The Effect of Domestic Slowdown on Momentum Profitability: Evidence from the Indian Market

SYED ALIN ALI, SAURABH JOSHI
Himalayan School of Management Studies
Swami Rama Himalayan University
Swami Rama Nagar, Dehradun
INDIA

Abstract: We examine momentum profits from April 2014 to February 2020, dividing the aforementioned time span into two sub-periods; the Boom years spanning from 2014 to end of 2016, marked by high optimism and the slowdown years from 2017 till end of 2019 which were marred by sequentially deteriorating economic indicators. Momentum returns were tracked for the 110 odd largest companies by way of market cap and listed on the National Stock Exchange. During the Boom years, fifteen of the sixteen momentum strategies tested gave results that were both economically as well as statistically significant, thus confirming to the existing literature. However, the study also found five of the momentum strategies to still give results that significantly outperform the benchmark index during the subsequent period of economic decline and turmoil, thus providing some evidence supporting the persistence of momentum profits even during conditions when the macro environment might seem unfavorable.

Keywords: Momentum Strategies, Economic Slowdown, Investment Strategies, Indian Stock Market, Momentum

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1 Introduction

To this day there still exists a lot of academic debate and controversy around the quiet-widely- followed practice of forming portfolios based on momentum; wherein the fund manager tracks historical data of securities and analyzes past returns in order to formulate investment strategies that could help generate significant profits in the near term. This is in stark opposition to the Efficient Market Hypothesis, proposed by Eugene Fama (1970), long considered a cornerstone of finance literature, which states that security prices, at any given time, are reflective of all the information available in the market and thus, are fairly valued all the time. As a consequence, the Efficient Market Hypothesis, which will hereafter be referred to as EMH, claims that it is impossible to generate excess returns by timing the market to either select undervalued securities or sell seemingly overvalued stocks. Therefore, proponents of the EMH believe it is impossible to outperform the market by searching for value, whether using fundamental analysis or technical analysis or both. However, detractors of the EMH have for long pointed at various anomalies to punch holes into the aforementioned claims by pointing to individuals like Warren Buffet and Peter Lynch, among a host of numerous others, who are firm believers in the principle of value investing and have been able to consistently generated excess returns over a significantly long period of time, thereby suggesting that whatever investing strategy they were using really works and is no flash in the pan, boldly flying in the face of the EMH. Another market anomaly that seems to shake the belief systems as propagated by the EMH is the existence and persistence of the momentum effect, i.e., the tendency of prices to continue moving in a particular direction for the short-term mostly as a consequence of fairly recent historical trends. There is significant evidence to prove that investing strategies based on momentum effects are not only limited to seemingly impractical academic exercises but are widely followed by both fund managers and investors alike. There is a vast amount of research which has dedicated itself to proving the persistence of the momentum effect in most of the equity markets of the developed world. Similarly, considerable research has also been devoted to identify the existence and persistence of momentum effects in the Indian stock market as well. Despite its wide acceptance as a dependable

investing strategy, detractors point to the instability of momentum returns, especially during times of market turbulence, as enough reason to temper expectations from the said strategy. In this regard, numerous studies investigating the influence of the global financial crisis on momentum returns have been conducted in the not so distant past. A similar study conducted in the backdrop of the global financial crisis of 2008 confirmed the susceptibility of momentum investing strategies during a financial crisis (Maheshwari & Dhankar 2017). It was the onset of the subprime lending crisis that served as the catalyst for the financial meltdown of 2008. Prevailing notions at that time suggesting the domestic economy was more or less insulated from developments in the western world were quickly dispelled as the Indian stock market witnessed a sharp fall that saw the SENSEX lose half of its value within the course of a year.

However, the period from 2014 to 2020 makes for an interesting case study. The months running up to the general elections of 2014 and the subsequent couple of years that followed seem to have been marked by a general sense of optimism as the citizens of the Indian republic, seemingly tired of the policy paralysis that usually ails a coalition government, gave a strong mandate to a particular political party to helm the affairs of the country for the next five years. However, the initial buoyancy gradually tapered off as the economy witnessed a decline over several consecutive quarters. The probable causes of the decline may be varied and debatable, however, general consensus will concur that the demonetisation exercise in 2016 and the apparently rushed rollout of the GST in 2017 did cause major disruptions in the economy and may have contributed to the deceleration in the economy. The decline across several consecutive quarters was also appropriately reflected in the gradual decline as witnessed in the BSE Midcap and Smallcap indices starting from the beginning of 2018. Despite numerous economic indicators not painting a rosy picture, large cap indices like the SENSEX and the NIFTY continued to move in an uptrend during the same period, suggesting that a lot of investors were moving money out of the riskier midcap and small cap stocks and allocating funds into more dependable large caps during this time. Previous studies on momentum profitability conducted in the backdrop of the global financial crisis observed momentum profits that were high in the pre-crisis period, turned negative during the crisis period (Maheshwari & Dhankar 2017). However, it is common knowledge that the previous crisis that the economy experienced was an outcome global financial meltdown of 2007 which had its epicenter in the US and the ripple effects of which were felt far and wide, whereas the slowdown in the Indian economy as witnessed from 2018 onwards had reasons that were more indigenous. It is in this backdrop that we would like to revisit momentum profits to develop a better understanding of investor behavior, especially during times of economic turbulence. We believe there is a strong case to be made to further study the profitability of momentum strategies in the Indian stock market, the literature on which is still scant, and an even stronger case to be made for studying the profitability of momentum strategies during times when the economy is facing turbulence owing to reasons that are more localized than global.

The present study contributes to the current literature in numerous ways. The study not only adds to the literature on the existence and persistence of momentum profitability across the globe, but also adds to the literature detailing the evidence of momentum profitability in the Indian stock market. The key contribution of this paper is that it explores momentum profits in the Indian stock market during times of economic distress which have been brought about by factors that are localized and cannot be attributed to some crisis in a distant country, and thus can be considered a first in its kind. Our findings stand in stark contrast to the relatively small body of literature along the same lines, but which seem to suggest the failure of momentum as an investment strategy during a financial crisis. Studies conducted in the past suggest several periods, termed as momentum crashes, where momentum strategy has not only failed to generate any meaningful returns but has also caused losses for the investors (Daniel et al 2012). This study aims at finding if such a momentum crash can also be observed among the large cap stocks in the Indian stock market. We hope that our findings will provide valuable insight into investor behavior during times of market stress and will act as a valuable precedent for the future as well. The rest of the paper is organized as follows: Section 2 provides a brief review of the relevant literature, followed by Section 3 which gives a description of the data and the testing methodology used. The

empirical results of the study and related observations are presented in Section 4. Section 5 contains a brief discussion about the observations of the study while Section 6 discusses the practical implications of the research. The conclusions derived from the findings of the study are presented in Section 5.

2 Literature Review

The momentum effect can be explained as the propensity of security prices to continue their movement in the same direction that they have been moving in, in the near future as well. This implies that share prices that have been moving up/down in the past 6-12 months, will continue moving up/down over the subsequent 6-12 months. Jegadeesh and Titman (1993) were the first to present evidence documenting the momentum effect in the US stock market by using a number of short and medium time horizons. They divided the sample stocks into decile portfolios based on their performance over the past 6-12 months. These portfolios were then held for the next 6-12 months and it was observed that the top decile (winner) portfolio generally tend to significantly outperform the bottom decile (loser) portfolio over the short to medium term, suggesting a continuation of trend in stock returns over the near future. Based on their results, Jegadeesh and Titman (1993) suggested an investment strategy based on momentum as a means to generate returns exceeding the market. In a subsequent research, they provided out-of-sample results that served to reaffirm their previous findings related to the strong presence of momentum effect in the US stock market (Jegadeesh & Titman 2001). Much of the initial studies into the presence of the momentum effect in stock markets was confined to the US. However, subsequent research has thrown up empirical evidence suggesting that the momentum effect can be witnessed globally and just restricted to the US market. Strong momentum effect was found in the European markets (Rouwenhorst 1998), while others suggested momentum profitability exists not just in the US and European markets, but in the Asian markets as well (Griffin et al 2005). Yet others have observed a strong presence of momentum profits in the Australian market (Hurn & Pavlov 2003). Around the same time, empirical evidence related to the presence of momentum profits were also found in the Spanish market (Forner & Marhuenda 2003) and Italian market (Mengoli 2004). Presence of momentum profits were found in both the Hong Kong market (Cheng & Wu 2010) and the Chinese market (Wu 2011).

Strong momentum profits have also been observed in the Indian stock market by Sehgal and Balakrishnan (2002), Ansari and Khan (2012), and Dhankar and Maheshwari (2014), to name a few. Thus, we can conclude that there is sufficient evidence in favor of momentum profits having a significant presence across global markets, even if the source of such profits might still be debatable. Literature delving into the factors that can help explain the sources of momentum profits can broadly be clubbed into two categories: One school of thought that believes that momentum profits can be explained as the premium for significant risk being undertaken by the investor (Conrad & Kaul 1998; Moskowitz & Grinblatt 1999; Chordia & Shivakumar 2002); while the other school of thought attributes a behavioral aspect to momentum profits and its persistence, postulating momentum profits to be an outcome of either an overreaction or an under-reaction to news and other developments in the business environment.. Moreover, the factors that can help explain momentum profitability are not the topic of this research and are therefore beyond the scope of this paper.

It must be noted that investment strategies based on momentum are often criticized because of the instability observed, as various studies seem to suggest that momentum profits do not remain consistent throughout the year. A number of studies have found a strong seasonal pattern to momentum profitability, wherein it was observed that momentum strategies generally result in heavy losses in the month of January when compared to other months of the year, in which momentum strategies are generally found to be profitable. Other studies have found a strong relationship between economic cycles and momentum profitability. As a matter of fact, strong momentum profits are observed during times of economic expansion, while momentum strategies yielded negative returns during periods of recession (Chordia & Shivakumar 2002). There are other studies which have found a strong link between market conditions and momentum profitability. A study conducted on all NYSE and AMEX stocks from 1929 to 1995 found average momentum profits

to be positive during periods when the market was up and negative when the market was down (Cooper et al 2004). It has also been found that momentum profits tend to be sensitive to changing market conditions, suggesting stronger momentum profits are realised when markets are stable rather than when markets are transitioning (Asem & Tian 2010). Other studies like the one done by Daniel et al (2012), and referenced earlier in this section, also propound the dependence of momentum profits on market conditions, finding momentum profit to be negative during times when the market is going through a turbulent phase and volatility seems to be high. Closer home, studies conducted in the Indian stock market to analyse momentum profits for their persistence and stability throughout the period of the global financial crisis of 2007 suggest high momentum profitability in the pre-crisis period that turn negative during the period of the crisis, and then turn positive again for the post-crisis period, thus reaffirming earlier studies which suggested phases in the market cycle where momentum profits would crash (Maheshwari & Dhankar 2017).

It is evident from the aforementioned literature that there is still some doubt about the stability of momentum profits. It is also apparent that there is still a scarcity of studies that examine the persistence of momentum profitability during times of financial crisis, and this dearth of literature is even more profound in case of the Indian stock market. Even though a study of this nature has been conducted (Maheshwari & Dhankar2017), however their study evaluated the persistence of momentum profitability during the turbulent period that the Indian stock market went through from 2008-2009 that can be attributed as a domino effect leading from the sub-prime crisis in the US. As mentioned earlier, there is still a need to examine momentum profitability during times of economic hardships that are not the result of a crisis in the US, as has been the case in the recent past. To fill this void, our study focuses on the momentum profitability from the period of 2014-2020, a six year period wherein GDP numbers were consistently declining over consecutive quarters from 2018 onwards. Moreover, the study is focused on momentum profits in the large companies listed on the NSE, in order to identify if investors tend to unduly favor large companies during periods of economic decline and if there is significant value to be gained from such an inclination. Using the conclusions derived from our study, we hope to get better insights into the behavioral psyche of the Indian investor.

3 Research Methodology

The sample used in our study comprises stocks of 110 companies, listed on the National Stock Exchange and largest by way of market capitalisation during the period from 2014-2020. As mentioned towards the end of the section on Literature review, we analyse momentum profits for our sample for a period of six years, three of which were marked by an economic slowdown, so as to identify whether significant gains can be made during times of economic uncertainty by adopting a momentum strategy or would an investor be simply better off buying the NIFTY index during such phases. Monthly arithmetic returns of all the stocks in the sample were calculated using monthly adjusted closing price data collected from the *Centre for Monitoring Indian Economy* (CMIE) Prowess database. Data related to the monthly closing price for the NIFTY index was collected from Yahoo Finance, while data related to the risk-free rate of return was collected from the RBI website. In consensus with existing literature, the NIFTY index has been used as a proxy for measuring returns on the market portfolio and the interest rate on a post office savings account has been used as a proxy for the risk-free rate of return. Moreover, monthly price data has been preferred over daily price data, as it has been found that the daily price data has a lot of random noise associated with them (Mun et al 2000). Similar studies conducted earlier also use monthly price information to avoid the distortions that may arise out of the bid-ask spread or out of infrequent trading (Jegadeesh & Titman 1993; Chordia & et al 2002; Cooper et al., 2004; Daniel et al., 2012). Both the *W* and *L* portfolios are then held for the subsequent *K* months (*K* = 3, 6, 9 or 12 months) holding period. Holding period average returns (AR) are then calculated using the arithmetic mean return method for both the *W* (winner) and *L* (loser) portfolios. Based on the portfolio formation and holding periods, a total of sixteen *JK* momentum strategies are tested in our study.

The study uses momentum portfolios, which are constructed using the methodology, which has now been popularised as the *JK* strategy, as proposed by

Jegadeesh and Titman in their seminal work (1993). Simply put, the *JK* strategy involves forming portfolios of stocks based on their returns in the past *J* months and then holding such portfolios for the next *K* months. Firstly, stock returns for each month of the *J* month period (*J* = 3, 6, 9 or 12 months) are calculated using the adjusted monthly closing prices. At the end of each *J* months, stocks are then ranked in ascending order of their cumulative returns over the *J* month period. Based on the rankings, the stocks are then segregated into deciles and assigned to one of the equally-weighted decile portfolios, wherein the top decile portfolio is termed as the loser portfolio, since it contains the worst performing stocks, and is thus assigned the letter 'L' and the bottom decile portfolio is termed as the winner portfolio and is assigned the letter 'W', as it contains the best performing stocks over the past *J* month formation period. The combination of *J* and *K* months yields a total of sixteen momentum strategies. For example, a J3K3 strategy would imply a portfolio that was formed after evaluating stock returns for the past three months (*J* = 3) and then held for the subsequent six months (*K* = 3).

Separate tests of momentum strategies have also been conducted wherein a month is skipped between the portfolio formation and holding period to mitigate the effect of the bid-ask bias, lagged reactions and price pressures. Portfolios are also rebalanced at the end of each month of the *K* month holding period. New portfolios are formed for each month of the portfolio formation period and this process is repeated for the six year period under study, from April 2014 to May 2020.An investment strategy based on momentum involves selling the losers and buying the winners. Thus, momentum profits over a *K* month holding period are calculated as follows:

Momentum Returns (*K* months) = $AR_A = AR_w (K) - AR_L (K)$ **(1)**

Where $\mathbf{AR_w (K), AR_L(K) and AR_A}$ are the average returns on the winner, loser and arbitrage (W-L) portfolios during the holding period (*K)*, respectively.

Moreover, *t*-test is used to evaluate the statistical significance of the observed momentum profits. The 't' test is calculated as follows:

$$t = \frac{AR_{A,t}}{S_{A,t}/\sqrt{N}}$$

Where $S_{A,t}$happens to be standard deviation.

Additionally, we also use the Sharpe-ratio as a measure of the risk adjusted return. Sharpe ratio is a measure of the reward relative to variability and measures the total return of the portfolio in relation to its total risk, where total risk of the portfolio is measured by the standard deviation of the portfolio returns. It is computed by dividing the portfolio's risk premium by its standard deviation. Thus, Sharpe ratio can be said to be a measure of the portfolio's risk premium per unit of exposure to portfolio risk. The Sharpe ratio is calculated as follows:

$$S_p = \frac{AR_p - r_f}{\sigma_p}$$

Where the various inputs are:
$AR_p$is the monthly portfolio return
$r_f$is the risk-free rate of return
σ_p is the portfolio standard deviation

We use the Sharpe ratio as a measure of portfolio performance in agreement with previous studies (Haugen 2002). As demonstrated by Haugen, a portfolio having a Sharpe ratio which is higher than that of the broader market indicates that the portfolio has outperformed the benchmark market index. The use of the Sharpe ratio for the purpose of this study is in conformity with the work of Maheshwari & Dhankar (2015), who had studied momentum profitability in the Indian stock market in the backdrop of the global financial crisis of 2007. The stationarity of the variables being studied was also tested using the Dickey-Fuller (ADF) and non-parametric Phillips-Perron (PP) test.

3.1 The Journey of the Six Years from 2014-2020

To say that the Indian economy has experienced an interesting series of events during the time period mentioned above would be an understatement; and we continue to be in some confounding times, with the world trapped in the throes of the corona virus pandemic that is not showing any signs of relenting. However, let us not get too ahead of ourselves. In order to evaluate the profitability of momentum strategies, we have divided the six year period, from 2014-2020, into two sub-periods: the Hopeful years and the Slowdown period.

3.1.1 The Hopeful Years

For the purpose of our study, the period from April 2014 to December 2016 is considered as the period of hopeful years. The starting point of the study is chosen as the year 2014, since this is when a new political party was voted to power on the back of a strong mandate and much fanfare. There was widespread optimism towards the overall prospects of the economy, as noted in an extensive study conducted by the Principal Financial along with its research partner Nielsen[1]. This renewed confidence also manifested itself in form of strong growth of the Indian stock market. Even though corporate profits as a percentage of GDP had still not attained the same level as before the global financial crisis of 2007, the general outlook was still hopeful. Moreover, the amount of Foreign Direct Investment also started seeing a gradual uptrend, thus reinforcing investor confidence.

3.1.2 The Slowdown Period

It seems that the days marked by hope were numbered, as the Indian economy received a big jolt in the form of the Demonetization exercise, which forced almost every citizen to stand in long queues for hours at end just so that he can withdraw a mere portion of his hard earned money. As India stood in line outside banks to exchange old notes for new, economic activity got hard hit, with the small and medium-sized enterprises bearing the hardest brunt of this abrupt announcement that came as a bolt out of the blue for many. Numerous eminent economists forecasted that this exercise would have a severe impact on the economy, with one former prime minister and economist forecasting a fall of at least 200 basis points in the GDP[2]. The aforementioned estimate did more than just manifest itself, in the form of consecutive decline in quarterly GDP figures, from a peak of 9.67 in quarter 2 of FY 2016-17 to a low 5.78 in quarter 1 of FY 2017-18. Thereafter, conditions did look up for some time as we registered growth in GDP for 3 consecutive quarters starting from Q2 of FY 2017-18, bringing some respite to the policy makers of the country. However, conditions took a turn for the worse as GDP numbers, on account of consistent decline in industrial production, have been on a decline for consecutive quarters since Q1 of FY 2018-19(see figures 4 & 5). This is a cause for increased alarm and rightly so. A decline in earnings among companies that fall under the mid cap and small cap categories was also reflected in a steep decline in the BSE Midcap and the BSE Smallcap index, while the NIFTY index continued on its upward trajectory towards new all-time highs during the same period (see figures 1, 2 & 3). Needless to say, this movement indicates strong outflows from the Midcap and Smallcap segments and consistent inflows into the Largecap companies. The aforementioned phenomena is evidence of the increased risk aversion that both financial institutions and retail investors, who look to avoid high risk investment plays during times of economic uncertainty, tend to display by pulling money out of riskier investment avenues like small and medium sized listed companies and parking funds into the more stable large companies. It is in this backdrop that we look to reexamine the persistence of momentum profitability during the boom period as well during the lean one.

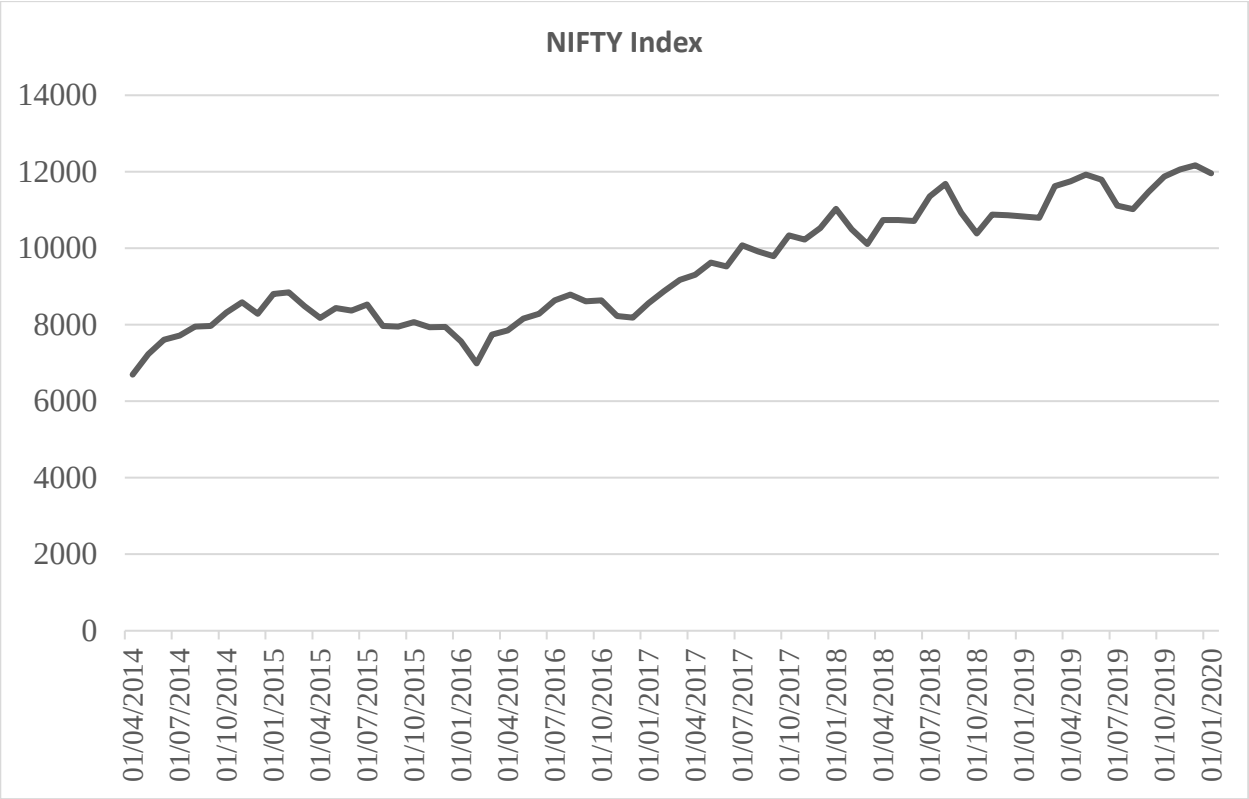

Fig. 1: NIFTY index from April 2014 to December 2019
Source: Yahoo Finance

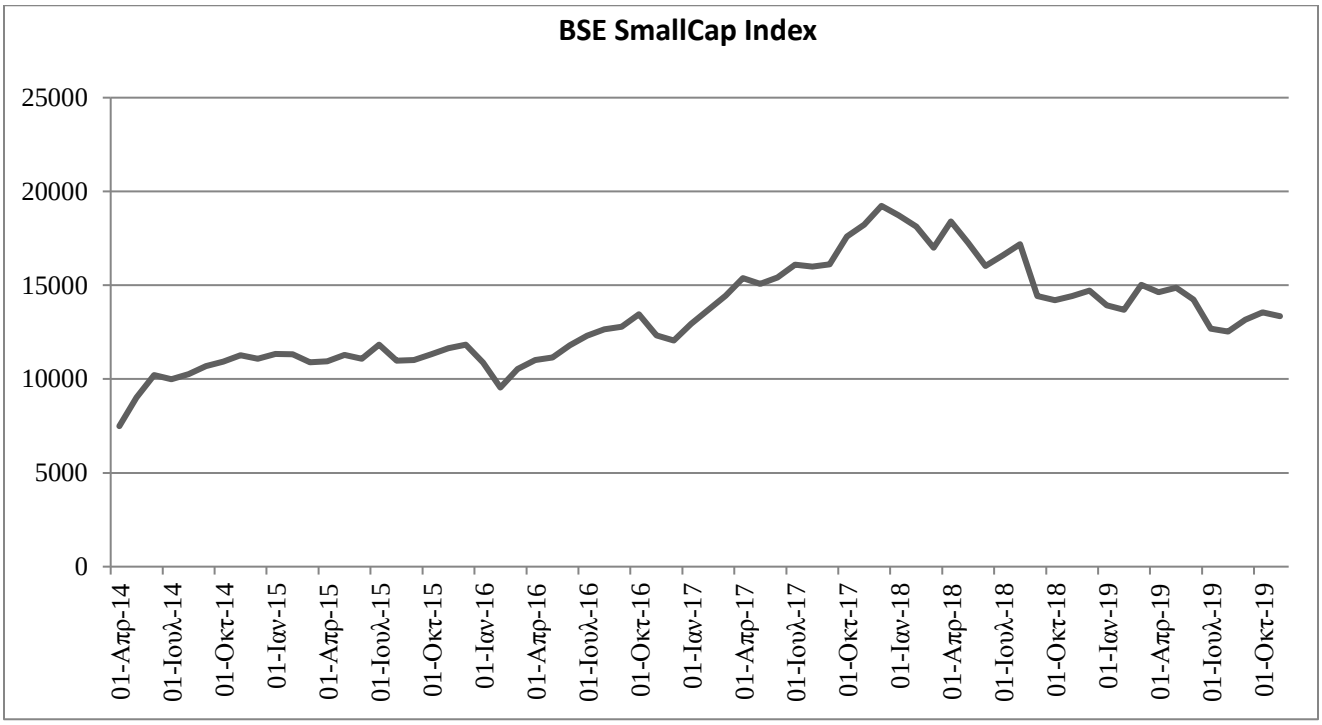

Fig. 2: BSE SmallCap Index, April 2014- October 2019
Source: Yahoo Finance

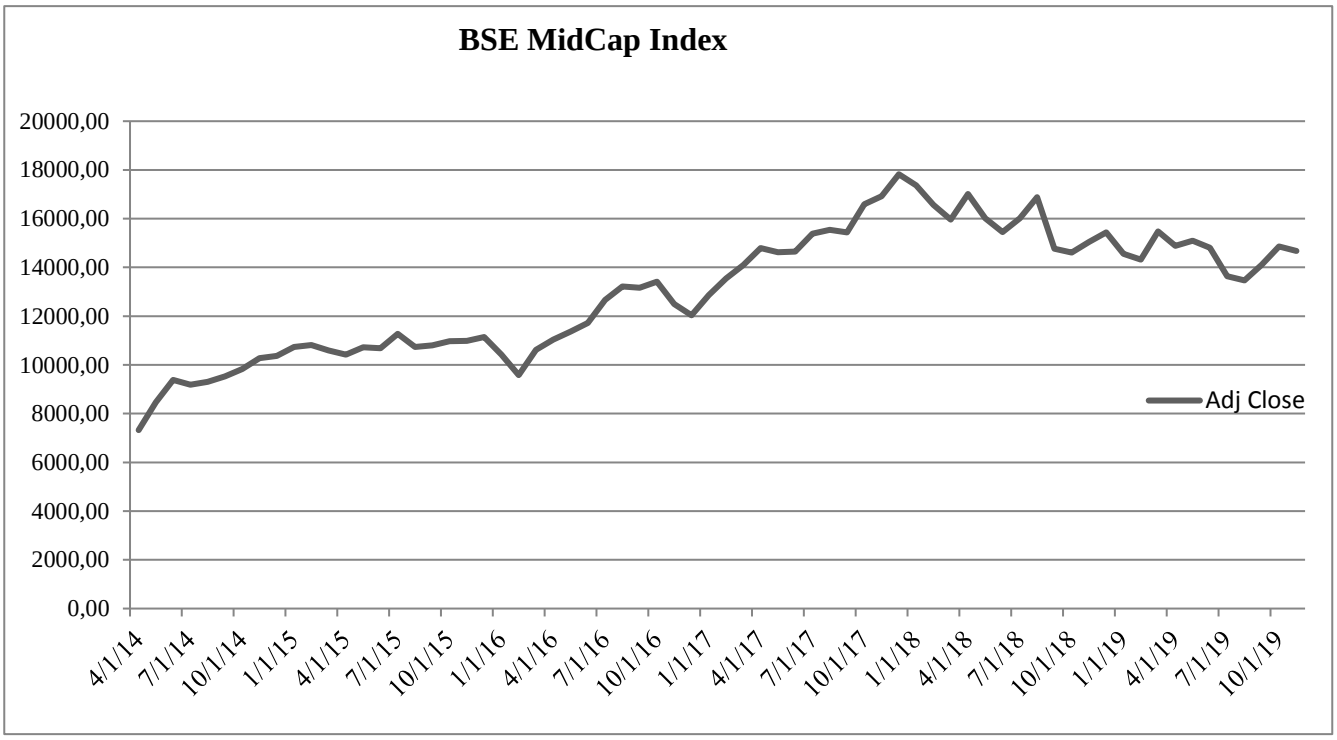

Fig. 3: BSE Midcap Index, April 2014-October 2019
Source: Yahoo Finance

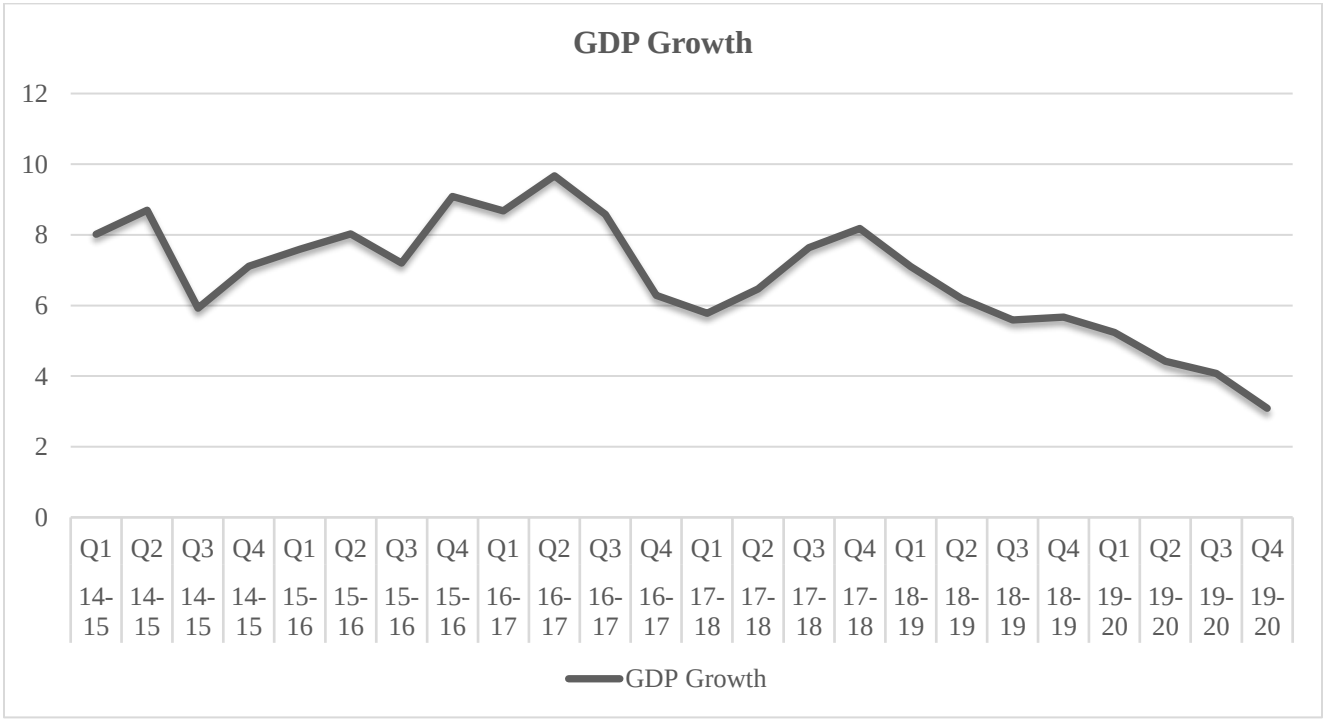

Fig. 4: Quarterly GDP growth numbers, 2014-2020
Source: statistics.com

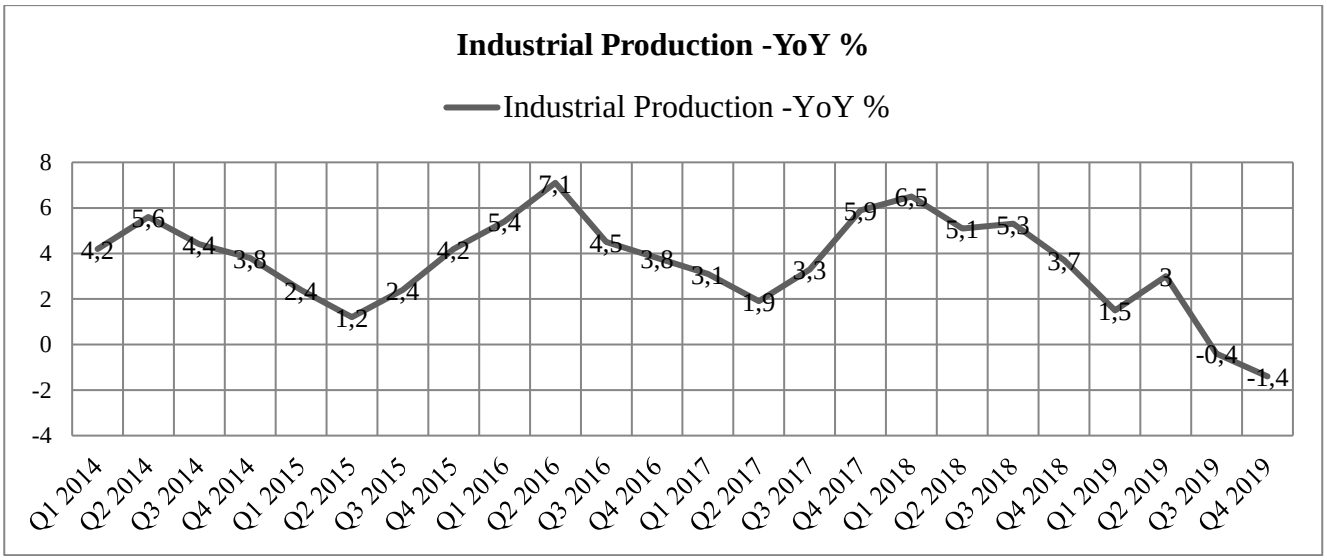

Fig. 5: Industrial Production index, Year-on-year (2014-2019)
Sources: Indiamacroadvisors.com

Table 1. Results for best performing momentum strategies 2014-16 (Winner)

Portfolio	**Winner**		**NIFTY**		**Sharpe Ratio**	
	Returns	**Std. Dev.**	**Returns**	**Std. Dev.**	**Winners**	**NIFTY**
J12K9*	2.74	±17.33	0.75	±9.79	1.25	0.39
J9K12*	2.62	±21.11	0.72	±12.80	1.304	0.362
J12K3*	2.54	±9.73	0.38	±7.28	0.681	0.2
J12K6*	2.52	±13.57	0.58	±9.68	0.969	0.158
J6K12*	2.47	±18.76	0.59	±12.81	1.37	0.244
J9K9*	2.28	±15.78	0.54	±10.49	1.112	0.183
J6K9*	2.27	±15.52	0.45	±10.27	1.123	0.103
J9K6*	2.25	±14.46	0.38	±9.69	0.797	0.029
J6K3*	2.19	±9.53	0.27	±6.77	0.586	-0.025
J6K6*	2.19	±13.61	0.25	±9.7	0.82	-0.051
J3K12*	2.14	±20.15	0.56	±12.29	1.07	0.225
J3K6*	2.1	±13.83	0.46	±9.14	0.768	0.088
J3K9*	2.07	±17.55	0.47	±9.74	0.891	0.125
J3K3*	2.01	±10.29	0.467	±6.67	0.49	0.059
J9K3*	1.9	±10.45	0.15	±7.09	.452	-.076

*statistically significant at 5 % confidence interval
** statistically significant at 10 % confidence interval

Table 2. Returns for best performing momentum strategies 2014-16 (loser)

Portfolio	**Loser**		**NIFTY**		**Sharpe Ratio**	
	Returns	**Std. Dev.**	**Returns**	**Std. Dev.**	**Loser**	**NIFTY**
J12K9*	2.51	±28.72	0.75	±9.79	0.682	0.39
J12K6*	2.14	±23.57	0.58	±9.68	0.462	0.158
J9K12*	1.96	±32.10	0.72	±12.80	0.609	0.362
J6K12**	1.68	±28.48	0.59	±12.81	0.57	0.244
J9K9**	1.57	±28.37	0.54	±10.49	0.394	0.183
J3K12**	1.29	±25.38	0.56	±12.29	0.455	0.225
J6K9**	1.28	±23.78	0.45	±10.27	0.361	0.103
J3K9*	1.1	±20.85	0.47	±9.74	0.334	0.125
J3K6*	1.05	±15.92	0.46	±9.14	0.273	.088
J6K6**	1.02	±19.83	0.25	±9.7	0.209	-0.051
J3K3**	1	±8.41	0.46	±6.67	0.238	.059

*statistically significant at 5 % confidence interval
** statistically significant at 10 % confidence interval

Table 3. Returns for best performing momentum strategies 2017-19 (winner)

Portfolio	**Winner**		**NIFTY**		**Sharpe Ratio**	
	Returns	**Std. Dev.**	**Returns**	**Std. Dev.**	**Winner**	**NIFTY**
J9K3*	1.56	±7.96	.86	±5.42	0.463	0.294
J6K3*	1.54	±7.74	.86	±5.42	0.476	0.294
J6K6*	1.39	±10.52	.82	±5.44	0.607	0.542
J9K6*	1.3	±10.65	.82	±5.44	0.548	0.542
J6K12*	1.19	±13	.78	±7.38	0.794	0.729

*statistically significant at 5 % confidence interval
** statistically significant at 10 % confidence interval

4 Results

Tables 1, 2 and 3 provide an overview of the average returns an investor would have earned for those momentum strategies that have yielded significant results and the accompanying risk for the same. The tables also provide details as to the outcomes had the investor adopted a passive investment approach, had bought into the NIFTY index and held it for the period as specified by the momentum strategy. Complete tables have been shown in the appendix at the end. Tables 1 and 2 provide a summary of the average returns and the accompanying risks that portfolios comprised solely of winners and portfolios comprised exclusively of losers would have generated for the same time horizon during the holding periods as dictated by the momentum strategies. It is interesting to note that the benchmark NIFTY index gave better returns during the crisis period, from 2017-19, in comparison to the period from 2014-16, accompanied with lower risk as is evident from the lower measures of standard deviation. On the other hand, we observe the performance of the winner portfolios, as measured by the Average Returns for each of the momentum strategy, declined significantly during the crisis period, although volatility was also much lower during the same time period. Volatility was found to be significantly lower for the loser portfolios as well for the holding periods during the same time duration. These observations are in stark contrast to the existing literature which has generally observed that during a crisis, momentum returns tend to suffer and volatility tends to increase (Maheshwari & Dhankar, 2017).

4.1 Momentum Returns in the Indian Market during the Boom Years

We tested for momentum profitability amongst the hundred largest listed companies on the Indian bourses by way of market capitalization. Our study yielded results that confirm the observations of previous studies on momentum returns in the Indian stock market. Upon viewing the performance results of all the sixteen momentum strategies for the period from April 2014 to December 2017, it was found that all of the momentum strategies for a portfolio consisting of the Winners produced economically significant returns, and all but one of the momentum strategies came back with statistically significant (5 percent) results. Thus, it can be said that during the boom years, fifteen out of the sixteen momentum strategies for the Winner portfolio outperformed the benchmark NIFTY index both economically as well as statistically. The most profitable strategy, the J12K9, delivered an average return of 2.74 per cent per month. Surprisingly, even the Loser portfolios performed better than the benchmark NIFTY index for most of the momentum strategies. A total of eleven momentum strategies produced economically significant returns, with five momentum strategies producing statistically significant returns in the five per cent confidence interval, while six strategies produced statistically significant returns within the ten per cent confidence interval. The best performing momentum strategy for the Loser portfolio also happens to be the J12K9, which delivered an average return of 2.51 per cent per month.

4.2 Momentum Returns during the Slowdown

In contrast to previous literature that found momentum returns to completely vanish during a crisis (Maheshwari & Dhankar 2017), our study has found that certain momentum strategies still manage to outperform the benchmark index from the period of 2017 till 2019.For the Winner portfolios, even though fifteen out of the sixteen momentum strategies managed to generate returns that were higher than the benchmark index, only five of them generated statistically significant returns. It must be noted that unlike the previous three year period, from 2014-2016, that was marked by broader optimism about the future prospects of the nation and that saw all but one of the momentum strategies deliver both economically and statistically significant returns, the subsequent three year period saw a considerable drop in average returns among all the momentum strategies. The most successful strategy, the J9K3, gave an average return of 1.56 per cent per month. Unlike the so-called boom years, the Loser portfolios gave negative returns for five of the momentum strategies while the remaining ones that did give positive returns were neither economically nor statistically significant and therefore have not been shown here.

5 Discussion

The observations of the study arrived at after combining the results from tables 1, 2, and 3 are surprisingly in disagreement with findings from previous momentum studies in the Indian stock market, which have found momentum strategies to

work extremely well except during periods of financial crisis. Such studies have suggested that stock markets tend to have phases of momentum crashes which become more pronounced during times of a financial crisis. Previous research that studied profitability of momentum strategies in the Indian stock market through the period of the global financial crisis of 2007 found that momentum strategies gave negative returns during the global financial meltdown caused by the sub-prime lending crisis in the US (Maheshwari & Dhankar 2017). These findings were consistent with other studies like Chordia & Shivakumar (2002). Non-significant negative returns were also observed by studies conducted across eight different equity markets and asset classes, as well as during multiple time periods (Daniel et al 2013). Previous studies are of the consensus that momentum crashes can be attributed to market volatility which tends to be high during periods of economic turmoil (Daniel et al, 2012). The poor returns generated by momentum strategies during such times are ascribed to strong short-term reversal effects instead of trend continuation. Our study finds momentum strategies that involve buying past winners generate returns that are much higher than the broader markets during the boom years, as evidenced by comparing the Sharpe ratios of Momentum strategies that show statistically significant outperformance during that time. However, the higher returns can be attributed as a premium that investors expect for taking on added risks. More interestingly, we find that the Sharpe ratios for the statistically significant momentum strategies during the Slowdown years to be comparable with those of the NIFTY Index, thereby implying that investors have a hard time guessing how prices might move based on recent action during times of economic instability, and thus stay away from picking or choosing particular stocks based on certain factors, which in this case happens to be momentum. It can also be inferred that momentum profitability cannot be completely attributed to added risks, as postulated by previous literature. This is because even though the risk involved in the successful momentum strategies tends to still be higher than the risk for the overall markets, the returns are not as high as they were during the Boom years. Our study also finds that momentum profits, at least for the Blue Chip companies, do not completely crash during times of economic slowdowns and certain momentum strategies can still yield significantly positive returns, though our study finds this to be true only for a portfolio comprising of previous winners, thus negating a contrarian approach while chasing momentum profits.

5.1 Practical Implications of the Research

It is observed that the portfolio formation period for momentum strategies that outperform the benchmark NIFTY index is similar during both the boom years as well as the slowdown years, which is found to be ranging between six months to twelve months in duration. However, an interesting trend is observed as far as the portfolio holding period is concerned. The holding periods for the Winner portfolios during the pre-crisis period happen to be above six months for all but one of the top half of the best performing momentum strategies, whereas the holding period for the Winners for strategies that beat the benchmark index is found to be between three months to six months during the slowdown years. Thus, as far as the portfolio formation period is concerned, the above observations would seem to imply that investors, irrespective of market conditions, find great value in stocks that have performed well over a relatively longer time horizon in the past one year. Additionally, one can also infer that even though momentum profits can persist even during times of economic turbulence, however, investors tend to hold portfolios based on most recent price action (momentum) for lesser of a duration than they would have during times of economic stability and growth.

As mentioned above, results from the study may lead one to conclude that during the so-called boom years, when public sentiment is mostly optimistic, momentum profits must mostly be driven by the long positions in the Winner portfolio. This can be inferred by the considerably higher returns for all the momentum strategies which outperform the benchmark NIFTY index at statistically significant levels. However, a contrarian approach cannot be written off completely, as is apparent from the fact that a majority of momentum strategies that involved holding a portfolio of past losers have also outperformed the index, both economically as well as statistically. The same cannot be said for times when the economic conditions are in turmoil, as most of the momentum strategies for winners do not produce statistically significant results and momentum strategies for the Losers underperform the benchmark, with some even yielding negative results.

6 Conclusions

There have been various market anomalies that are well detailed and have been studied widely in the past. Among these, momentum is the strongest of these market anomalies and is widely used in practice by the larger investment community. The momentum strategy is one wherein you sell your past losers and buy the recent winners. There are numerous studies that show evidence regarding the presence of momentum effect not only in the markets of the developed world but also in the emerging markets as well. However, previous literature also proved that momentum effect ceases to exist during market turbulence. As a matter of fact, studies conducted on the persistence of the momentum effect in the backdrop of the global financial crisis have found momentum strategies to yield negative returns. As mentioned earlier, most recent studies detailing the persistence of momentum profits use the global financial crisis of 2007 as a point of reference. However, we wanted to study if the momentum effect showed similar behavior if the economy experienced turbulence on account of domestic policy measures, for a change; and the results throw up some interesting findings. We observe that some momentum strategies wherein you buy previous winners continue to generate results that are both economically as well as statistically significant. Such findings have an interesting implication for the implementation of momentum strategies and support an investment approach based on momentum even during times when economic conditions do not seem favorable, although investors would be advised to have a shorter holding period. Moreover, since we only studied the hundred largest companies by way of market capitalization, it seems that this approach might not work outside of the Blue Chip stocks, although that would remain a matter of conjecture until it is studied in greater detail.

6.1 Future Scope

We strongly believe that even though the findings of this study are useful, there will still be certain limitations to our work. First and foremost, we fail to account for the trading costs. Since trading would also involve brokerage, any adjustments made for transactions costs might lead to erosion of momentum profits, although it is our belief that the effect would be negligible. Second, market conditions, especially in India, have drastically changed since the financial crisis of 2007. Technological advancements have led to an increased financial literacy, resultingin more and more people in the country to continue increasing their exposure to equity as an investment avenue. Moreover, it also seems that governments the world over appear much too eager to adopt increased measures of quantitative easing to ensure, among other things, that their stock markets do not tank. Therefore, there could be a chance that a crisis similar to the one in 2007 might not have the same effect now as it did back then. It is also important to note that systemic shocks to the economy on account of domestic policy measures (like demonetization) usually have a lagging effect which isn't evident until after some time. This is unlike the Global Financial Crisis of 2007, which just exploded all of a sudden and caused large scale pandemonium across the globe, leading to a lot of selling pressure and thus causing price to drop drastically. Therefore, it would be unfair to compare how momentum profits reacted during the Sub-prime lending crisis of 2007 with the results momentum strategies gave during the economic slowdown from 2017 to 2019 on account of the differences in prevailing market conditions at the time. We trust our study can definitely serve as a template for implementing momentum strategies during future slowdowns. However, further research can definitely go a long way to validate the practical implications of our findings. A comparison of momentum profitability among the NIFTY 100 and NIFTY NEXT 100 during the same time duration as the one used in this paper would be of some interest since it would provide evidence as to whether or not investors place a special emphasis on companies that have a larger market cap within the broader universe of LargeCap companies listed on the NSE, especially during times of economic slowdowns. Further scope of research could also include using the aforementioned sets of companies and comparing momentum returns since the lows of the March 2020 crash to identify any trends in investor conduct during times of a market recovery. We firmly believe that such studies would go a long way in furthering our understanding and knowledge of investor behavior in India.

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Appendix

Table 4. Results2014-16

	NIFTY		winners			losers			winners-losers		
Momentum Strategy	**Avg. Return μ**	**Std. Dev. σ**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**
J3K3	0.467	±6.67	2.01	±10.29	.001* (3.895)	1	±8.41	.092** (1.745)	1.01	±8.86	.389 (.874)
J3K6	0.46	±9.14	2.1	±13.83	.000* (5.985)	1.05	±15.92	.040* (2.147)	1.04	±14.39	.319 (1.014)
J3K9	.47	±9.74	2.07	±17.55	.000* (5.982)	1.1	±20.85	.041* (2.143)	.96	±23.35	.373 (.906)
J3K12	.56	±12.29	2.14	±20.15	.000* (6.685)	1.29	±25.38	.011** (2.719)	.84	±28.72	.588 (.548)
J6K3	.27	±6.77	2.19	±9.53	.000* (5.232)	.97	±10.92	.162 (1.438)	1.22	±8.88	.204 (1.303)
J6K6	.25	±9.7	2.19	±13.61	.000* (6.737)	1.02	±19.83	.078** (1.838)	1.16	±17.54	.220 (1.257)
J6K9	.45	±10.27	2.27	±15.52	.000* (8.664)	1.28	±23.78	.030** (2.294)	.98	±21.47	.355 (.942)
J6K12	.59	±12.81	2.47	±18.76	.000* (10.581)	1.68	±28.48	.003** (3.320)	.78	±26.50	.708 (.378)
J9K3	.15	±7.09	1.9	±10.45	.001* (3.672)	.77	±13.32	.340 (.973)	1.13	±10.98	.319 (1.019)
J9K6	.38	±9.69	2.25	±14.46	.000* (5.598)	1.06	±22.46	.234 (1.224)	1.18	±20.03	.349 (.955)
J9K9	.54	±10.49	2.28	±15.78	.000* (7.431)	1.57	±28.37	.058** (1.997)	.70	±26.03	.821 (.229)
J9K12	.72	±12.80	2.62	±21.11	.000* (8.350)	1.96	±32.10	.010* (2.795)	.66	±34.22	.933 (-.085)
J12K3	.38	±7.28	2.54	±9.73	.000* (4.301)	1.48	±14.86	.171 (1.42)	1.06	±12.29	.572 (.575)
J12K6	.58	±9.68	2.52	±13.57	.000* (6.977)	2.14	±23.57	.032* (2.308)	.37	±19.68	.810 (-.244)
J12K9	.75	±9.79	2.74	±17.33	.000* (7.445)	2.51	±28.72	.009* (2.897)	.23	±28.96	.493 (-.698)
J12K12	.99	±9.58	1.14	±12.31	.353 (.951)	.978	±22.70	.956 (-.056)	.16	±19.66	.073 (-1.890)

Table 5. Results 2017-2019

	NIFTY		winners			losers			winners-losers		
Momentum Strategy	**Avg. Return μ**	**Std. Dev. σ**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**
J3K3	0.86	±5.42	1.21	±7.53	.278 (1.103)	0.36	±8.42	.238 (-1.201)	0.85	±9.06	.981 (-.024)
J3K6	0.46	±9.14	2.10	±13.83	.130 (1.553)	1.05	±15.92	.002 (-3.322)	1.04	±14.39	.196 (1.321)
J3K9	0.77	±6.24	0.81	±13.12	.818 (.232)	-0.019	±13.04	.003 (-3.246)	0.83	±14.25	.820 (.230)
J3K12	0.78	±7.38	0.66	±12.83	.428 (-.806)	-0.08	±12.38	.000 (-6.272)	0.74	±13.56	.893 (-.135)
J6K3	0.86	±5.42	1.54	±7.74	.027* (2.319)	0.032	±9.4	.054 (-1.999)	1.53	±6.85	.191 (1.333)
J6K6	0.82	±5.44	1.39	±10.52	.013* (2.630)	-0.16	±11.40	.002 (-3.434)	1.56	±8.90	.011* (2.699)
J6K9	0.77	±6.24	1.10	±13.03	.109 (1.653)	-0.12	±12.5	.000 (-4.046)	1.22	±12.65	.098** (1.711)
J6K12	0.78	±7.38	1.19	±13	.010* (2.808)	-0.10	±12	.000 (-6.633)	1.29	±12.38	.034* (2.248)
J9K3	0.86	±5.42	1.56	±7.96	.037* (2.170)	0.21	±10.43	.155 (-1.453)	1.35	±6.99	.375 (.899)
J9K6	0.82	±5.44	1.30	±10.65	.041* (2.137)	0.15	±11.27	.020 (-2.458)	1.15	±8.27	.235 (1.210)
J9K9	0.77	±6.24	1.10	±13.80	.136 (1.533)	0.02	±12.69	.001 (-3.641)	1.07	±11.61	.248 (1.181)
J9K12	0.78	±7.38	0.90	±15.18	.5 (.685)	0.83	±13.33	.000 (-5.106)	0.82	±10.75	.849 (.192)
J12K3	0.86	±5.42	1.15	±6.46	.339 (.970)	0.23	±11	.203 (-1.299)	0.92	±8.78	.934 (.083)
J12K6	0.82	±5.44	1.19	±9.68	.118 (1.609)	0.17	±11.55	.038 (-2.170)	1.02	±10.58	.579 (.560)
J12K9	.81	±6.19	1.03	±14.2	.369 (.914)	0.12	±10.24	.001 (-3.813)	0.91	±13.99	.732 (.346)
J12K12	.78	±7.38	.55	±10.47	.089 (-1.771)	.03	±10.77	.000 (-4.363)	.51	±10.76	.167 (-1.423)

Table 6. 2014-2016 1 month lag

	Average return on NIFTY index		winners			losers			winners-losers		
Momentum Strategy	**Avg. Return μ**	**Std. Dev. σ**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**
J3K3	0.47	±6.71	2.05	±9.24	.000* (5.324)	1.17	±8.96	.036* (2.202)	0.88	±6.6	.459 (.751)
J3K6	0.48	±9.31	2.17	±14.2	.000* (6.294)	1.07	±16.15	.051** (2.034)	1.09	±13.60	.274 (1.116)
J3K9	0.52	±10.19	2.07	±16.92	.000* (6.250)	1.13	±20.23	.036* (2.2)	0.94	±21.13	.419 (.820)
J3K12	0.61	±12.92	2.23	±20.51	.000* (7.563)	1.45	±25.45	.003* (3.204)	0.78	±25.26	.722 (.359)
J6K3	0.2	±6.99	2.02	±9.65	.000* (4.911)	0.95	±12.58	.164 (1.432)	1.07	±9.83	.322 (1.010)
J6K6	0.44	±9.63	2.22	±12.41	.000* (7.570)	0.81	±20.98	.433 (.797)	1.4	±16.83	.191 (1.342)
J6K9	0.52	±10.75	2.46	±16.46	.000* (8.754)	1.37	±24.99	.038* (2.190)	1.09	±21.59	.332 (.988)
J6K12	0.69	±13.30	2.49	±18.39	.000* (10.156)	1.73	±28.20	.004* (3.186)	0.76	±27	.889 (.142)
J9K3	0.37	±7.09	2.05	±9.79	.000* (4.107)	0.88	±13.85	.487 (.707)	1.17	±12.58	.445 (.777)
J9K6	0.52	±10.11	2.34	±14.68	.000* (6.201)	1.31	±22.52	.199 (1.322)	1.03	±19.58	.531 (.636)
J9K9	0.68	±12.48	2.61	±16.92	.000* (8.861)	1.79	±27.20	.042* (2.148)	0.81	±26.17	.840 (.204)
J9K12	0.86	±12.48	2.77	±21.66	.000* (8.131)	2.22	±31.21	.008* (2.916)	0.55	±36.08	.623 (-.499)
J12K3	0.45	±7.44	2.27	±9.71	.000* (4.283)	1.98	±14.26	.046* (2.132)	0.28	±10.27	.877 (-.157)
J12K6	0.74	±10.08	2.54	±13.62	.000* (7.194)	2.37	±23.10	.030* (2.332)	0.17	±18.02	.472 (-.733)
J12K9	0.9	±9.66	2.96	±18.83	.000* (6.892)	2.83	±27.41	.005* (3.140)	0.13	±29.54	.291 (-1.084)
J12K12	1.12	±9.51	1.27	±13.63	.325 (1.010)	1.18	±23.10	.875 (.160)	0.08	±18.02	.011 (-2.789)

Table 7. 2017-2019 1 month lag

	NIFTY index		winners			losers			winners-losers		
Momentum Strategy	**Avg. Return μ**	**Std. Dev. σ**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**	**Avg. Return μ**	**Std. Dev. σ**	**t-value**
J3K3	0.80	±5.39	1.17	±7.90	.252 (1.165)	-0.009	±7.7	.047 (-2.059)	1.18	±8.08	.449 (.766)
J3K6	0.75	±5	1.15	±11.64	.176 (1.385)	-0.009	±10.98	.010 (-2.769)	1.16	±11.18	.263 (1.141)
J3K9	0.71	±5.75	0.70	±11.76	.975 (-.032)	-0.02	±12	.003 (-3.229)	0.73	±12	.926 (.094)
J3K12	0.71	±6.35	0.65	±12.68	.731 (-.348)	-0.06	±12.35	.000 (-5.292)	0.71	±14.88	.995 (-.006)
J6K3	0.80	±5.39	1.47	±7.06	.021* (2.425)	-0.43	±9.05	.005 (-3.023)	1.91	±7.23	.044 (2.099)
J6K6	0.75	±5	1.15	±9.78	.091** (1.746)	-0.076	±12.12	.008 (-2.822)	1.23	±10.99	.217 (1.261)
J6K9	0.71	±5.75	1.05	±11.44	.083** (1.798)	-0.005	±11.97	.003 (-3.303)	1.05	±11.80	.205 (1.298)
J6K12	0.71	±6.36	1.01	±9.89	.041* (2.163)	-0.046	±11.54	.000 (-5.866)	1.06	±10.82	.157 (1.463)
J9K3	0.80	±5.39	1.14	±7.53	.271 (1.119)	0.21	±9.64	.185 (-1.355)	0.93	±6.88	.814 (.237)
J9K6	0.75	±5	1.13	±10.36	.158 (1.448)	0.20	±12.31	.090 (-1.753)	0.92	±9.98	.626 (.492)
J9K9	0.71	±5.75	0.98	±12.12	.180 (1.375)	0.14	±11.57	.010 (-2.786)	0.83	±11.73	.639 (.474)
J9K12	0.71	±6.36	0.68	±12.63	.858 (-.181)	0.08	±13.45	.000 (-4.151)	0.59	±12.82	.661 (-.444)
J12K3	0.80	±5.39	1.07	±5.93	.365 (.918)	-0.05	±10.52	.066 (-1.990)	1.13	±7.28	.609 (.516)
J12K6	0.75	±5	1.20	±10.24	.095** (1.722)	0.19	±11.25	.064 (-1.924)	1.01	±11.03	.486 (.706)
J12K9	0.76	±5.74	0.84	±14.29	.766 (.301)	0.21	±11	.009 (-2.796)	0.62	±14.55	.662 (-.442)
J12K12	0.71	±6.36	0.53	±10.44	.195 (-1.335)	-0.14	±10.69	.000 (-5.479)	0.67	±10.46	.840 (-.203)

Table 8. Sharpe Ratios of Momentum portfolios for 2014-2016

Formation Period	**Portfolio**	**Holding Period**			
		K3	**K6**	**K9**	**K12**
J3	**NIFTY**	.059	.088	.125	.225
	Winner	.49	.768	.891	1.07
	Loser	.238	.273	.334	.455
	W-L	.229	.297	.243	.213
J6	**NIFTY**	-.025	-.051	.103	.244
	Winner	.586	.820	1.123	1.370
	Loser	.176	.209	.361	.570
	W-L	.300	.285	.272	.206
J9	**NIFTY**	-.076	.029	.183	.362
	Winner	.452	.797	1.112	1.304
	Loser	.100	.196	.394	.609
	W-L	.217	.255	.129	.116
J12	**NIFTY**	.020	.158	.390	.831
	Winner	.681	.969	1.25	.791
	Loser	.231	.462	.682	.341
	W-L	.178	.013	-.030	-.101

Table 9. Sharpe Ratio for Momentum portfolios 2017-2019

Formation Period	**Portfolio**	**Holding Period**			
		K3	**K6**	**K9**	**K12**
J3	**NIFTY**	.294	.542	.629	.729
	Winner	.351	.473	.333	.306
	Loser	.01	-.191	-.243	-.407
	W-L	.171	.551	.319	.366
J6	**NIFTY**	.294	.542	.629	.729
	Winner	.476	.607	.532	.794
	Loser	-.095	-.263	-.327	-.436
	W-L	.524	.830	.635	.934
J9	**NIFTY**	.294	.542	.629	.729
	Winner	.463	.548	.501	.453
	Loser	-.035	-.095	-.217	-.224
	W-L	.437	.594	.574	.547
J12	**NIFTY**	.294	.542	.704	.729
	Winner	.382	.533	.446	.256
	Loser	-.026	-.082	-.187	-.328
	W-L	.201	.389	.376	.206