. The research revealed that there is Day-of-the-week effect present in the stock prices. This effect was mostly seen on Monday, Tuesday or Wednesday. However, only two firms showed the Thursday effect. Also, it was seen that the effect was most significant on the 1st, 2nd, and 3rd week of the month, helping the investors to tap the opportunities available.

Nageswari et al. (2013) observed the presence of January anomaly in the Stock Markets of India, which defeats the efficient market hypothesis. The empirical study indicated the absence of the January anomaly. The study concluded that there is exists difference in the average returns among months of the year, with March showing highest positive returns and January screening highest negative returns. Sriram and Devi (2013) have concluded that there is absence of January effect and seasonal effects in the Sensex returns of the stock market of India. The market is found to be informational efficient. Lodha and Soral (2015) investigated to find seasonality effects in the Bombay Stock Exchange of India in the given four types, i.e., Day-of-the-week effect, month-of-the-year effect, quarterly effect, and monthly effect. It was confirmed by the analysis that all four anomalies are present. Also, as per the research, the most significant Day was Monday, the month was September and December, the quarter was the First quarter, and in the month, it was the first half of the month. Lu and Gao (2016) analyzed the daily stock market anomalies in the Chinese Stock market. The analyzed results of the study explains that since 2004 there exist day of the week effect in the stock markets of China. Kumar and Jawa (2017) tried to understand the impact of events in a calendar year on the Indian equity market. The Arch Model method and Hypothesis was used for testing the impact on Nifty returns due to weekend, or Day of the week and month of the year. The research established the manifestation of seasonal irregularities over the returns on the stock exchanges.

Sathyanaryana and Harish (2017) analyzed the anomaly returns of a calendar month on the Sensex. The BSE is used as a representative of the stock market in India for this research. Various tools are used to comprehend an association between the stock exchange and seasonal anomaly like correlation, descriptive statistics, etc. The study concludes there is no significant relationship between anomaly returns over exchange returns. Sudarvel, Dhanu, and Velmurugan (2017) found the presence of seasonality and anomalies in the stock markets in India using the Bombay Stock Exchange Index for a period of one year. The researchers used various statistical methods to analyze the data. The results from regression and paired t-test approve the presence of seasonal anomalies in the stock markets. The existence of these anomalies offers opportunities to investors to earn abnormal profits.

Kushwah and Munshi (2018) have worked to understand certain abnormal profit situations and how investors can beat the market. The study has analyzed the impact of four major events, i.e., budget, Diwali, change in the financial year, change in the calendar year on the Indian stock market's returns. The research designated no significant effect on Nifty 50 returns indicating that the investors cannot take advantage of seasonality to book abnormal returns. It was also seen that Diwali and Change in calendar year events have an inverse relationship and negative correlation with Nifty returns. However, Budget announcements and changes in financial year events have a positive relationship and correlation with Nifty returns.

Lee and Brahmasrene (2019) used regression analysis and found a positive coefficient of the exchange rate return (conditional standard deviation) implying market players assumes higher returns with risky investments. Nguyen et al. (2020) examined the seasonal effect (day-of-the-week) on foreign currencies of various developing nations. Andriyani et al. (2020) illuminated that the countries where the stock markets are not properly developed (developing nations) and use a floating exchange rate regime, therein foreign exchange markets are considered to be more efficient.

In their study, Kulkarni, Jadha, and Dhingra (2020) used data from Bombay Stock Exchange Index for ten years in order to build a best-fit model for predicting stock prices using ARIMA, Simple Moving Average and Holt-Winters Method for the research. The research concluded that simple moving-average method can make predictions better than AIRMA and Holt-Winters method as they couldn't work appropriately for random walk series of stocks. Anwar, Okot, and Suhendra (2021) employed GARCH panel to find the effect of day-of-the-week on selected countries. It was found that lower volatility in return is present on Monday while highest volatility can be seen on Thursday.

3. Research Objectives

It has been observed that seasonal or monthly effects are present in numerous developed and emerging stock markets. These seasonal effects tend to generate higher or lower returns contingent upon the time series, which are said to be the anomalies. In order to fill this gap, the study tries to explore the efficiency in the Stock Market of India.

The paper's primary objective is to understand the manifestation of seasonal impact in the Indian stock market. This study will help the investors to understand how they can beat the market and earn abnormal returns by timing their investments. Also, the research aims to find out the long-term nature of equity and tries to decipher their performance in the long vs. short term and the risk and volatility involved in it.

In order to carry the empirical research, data is collected from the website of Bombay Stock Exchange (BSE) for 20 years. The data is analyzed by using descriptive analysis, graphical analysis, regression analysis, and using various tests. To understand the nature of equity rolling returns of Compound Annual Growth Rate for Sensex is used.

4. Research Methodology

The research methodology used in this study is quantitative. To examine and understand the existence of seasonal anomalies in the Stock Market of India and verify the notion that equity markets are for long-term investors by analyzing the returns over various time intervals, a systematic study is followed. The research is mainly done on the secondary data collected through the database on Sensex index values from the Bombay stock exchange for the period ranging from January 2001 to August 2020.

To examine the stock market seasonality in India, first we measure return of BSE Index as given below:

$$R_t = [\ln(P_t) - \ln(P_{t-1})] * 100$$

Where,

R_t is the log return at period t,

P_t is the monthly (daily) closing prices of the SENSEX at time t

P_{t-1} is the monthly (daily) closing prices of the SENSEX at time t–1

Often the academicians in their research use Logarithmic returns. The log returns are advantageous as they continuously compound the return and hence become symmetric; while the arithmetic return (AR) is not, i.e., in arithmetic returns the positive and negative percentage are unequal. However, the logarithmic returns and arithmetic returns are not exactly equal, but are approximately equal to each other especially for smaller returns. If the percentage changes are large, then only the variation between them is large.

Also, it becomes important to test whether the series is stationary; otherwise the ordinary least squares model results will be counterfeit. Therefore, we will first use Augmented Dickey Fuller (ADF) model to test the stationarity of the Sensex return.

4.1. Test of Stationarity

Dickey-Fuller test carries out the hypothesis testing by estimating regression equation. The simplest approach would be if there is a presence of unit root in the AR(1) model.

AR(1) approach is stated below:

$$Y_t = C + \rho Y_{t-1} + \varepsilon_t$$

Where, C is the intercept term,

ρ is the coefficient for the attribute or the independent variable,

Y_t, Y_{t-1} are the returns at respective time period,

ε_t is the error term.

The parameters in the above equation are presumed to be white noise. The term white noise means a set of uncorrelated random variables in the random process, having zero mean value, and a finite variance.

Thus,

if $-1 < \rho < 1$, series will be considered as stationary.

If $\rho = 1$, it is a non-stationary series.

if $\rho > 1$, it is an explosive series.

Hence, it can be said that the series is considered to be stationery if the value of ρ is strictly <1.

Subtracting Y_{t-1} from both sides of the equation:

$$\Delta Y_t = C + \gamma Y_{t-1} + \varepsilon_t$$

Where $\gamma = \rho - 1$

The H0 and H1 is given as follows-

H0: $\gamma = 0$, which means non-stationary

H1: $\gamma < 0$, which means stationary

4.2. Monthly Anomalies Test

Let us now conduct a test of seasonality in stock returns. In order to test the monthly seasonality, we have used a month-of-the-year dummy variable. The dummy variable will take the value of unity for a given month and 0 in the rest of the other months. Also, the intercept term is specified in conjunction with dummy variables for the rest of the months, except only one month. The benchmark month in our case is the omitted month, i.e., the month of January. Hence, the coefficient of each variable computes the additional outcome of the respective month compared to the base month i.e. January. The presence of seasonal anomalies can be established if the coefficient of at least one of the dummy variable would be statistically significant.

$$R = \alpha + \beta_1 X_{\text{February}} + \beta_2 X_{\text{march}} + \beta_3 X_{\text{april}} + \beta_4 X_{\text{may}} + \beta_5 X_{\text{june}} + \beta_6 X_{\text{july}} + \beta_7 X_{\text{august}} + \beta_8 X_{\text{September}} + \beta_9 X_{\text{october}} + \beta_{10} X_{\text{november}} + \beta_{11} X_{\text{December}} + \text{error}$$

Where,

R means returns on Sensex

α is the intercept term and takes the value for the base month i.e. January,

$\beta_1\ \beta_2\ \beta_3\ \beta_4\ \beta_5\ \beta_6\ \beta_7\ \beta_8\ \beta_9\ \beta_{10}\ \beta_{11}$ are coefficients for the month February, March…..till December respectively,

X_{February} will take value 1 if month is February, otherwise 0,

X_{March} will take value 1 if month is March, otherwise 0,

X_{April} will take value 1 if month is April, otherwise 0 and so on…

Hypothesis for the first model:

H0: *All the coefficients of the variables are equal to zero.*

H1: *At least one coefficient is different than 0.*

4.3. Day-Of-The-Week Effect

$$R = \alpha + \beta_1 X_{\text{Tuesday}} + \beta_2 X_{\text{Wednesday}} + \beta_3 X_{\text{Thursday}} + \beta_4 X_{\text{Friday}} + \text{error}$$

Where,

R means returns on Sensex,

α is the intercept term and takes the value for the base day, i.e., Monday,

$\beta_1\ \beta_2\ \beta_3\ \beta_4$ are coefficients for the days Tuesday, Wednesday, Thursday and Friday respectively,

X_{Tuesday} will take value 1 if day is Tuesday, otherwise 0,

$X_{\text{Wednesday}}$ will take value 1 if day is Wednesday, otherwise 0 and so on…..

Hypothesis for the second model:

H0: *All the coefficients of the variables are equal to zero.*

H1: *At least one coefficient is different than 0.*

5. Empirical Results

5.1. Graphical Analysis

First of all, the data for Sensex is plotted. In Figure 1, we can see that in the sample period, Sensex was moving in a narrow range for a long period of time till 2005. With the start of 2005, the index started to rise exponentially. It reflected the favorable economic conditions witnessed by the Indian economy. This boom period ended in December 2007.

Figure 1: Sensex Index

The subprime crisis broke in America, and from there, its impact was spread all over the world, which led to falling in the stock indices. Since 2009 developing and emerging economies witnessed signs of green shoots of recovery on account of fiscal and monetary expansionary policy with the central bank's support, which reduced the key lending rates. By 2010, because of the global integration of all the economies, India and other nations recovered and started growing. Because all the economies integrated by the end of 2010 to crawl out of the crisis helped India heal and grow quickly. A sharp upsurge can see this growth trend in the Sensex index values.

From Figure 1, we can see that there exists a significant trend in the index from 2004–05 onwards. Also, it can be seen, but not very prominent in the graph are the small dips and peaks, which highlight the volatile nature of the equity markets. As the series is not stationary we cannot use the above series for econometrics purposes. So, we plot the graph for log returns of the series below.

5.2. Test of Stationarity

Graphical Analysis - The graph plotted in Figure 2 represents the log returns for Sensex from the period January 2001 to August 2020. The graph presented underneath displays the existence of stationarity in the returns series.

Regression Analysis - We also build a lag 1 model, i.e., regressing the change in the index value at a given time to previous day value to check for any relation between successive time periods. As it can be seen that the coefficient is insignificant through the *p* value, which is very high at 80% as well the *t* statistic is higher than the critical value from the Dicky-Fuller test, therefore we cannot reject our null hypothesis (see Table 1).

5.3. Analysis of Monthly Anomalies

Regression Analysis - After conducting the graphical analysis for checking stationarity, we build a regression model to check for any seasonal impact. From the model we saw that the *p*-value for all the months including the intercept is very high, more than 10% significance level, so all the coefficients are insignificant. Therefore, the returns for the index are not significantly different from zero in any month. This shows that the stock market of India is highly efficient where there is no scope for abnormal returns. Thus, it can be quoted that in Indian markets the investors cannot take advantage by timing their entry.

Descriptive Statistics – Table 2 shows the descriptive analysis for the complete period and each month. Monthly returns vary widely in Indian stock market. It can be seen the return is highest in the month of December while negative in January to March. The standard deviation and variance results show the existence of largely deviated series of return.

5.4. Analysis of Day-of-the-Week Effect

Regression Analysis - Here we build a regression model to check for any weekly impact or whether any particular day offers higher returns as compared to other days.

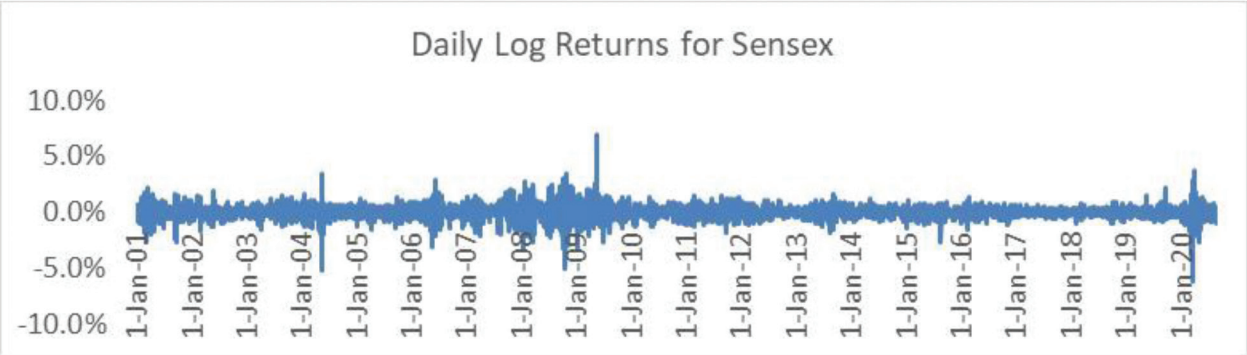

Figure 2: Sensex Log Returns

Table 1: Test of Stationarity

	Coefficients	Standard Error	*t* Stat	*P*-value
Intercept	8.62024	7.03	1.23	22%
X Variable 1	−0.00008	0.00	−0.25	80%

Table 2: Descriptive Statistics, the Sensex Returns: Jan 2001– Aug 2020

Month	Average	Max	Min	Variance
Jan	0.0%	11.2%	−13.0%	0.4%
Feb	−0.9%	7.6%	−8.2%	0.2%
Mar	−0.6%	10.2%	−23.1%	0.8%
Apr	2.5%	17.5%	−5.2%	0.4%
May	0.9%	28.3%	−15.8%	0.9%
Jun	1.4%	13.4%	−18.0%	0.4%
Jul	2.3%	8.1%	−7.9%	0.2%
Aug	0.9%	11.9%	−8.4%	0.2%
Sep	1.8%	12.9%	−13.4%	0.5%
Oct	1.2%	14.7%	−23.9%	0.7%
Nov	2.1%	11.4%	−8.9%	0.4%
Dec	2.6%	15.7%	−4.2%	0.2%
Grand Total	1.2%	28.3%	−23.9%	0.4%

Table 3: Compound Annual Growth Rate for Sensex

		Rolling Returns For Respective Time Frames					
METRIC	TIME (YEARS)	1 Year	2 Year	3 Year	5 Year	7 Year	10 Year
VARIANCE	LAST 5	1.5%	0.4%	0.1%	0.1%	0.1%	0.1%
	LAST 10	1.9%	1.2%	0.3%	0.2%	0.2%	0.2%
	LAST 20	7.1%	3.0%	1.8%	1.1%	0.4%	0.2%
MAXIMUM	LAST 5	32.0%	22.7%	18.2%	15.4%	17.4%	16.9%
	LAST 10	48.5%	57.1%	28.7%	22.0%	25.6%	21.2%
	LAST 20	113.0%	66.1%	61.5%	47.8%	28.9%	21.2%
MINIMUM	LAST 5	−32.3%	−12.4%	−3.7%	−2.5%	4.2%	4.8%
	LAST 10	−32.3%	−12.4%	−4.7%	−2.5%	4.2%	4.8%
	LAST 20	−57.0%	−21.7%	−7.2%	−2.5%	4.2%	4.8%
AVERAGE	LAST 5	6.6%	8.7%	9.9%	9.6%	10.2%	9.3%
	LAST 10	8.9%	10.7%	9.5%	9.4%	11.2%	13.1%
	LAST 20	16.6%	15.9%	15.9%	15.2%	13.8%	13.1%

From the model we saw that the *p*-value for all the days including the intercept is very high, more than 10% significance level, so all the coefficients are insignificant. Hence, we cannot reject our null hypothesis that the returns are not significantly different from zero.

5.5. Analysis of Long-Term Equity Returns

Through post-analysis of the Sensex index data at the daily and monthly level to check for abnormal returns and seasonal patterns, we evaluate the historical data for the market's returns and performance. It is generally said that equity is an investment for the long term due to its volatile short-term nature. It becomes imperative for a retail investor to understand this concept and carefully make an intelligent decision while investing their hard-earned money. In the regime of falling interest rates globally as well as in India, when the central banks are pursuing an expansionary monetary policy due to slow down and COVID impact, the interest rates offered by banks on fixed deposits are on a decline, hardly enough to beat inflation itself or encourage savings. In this context, equity participation becomes even more important and hence understanding the underlying risks and volatility involved (see Table 3).

To understand this, we calculate the rolling returns at different time intervals like 1, 2, 3, 5, 7 and 10 year time period, which simply means the respective time period on a rolling basis on any given day. The analysis further divides the data into three different time periods, which are last 5 years, last 10 years and entire time period of last 20 years from 2001 to present. This is done to decipher if there has been any marked change in the equity markets or its behavior over time as globalization, integration and information flow become more efficient and participation increases over time.

From the data above, we can see that the variance is the lowest for the ten-year rolling period than the 1- or 2-year period implying that the risks are mitigated in the long term. Also, we see here that the range of returns is very high in the short term, from negative to more than 100%, as is evident by the higher maximum and minimum values as compared to long term rolling windows of 7 years or 10-year window. A very important point to be noted above is the minimum values of returns that we see. For the seven-year and ten-years rolling window, the minimum is also positive at 4.2% and 4.8%, respectively, which means that if we keep investing in the equity market in the long run, in the worst scenario, we will get the returns that are on par with bank FDs alongside a potential of huge upside gains. Another fascinating insight that the data throws up is the fall in market returns, as is evident from the last five-year averages vs. last ten year averages or beginning 2001 where the average return has fallen across all rolling window cycles. For example, Sensex gave an average return of 13.1 % CAGR since 2001 vs. just 9.3% in the last five years for the ten-year rolling window.

6. Conclusion

The study aimed to examine the seasonal impact present in the stock markets in India. Such an analysis is crucial as it gives the information to the investor about how to earn abnormal returns. We considered the Sensex representative of India's stock market from January 2001 to August 2020. We tested whether seasonality is present in Sensex returns using granular datasets. The paper also focuses on the emphasis given to the long-term nature of equity markets and tries to decipher their performance in the long vs. short term.

The descriptive statistics showed that the maximum average return (positive) occurred in December and the lowest (negative) in February. The regression results also highlighted the efficiency of the markets because seasonality is not present in Sensex returns. Thus, the results established that in India's stock market, the returns are efficient, and the market performance is random.

The breakup of the data and the analysis brings out the long-term nature of the equity markets. The returns are more stable, less variation means fewer risks, and the downside is capped in the longer term of 7-year to 10-year windows. Investors can, thus, be advised to reap benefits from this unique investment instrument offered by the market and do not panic when there is a fall in the benchmark indices in the short term. This volatility is of supreme importance as it helps the investors to make returns by compensating for the loss in one period by superior performance in some other periods.

A case in point is the superlative performance that was witnessed in the markets during the pandemic of COVID-19. It does sound non-intuitive to call it superlative, but actually it is. The first four months since the lockdown, i.e., March to July 2020, witnessed free fall in the markets to the tune of about 30% when it crashed due to the uncertainty about the cure and the economy. However, the next five months from August onwards have been a roller coaster for the markets due to the positive sentiment around vaccination, economy opening up as well as surplus liquidity in the international markets. As a result, the markets, not only recovered their losses, but hovered around their lifetime highs. The current scenario just proves that, in the long term due to the volatility, investors who remain committed stand to benefit.

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