# A Study of Stock Market Crash in India using Trend Indicators

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Stock Markets around the world have always been a source of immense attraction for the investors due to their ability to give higher returns than many other asset classes. Technical Analysis and Fundamental Analysis are two techniques which try to predict the stock markets. There are various methods for technical analysis namely Chart pattern and Indicators. One of the Indicators studies includes trend indicators namely Simple Moving average. In the present study we have used Simple Moving average trend indicator to identify crashes on Indian Stock Markets. These crashes are of more than 25% fall and within a period of 60 days from the date of peak. Three such crashes have been identified from the study period of 1997 to 2011. Simple Moving Average was able to generate signals for all the three crashes.
**Keywords:** Crashes, Sensex, Moving Average, Simple Moving Average

## Introduction

### Technical Analysis

The study of the financial market action is referred to as the technical analysis. It examines the price action prevalent in the financial markets instead of the fundamental factors which seem to have an effect on the market prices. In spite of all the relevant information provided the prediction of the stock markets can still not be made exactly. Other important factors having a bearing on the performance of the markets cannot be ignored. The technical analysts are of the opinion that all the relevant information is indicated in the price leaving apart news of shocks relating to for example natural disasters etc.

The charts, which are used to indicate the performance of the market shows trends, momentum and patterns and are reflection of the mirror of the mood of the crowd, not a manifestation of the fundamentals. Thus, technical analysis focuses upon encapsulating the human mass psychology and such it is also called behavioral finance.

### Fundamental Analysis

The fundamental analysis is based on the premise that there exists a cause and effect relationship between the fundamental factors and the price changes. In other words, a rise in the prices is backed by positive fundamental news whereas negative news sets the premise for a downfall in the prices. In the long-run however, such correlation cannot be observed. The stock market itself is the best forecaster of the future fundamental movement. It is observed that the prices rise in many cases in a bull trend where actually the economy is still in recession. Also, the prices are observed to fall even in an economy which is growing. The technical analysis is distinct from that of the fundamental analysis since it focuses on identifying the changes in the trends and also which precede the fundamental analyses.

### Why do Investors Behave the Way they do?

The greed (optimism) during buying and fear when selling, people are faced with is the main reason for them not being able to make huge profits. Optimism and pessimism, the emotional states of an investor

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govern his motivation to buy or sell. On the basis of this state the fundamental scenarios are formulated which further results into non-realization of emotion being the dominant factor in the process of taking decisions. The main disadvantage of fundamental analysis is the emotional aspect. In order to make money out of the investments, investors should learn to buy when they are fearful and sell when they are euphoric. Technical analysis can certainly aid in this.

## Literature Review

### Moving Averages

One of the popular and versatile techniques of identifying the price trends is the moving averages. They function by smoothing out the fluctuations in market prices and thus make it easier to conclude the trends prevalent in the markets. They also act as important indicators to signal significant changes in the directions as soon as possible.

This method is the most widely used one. In order to calculate a 5-day moving average for example, one needs to add the closing prices of the last five closings and divide this sum by 5. Further, the new closing values can be added and the oldest ones can be skipped.

Short-term is analyzed by using the 13-days or 21-days averages, whereas the medium term can be studied by using the 34-day or 55-day averages. Similarly, for a long-term 89-days and 144-days averages can be analyzed. Also, very long-term trends or secular trends can be analyzed by using the 233-day, 377-day, 610-day and 987-day moving averages.

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### Momentum and Momentum Indicator Signals

The speed of the price trend, as in whether it is accelerating or decelerating gives the momentum in financial markets rather than the actual price itself. Though moving averages are lagging indicators giving the signals after the price trend has already turned, momentum indicators lead the price trend. They give signals before the price trend turns. However, one the momentum provides a signal it has to be confirmed by a moving average crossover.

When there is a rise in the prices the momentum indicator also rises leading to uptrend price acceleration. When there is an increase in the prices and a fall in the value of the indicator there is a uptrend price deceleration. When there is a fall in the prices combined with a rise in the indicator, there is a price downtrend deceleration. Likewise, a fall in the prices combined with a rise in the indicators give a downtrend price deceleration. Thus, the momentum indicators need to be applied together with the moving averages. The oscillator of momentum can be divided into the four quadrants, namely Up Quadrant, Advancing Quadrant,

Down quadrant and Terminating quadrant. Here, up quadrant (u) denotes an oscillator below the zero line and rising, Advancing Quadrant (a) indicates as oscillator above the zero line and rising, Down quadrant (d) indicates an oscillator above the zero line and declining and Terminating quadrant (t) indicates an oscillator below the zero line and declining. The idealized form of the indicator is in a bell shape.

The three investment horizons can be tracked by incorporating three momentum indicators, namely the monthly or long term indicator, weekly or medium term indicator and intermediate-term indicator to gauge the long-term, medium-term or short-term trend. The momentum indicators are combined with the moving averages to identify the trends in force and assessing the future of these trends. Momentum bottom indicates the situation of highest investment return. It also adds to situations which are characterized by price confirming the momentum indicators uptrend and rise above the moving average. Also, when the momentum indicator tops out the investors should begin selling and likewise should sell further when the price cascades below the moving average.

Thus, funds should be invested in stocks having a rising momentum indicator while the funds having a falling momentum indicator should be sold out.

## Research Methodology

A crash is defined as fall of more than 25% of the value of peak and within a period of 60 days from the date of peak. Also for the past 262 days from the date of the peak there should be no value greater than the value of the peak. In the present study Simple Moving Average for analysis of crash. In order to calculate a 10-day moving average one needs to add the closing prices of the last ten closings and divide this sum by 10. Further, the new closing values can be added and the oldest ones can be skipped. Generally Short-term is analyzed by using the 13-days or 21-days averages, whereas the medium term can be studied by using the 34-day or 55-day averages. Similarly, for a long-term 89-days and 144-days averages can be analyzed. Also, long-term trends or secular trends can be examined by using the 233-day, 377-day, 610-day and 987-day moving averages. 60 - days Simple Moving Average of Indices is used to identify the crash in this study.

## Results and Analysis

**Study of signals generated prior to downward trend reversals on BSE Sensex using Trend Indicators (Simple Moving Average)**

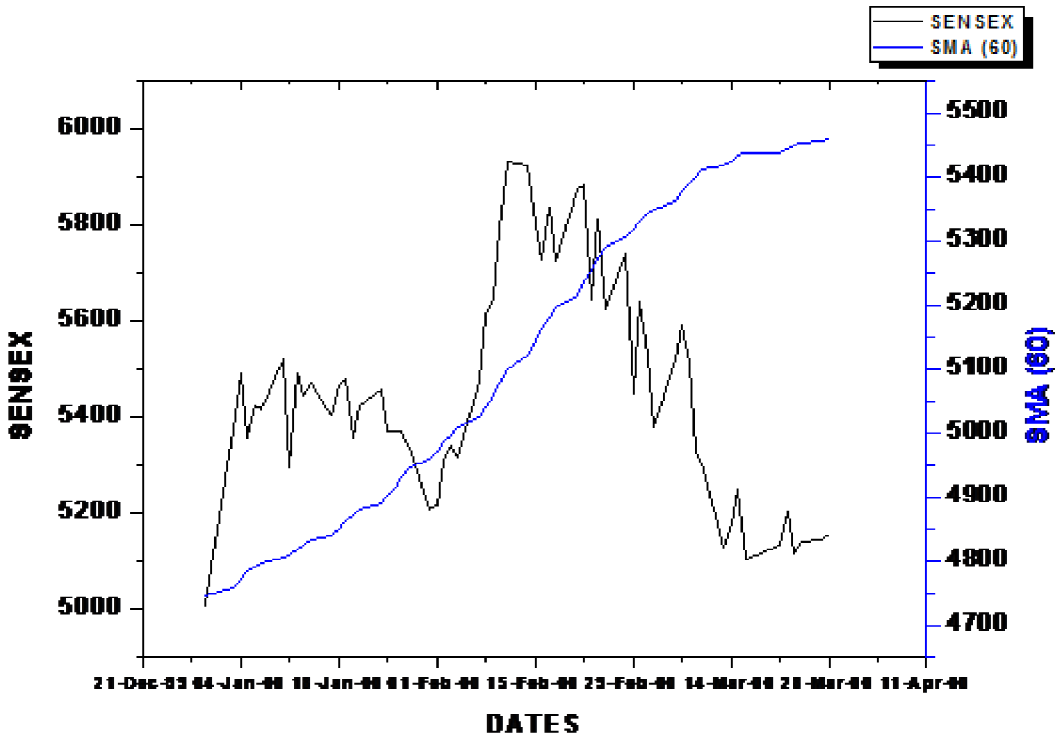
**Study of crash which started on 11th Feb 2000**

For analyzing the crash using moving average of 30 days pre and post the start date of the crash is plotted. Following graph shows the BSE Sensex data and 60 day simple moving average. (graph on next page).

When the price moves through an important moving average, it is an indication that the trend may be reversing. In the above figure this happens on 28th January when the price breaks below the moving average and after some time the downtrend changes to uptrend. On 28th February, eleven days after the start of the crash the price breaks below the moving average line. Thus moving average was able to generate the sell signal.

### Study of crash which started on 10th May 2006

For analyzing the crash using moving average of 30 days pre and post the start date of the crash is plotted. Following graph shows the BSE Sensex data and 60 day simple moving average.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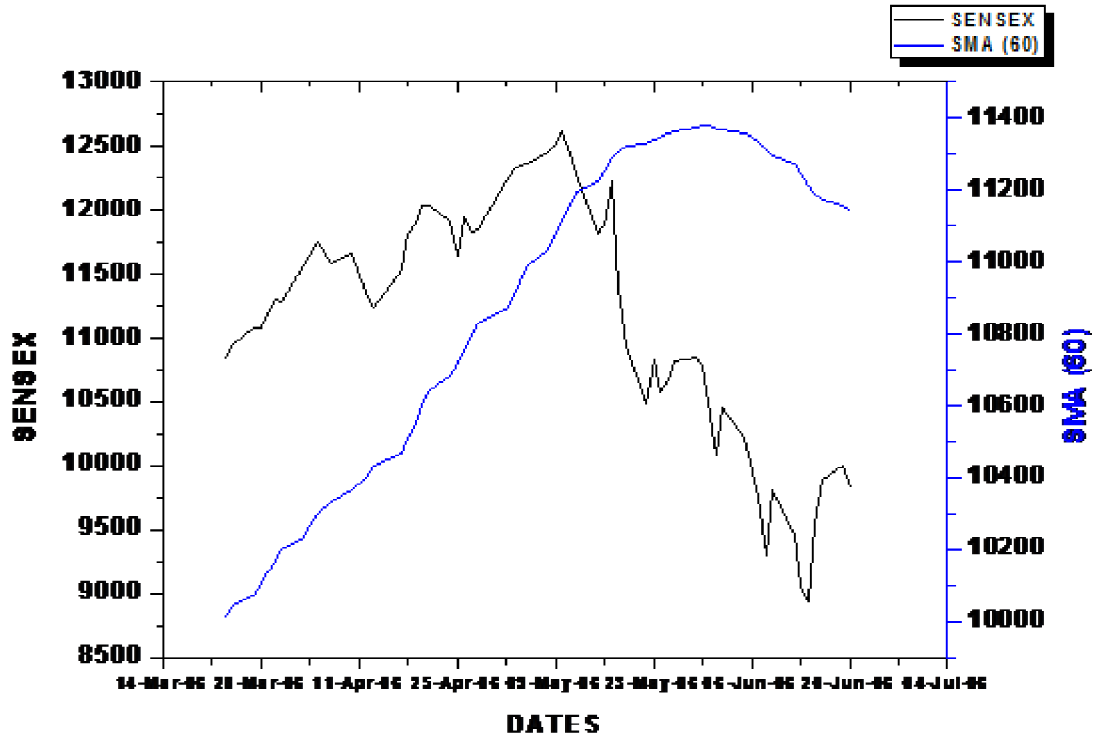
DATES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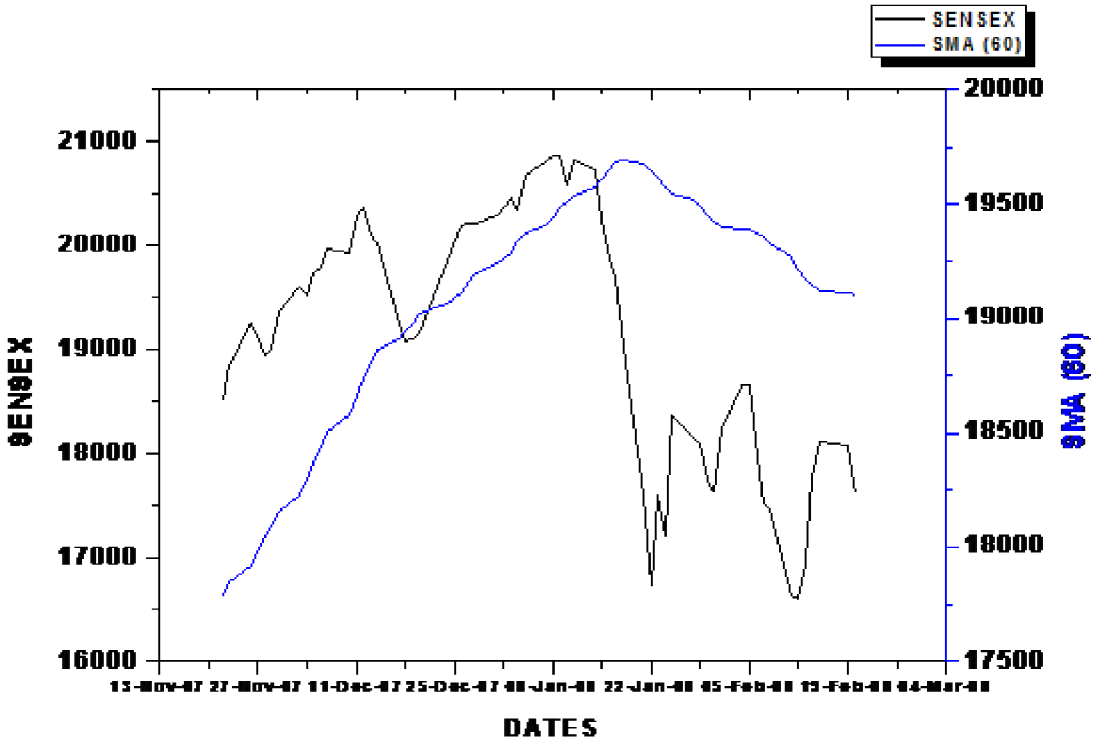
10200
10000
SENSEX
SMA (60)
14-Mar-05 28-Mar-05 11-Apr-05 25-Apr-05 09-May-05 23-May-05 06-Jun-05 20-Jun-05 04-Jul-05
DATES

When the price moves through an important moving average, it is an indication that the uptrend may be reversing. In the above figure this happens on 12th May, two days after the start of the crash. Thus moving average was able to generate this signal.

- **Study of crash which started on 08th January 2008**

  For analyzing the crash using moving average of 30 days pre and post the start date of the crash is plotted. Following graph shows the BSE Sensex data and 60 day simple moving average.




When the price moves through an important moving average, it is an indication that the trend may be reversing. In the above figure this happens on 17th December when the price breaks below the moving average and after some time the downtrend changes to uptrend. Finally on 14th January, four days after the start of the crash the price breaks below the moving average line. Thus moving average was able to generate the sell signal.

## Conculsion

Time Lap is the number of days that have passed after the peak was achieved and signal was generated. It is clear from the above results that for the Period of Crash from 11 Feb 2000 to 11 May 2000 the time lap for Simple Moving average was 18 days. Period of Crash from 10 May 2006 to 14 June 2006, Simple Moving average was also able to generate the sell signal but after two days after the start of the crash. For Period of Crash from 8 Jan 2008 to 17 Mar 2008, Simple Moving average was able to generate the sell signal but after four days after the start of the crash. Thus, as far as time lap parameter is considered Simple Moving average has been consistently giving good performance, for prediction of crashes in stock markets. Further study may be done for crashes in other financial markets using Simple Moving Average.

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