A Case Study of Stock Market Bubbles in the Indian Stock Market

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Abstract

This paper's objective was to analyze various stock market crashes to identify the stocks that offered a durable competitive advantage. To do so, stock market data were analyzed from January 2001 – December 2018, and it was found that Nifty observed 10 major crashes during this period. After identifying the stocks that outperformed or performed moderately during the crisis, the compounded annual growth rate (CAGR) was computed for them. The results exhibited that the stocks that survived the market crashes had high CAGR and were considered stocks with a durable competitive advantage (DCA). The results exhibited that in India, stocks with DCA belonged to consumer goods, pharma and healthcare, and financial services sector. The present paper underlined the sectors in the Indian market, which are relatively immune to economic downturns and provided a cushion of safety compared to their other sector equivalents. The paper presented indicators for investors to identify stocks with DCA.

Keywords : stock market, crash, Nifty, durable competitive advantage

JEL Classification : G01, G10, G11, G40, G15

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Researchers explain a market bubble as a cycle represented by a rapid expansion, reaching its peak, and followed by a subsequent contraction. In other words, it is an overheated market, where irrational exuberance or greed drives security prices to unsustainable heights. It usually occurs at the end of an extended bull phase where the prices exceed the businesses' real value as gauged by their earnings. The PE ratio is generally more than the historical means. A large number of investors, those who do not want to miss a boat, enter the market with the hope of making a profit, the stock becomes scarce, and as a result of which prices skyrocket and are not supported by the underlying value of the company. In due course of time, some investors who entered the market at recovery or early expansion phase recognize that the upward trend is unsustainable and start selling off. Due to herd mentality, other crowds also start dumping their stocks with an expectation to recover their investments. As a result, the overall stock prices start plunging down. Those who entered the market late often suffer substantial losses.

In a nutshell, as the market starts correcting itself (usually a 10% decline), the bubble collapses, and in severe cases, it may even burst, leading to an acute market crash characterized by a more significant drop in prices (usually 20% or more).

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Over and again, investors' sentiments have evidenced to be an uncontrollable force in taming the market trends. A stock market crash is a sudden dramatic decline of stock prices across a significant cross-section of a stock market, resulting in a significant loss of paper wealth (Galbraith, 1988). Indian stock markets have encountered many such roller - coaster rides in its history. Acute crashes and sharp corrections have been a widespread phenomenon in its past and subsequent 'V' shape recoveries. Indian indices have plunged more than 50% during the worldwide market crash of 2000, 2008, and so on. Primarily, crashes are triggered due to panic amongst investors. Sometimes, exogenous events, along with investors' herding mentality, where selling by some big players propels other market players to sell, results in a market crash. It does not matter how robust the stock fundamentals are ; powerful negative emotions can pull down a robust bullish stock market. Such psychological aspects of human behavior impede the investors from making rational decisions.

Prior literature has validated the existence of various psychological and behavioral biases influencing investors' investing decisions, which have led to the rejection of the traditional EMH hypothesis and rational decision making (Raut & Das, 2015). It is challenging for an average investor to thrive and generate consistent returns through such an arduous phase. When no clear direction emerges, it is difficult to identify the stocks which offer a durable competitive advantage. By investing in the types of businesses that survive and thrive in difficult times, investors can be both more profitable and more resilient. Investing in stocks with DCA can help investors save their money at stake in the stock market. It also benefits them in protecting against the crash turmoil and, to a large extent, reduce herding.

There is no single definition of a stock market crash ; there are numerous definitions available that are vague and highly subjective. According to Jones (2008), a double-digit percentage fall in the stock markets over 5 minutes is known as a crash. As per Jayadev et al. (2009), fall in the NIFTY of more than 10% within a span of 20 days or difference of more than 10% between the high on a day and the low on the next trading day or decline in the NIFTY of more than 9% within a span of 5 days qualifies to be a stock market crash. For this research paper, we have defined a stock market crash as a situation where any two out of the above three criteria have been met. As per this definition, Nifty observed as many as 10 significant crashes from January 2001 – December 2018.

Herding

One of the most evident features of human beings which is visible in social affairs is imitation, which leads to herding. Imitation has been explained as one of the most evolved cognitive processes, requiring a developed cortex and sophisticated processing abilities. In other words, people learn basics in their lives by imitating others. Primarily, it is logical and wise to imitate others when people are short of sufficient time, energy, and resources to take a decision. Individual investors display herd behavior as they are more willing to follow the decisions of popular analysts, large groups, or noise traders. One of the reasons could be that a human being is a social animal and tends to seek acceptance from a group instead of being alone in a crowd. It could also be because of peer pressure or society pressure.

A large amount of research has investigated the level of herding behavior in developed as well as emerging markets. The results are contradictory from country to country. Many studies validated the fact that herd behavior among all types of investors increased significantly during crisis times (Kim & Wei, 2001 ; My & Truong, 2011 ; Yousaf et al., 2018). Prosad et al. (2012) demonstrated that herding behavior existed only in the period of stress. Lao and Singh (2011) validated the existence of herding in Chinese and Indian stock markets. On the contrary, studies such as Lakshman et al. (2013), Ganesh et al. (2016), and Jose et al. (2018) failed to confirm the presence of herding behavior in the Indian stock market. Chiang and Zheng (2010) examined herding behavior in 18 countries in the global market between 1988 and 2009. Their research validated that herding behavior existed in developed stock markets except for the U.S. Khan et al. (2011) focused on herd behavior in European nations comprising of

France, the UK, Germany, and Italy. It was concluded that the UK market showed less herding behavior than other countries. Furthermore, some other significant studies (Chiang et al., 2013 ; Christie & Huang, 1995 ; Grinblatt et al., 1995 ; Lindhe, 2012) also examined the herd behavior in investment decision-making.

Durable Competitive Advantage

As highlighted by Buffett and Clark (2008), an investor should always invest in stocks that offer a durable competitive advantage. Such companies are more likely to be able to sustain their profitability over a long period. It is the consistency of the product that creates consistency in the company's profits. Other advantages of DCA companies are as follows :

(i) They can charge a premium price for their superior products.

(ii) Such companies are more likely to sustain their profitability over a long period, translating into larger profit margins, more sales, and more gains for the investors in terms of increasing share prices and dividends.

(iii) It implies less volatility and risk when the rest of the market is facing turmoil.

(iv) Such companies are cash-rich companies. So, when a stock with DCA drops in price, one can be much more confident about its stock recovery.

This paper presents indicators for investors to identify stocks with DCA. In other words, it will be a practical tool for investors, portfolio managers, and consultants to identify DCA companies and build a healthy portfolio. By investing in such stocks that survive and thrive in difficult times, investors can be both, more profitable and more resilient.

Methodology

Using the stock market data from the year January 2001 – December 2018 from the NSE website, we have tried to thoroughly analyze the stock market crashes to identify the stocks that performed poorly, moderately, or outperformed during these tough times. In other words, we have tried to identify the stocks which offer a durable competitive advantage. The period starting from January 2001 is after the burst of the IT bubble in US markets and its subsequent impact on Indian markets. This 18 - year period further included the subprime crises, three general elections with a complete change of political leadership, the quantitative easing era, declaration of NPAs by Indian banks, and the impositions of strict trade rules during US leadership change in 2016. Further, this period captures the market response towards demonetization and major tax structure reforms through Goods and Services Tax. As per Buffet, a more extended period of holding provides extraordinary returns, and this paper attempts to capture similar extraordinary returns in the Indian markets during this period, which witnessed significant changes in market scenarios from January 2001 – December 2018.

After identifying the stocks that outperformed or performed moderately during the crises, the compounded annual growth rate (CAGR) has been computed for them. CAGR is an indicator that measures the return on investment for the investment duration. It represents one of the most accurate ways to calculate the mean annual growth rate of an investment over a specified period of time longer than one year. The formula for calculating CAGR is as follows :

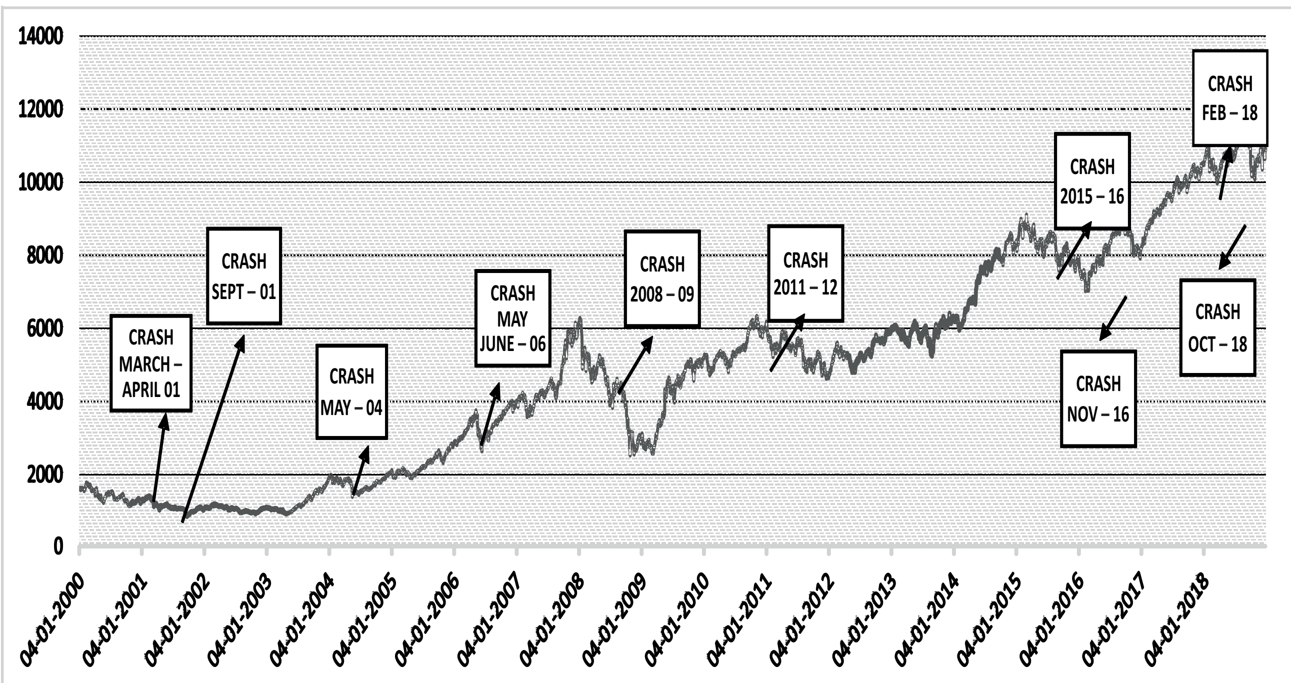
$$CAGR = ((\text{Final Value} / \text{Initial Value})\,\hat{}\,(1 / \text{Years of Investment})) - 1$$

$$CAGR = \left(\frac{\text{Ending Value}}{\text{Beginning Value}}\right)^{\left(\frac{1}{\#\text{ of years}}\right)} - 1$$

Major Corrections or Market Crashes in the Indian Stock Market in the Last 18 Years

Figure 1 exhibits the major stock market crashes that hit the Indian stock market from January 2001 – December 2018.

Figure 1. ***Major Corrections or Market Crashes***

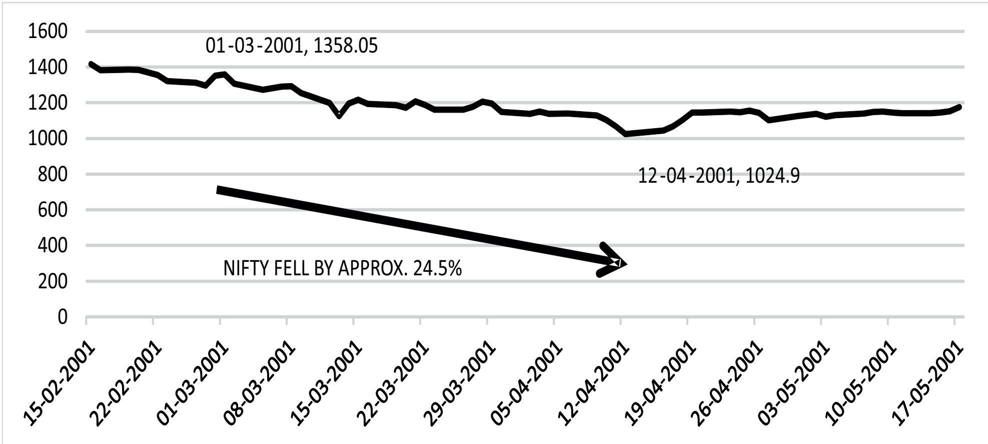


Crash 1 : March – April 2001

Figure 2 depicts the March – April 2001 crash where Nifty fell by approx. 24.5%. The reason for this crash was Ketan Parekh's malfeasance along with the Dot Com bubble. Parekh invested hugely in not-so-famous small-cap companies and elevated their stock prices by conspiring with big investors through circular trading with other traders. As a result, the share price of many companies started increasing at an alarming rate. His group of 10 stocks was collectively known as "K-10" stocks.

On March 1, 2001, the market crashed immediately after the Union Budget was showed, persuading the government to probe into the market shock. Consequently, RBI rejected to vindicate Parekh's pay orders as security for loans to BOI as they found them to be sceptical. An inquiry was set up against Parekh, and in panic, he liquidated his entire ownership of K-10 stocks. His large-scale dumping led to a severe market crash, thereby

Figure 2. ***Crash 1 – March – April 2001***



resulting in massive losses to all investors, including insurance companies and mutual funds ("Ketan Parekh still 'active'," 2010).

Table 1(a) and Table 1(b) reveal the sectors which outperformed or performed moderately during the crisis period, such as energy, consumer goods, construction, and cement & cement products. On the contrary, the sectors which suffered the most were financial services, industrial manufacturing, IT, and entertainment (as shown in Table 1(c)).

Table 1(a). ***Stocks that Outperformed***

Name	Sector	Change
UPL Ltd.	Fertilizers & Pesticides	46%
Bharat Forge Ltd.	Industrial Manufacturing	21%
ICICI Bank Ltd.	Financial Services	10%
ACC Ltd.	Cement & Cement Products	9%
Larsen & Tourbo Ltd.	Construction	7%
Bajaj Finance Ltd.	Financial Services	6%
Engineers India Ltd.	Construction	4%
Container Corporation of India Ltd.	Services	4%
TVS Motor Ltd.	Automobile	3%
Cadila Healthcare Ltd.	Pharma	2%

Table 1(b). ***Stocks that Performed Moderately***

Name	Sector	Change
ONGC Ltd.	Energy	–4%
GAIL Ltd.	Energy	–4%
State Bank of India	Financial Services	–4%
Hindustan Petroleum Corporation Ltd.	Energy	–3%
ITC Ltd.	Consumer Goods	–3%

HDFC Bank Ltd.	Financial Services	–3%
Grasim Industries Ltd.	Cement & Cement Products	–2%
Berger Paints India Ltd.	Consumer Goods	–2%
Motherson Sumi Systems Ltd.	Automobile	–1%
Marico Ltd.	Consumer Goods	0%

Table 1(c). ***Stocks that Performed Poorly***

Name	Sector	Change
Wipro Ltd.	IT	–41%
Infosys Ltd.	IT	–23%
Bharat Heavy Electricals Ltd.	Industrial Manufacturing	–19%
Bharat Electronics Ltd.	Industrial Manufacturing	–18%
Tata Power Ltd.	Energy	–17%
Tata Motors Ltd.	Automobile	–17%
Mahindra & Mahindra Ltd.	Automobile	–16%
Reliance Capital Ltd.	Financial Services	–15%
Zee Entertainment Enterprises Ltd.	Media & Entertainment	–14%
Karur Vysya Bank Ltd.	Financial Services	–14%

Crash 2 : September 2001

Figure 3 shows the second crash, which occurred in September 2001, where Nifty fell by 17.5% (approx.). The fall in stock prices was due to the terrorist attack on the World Trade Center twin towers on 11-9-2001. The fall was not that much bigger than what was observed in Japan and the Hong Kong stock markets due to SEBI's tight regulations. The USA's terror spread to India as retail investors started selling out of panic. All the sectors were down, with most IT stocks hitting 'lower' circuit breakers ; whereas, some old stocks such as ACC, HLL, ITC, L&T, and RIL declined moderately.

Figure 3. ***Crash 2 – September 2001***

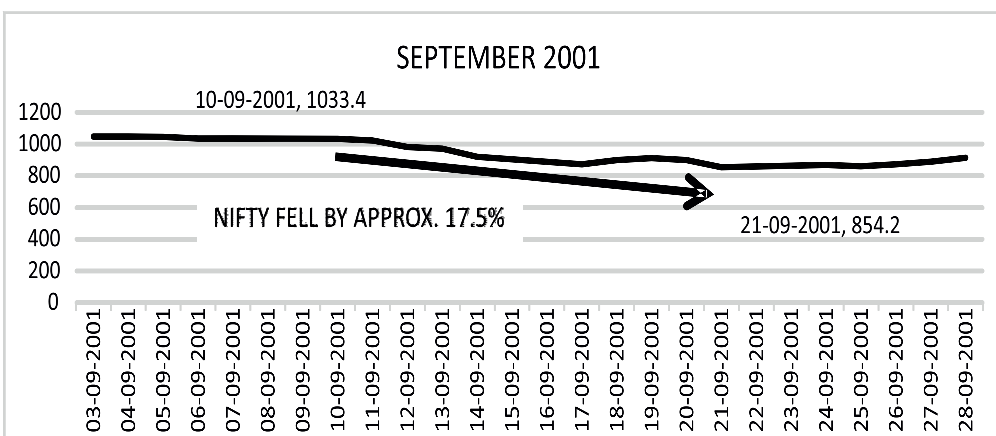


Table 2(a). *Stocks that Outperformed*

Larsen & Toubro Ltd.	Construction	2%

Table 2(b). *Stocks that Performed Moderately*

Name	Sector	Change
Sun Pharmaceutical Industries Ltd.	Pharma	–8%
Berger Paints India Ltd.	Consumer Goods	–8%
Godrej Consumer Products Ltd.	Consumer Goods	–8%
ONGC Ltd.	Energy	–8%
ITC Ltd.	Consumer Goods	–8%
Bharat Electronics Ltd.	Industrial Manufacturing	–6%
TVS Motor Ltd.	Automobile	–6%
Marico Ltd.	Consumer Goods	–5%
Container Corporation of India Ltd.	Services	–4%
Tata Power Ltd.	Energy	–3%
UPL Ltd.	Fertilizers & Pesticides	–3%
Bajaj Finance Ltd.	Financial Services	–1%
Motherson Sumi Systems Ltd.	Automobile	0%
Cadila Healthcare Ltd.	Pharma	0%

Table 2(c). *Stocks that Performed Poorly*

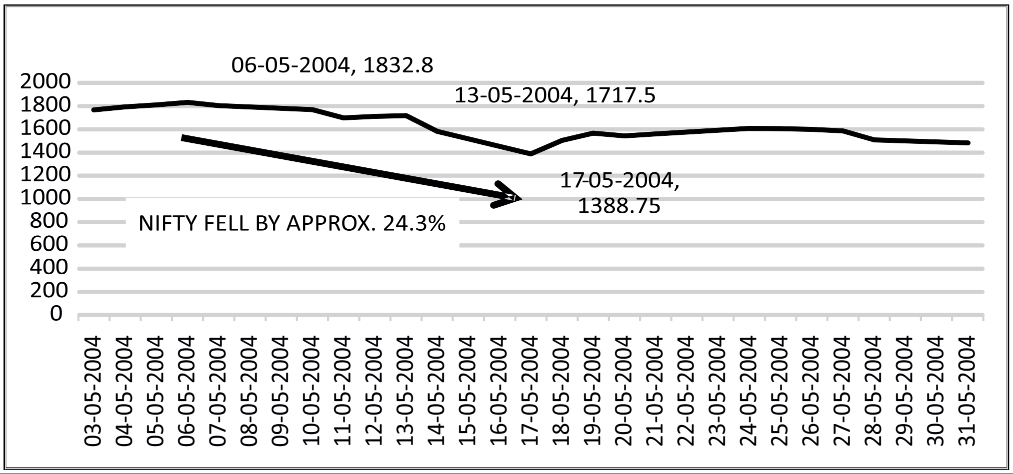
Name	Sector	Change
Wipro Ltd.	IT	–40%
Infosys Ltd.	IT	–36%
Reliance Industries Ltd.	Energy	–29%
ICICI Bank Ltd.	Financial Services	–29%
Mahindra & Mahindra Ltd.	Automobile	–26%
State Bank of India	Financial Services	–25%
Bharat Heavy Electricals Ltd.	Industrial Manufacturing	–22%
Engineers India Ltd.	Construction	–20%
Reliance Capital Ltd.	Financial Services	–18%
Bharat Petroleum Corporation Ltd.	Energy	–18%
Karur Vysya Bank Ltd.	Financial Services	–18%

Tables 2(a), 2(b), and 2(c) list the stocks that outperformed, performed moderately, and performed poorly during the crisis period, respectively.

Crash 3 : May 2004

The third crash in the Indian stock market during the period from 2001 – 2018 has been portrayed in Figure 4, where Nifty fell by 24.3%. The reason behind the downfall was an unanticipated change in government. Till April 2004, it was expected that NDA would come back to power by a fair margin. However, when the elections' outcome started to be disclosed in May 2004, it was a shock for investors and the general public. UPA coalition

Figure 4. ***Crash 3 – May 2004***



government was formed, and as a result, there was panic in the market, twice attracting suspension of trading. On May 17, the Left govt. commented on the divestment of PSUs and investor confidence was shaken, resulting in the sharpest fall ever in one single day.

Tables 3(a), 3(b), and 3(c) enumerate the stocks that outperformed, performed moderately, and performed poorly during the crisis period, respectively. The sectors which suffered the most were financial services and energy. On the other hand, the sector that could survive through the crash was consumer goods.

Table 3(a). ***Stocks that Outperformed***

Name	Sector	Change
Larsen & Toubro Ltd.	Construction	10%
Century Textiles Ltd.	Diversified	8%
Cadila Healthcare Ltd.	Pharma	5%
Cholamandalam Investment and Finance Company Ltd.	Financial Services	3%
Godrej Consumer Products Ltd.	Consumer Goods	2%

Table 3(b). ***Stocks that Performed Moderately***

Name	Sector	Change
Apollo Hospitals Enterprise Ltd.	Healthcare Services	–9%
Marico Ltd.	Consumer Goods	–9%
Cipla Ltd.	Pharma	–8%
UPL Ltd.	Fertilisers & Pesticides	–7%
ACC Ltd.	Cement & Cement Products	–7%
Bajaj Finance Ltd.	Financial Services	–7%
Bata India Ltd.	Consumer Goods	–6%
Britannia Industries Ltd.	Consumer Goods	–6%

Zee Entertainment Enterprises Ltd.	Media & Entertainment	–5%
Amara Raja Batteries Ltd.	Automobile	–4%

Table 3(c). ***Stocks that Performed Poorly***

Name	Sector	Change
Federal Bank Ltd.	Financial Services	–42%
GAIL Ltd.	Energy	–41%
Engineers India Ltd.	Construction	–40%
Bank of Baroda	Financial Services	–38%
PNB Ltd.	Financial Services	–38%
Indian Oil Corporation Ltd.	Energy	–35%
Tata Power Ltd.	Energy	–32%
Axis Bank Ltd.	Financial Services	–32%
Bharat Heavy Electricals Ltd.	Industrial Manufacturing	–32%

Crash 4 : May – June 2006

On May 18, 2006, NIFTY crashed by 246 points and Sensex by 826 points, which was one of the largest ever intra-day drop in the stock market history. The fourth crash in the Indian stock market (during the time period from 2001 – 2018) happened in May – June 2006, wherein Nifty fell by approx. 27.5%. The reasons cited were U.S. CPI number was released ; flaws were found in the London Metal Exchange, resulting in losses in emerging markets like India, Mexico, and Brazil. U.S. Fed also increased the interest rates to 5% clubbed with a further indication of increase made global investors change their attitude on emerging markets. On May 22, 2006, the market experienced its biggest intra-day fall ever, with Nifty going down by 165 points. Trading got suspended for an hour due to the sharp fall. Also, the massive selling by the FIIs was one of the primary reasons for the market meltdown. Financial services and automobile sectors were impacted more during the crisis (refer to Figure 5).

The stocks that outperformed, performed moderately, and performed poorly during the crash time have been listed in Tables 4(a), 4(b), and 4(c), respectively.

Figure 5. ***Crash 4 – May – June 2006***

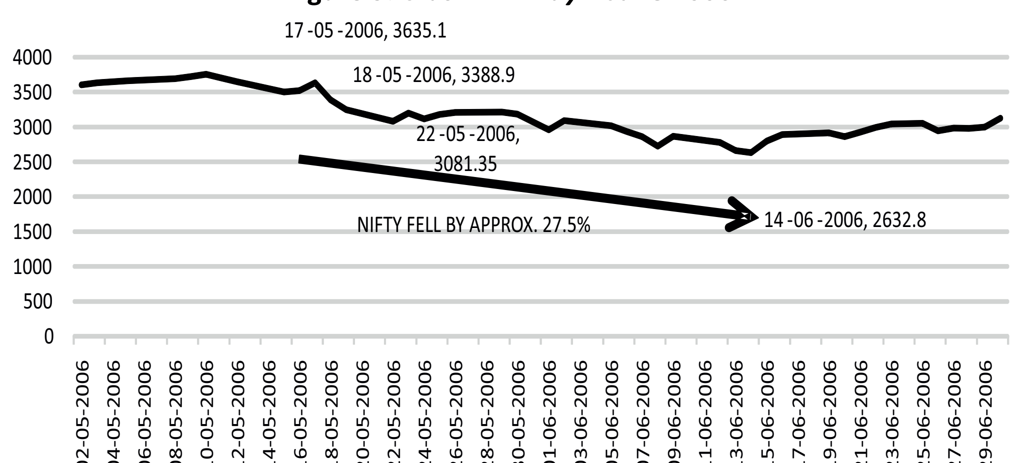


Table 4(a). ***Stocks that Outperformed***

Castrol India Ltd.	Energy	5%

Table 4(b). ***Stocks that Performed Moderately***

Name	Sector	Change
Sun Pharmaceutical Industries Ltd.	Pharma	–18%
Britannia Industries Ltd.	Consumer Goods	–18%
Bharti Airtel Ltd.	Telecom	–18%
GAIL Ltd.	Energy	–18%
Reliance Industries Limited	Energy	–18%
Canara Bank Ltd.	Financial Services	–18%
Apollo Hospitals Enterprise. Ltd.	Healthcare Services	–18%
UPL Ltd.	Fertilizers & Pesticides	–17%
Container Corporation of India Ltd.	Services	–15%
Asian Paints Ltd.	Consumer Goods	–14%
Bata India Ltd.	Consumer Goods	–12%
GRUH Finance Ltd.	Financial Services	–8%
ACC Ltd.	Cement & Cement Products	–8%

Table 4(c). ***Stocks that Performed Poorly***

Name	Sector	Change
Reliance Capital Ltd.	Financial Services	–46%
TVS Motor Ltd.	Automobile	–42%
Indian Oil Corporation Ltd.	Energy	–40%
Engineers India Ltd.	Construction	–40%
Bharat Electronics Ltd.	Industrial Manufacturing	–38%
AIA Engineering Ltd.	Metals	–38%
Bajaj Finance Ltd.	Financial Services	–37%
PNB Ltd.	Financial Services	–37%
Kotak Mahindra Bank Ltd.	Financial Services	–36%
Federal Bank Ltd.	Financial Services	–36%
Indraprastha Gas Ltd.	Energy	–36%
Ashok Leyland Ltd.	Automobile	–36%
Apollo Tyres Ltd.	Automobile	–36%

Crash 5 : 2008 – 09

Figure 6 presents one of the biggest stock markets crashes in worldwide history to date. From January 7, 2008 – October 27, 2008, Nifty fell by approx. 60%.

➯ In the later part of January 2008, the Nifty fell tremendously after scaling the 6,279 peak on January 7, 2008, leading to one of the massive corrosions in investor wealth. The Indices stopped trading on January 21, 2008

Figure 6. ***Crash 5 – 2008 – 09***

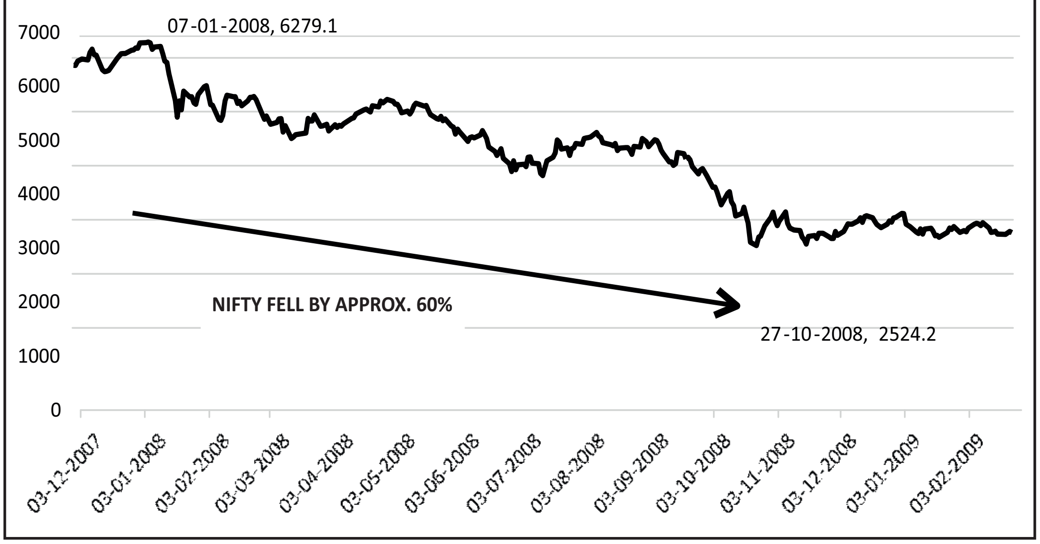


Table 5(a). ***Stocks that Outperformed***

Name	Sector	Change
Union Bank of India	Financial Services	70%
Castrol India Ltd.	Energy	8%
Sun Pharma Advanced Research Company Ltd.	Pharma	5%

Table 5(b). ***Stocks that Performed Moderately***

Name	Sector	Change
Britannia Industries Ltd.	Consumer Goods	–25%
Godrej Consumer Products Ltd.	Consumer Goods	–25%
Cipla Ltd.	Pharma	–25%
Asian Paint Ltd.	Consumer Goods	–24%
Infosys Ltd.	IT	–24%
Cadila Healthcare Ltd.	Pharma	–16%
Bata India Ltd.	Consumer Goods	–4%
Lupin Ltd.	Pharma	–1%

for a while at 2:30 pm due to a technical snag. The day was referred to as "Black Monday." The reasons for the fall included changes in the global investment climate, fears of the world's developed economy going into recession, FIIs selling their funds to move from risky emerging markets to stable developed markets, a cut in U.S. interest rates, etc.

- On January 22, 2008, the Nifty again fell by 309 points to 4,899.
- On February 11, 2008, the Nifty fell to 4,857 by a 5% fall in one day.
- On March 3, 2008, the Nifty fell by 300 points.
- On March 17, 2008, the Nifty fell further to 4,503 – a fall of 5% in one day.

Table 5(c). ***Stocks that Performed Poorly***

Name	Sector	Change
Cholamandalam Investment and Finance Company Ltd.	Financial Services	–89%
Century Textiles Ltd.	Diversified	–88%
Bajaj Finance Ltd.	Financial Services	–86%
JSW Steel Ltd.	Metals	–84%
Tata Motors Ltd.	Automobile	–82%
Reliance Capital Ltd.	Financial Services	–79%
Kotak Mahindra Ltd.	Financial Services	–79%
Yes Bank Ltd.	Financial Services	–77%
ICICI Bank Ltd.	Financial Services	–77%
Central Bank of India	Financial Services	–75%

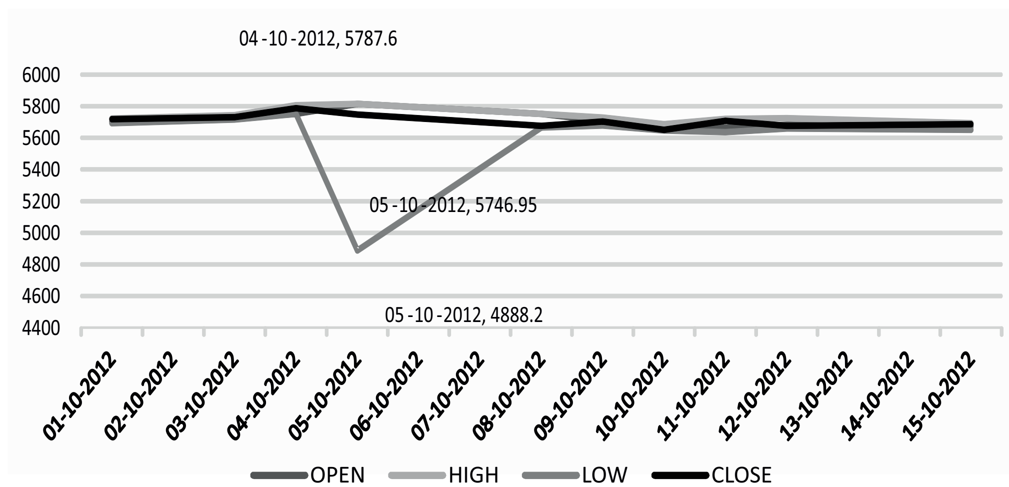
- On October 27, 2008, Nifty closed at its lowest, 2,524.

The stocks that outperformed, performed moderately, and performed poorly during the crash time have been shown in Tables 5(a), 5(b), and 5(c), respectively. Sectors like financial services, automobiles, and industrial manufacturing faced tough times during the crises. On the contrary, sectors like consumer goods, healthcare, and pharma were able to outlive.

Flash Crash : October 2012

A flash crash is a situation when the stock market plummets rapidly within minutes and then bounces back. Various factors can trigger a flash crash, but computer trading programs make any crash worse. If a flash crash lasts for long, investors lose their confidence, which destroys their wealth. It may also trigger a recession if it

Figure 7. ***Flash Crash – October 2012***



happens in the wrong stage of the business cycle. One of such flash crashes happened on October 5, 2012, wherein Nifty fell from 5787.6 to 4888.2 (approx. 15%) as shown in Figure 7. The market circuit filter got triggered due to the entry of 59 erroneous orders by Emkay Global, which resulted in multiple trades for an aggregate value of over ₹ 650 crore. The 'erroneous trade' took a significant toll on some of the key stocks on the NSE : L&T hit a low of ₹ 1,307.25 against Thursday's close of ₹ 1,634.05 ; Tata Motors dipped to ₹ 219.45 (₹ 274.30) ; Reliance Industries to ₹ 682.35 (₹ 852.90) ; Infosys to ₹ 2,060.55 (₹ 2,575.65), and SBI to ₹ 2,010.30 (₹ 2,345.70) ("Nifty plunges 900 points," 2012).

Other Flash Crashes in India

Figure 8 enumerates various other flash crashes in the Indian stock market during the period of January 2001– December 2018.

➯ **Crash 6 : 2015 – 2016 :** Crash 6 and Crash 7 that happened in the year 2015 and early 2016 have been portrayed in Figure 9.

➯ **August 2015 :** The reason for the downfall was the spiral effect due to dreads over a contraction of China's economy ; the Chinese currency was depreciating, leading to rapid selling of stocks in China and India. On Monday, August 24, world stock markets plunged with a simultaneous downfall in the commodity market. As a result, most Asian countries, including Japan, were losing their currencies' value against the United States dollar. In India, the Nifty recorded its biggest single - day fall of 5.94%. The stocks that outperformed, performed moderately, and performed poorly during the time frame have been listed in Tables 6(a), 6(b), and 6(c), respectively.

Figure 8. ***Other Flash Crashes in India***

June 1, 2010	• Reliance stock fell 20% and also pulled down the Sensex by 600 points due to a punching error.
October 26, 2011	• BSE had to annual all trades on 'mahurat day' in 2011 due to extraordinary volumes.
April 20, 2012	• Nifty future dropped over 300 points after stop losses got triggered. The same day shares of Infosys also witnessed a momentary drop of 20%.
October 5, 2012	• Erroneous orders worth over ₹ 650 cr by Emkay triggered a 900 point drop on the Nifty.
September 29, 2016	• Surgical strike by India on Pakistan base. • The Nifty 50 suffered a big jolt, which took the index below its crucial support level at 8,600, led by losses in BHEL, Aurobindo Pharma, ICICI Bank, Tata Power, Adani Port.

Figure 9. *Crash 6 & Crash 7 – 2015 – 16*

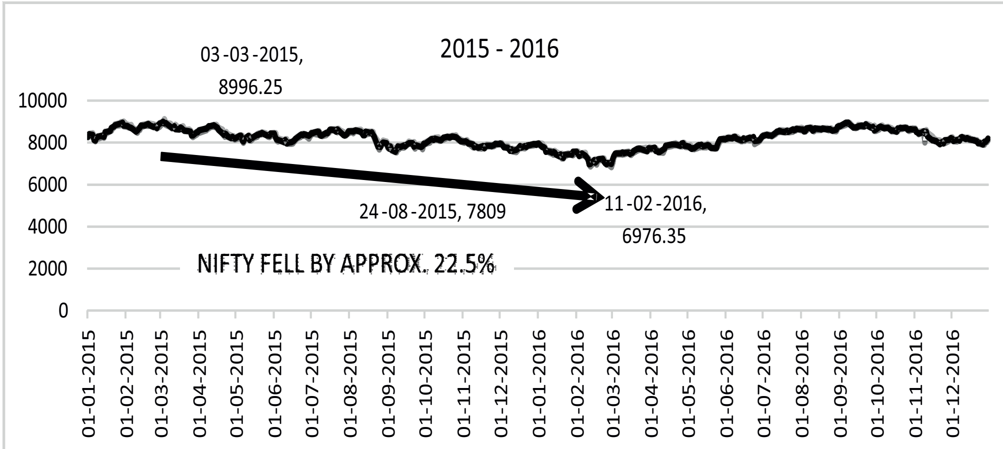


Table 6(a). ***Stocks that Outperformed***

Name	Sector	Change
Aditya Birla Fashion and Retail Ltd.	Consumer Goods	5%
Adani Ports and Special Economic Zone Ltd.	Services	3%
Adani Power Ltd.	Energy	2%

Table 6(b). ***Stocks that Performed Moderately***

Name	Sector	Change
Hero Motocorp Ltd.	Automobile	–3%
Bata India Ltd.	Consumer Goods	–3%
ITC Ltd.	Consumer Goods	–3%
Mphasis Ltd.	IT	–3%
Procter & Gamble Hygiene & Health Care Ltd.	Consumer Goods	–3%
Colgate Palmolive (India) Ltd.	Consumer Goods	–3%
Shriram Transport Finance Co. Ltd.	Financial Services	–3%
Shree Cement Ltd.	Cement & Cement Products	–2%
Balkrishna Industries Ltd.	Automobile	–2%
AIA Engineering Ltd.	Metals	–2%
Power Grid Corporation of India Ltd.	Energy	–2%
Ajanta Pharmaceuticals Ltd.	Pharma	–1%
ACC Ltd.	Cement & Cement Products	–1%
NMDC Ltd.	Metals	0%

Table 6(c). ***Stocks that Performed Poorly***

Name	Sector	Change
Wockhardt Ltd.	Pharma	–21%
Vakrangee Ltd.	IT	–20%
Sterlite Technologies Ltd.	Telecom	–18%

Rajesh Exports Ltd.	Consumer Goods	–17%
Indiabulls Real Estate Ltd.	Construction	–17%
Century Textiles Ltd.	Diversified	–17%
JSW Energy Ltd.	Energy	–16%
Mangalore Refinery & Petrochemicals Ltd.	Energy	–16%
Bank of India	Financial Services	–16%
Indiabulls Ventures Ltd.	Financial Services	–15%

➭ **Crash 7 - February 2016 :** The Indian stock market was persistent in going down in 2016. By February 11, 2016, Nifty saw a fall of 23% over the past 11 months, losing 513 points in four consecutive days of February. The factors contributing to this downfall were the declaration of NPAs of Indian banks, "global weaknesses," and "global factors". Tables 7(a), 7(b), and 7(c) enumerate the stocks that outperformed, performed moderately, and performed poorly during the crash.

➭ **Crash 8 - November 2016 :** Figure 10 portrays the market crash which hit the Indian stock market in November 2016, wherein Nifty fell by 7.2%. The crash was due to the Modi government's announcement of the demonetization drive to curb black money. Some newspapers and magazines believed that the weakening of the rupee against the dollar and the U.S. presidential election affected the investors' behavior.

Tables 8(a), 8(b), and 8(c) enumerate the stocks that outperformed, performed moderately, and performed poorly during the crash.

➭ **Crash 9 - February 2018 :** On February 2, 2018, following the Finance minister's proposal in the budget speech to introduce a 10% long-term capital gains tax on equity, the Indian stock market crashed, resulting in frantic selling. Nifty dropped by approximately 5% within three consecutive days, leading to another market crash in the

Table 7(a). ***Stocks that Outperformed***

Name	Sector	Change
Apollo Tyres Ltd.	Automobile	8%
Procter & Gamble Hygiene & Health Care Ltd.	Consumer Goods	7%
Exide Industries Ltd.	Automobile	2%
Ajanta Pharmaceuticals Ltd.	Pharma	1%
Bosch Ltd.	Automobile	1%

Table 7(b). ***Stocks that Performed Moderately***

Name	Sector	Change
Apollo Hospitals Enterprise Ltd.	Healthcare Services	–2%
United Breweries Ltd.	Consumer Goods	–2%
Sun Pharmaceutical Industries Ltd.	Pharma	–2%
Grasim Industries Ltd.	Cement & Cement Products	–2%
Cadila Healthcare Ltd.	Pharma	–2%
Glenmark Pharmaceuticals Ltd.	Pharma	–2%

Cholamandalam Investment and Finance Company Ltd.	Financial Services	–2%
Bharat Forge Ltd.	Industrial Manufacturing	–1%
Lupin Ltd.	Pharma	–1%
Shree Cement Ltd.	Cement & Cement Products	0%
Balkrishna Industries Ltd.	Automobile	0%
Alkem Laboratories Ltd.	Pharma	0%
Emami Ltd.	Consumer Goods	0%
Marico Ltd.	Consumer Goods	0%
Bharti Airtel Ltd.	Telecom	0%

Table 7(c). *Stocks that Performed Poorly*

Name	Sector	Change
PNB Ltd.	Financial Services	–19%
Suzlon Energy Ltd.	Energy	–18%
Tata Motors Ltd.	Automobile	–18%
Engineers India Ltd.	Construction	–17%
Aditya Birla Fashion & Retail Ltd.	Consumer Goods	–16%
Aurobindo Pharma Ltd.	Pharma	–16%
Wockhardt Ltd.	Pharma	–16%
Vedanta Ltd.	Metals	–16%
Dewan Housing Finance Corporation Ltd.	Financial Services	–15%
DLF Ltd.	Construction	–15%

Figure 10. *Crash 8 – November 16*

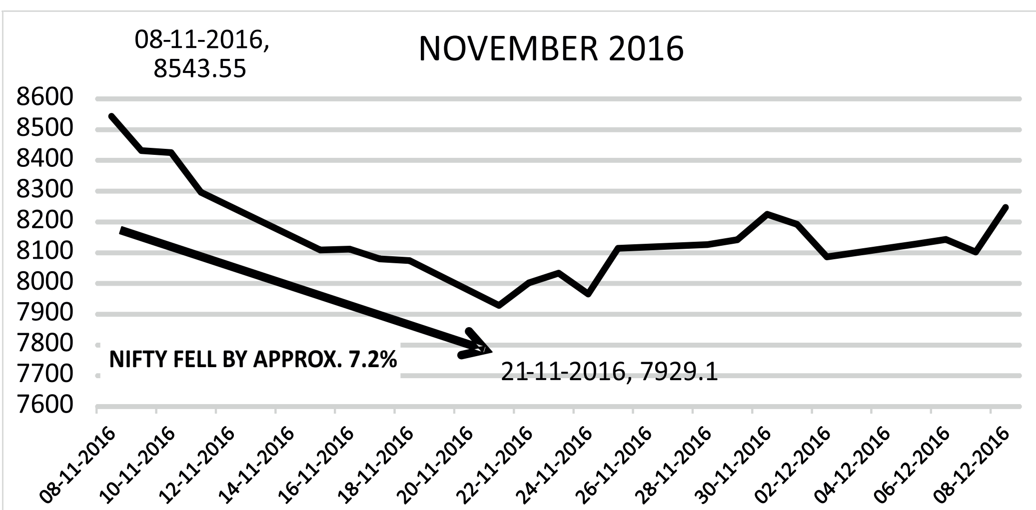


Table 8(a). *Stocks that Outperformed*

Name	Sector	Change
Indian Bank	Financial Services	16%
Sun Pharmaceutical Industries Ltd.	Pharma	9%
Bank of Baroda	Financial Services	8%
Bank of India	Financial Services	7%
Union Bank of India	Financial Services	6%
Power Grid Corporation of India Ltd.	Energy	5%
Canara Bank	Financial Services	4%
Mahanagar Gas Ltd.	Energy	4%
Engineers India Ltd.	Construction	3%
PFC Ltd.	Financial Services	3%
Info Edge (India) Ltd.	IT	2%
Cipla Ltd.	Pharma	2%
State Bank of India	Financial Services	2%
NATCO Pharma Ltd.	Pharma	2%
ONGC Ltd.	Energy	2%
Bata India Ltd.	Consumer Goods	1%

Table 8(b). *Stocks that Performed Moderately*

Name	Sector	Change
Hindustan Petroleum Corporation Ltd.	Energy	–2%
Bharti Airtel Ltd.	Telecom	–2%
Tech Mahindra Ltd.	IT	–2%
Glenmark Pharmaceuticals Ltd.	Pharma	–1%
Reliance Industries Limited	Energy	–1%
AIA Engineering Ltd.	Metals	–1%
Torrent Pharma Ltd.	Pharma	–1%
Bharti Infratel Ltd.	Telecom	0%
Mindtree Ltd.	IT	0%
NTPC Ltd.	Energy	0%

Table 8(c). *Stocks that Performed Poorly*

Name	Sector	Change
Manappuram Finance Ltd.	Financial Services	–32%
Century Textiles Ltd.	Diversified	–30%
Dewan Housing Finance Corporation Ltd.	Financial Services	–30%
PC Jewellers Ltd.	Consumer Goods	–27%
Indiabulls Real Estate Ltd.	Construction	–25%
DLF Ltd.	Construction	–24%
Mahindra & Mahindra Financial Services Ltd.	Financial Services	–24%
Oberoi Realty Ltd.	Construction	–23%

Shriram Transport Finance Co. Ltd.	Financial Services	–22%
Edelweiss Financial Services Ltd.	Financial Services	–21%
L&T Finance Ltd.	Financial Services	–21%

Indian stock market (as shown in Figure 11).

The stocks that outperformed, performed moderately, and performed poorly during the crisis period are listed in Tables 9(a), 9(b), and 9(c), respectively.

Figure 11. ***Crash 9* – *February 2018***

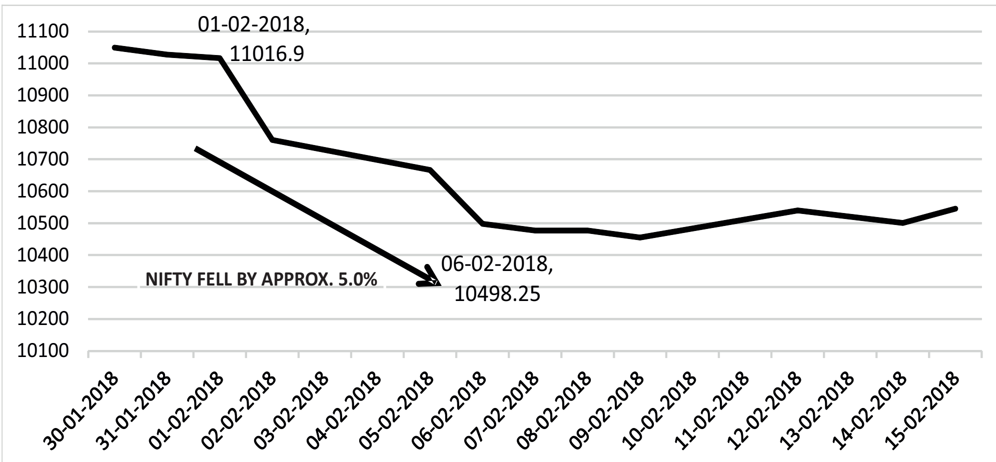


Table 9(a). ***Stocks that Outperformed***

Name	Sector	Change
Bank of Baroda	Financial Services	1%
Ashok Leyland Ltd.	Automobile	3%

Table 9(b). ***Stocks that Performed Moderately***

Name	Sector	Change
Syngene International Ltd.	Pharma	–1%
Tech Mahindra Ltd.	IT	–1%
ITC Ltd.	Consumer Goods	–1%
Bharti Infratel Ltd.	Telecom	–1%
Sun Pharmaceutical Industries Ltd.	Pharma	0%
Power Grid Corporation of India Ltd.	Energy	0%
General Insurance Corporation of India	Financial Services	0%
Bharti Airtel Ltd.	Telecom	0%
Bosch Ltd.	Automobile	0%
Jubilant Life Sciences Ltd.	Pharma	0%

Table 9(c). *Stocks that Performed Badly*		
Name	**Sector**	**Change**
Vakrangee Ltd.	IT	–27%
PC Jewellers Ltd.	Consumer Goods	–19%
Dilip Buildcon Ltd.	Construction	–15%
GMR Infrastructure Ltd.	Construction	–15%
Torrent Power Ltd.	Energy	–13%
Reliance Infrastructure Ltd.	Energy	–12%
Suzlon Energy Ltd.	Energy	–12%
NBCC (India) Ltd.	Construction	–12%
Indiabulls Ventures Ltd.	Financial Services	–12%
Oberoi Realty Ltd.	Construction	–12%
Manappuram Finance Ltd.	Financial Services	–12%

➯ **Crash 10 - October 2018 :** The stock market got shattered after crisis-stricken IL&FS shirked on its interest payments, eliciting liquidity fears among non-banking finance companies (NBFC). Several NBFC shares were poorly thrashed, which further affected the overall market. The stock market correction, which began with the IL&FS crisis, led to several other adversarial issues like the rising crude oil prices, tightening of monetary policy by U.S. Fed, trade wars between U.S. and China, falling rupee, and widening current account deficit in India. All this induced FIIs to liquidate their holdings from Indian stock markets, further weakening the market sentiment, and aggravating the downfall. Figure 12 displays the 10th crash (during 2001 – 2018) of the Indian stock market that occurred in October 2018.

The stocks that outperformed, performed moderately, and performed poorly during the crisis period are listed in Tables 10(a), 10(b), and 10(c), respectively.

After analyzing the above-market crashes for the period from 2001 – 2018, we identified several stocks that have outperformed or have performed moderately during the crisis phases. In other words, these are the stocks that

Figure 12. ***Crash 10 – October 2018***

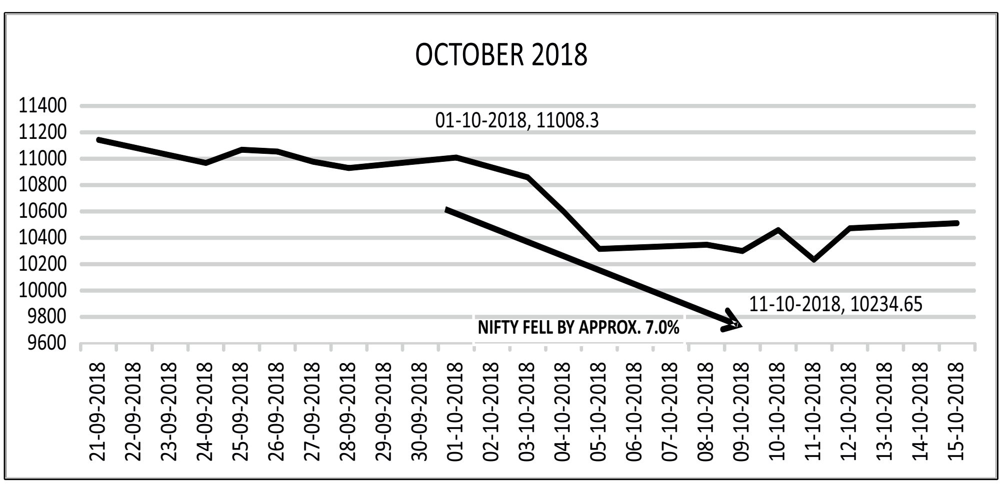


Table 10(a). ***Stocks that Outperformed***

Name	Sector	Change
Vakrangee Ltd.	IT	34%
Yes Bank Ltd.	Financial Services	20%
Adani Power Ltd.	Energy	15%
Mangalore Refinery & Petrochemicals Ltd.	Energy	12%
Indiabulls Real Estate Ltd.	Infrastructure	12%
IDBI Bank Ltd.	Financial Services	9%
PI Industries Ltd.	Fertilizers & Pesticides	8%
Zee Entertainment Enterprises Ltd.	Media & Entertainment	6%
Apollo Hospitals Enterprise Ltd.	Healthcare Services	5%

Table 10(b). ***Stocks that Performed Moderately***

Name	Sector	Change
Colgate Palmolive (India) Ltd.	Consumer Goods	1%
PNB Ltd.	Financial Services	2%
Torrent Power Ltd.	Energy	2%
Info Edge Ltd.	IT	2%
NHPC Ltd.	Energy	2%
Cholamandalam Investment and Finance Company Ltd.	Financial Services	2%
Bharat Electronics Ltd.	Industrial Manufacturing	3%
Bharat Heavy Electricals Ltd.	Industrial Manufacturing	3%
AU Small Finance Bank Ltd.	Financial Services	3%
SBI Life Insurance Company Ltd.	Financial Services	4%

Table 10(c). ***Stocks that Performed Badly***

Name	Sector	Change
Central Bank of India	Financial Services	–33%
Bharat Petroleum Corporation Ltd.	Energy	–24%
Indiabulls Ventures Ltd.	Financial Services	–23%
Prestige Estates Projects Ltd.	Construction	–21%
Tata Motors Ltd.	Automobile	–20%
Dilip Buildcon Ltd.	Construction	–18%
Page Industries Ltd.	Textiles	–16%
Tata Motors Ltd. DVR	Automobile	–16%
Reliance Capital Ltd.	Financial Services	–16%
Quess Corp. Ltd.	Services	–15%

managed not only to survive but also thrive through a difficult period. Table 11 lists out the stocks that have survived the stock market crashes along with their CAGR (compound annual growth rate).

From Table 11, we can infer that the stocks that have survived the market crashes also have a high compounded

Table 11. ***List of Durable Competitive Advantage Stocks along with CAGR***

Name	Sector	CAGR
Bajaj Finance Ltd.	Financial Services	64.80%
Ajanta Pharmaceuticals Ltd.	Pharma	50.44%
Shree Cement Ltd.	Cement & Cement Products	42.42%
Cholamandalam Investment and Finance Company Ltd.	Financial Services	36.63%
Balkrishna Industries Ltd.	Automobile	35.72%
Britannia Industries Ltd.	Consumer Goods	35.50%
Berger Paints India Ltd.	Consumer Goods	34.31%
Lupin Ltd.	Pharma	34.19%
Motherson Sumi Systems Ltd.	Automobile	33.03%
Procter & Gamble Hygiene & Health Care Ltd.	Consumer Goods	32.21%
TVS Motor Ltd.	Automobile	27.15%
Marico Ltd.	Consumer Goods	26.69%
Hindustan Petroleum Corporation Ltd.	Energy	25.92%
Bharat Forge Ltd.	Industrial Manufacturing	25.88%
Godrej Consumer Products Ltd.	Consumer Goods	22.52%
Asian Paints Ltd.	Consumer Goods	20.76%
Sun Pharmaceutical Industries Ltd.	Pharma	20.58%
Mphasis Ltd.	IT	19.68%
HDFC Bank Ltd.	Financial Services	19.66%
Cadila Healthcare Ltd.	Pharma	19.24%
Reliance Industries Limited	Energy	18.08%
Bata India Ltd.	Consumer Goods	17.06%
ITC Ltd.	Consumer Goods	16.45%
Larsen & Toubro Ltd.	Construction	15.62%
Bharti Airtel Ltd.	Telecom	10.46%
Apollo Hospitals Enterprise Ltd.	Healthcare Services	8.22%

annual growth rate. In other words, we can say that stocks that have high CAGR are considered as stocks with a durable competitive advantage (DCA). Also, most of the stocks belong to consumer goods, pharma and healthcare, and financial services. These are the relatively immune sectors to economic downturns and provide a cushion of safety compared to their other sector equivalents. Thus, they are considered to offer a durable competitive advantage.

Other Quantitative Parameters to Identify Durable Competitive Advantage Stocks

To identify durable competitive advantage stocks, investors should make use of fundamental analysis instead of technical analysis. According to Nagendra et al. (2018), fundamental analysis is more suitable for long-term investments ; however, technical analysis has a short-term perspective. Warren Buffett's investment strategy includes investing in financially sound companies with an "enduring moat," or specific characteristic that provides them an edge over their competitor. It could be a strong household brand name, a differentiator, a low-cost provider, strong customer loyalty, a vast distribution network, or so on. However, a durable competitive advantage is something that is more qualitative and subjective in nature. Therefore, different fundamental indicators and parameters can be used to identify stocks with DCA, which are as follows :

(1) Price Earnings Ratio : The P/E ratio is crucial for identifying sound companies. Companies that have a history of steady earnings growth are considered durable companies. Stocks with low P/E, whose business fundamentals are good, are generally considered undervalued stocks that can yield higher returns. Roughly, fundamentally good stocks with a P/E of less than 20 are considered as worth investing in. However, when PE is greater than 20, it is advisable to look at the PEG ratio as well. The PEG ratio incorporates P/E ratio and company's expected earnings growth to reveal better valuation of expanding companies. Generally, a stock whose PEG is less than one is considered as low priced. It does not matter how high the P/E is ; if its PEG is less than one, it can be considered undervalued.

(2) Price to Book Value Ratio : The ratio is determined by dividing a company's market value by its book value. A low P/B ratio (usually less than 1.5) indicates that the stock is undervalued. However, relying only on this measure can be painful, so it should be used along with other profitability parameters like ROE to get a better picture of the company's valuation.

(3) Debt to Equity Ratio : This ratio helps to identify how a company finances its assets. A sound business should always have a manageable debt level as a large amount of debt increases its financial risk. A lower D/E ratio indicates that the company uses a lower amount of debt than its equity. Generally, the ratio should be less than 0.5.

(4) Gross Profit Margin : It is an indicator of efficiency, which tells how much profit a company makes on its cost of goods sold. A company's gross profit margin should be steady. If the margin is not reduced with increasing sales, there is always a *moat* in that business.

(5) Operating Profit Margin : It is indicative of how well a company manages its operations. A company with a steady or increasing operative profit margin qualifies to be having a durable competitive advantage. If OPM is harmful in a particular year, investors must thoroughly analyze the fundamentals ; it can be because of R&D cost for that year or any expenditure. However, OPM should not be negative for more than 2 years.

(6) Return on Equity : It measures the rate at which shareholders are making money on their investments. Companies that have high ROE tend to possess a durable competitive advantage. Investors should look at high ROE (more than 15%) from the past 5 – 10 years to analyze its performance.

(7) Free Cash Flow : FCF is the leftover cash with a company after paying for all its expenses. It is the actual earnings of the owners. It indicates to investors that the company is a cash-rich company, and whenever there is a crisis or economic downturn, the company can manage its operations.

Some Suggestions to Survive Market Crashes

Defensive Strategy

At the time of a market crash, many people start selling their stocks due to panic and anxiety; thus, they incur huge losses and miss out on LT returns. According to Mishra et al. (2010), stock market volatility has drastically increased in recent times in emerging and mature economies. Therefore, it is always better to seek shelter from the tempest at time of risky weather conditions, and one should devote the resources to strategies that may help to survive through turbulent conditions. In other words, investors should play defensive by staying focused on their long-term goals. Minimum volatility and quality factors can provide investors with the conviction to stay invested. One should invest in the stocks that provide a cushion of safety compared to their other sector equivalents. According to Parikh, VP, equities at Motilal Oswal Securities, FMCG, consumer durables, logistics, and pharma companies are considered to be good defensive bets (Varma, 2011).

Defensive stocks are the ones which are relatively immune to economic downturns. They float even during the turbulence. In other words, they are not much influenced by the economic cycle, e.g., Colgate, which belongs to the oral care segment, its business will not be much impacted by a downturn due to its regular usage. On the other hand, stocks from the automobile sector will be affected by rising interest rates or repo rates as consumers will postpone their purchases.

Recognizing a Defensive Stock

Various parameters like beta, ROE, and dividend yield can be used to identify defensive stocks. Typically, defensive stocks have a beta of less than 1, that is, the stock is less volatile than the overall market. In other words, the stock would move slower than the market on the upside as well as the downside. According to Parikh, a stock's average ROE of the last 5 years should be higher than 25% (Varma, 2011). Also, the company should have steady dividend payments with an attractive dividend yield.

Rebalancing your Portfolio

Investors need to review the asset allocation of their portfolio at least one time in a year. It is crucial to rebalance the portfolio when a particular asset makes tremendous profits or generates terrible losses. Rebalancing helps in protecting investors from being exposed to detrimental risks.

In other words, adjusting a portfolio is nothing but correcting the deviations in the initial allocation. For instance, at first, you have allocated 60% of your wealth in equity, 15% in debt, 15% in real estate, and 10% in PPF. After a year, assuming equity increases to 80% of your overall portfolio and 18% in debt, you are required to reduce your exposure to equity as well as to debt to achieve the original mix. This will protect you from the negative market phase and reduce your exposure to overall risk.

There are various ways in which balancing can be done, such as calendar rebalancing, which involves analyzing the portfolio at predetermined time intervals (monthly, quarterly, and and so on) and altering to the initial allocation at the desired frequency. Another technique can be percentage-of-portfolio rebalancing, where a target weight is assigned to every asset along with a corresponding corridor. For instance, 30% in blue-chip, 30% in equity, and 40% in debt with a tolerance range of +/– 3%. In other words, blue-chip and equity may range from 27% – 33%, and debt may fluctuate within 37% – 43%. When any asset class reaches the extreme, the entire portfolio is required to be rebalanced. A third approach is constant – proportion portfolio insurance, wherein a minimum safety reserve must be maintained to meet downside risks.

Diversification Strategy

It is essential not to put all eggs in one basket. Diversification is vital in coping with risk. However, one should not go for overdiversification as well, which may lead to suboptimal margins. It simply means one should invest across a few asset classes by retaining the optimal asset allocation. It is also crucial to incorporate factors such as income, age, expenses, and most importantly goals while building a diversified portfolio. Investors may also invest in disruption-resistant stocks when investing for the long run.

Looking Out for Opportunities

Always consider a market correction as an opportunity to invest. If one has surplus funds and wants to invest in the long term, dips in the market are the best time to invest. One should not be disappointed if investments are not doing well; instead, one should focus on one's goals. Higher investments when the market hits a low helps in averaging out the cost better.

Never Ignore Emergency/ Reserve Funds

Your ability to take risks depends upon the fact that whether you can survive a loss or not. Thus, it is significant to keep a minimum of 6 months of expenses separately as an emergency/ reserve fund. This fund's objective is to meet the expenses in case of financial emergency, like, loss of a job, medical emergency, or any unforeseen circumstances. This reduces the urge to withdraw money at the time of a stock market crash.

Stick with your Financial Plan

It is imperative to stick with your financial plan even during a downturn. When the market moves sideways for years, it looks harder to achieve your goals. However, always remember, the market will eventually bounce back. So, do not stop or withdraw your ongoing investments.

Conclusion

Although investors cannot circumvent all behavioral errors, but they can try to reduce their effects. The best way to avoid these biases requires a proper understanding of one's behavioral mistakes, resisting the propensity to engage in such behaviors, and formulating and implementing rational and objective investment strategies. Investors must also devote their resources for the long-term, identify their risk appetite, establish an apt asset allocation strategy, and rebalance their portfolios periodically. Remember, the secret to float during turbulence is to remain unemotional and examine the scenario calmly and logically. This will definitely lead to judicious investment decisions.

Limitations of the Study and Scope for Future Research

This study has analyzed stock market crashes to identify stocks with DCA, which may help investors to thrive and generate consistent returns through difficult times. A more detailed study encompassing the valuations along with high-frequency data may be taken up for gathering evidence. Future studies can analyze investors' reactions, investing patterns, and behavioral anomalies that they demonstrate during the market crashes. Future researchers can also concentrate on identifying ways to predict stock market crashes so that investors can make their buy or sell decisions rationally.

Authors' Contribution

Dr. Sunaina Kanojia and Deepali Malhotra conceived the idea and framed the research design to undertake the empirical study. The theoretical formalism, data collection, numerical calculations, and analysis were done by Deepali Malhotra. Dr. Sunaina Kanojia verified the analytical methods and supervised the study. Both the authors discussed the results and contributed to the final manuscript.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter, or materials discussed in this manuscript.

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