

# Impact of Hindenburg Report on Indian Stock Market: An Event Study Approach and Cross-sectional Analysis

Altaf Mallik<sup>1</sup>, Dr. Sanjay Kumar Singh<sup>2</sup>

<sup>1</sup>Assistant Professor, Head of Department, <sup>2</sup>Professor, P. G. Head

<sup>1</sup>P. G. Department of Commerce & Business Management, H. D. Jain College, Ara, Bhojpur, Bihar-802301, (A Constituent Unit of Veer Kunwar Singh University, Ara)

<sup>2</sup>Department of Commerce, Veer Kunwar Singh University, Ara, Bhojpur, Bihar-802301,

## Abstract:

The present research examines the impact Hindenburg Research report (published on 23 January 2023) on the sectoral indices of National Stock Exchange NSE. To analyse the impact of the report event study methodology has been used. The paper uses an estimation window of 200 days with an elected event window of 21 days (t-10 to t+10) and Nifty-50 as the benchmark index to calculate the normal return based on the market model. Based on normal returns, Abnormal returns were also calculated and based on abnormal return the average abnormal returns (AAR). The cumulative average abnormal returns (CAAR) were also calculated. All these were analysed to measure the magnitude and timing of different sectoral indices. The exposure of different sectors to such reports were analysed using Beta and R-squared to measure cross sectional differences and market integration. The statistical results shows that the CAAR was negative on the event day and declined rapidly till t+7 days and stabilized after that to -2.5% to -2.9% before levelling off which indicate the report had a significant impact yet a timebound impact and this is in alignment of the semi-strong form of efficiency. The response of the report was asymmetric as it shows varied reaction of the selected sectors. The three most badly impacted sectors were Oil & Gas, PSU Banks and Metals as they showed the largest negative CARs, while some sectors such as IT, Auto and FMCG were moderately impacted as they showed the smallest negative CARs, indicating that investors started shifting their portfolio into sectors which were defensive and globally diversified. The sectoral indices show either no movement or only normal movement before the event, indicating that there was no information leakage. The analysis of the relationship between beta and CAR along with the moderately high R-squared values, suggest that the market responses were driven by governance- and exposure-based variables, rather than the market-based variable. Additionally, this paper shows that such reports have a spillover effect in an emerging market environment, as the impact felt beyond the Adani Group after the release of the report.

**Keywords:** Hindenburg Report; Short Selling; Event Study; Sectoral Indices; Indian Stock Market.

## INTRODUCTION:

### Background:

On 24<sup>th</sup> of January, 2023, *Hindenburg Research*, basically a short-seller published a report<sup>1</sup> intitled “*Adani Group: How The World’s 3<sup>rd</sup> Richest Man Is pulling The Largest Con In The Corporate History*” the research firm alleged the Adani Group that by resorting to stock manipulation and accounting fraud over several years has overvalued its stock in 7 listed companies by 85% and the group stocks have spiked 819% in their values over the last three years, and took a short position in the bond of Adani Group being traded outside India. The report resulted in decline of all major indices in the Indian Stock Market and brought a free fall in the share prices of the group in Indian and overseas, ousting Gautam Adani from the

list of top 10 richest man of the word in the very third day after the publication of report and eroding the groups combined market capitalisation by ₹4.19 trillion<sup>2</sup>. Since its inception in 2017, the Hindenburg Research has flagged wrongdoings in 16 companies, the famous one being Nikola Corp in September 2020<sup>3</sup>. In its first major article in 2018, where it reported the non-existence of assets claimed by Yangtze River Port & Logistics. The China based company with a market capitalisation of \$2 billion, lost 98% of its value after publication of article<sup>4</sup>. The company was delisted from the Nasdaq and lost its law suits against the short-seller.

The publication of key financial reports often affects the behaviour of share prices in the stock markets by introducing new information. Usually, such reports are published on regular interval by the concerned institution or the market regulators and other institutions which are integral to the financial market ecosystem. But sometimes such reports are published by the research firm popularly known as short-sellers which are not formally considered to be the part of financial market and are negative in nature. They address the problem of information asymmetry in the market and benefit from declining share prices (Ramesh,2002-4, Zhang,2022-4). The stock markets are always vulnerable to new information content and when the report of short-selling is made public, its impact is not limited to the concerned entity rather has a cascading effect and engulf the entire stock market even though for a short period of time(Thanh Tuyen Vu and Junyan Liu, 2025). The emerging market are more prone to amplify the market responses because of the existence of information asymmetry in such markets (Barberis, Shleifer and Vishny, 1998) **Problem of the Study:**

Despite the improvement of corporate governance standard and strict compliance norms planned corporate frauds are still a big challenge.

worldwide. Although, sometimes the short seller unearths these corporate frauds but in most of the time the cases are reported very late even by the short-seller causing a huge lose to the investor community. Like other corporate events i.e. mergers, demerger, acquisitions, dividend announcement short-seller reports are new information introduced in the capital market and affecting not only the concern company or conglomerate but the entire market. The prior research mostly focusses either on individual company or group of companies and the sectoral wise impact are not analysed. While the research shows that the short-seller information has sectoral and inter-connected sectoral vulnerability due to cascading effect (Ekkehart Boehmer, 2012)

### **Objective of the Study and Research Gap:**

This study aims to analyse the short-term impact of Hindenburg Research Report on the Indian Stock Market with particular reference to National Stock Exchange (NSE). The study will also analyse the time taken by the market to attain normalcy. Till the time this article is being written no study has been found which analyse the impact of Hindenburg Research Report on the entire Indian Stock Market taking the sectoral data.

1. <https://hindenburgresearch.com/adani/>
2. <https://www.thehindu.com/business/Industry/gautam-adani-no-longer-among-worlds-top-10-richest-people/article66453221.ece>
3. <https://energy.economictimes.indiatimes.com/news/renewable/who-is-behind-hindenburg-the-company-that-is-shorting-adani/97349805>
4. [https://www.sec.gov/Archives/edgar/data/1487843/000121390018012230/fs32018a4\\_yangtzeriver.htm](https://www.sec.gov/Archives/edgar/data/1487843/000121390018012230/fs32018a4_yangtzeriver.htm)

**Research Question:**

This research article endeavours to address the following two questions:

1. Does the release of the Hindenburg Report affect stock prices in the Indian market in the short term?
2. Are certain sectors more sensitive to the impacts of the Hindenburg Report than others?

**Significance of the Study:**

The available literature extensively examines the short-term impact of significant corporate event such as mergers, acquisitions, and dividend announcements on the concerned stocks or companies, the broader implication of adverse information put forth by short-seller reports—especially in terms of sectoral vulnerability and the time required for market to become normal—remain underexplored with reference to Indian Stock Market. The research will provide insight into the impact of short seller information in emerging market like India. Further, the research will enlighten the investors about the market dynamics surrounding such report and help them in deciding their investing behaviour during such time and will also help the market regulators to frame rules and guideline to protect the investors wealth.

**Outline of the Paper:**

The rest of the article will be organised as: literature review followed by research methodology, analysis and Interpretation of data, conclusion and scope of future research.

**LITERATURE REVIEW:*****Short Selling***

The short sellers are the market analyst or researcher deriving benefit from declining prices of stocks and are better known for their sophisticated method of research and bringing efficiency by removing information asymmetry (Weiming Zhang, 2022). The short-sellers have been very instrumental in unearthing various corporate irregularities and cases of frauds (Karpoff, 2015) and help in improving market efficiency (Reed, 2007; Li, Ramesh and Shen, 2011). However, the short selling is not always good as it creates liquidity problem in the market (Stefano Alderighi, 2020) and sometimes spread misleading information and make exaggerated claims creating unnecessary rush in the market and resulting in loss of wealth for the shareholders and companies. But despite this short seller are often considered to be informal market watchdog as they help in uncovering the corporate misconduct and accounting manipulation serving the larger interest of investor community and other market participants (Karpoff and Lou, 2010). As it has been cleared by the recent and past literature, the role of short sellers in the stock market, the literature review will further delve deep into the impact created by the short-sellers information along with the role of event study methodology in measuring the impact of such information in the share market in general and with specific reference to the sectoral impact.

***Efficient Market Hypothesis***

The efficient market hypothesis assumes that the stock prices reflect all the available information as all the information has been discounted and it is almost impossible to generate abnormal information (Trajanov, 2020). The event study methodology is instrumental in testing whether the new information content is helpful in producing average abnormal return (AAR) just after the new information is public at least theoretically if the market is efficient (Pandey, 2022). However, the studies show that the market generate average abnormal returns following the events and produce results that are contrary to the efficient market hypothesis (EMH) which often challenges its validity and referred to as market anomalies (Wong, 2020). The research shows that hidden information content such as insider trading, delayed reporting of important information affect the adjustment of prices and prices do not represent all the information as they finally get adjusted after the new information is in public domain (Theissen, 2014).

***Impact of Macroeconomic and Global Crises on the Indian Stock Market***

The stock market of India like other stock market across the globe is sensitive to the macroeconomics and

international crises and shows sector specific vulnerabilities as sectors such as Banking, Energy, Realty, Service, and Fast- Moving Consumer Goods (FMCG) were more sensitive to these announcement (Gurmeet Singh, 2020). The COVID-19 pandemic was the pinnacle of global crisis that affect the stock market of the world including India when the cumulative average abnormal (CAAR) return was negative across the sector and for different event window (Gupta, 2021), (Chavali, 2020).

#### Stock Market Reactions to Corporate and Information-Specific Events

Sometimes the news doesn't affect the entire market when it is firm or corporate specific. These information's are mostly related to disclosure norms, corporate governance, and financial health of the firm. These information leads to revaluation of the firm as the current and potential investors process it to evaluate risk and management integrity. For example, the news of privatisation of banks in India impacted the stock prices of banks. The study indicated that the cumulative average return (CAR) was significant both for public and private sector banks after the announcement of privatisation banks (Varun Kumar, 2021). The corporate announcements are made frequently due to regulatory and financial requirements and are part of the routine work. But research indicated that announcement such as bonus announcements, ex- bonus, and ex-split events do not affect the share prices in a similar pattern in the times of stressed conditions i.e. pandemic (Tiwari, 2022). The reports of corporate misconduct, corporate transparency and external scrutiny impact the investors perception and in turn affect the valuation of stocks. The earning manipulation leads to the discounted prices of share due to increased risk perceived by the investors (Choudhary, 2021). The crash of stock prices can happen due to lower transparency in the emerging economies with weak corporate governance structure and compliances (Moslehpour, 2021). The external players such as external reports and audit reports sometimes provide critical information about the corporates that can significantly generating response from the market. The audit qualifications influence the investment decisions (Giuseppe Ianniello, 2015).

#### Cross-sectional Determinants of Stock Market Reactions

Cross-Sectional analysis is crucial for understanding the heterogeneity of impact in different stock markets to the incidents as the response of the firm, industry, sectors and the country have varied response to the same events. For instance, the response of energy sector was different from healthcare, telecommunications, and information technology in the aftermath of covid outbreak (Maretno A. Harjoto, 2021). In a similar fashion, in China the government measures after COVID-19 generated positive average abnormal return for manufacturing sector but the response was negative for the labour intensive firms (Schoenherr, 2022).

#### Cascading Effects of Short-Seller Information on Stock Prices:

The news related to any corporate entity does not only affect the stock price of that entity rather it creates a cascading effect through multiple channels. The core function of short-seller as information intermediaries arises from their ability to detect the overpriced securities due to information asymmetry and signalling of pessimistic view (Liu, 2025). The heightened activity of short- seller incentivise short-selling as it accelerate the price discovery by revealing the negative information as they trigger hosts of negative information following the main information (Robert Bushman, 2023). Stock price movement and the amount of short selling does not exist in a simple linear manner as both are involved with a much larger set of nonlinear and complex behaviours, based on how participants in the market interact with each other and how they use the regulatory environment to transmit information about the stock (Liu, 2025). Short seller information generates feedback through four main dimensions; Market Micro-Structure, Information Asymmetry, Investor Psychology, Regulatory Policies that will create either increased volatility or decreased volatility depending on the conditions at hand.

#### Differential Sectoral Responses to News Events

The new information content does not affect the market with the same magnitude across the sector and

indices, pronounced heterogeneity is found in how they respond. The studies demonstrate that different sector respond differently to any new information. For instance, the study of Vietnamese stock exchange shows that after the trade agreement six sectors responded positively and fourteen sector responded negatively (Pham *et al.*, 2024). The variation is not only sector-wise rather the timing of the reaction is also differentiated. The research reveals that the market reaction may vary significantly across the sector. Some sector shows immediate reaction while other respond after sometime (Syarif, 2025). Among the sector that is found to be more sensitive is banking sector. The sector exhibits heightened sensitivity macroeconomic announcements as the news of interest rate changes and unemployment emerges triggering significant abnormal returns (Pelcher, 2023).

### Recent Studies

The studies on the impact of Hindenburg Research report shows that the impact of the report was severe on the Adani Group of Enterprise (Mallesha L. and Archana H. N., 2023; Kumar, 2024). The report created impact outside the Adani Group of Enterprise as the stock prices of Life Insurance Corporation of India (LIC) and State Bank of India (SBI) exhibited decline in its share prices (Ghosh, 2023; Dinesh Rawat, 2025) which shows that such reports by the short-seller creates a spillover effect.

### Gaps in the Existing Literature

The recent studies show that the impact of Hindenburg Research report has been analysed widely but the sectoral analysis has not been done as to how these reports affect different sectoral indices following such reports.

## **DATA AND RESEARCH METHODOLOGY:**

### Event Study Methodology

The event study methodology since its introduction in 1931 has been quite instrumental in measuring the impact of unknown and sudden event in the stock market. The methodology got formalised when the Fama and Fisher (1969) published their seminal work on stock split. Since then, the methodology is not limited to stock split rather it has been widely used for events such as merger and acquisition, dividend announcement, political event, budgetary provisions, corporate fraud disclosure, regulatory changes, etc. making it more suitable to apply in measuring the impact of short-selling information's. Further, the methodology helps in analysing the pattern of market recovery following the negative impact of unknown event (Varma *et al.*, 2021). The methodology provides deeper insights by providing the abnormal returns around the event (Pusvita Yuana, 2025). The event studies also offer insights into behavioural finance as to how investors sentiments are affected by the happening of certain events (Barberis, Shleifer and Vishny, 1998). As the methodology integrate both quantitative and qualitative, making it more encompassing and versatile in nature. There has been a constant refinement of the methodology which expand its applicability to major the sectoral vulnerability (Kadhem, 2025).

### Hypothesis

Based on the background on which this research is being proposed and the literature being analysed, the following null hypothesis have been formulated;

1. Hindenburg Research report on Adani Group has no impact on Indian Stock Market.
2. Hindenburg Research report on Adani Group has an impact on Indian Stock Market.

### Data

We try to examine the impact of Hindenburg Research report on sectoral indices i.e. Nifty Bank, Nifty Auto, Nifty Financial Services, Nifty Financial Services 25/50, Nifty FMCG, Nifty IT, Nifty Media, Nifty Metal, Nifty Farma, Nifty PSU Bank, Nifty Private Bank, Nifty Reality, Nifty Health Care Index, Nifty Consumer Durable and Nifty Oil & Gas of National Stock Exchange (NSE) of India. Although, Bombay Stock Exchange (BSE) also has sectoral indices but it does not have no index for Public Sector Undertaking (PSU) bank unlike NSE. To calculate normal return using alpha and beta coefficient of the

regression between the stock returns and the respective benchmark index returns, we require a benchmark index for our sample sets. Nifty-50 has been used as a benchmark for all the fifteen sectors mentioned above. For the purpose of calculation, we have used the daily closing prices of the sectoral stocks and the benchmark indices have been collected from the NSE's official website<sup>5</sup>.

Table-1

S. No.	Sectoral Indices
1	Nifty Bank
2	Nifty Auto
3	Nifty Financial Services
4	Nifty Financial Services 25/50
5	Nifty FMCG
6	Nifty IT
7	Nifty Media
8	Nifty Metal
9	Nifty Farma
10	Nifty PSU Banks
11	Nifty Private Bank
12	Nifty Reality
13	Nifty Healthcare Index
14	Nifty Consumer Durable
15	Nifty Oil & Gas

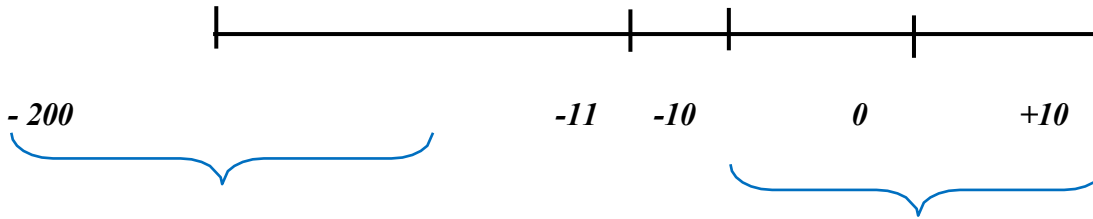
Source(s): [www.nseindia.com](http://www.nseindia.com)

#### RESEARCH METHODOLOGY:

To calculate the impact of Hindenburg Research report on the sectoral indices of the NSE standard event study of the (Brown and Warner, 1980; Haven *et al.*, 1985) will be used in this paper. For this purpose, first of all we will define event date, event window and estimation window. On January 23, 2023 the research report was published so On January 23, 2023 will be our Event Date. The estimation window will be of 200 days will be used (t-200 to t-11). The event window will include 21 days (t-10 to t+11).

5. <https://www.nseindia.com/reports-indices-historical-index-data>

**Event Day  $t$**



**Estimation Window**

Source(s): Author’s Estimation

We need to select and apply an estimation model to estimate the expected/normal stock return; the ordinary least squares (OLS) market model is the most common estimation model in event study research to assess the impact of an event (Brown and Warner, 1980; Dharen Kumar Pandey, 2021; Gupta, 2021; Varun Kumar, 2021). Therefore, we will use the OLS market model to estimate the normal return.

$$NR_{st} = \alpha + \beta R_{mt} \tag{1}$$

The abnormal return for a given stock at time  $t$  ( $AR_{st}$ ) is equal to the difference between its actual return on that same date ( $R_{st}$ ) and the actual return on that same date that would be expected if it had followed the returns of the overall market as well as the returns of the overall market ( $NR_{st}$ ) with a value of  $\alpha$  for the intercept and  $\beta$  for the slope of the regression model; and a value of  $R_{mt}$  for the return on the overall market (or benchmark) for each day  $t$ . The abnormal return will be calculated as per following equation:

$$AR_{st} = R_{st} - NR_{st} \tag{2}$$

Here,  $AR_{st}$  denotes the abnormal return of stock  $s$  at time  $t$ ;  $NR_{st}$  is defined as in equation (1); and  $R_{st}$  is the actual return on stock  $s$  on day  $t$ , computed according to equation (3) as:

$$R_{st} = 100 \times \log \left( \frac{CP_{st}}{CP_{s,t-1}} \right) \tag{3}$$

$CP_{s,t-1}$

Where  $\log(N)$  is the natural log of  $N$ ;  $CP_{st}$  is the closing price of the Stock  $S$  on Day  $T$ ; and  $CP_{st-1}$  is the closing price of stock  $s$  on day  $t-1$ . Then, the abnormal returns, which were calculated for each of the sample bank, are combined for all of the sample banks and divided by the total number of banks to provide the AAR for Day  $T$ , as shown in equation (4):

$$AAR_t = \frac{1}{N} \sum_{s=1}^N AR_{st} \tag{4}$$

The term ( $AAR_t$ ) represents the average abnormal return on a specific day ( $t$ ) and ( $N$ ) is the number of observations in our sample. The AARs of each day will be summed up to calculate the cumulative average abnormal returns (CAARs). For testing if the CAARs are statistically significant, we use t- statistics. We can determine this using t-tests for ( $AAR_t$ ) and ( $CAAR_t$ ) with the formulae presented in equations (5) and (6):

$$AAR_{t,t} = \frac{AAAR_t}{\sigma_{N,et}}$$

$$CAAR_t = \frac{CAAR_t}{\sigma_{\{N,et\}} \sqrt{N_{t+1}}}$$

(5)

(6)

CAAR<sub>t</sub> is a measure of the cumulative average abnormal return for Day t. N<sub>t+1</sub> means that we are looking at the absolute value of the day after the event. σ<sub>N,et</sub> is a measure of the standard deviation of all of the estimation-period abnormal returns for all of the banks in our sample, which is defined by the following equation (7):

$$\sigma_{N,et} = \sqrt{\sum_{s=1}^N \sigma_{2s,et}^2}$$

$$\sigma_{N,et} = \sqrt{\sum_{s=1}^N \sigma_{2s,et}^2}$$

N<sub>2</sub>(7)

Where σ<sub>s,et</sub> is the daily standard deviation of stock returns for each “sample sector and N is the number of sectors in our “sample.” The t-values from the calculation above are then compared with the critical t-values found in tables for each desired level of significance, so that we can make conclusions about whether to accept or reject our research hypotheses.

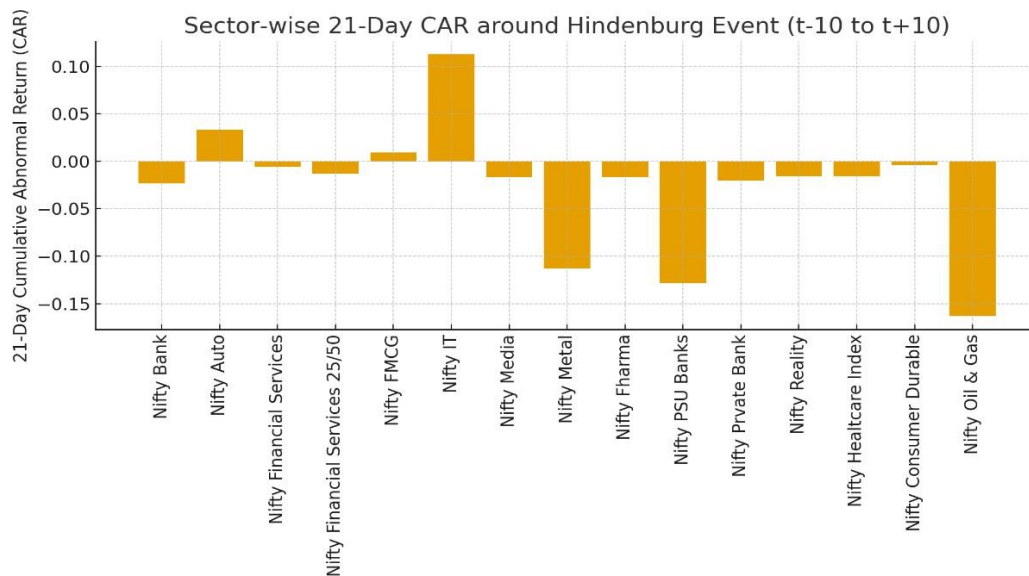
### QUANTITATIVE RESULTS AND DISCUSSIONS: - ANALYSIS OF CUMULATIVE AVERAGE RETURN:

The detailed analysis of the 15 sample sectors that we had chosen for the study (Figure-1). We found that most of cumulative abnormal returns from the (-10 +10) window were negative; the severe losses were incurred by Oil & Gas Index and were statistically significant too, while the PSU Banks and Metals had incurred large negative CARs. But surprisingly, IT, Auto and FMCG sectors showed CARs, indicating rotation toward less vulnerable sectors. However, the overall trend of the average CARs demonstrates that market experienced abnormal losses that was accumulated for almost a week after the report and then began to show the sign of stabilisation. This trend confirmed that the Hindenburg Report adversely impacted the Indian Stock Market across the sector in short term and economically meaningful way with sectoral heterogeneity. (Summary-1:<https://drive.google.com/drive/u/3/home>).

Further analysis of the data suggests that the 12 out of 15 sectors indices exhibited negative CARs and if we look at the t the cross sectional mean CAR of all the sectoral indices during the event window it was around -2.5% further suggesting that the negative impact was experienced the market pervaded across almost all the industries and not limited to Adani Group Conglomerate and few selected industries. Sectoral analysis further reveals that the Oil & Gas was the worst performing sector as it experiences a CAR of around -16% with a t-statistics showing greater than 5% critical value and another two worst impacted sector was PSU Banks and Metals that experienced a CAR of - 11% and more indicating investors concerned about the exposure to Adani conglomerate and the shock generated by the report to different sectors. Surprisingly, some sectors such as FMGC, IT, and Auto experienced positive CAR that indicate that the investors were reallocating their portfolios these sectors as these sectors were perceived to be less vulnerable to the Hindenburg Report allegation on the Adani Group and were used as safe heaven

by the investors. Further, the CAR appeared to plateau after the end of ten days event window indicating that the market captures the available information in a very short period of time after and the impact was felt for a limited time frame after which the abnormal return ceased to exist and market return to normalcy/equilibrium and stop overreacting to the report. As an overall scenario, the movement of the share prices (represented by CAR) demonstrate that the reaction on the first day of the event was smaller in magnitude but with the news spreading widely, the stock market starts to react and thereby impacting almost all the sectors for the next several trading days. However, after few days the impact got concentrated to specific sectors and consolidated the view that Hindenburg resulted in transfer of wealth and risk in the Indian Stock Market and was more concentrated to few sectors rather the collapse of the entire market.

Figure-1



**Note:** - at 5% Significance Level (1.96).

**BETA AND R-SQUARE ANALYSIS:**

The (Table-2) Beta ( $\beta$ ) quantifies the systematic risk that exist in each of the 15 NSE sectoral indexes chosen for the study, i.e., how the particular sector responds to changes experienced in the general/benchmark index. The sector- wise analysis of the Beta ( $\beta$ ) shows that out of 15 NSE sector indexes nine (9) sectors i.e. Nifty Metal, Nifty PSU Banks, Nifty Reality, Nifty IT, Nifty Media, Nifty Private Bank, Nifty Financial Services 25/50, Nifty Bank having a beta value greater than one (1) and hence these sectors can be categorised as cyclically aggressive sectors. The price appreciation of these sectors usually outperforms the market during the bull run and underperform during the bear market. Among the nine (9) sectors indexes having a beta greater than one (1), Nifty Metal (beta = 1.32) followed by Nifty PSU Banks (beta = 1.24) and Nifty Reality (beta = 1.20) are the most reactive to the market, indicating the existence of systematic risk exposure of these sectors. The banking sectors and financial service sectors with beta slightly over one (1) implies that being a core market related sectors their performance depends on the overall economic conditions that persist in the economy rather than any negative news that shock the market for a short period of time.

Contrary to the above, the betas of Nifty Auto, Nifty Oil & Gas, Nifty Consumer Durable, Nifty FMCG, Nifty Healthcare Index, Nifty Farma having a beta less than one (1). These sectors are most susceptible to the market swings and considered to low-risk sectors relatively. Sectors such as Nifty FMCG, Nifty Pharma, and Nifty Healthcare Index, with a beta close to 0.60, will be categorised as less vulnerable or defensive sectors, as their performance are based on stable demand and sector specific factors than some

external shocks of which they are not a direct party. The sectors with betas close to one (1) but not going beyond one (1) such as Nifty Auto, Nifty Consumer Durable, and Nifty Oil & Gas are moderately cyclical i.e. they react to the market swings but not as vehemently as sectors such metals and PSU banks.

The estimated betas help us to make a categorisation of sectoral indexes on the basis of risk – high risk to low-risk sectors or sensitive to defensive sectors. These categorisations are important while interpreting the result of event study as it indicates the most reactive sectors to such events and provide protection against such broad volatility.

The value of R-squared based on market model regression ranges from 0.36 to 0.86 and their mean being 0.57. This means minimum 36% and maximum 86% of the movement in each sector return can be attributed to the movement in the general market indexes and rest either represents either industry or firm specific factors. The return of Banking/Financial sector with high R-squared values (>0.75) suggest that their return the existing market conditions. Contrary to this the FMCG, Healthcare/pharmaceuticals sector having a R- squared values (0.36 & 0.41) indicate that their reaction is based on fundamental of macro-economic conditions and overall systematic risk that exist in the market. Finally, the sectors with large cumulative abnormal returns are Oil & Gas and PSU Banks during event window and having a moderately high R-squared values suggesting that the Hindenburg report generated sector specific shock against the ordinary market behaviour.

**Table-2**

Sector	Beta	Intercept	R-Square
Nifty Bank	1.0457	0.000614	0.7637
Nifty Auto	0.935	0.000742	0.5555
Nifty Financial Services	1.0754	0.000311	0.8219
Nifty Financial Services 25/50	1.0604	0.000289	0.86
Nifty FMCG	0.6231	0.000971	0.4125
Nifty IT	1.1835	-0.001397	0.5794
Nifty Media	1.1436	-0.000814	0.4962
Nifty Metal	1.3161	6.6e-05	0.4688
Nifty Farma	0.5957	-0.000415	0.3645
Nifty PSU Banks	1.2382	0.002048	0.4337
Nifty Prvate Bank	1.0784	0.000592	0.7464
Nifty Reality	1.1951	-0.000433	0.5708
Nifty Healthcare Index	0.6228	-0.000355	0.3931
Nifty Consumer Durable	0.8636	-0.000691	0.5981
Nifty Oil & Gas	0.9326	0.000249	0.4824

**CONCLUSIONS AND IMPLICATIONS OF THE STUDY**

The present study investigates the short-term impact of the Hindenburg Research report (January 23, 2023) on the Adani Group and on Indian stock market with specific reference to National Stock Exchange (NSE) taking 15 sectors as sample. The study uses event study methodology to asses the impact based on 200-day estimation period, 21-day event window (t-10 to t+10) along with cross-sectional beta and R-squares tests.

The ACAR shows a negative patter immediately following the event date and decreases rapidly till t+3 days and reaches to its lowest point at t+7 days (approximately -2.5% to -2.9%) and thereafter stabiles and do not decline further significantly. The pattern outrightly reject the null hypothesis as to the no effect of Hindenburg Research on Indian stock market and is consistent with the semi-strong form market efficiency as the prices attain a new equilibrium within a short time frame of around one week for many sectors. (Summary-2: <https://drive.google.com/drive/u/3/home>).

The impact of the Hindenburg Research report is extremely asymmetric across the chosen sectors. The

CARs occur negative for three sectors Nifty Oil & Gas (-16%), Nifty PSU Banks (-13%) and Nifty Metal (-11%) for 21 days window. These sectors are primarily associated with the production & distribution of energy products, construction/infrastructure projects and concentrated lending to large conglomerates (notably those affiliated with the Adani Group). Sectors such as Nifty Bank, Private Bank, Media, Realty, Pharma and Healthcare shows moderately negative CAR indicating an indirect contagion of the sectors as they are not directly associated with the Adani Group of Companies and increase the perception of systematic risk although the pattern of CAR shows no existence of extreme systematic risk in these sectors. Contrary to the sectors mentioned previously Nifty IT and Nifty Auto shows a positive cumulative abnormal return (approximately +11% for IT, and positive and statistically significant in shorter windows for Auto). Nifty FMCG shows slightly small positive CAR indicating a shift from sectors that are exposed to Adani Group (e.g., Energy) to sectors that are consumption driven, export oriented and defensive (e.g., IT).

The beta estimates show two different beta cluster i.e. high and low beta stocks. Although a very poor and slightly negative correlation exist between CAR and beta and if we associate it with moderate to high R-square values it indicates that idiosyncratic firm-specific information that are related to governance structure and group exposure played an important role in generating asymmetric responses among different sectors i.e. Oil & Gas.

From the above findings several conclusions can be drawn for practical policy implications. For the investors and portfolio manager the findings stress the needs for sectoral diversification while responding to such new information event. The finding also necessitates the need for quick reaction times to major information events, and why it is needed to incorporate additional measures and look beyond the traditional CAPM-based risk assessments to assess the risk exposure factors specific to the firm and including exposure to specific group and debt network risks. Additionally, the findings stress the need for lending institutions to develop stringent procedures and strong model for risk assessment that accounts for governance structure, and transparency regarding their lending to such a large business conglomerate. Finally, as can be seen from the findings that market responds asymmetrically to new information content and necessitate a call for setting strict standards for disclosures and governance requirements and an stress testing for exposures to large business houses and a continued refinement of safeguard mechanism and communication strategies to manage such market shocks.

The future research may be done on firm specific response, alternate event windows, multifactor models, sentiment-based measures, cross country comparison and policy & regulatory response during such type of governance related shocks.

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