



# ANVESHAN

## अन्वेषण

Post Graduate and Research Department of Commerce

*Chief-Patron*

**Rev. Dr. Dominic Savio, S.J.**  
(Principal)

*Patron*

**Rev. A. Peter Arockiam, S.J.**  
(Vice-Principal, Commerce-evening)

*Editors*

**Dr. Sanjib Kumar Basu**  
**Dr. Sumanta Dutta**

*Associate Editor*

**Prof. Ankita Samanta**

*Editorial Board Members*

**Dr. Uttam Kumar Dutta,**  
Professor, Department of Commerce  
Netaji Subhas Open University

**Dr. Pradipta Banerjee**  
Professor and Head, Department of Commerce  
Sidho Kanho Birsha University

**Dr. Rajib DasGupta**  
Professor, Department of Commerce,  
University of Calcutta

**Dr. Sujit Mukherjee**  
Professor, School of Management Sciences  
Maulana Abul Kalam Azad University of Technology

2021



**Bharti Publications**  
**New Delhi-110002 (India)**

## *Copyright © Editors*

**Title:** Anveshan (अन्वेषण)

**Editors:** Dr. Sanjib Kumar Basu and Dr. Sumanta Dutta

All rights reserved. No part of this publication may be reproduced or transmitted, in any form or by any means, without permission. Any person who does any unauthorised act in relation to this publication may be liable to criminal prosecution and civil claims for damages.

First Published, 2021

ISBN: 978-93-91681-35-7

Published by:

### **Bharti Publications**

4819/24, 3<sup>rd</sup> Floor, Mathur Lane

Ansari Road, Darya Ganj, New Delhi-110002

Phone: 011-23247537, Mobile: +91-989-989-7381

E-mail: bhartipublications@gmail. com

info@bharatipublications. com

Website: www. bhartipublications. com

Printed in India, by Sagar Color Scan, Delhi

**Disclaimer:** The views expressed in the paper/chapter are those of the Author(s)/ contributor(s) and not necessarily of the publisher and editors. Author(s)/ contributor(s) are themselves responsible for the facts stated, opinions expressed, conclusions reached and plagiarism. The publisher and editors of the book bear no responsibility.

## Message from the Principal



*It gives me immense pleasure to share the information that the Post Graduate and Research Department of Commerce of our college has taken the initiative to publish an Edited Book Series Anveshan (अन्वेषण) from 2021 to encourage the students of Post Graduate & Research Department of Commerce to pursue research.*

*As a matter of further advancement in commerce education, this initiative unique in the sense, will inspire our young post graduate students to undertake meaningful research. It will be an add-on attempt to the enriched catalogue of college publications and academic literature.*

*I would like to congratulate the students whose dissertations are published in this edited volume as a research paper and simultaneously expect that all the students will consider research more seriously. In addition to that, I also like to congratulate the Editors and the entire Editorial Board members for their wonderful job and I strongly believe that this good work will be carried forward in the years to come.*

**Nihil Ultra**

*Rev. Dr. Dominic Savio, S.J.*

*Principal*

*St. Xavier's College (Autonomous), Kolkata*

## Message from the Vice Principal (Commerce-Evening)



*It is a matter of pride that Post Graduate and Research Department of Commerce of our college has taken a noble initiative to launch an Edited Book Series Anveshan (अन्वेषण) from 2021 to encourage the students of Post Graduate & Research Department of Commerce to pursue meaningful research. As we know, research starts with questions for which a researcher wishes to seek answers. Through these initiatives, we try to inculcate a culture of research in the mind of younger generations. It will enrich the college publications and academic literature of our oldest post graduate department.*

*I would like to congratulate the students whose dissertations are published in this edited volume. Besides that, I also like to congratulate the Editors and the entire editorial advisory team for their continuous effort in this regard. I strongly believe that this will bring a new culture of research centric environment in line with New Education Policy 2020.*

**Nihil Ultra**

*Rev. Fr. Peter Arockiam S.J.*

*Vice Principal, Commerce (Evening)*

*St. Xavier's College (Autonomous), Kolkata,*

*West Bengal, India.*

## Editorial

*St. Xavier's College (Autonomous), Kolkata is well known for its academic excellence and committed services towards dissemination of knowledge in the academic world. The College appreciates the role of research in education and aims in developing an inclination towards research among the faculty members and the students. In this pursuit, the Post Graduate and Research Department of Commerce has taken an initiative to publish an Edited Book Series titled Anveshan (अन्वेषण) from 2021 to encourage the students of Post Graduate and Research Department of Commerce to pursue meaningful research under the able guidance of the faculty members of the department.*

*The research articles for this volume are selected on the basis of the final score obtained by the respective candidates in their Dissertation Work at the end semester examination. The articles cover the contemporary issues in the field of accounting, finance as well as marketing management.*

*We sincerely thank to Rev. Dr. Dominic Savio, S.J., Principal and Rev. Fr. A. Peter Arockiam, S.J., Vice-Principal, Department of Commerce (Evening) of our college for their constant words of inspiration and support.*

*We congratulate all the students whose research papers are published in this edited volume and express our sincere thanks to their supervisors and referees.*

*We would also like to thank Almighty God and pray for His blessings without which this achievement would not have been possible.*

**Sanjib Kumar Basu  
Sumanta Dutta**



# CONTENT

<i>Message from the Principal</i>	iii
<i>Message from the Vice Principal (Commerce-Evening)</i>	iv
<i>Editorial</i>	v

## Section 1

### Accounting & Finance

<b>1. An Analytical Study on Progress, Financial Performance and Efficiency of Selected Banks in India</b> Jayshree Roongta	3-16
<b>2. Study on Women Entrepreneurship with Reference to Selected Women Entrepreneurs in Kolkata</b> Divyani Datta	17-22
<b>3. An Empirical Analysis of Herding Behaviour in Indian Stock Market During COVID-19</b> Debangana Ray	23-42
<b>4. A Study on the Financial Performance of Oil and Natural Gas Corporation Limited from 2015-16 to 2019-20</b> Arkatanu Chakraborty	43-57
<b>5. A Study on Impact of Merger and Acquisition on the Financial Performance of ONGC and HPCL</b> Adeeba Arfeen	58-66
<b>6. A Study on Change in Stock Price and Stock Market Participants Behaviour towards Stock Split</b> Kumar Satyam	67-75
<b>7. An Empirical Study on Real Estate Market: Slowdown to Lockdown</b> Debarghya Chowdhury	76-85
<b>8. The Relationship between Economic Growth and Foreign Direct Investment</b> Sahil Rampal	86-96

## Section 2

# Marketing

- |   |                |
|---|----------------|
| <b>9. Perception of Consumers towards Online Food Delivery Safety Amidst Pandemic: A Study Based on Kolkata</b><br>Priyanka Paul  | <b>99-110</b>  |
| <b>10. Impact of Service Quality on Customer Satisfaction of the Selected Banks in Dhanbad During COVID-19 Pandemic</b><br>Shreya Singh   | <b>111-120</b> |
| <b>11. The Impact of Advertisement Campaigns by Audio Streaming Services on Consumer Preference and Response During the COVID-19 Pandemic: A Study in Four Major Metropolitan Cities</b><br>Rebanto Roy | <b>121-126</b> |
| <b>12. A Study on the Effectiveness of Online Education Among College Students in Kolkata</b><br>Sourya Chakrabarty   | <b>127-136</b> |

## **Section 1**

# **Accounting & Finance**



# An Analytical Study on Progress, Financial Performance and Efficiency of Selected Banks in India

Jayshree Roongta<sup>1</sup>

Post Graduate & Research Department of Commerce, Batch: (2019-2021)  
St. Xavier's College (Autonomous), Kolkata

## Abstract

*In the advanced financial landscape, banks represent the most prominent position. Its influence is valuable for a country's monetary movement and industrial progress. Banking firms function in a highly legislated setting in all parts of the world.*

*Indian banking is a perfect blend of public, private and foreign standings. Banks in India focus on initiating, directing and distributing savings effectively. The variables for measuring financial performance include balancing liquidity with profitability, reserve management and credit creation.*

*In the context of the national financial prospects, the analysis of the banking industry should be performed, given the influence of the banking and other associative financial sectors on financial stability. As the banking industry has a significant impact on the economy holistically, it is very essential to examine, assess and evaluate its performance efficiency and effectiveness.*

*Numerous methodologies are used to evaluate the banks performance. The CAMELS Framework, formulated by federal regulators in the USA in the 1970s, is one of the prominent methods. This study uses CAMELS Model for the assessment of financial health and performance by the management of the bank. An evaluation of five key elements of the operations of a financial institution is based on the CAMELS rating system. These include: capital adequacy, asset quality, management efficiency, earnings efficiency, and liquidity standings. The Bank is required for capital adequacy, asset quality to be strengthened, management to be improved, income to be increased and liquidity to be maintained against various risks.*

**Keywords:** Banks, Financial Efficiency, Financial Performance, Progress.

---

1. This Dissertation was done by the scholar under the guidance of Dr. Amitava Roy

## Introduction

Banks are critical not only in terms of economic development, but also in terms of financial stability. Banks are unique given three major contexts in emerging economies. For starters, they play a key role in the expansion of other financial intermediaries and markets. Second, because of a lack of good equity and bond markets, the business sector is heavily dependent upon banks in order to meet their financial requisitions. Emerging economies like India need banks that meet the requirements of a wide range of household savers, the ones strongly favouring covered revenues, liquidity and financial stability due to their inadequate capacity to manage financial risk.

India's banking industry has a long-lasting history covering conventional banking from the British through the reform era, nationalisation to banking privatisation and now an increasing number of India's international banks. Banking has been on a long journey in India, therefore. The changing times have also led to a new level for the banking sector in India. Banking is now easy and instantaneous because the holder of the account does not have to wait hours for him to get a draft or withdraw money from his account. The technology adopted led to a dramatic change visibility in the banks' functioning. Though non-movingness from the driving factors of trust and confidence of the public in the institution stay rigid. Most banks succeed in conforming with shareholders and other stakeholders' confidence.

Contents above very well highlight as to how the understanding of financial performance and efficiency, and the progress of the different banks – public sector banks, private sectors banks and the foreign banks count to be an essentiality. When the context is to financial performance and efficiency, there are a number of financial ratios that enable determination of the same. With regards to progress, the same shall be computed and analysed via Bank Networking understanding, which stands inclusive of number of bank branches and ATMs in India. This study thus, tends to establish an extensive analysis within the same domain using various tools and techniques.

## Literature Review

Author(s)	Title	Conclusion
Vinoth Kumar and Bhawna Malhotra, 2017	"A CAMEL Model Analysis of Private Banks in India"	The researcher evaluated the financial capacity of the specified Banks and applied composite rankings, average and covariance to arrive at the conclusion the analysis of the various parameters of CAMEL. The study concluded that Axis was first under the analytical classification for the CAMEL, followed by ICICI and Kotak Mahindra. The policymakers of the associated lowest-ranking banks should take the requisite measures and try to find a solution to their vulnerabilities.

Author(s)	Title	Conclusion
Srinivasan and Yuva Priya Saminathan, 2016	"A CAMEL Model Analysis of Public, Private and Foreign Sector Banks in India"	The researchers compared the financial situation of the different banks to evaluate their efficiency and effectiveness through parameters- return on assets, return on equity and net interest margin. There was no substantial difference in profitability between the different banking classes.
Koundal, Virender, 2012	"Performance of Indian Banks in Indian Financial System"	Various metrics - number of banks, offices, number of staff, company per employee, deposits per employee, advances per employee, size of bank assets, non-performing assets, etc. have been used to calculate the competitiveness of the banking sector. The result revealed that smaller banks are globally efficient in scale, but large banks are locally efficient.
Kumar Das, S., and I. Drine, 2011	"Financial Liberalization and Banking Sector Efficiency in India: A Fourier Flexible Functional Form and Stochastic Frontier Approach"	In contrast to domestic private and public sector banks, international banks have found that they are more profitable. The most productive banks are public sector banks, followed by the domestic private sector and international banks.
Mittal and Dhade, 2007	"Profitability and Productivity in Indian Banks – A comparative study"	In order to quantify profitability, spread ratio and load ratio were used while BPE, PPE and advances were considered for output calculation. The study showed that international banks and private sector banks have seen higher productivity than public sector banks.

## Research Gap

The banking industry is one of India's fast-growing industries. It has turned itself from a stagnant business enterprise into a competitive industry. Due to innumerable national as well as worldwide financial instability and catastrophic events, the Indian banking sector in past decades has been at the heart of Indian economy. The Indian banking industry has seen tremendous competition, progress, productivity, profitability and robustness, particularly in recent years. With the age of globalization and the advent of reforms in the banking sector, Indian banks began working in public, private and international cooperation. These new entries have introduced technology, a new financial regulatory culture, creative goods, mergers and consolidations. There is therefore a need to research the financial results of the banks.

The objective of this research is therefore to bridge the gap by analysing the financial results of selected public, private and foreign banks in India with certain identified ratios and deploying statistical tools to portray the progress of selected banks in India.

## Objectives

1. To analyse the progress of selected public sector banks, private sector banks and foreign banks in India, measured via growth in number of bank branches and Automated Teller Machines (ATMs).
2. To examine the trend of financial performance of selected public sector banks, private sector banks and foreign banks under study.
3. To evaluate the financial efficiency of selected public sector banks, private sector banks and foreign banks under study using CAMEL approach.

## Research Methodology

- Period of the study is ten-year period from 2010-2011 to 2019-2020.
- Sample Design:
  1. Public Sector Banks - Bank of Baroda, Bank of India, State Bank of India
  2. Private Sector Banks - Axis Bank, HDFC Bank, ICICI Bank
  3. Foreign Banks - Citibank, HSBC Bank, Standard Chartered Bank
- The analysis is based on secondary data.
- Sources of Data Collection include Reports on Trends and Progress of Banking in India; Annual Reports of the respective concerned banks; Performance Highlights of Public and Foreign Banks in India
- Tools and Techniques used for Analysis:
  1. Arithmetic Mean, Standard Deviation, Coefficient of Variation
  2. Growth Analysis based on above parameters
  3. Trend Analysis based on above parameters
  4. CAMEL Model

## Analysis and Findings

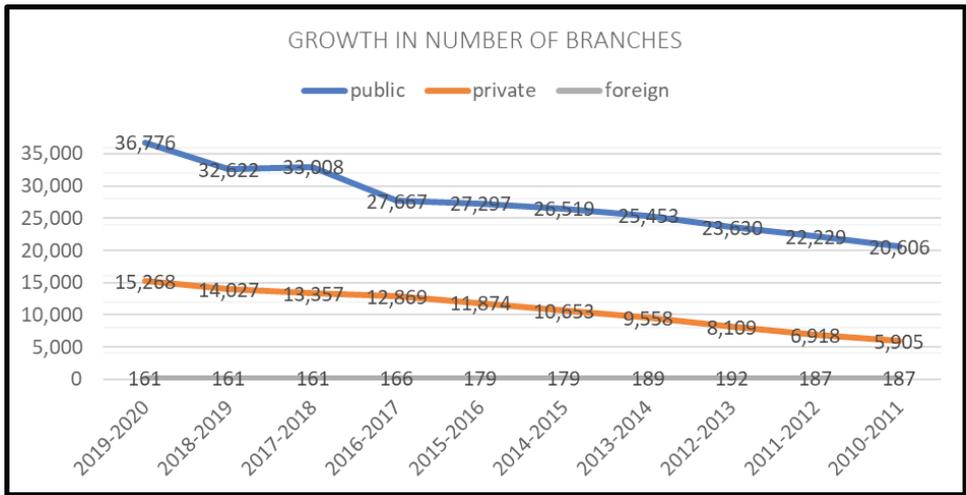
### ➤ Growth Analysis of Banks Based on Bank Networking

#### Bank Networking

Banks pursue a policy of developing a network of efficiently penetrated branches and ATMs so that they can continue to expand their geographical reach with greater growth potential. Banks try to profoundly strengthen substantial density throughout the country in areas conducive to the development of their companies.

**Number of Branches**

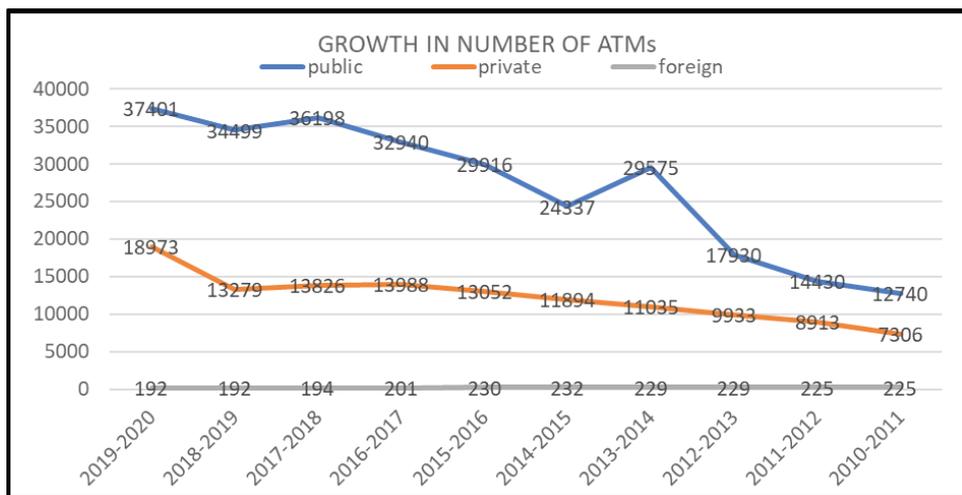
Bank	Average	Rank
<b>PUBLIC SECTOR BANKS:</b> Bank of Baroda	5,34.50	2
Bank Of India	4,667.60	3
State Bank of India	17,572.60	1
<b>PRIVATE SECTOR BANKS:</b> Axis Bank	2,843.90	6
HDFC Bank	3,955.00	5
ICICI Bank	4,054.90	4
<b>FOREIGN BANKS:</b> Citibank	39.80	8
HSBC Bank	37.90	9
Standard Chartered Bank	98.50	7



- On analysing bank networking growth, it is inferred that maximum growth in number of branches had been recorded for State Bank of India (17,572.6) followed by Bank of Baroda (5,340.5). Least growth has been witnessed for HSBC Bank (37.9).
- Under further analysis, it is observed that there has been a significant increase in the growth of number of branches during the period under study 2010-11 to 2019-20 for public and private sector banks, while the same is not significantly true for foreign banks.

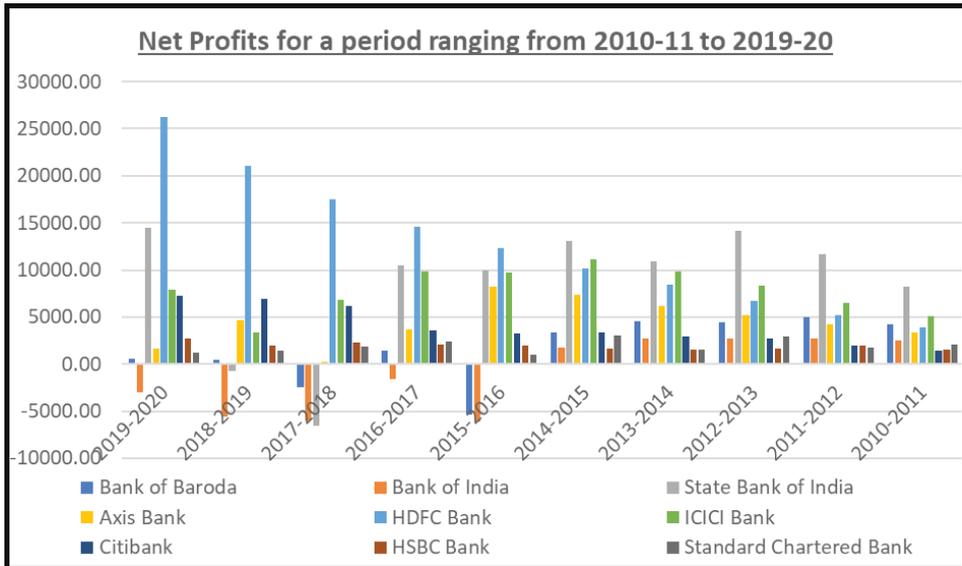
### Number of ATMs

Bank	Average	Rank
<b>PUBLIC SECTOR BANKS:</b> Bank of Baroda	4,755.20	3
Bank of India	2,345.30	6
State Bank of India	19,896.10	1
<b>PRIVATE SECTOR BANKS:</b> Axis Bank	2,754.90	5
HDFC Bank	5,018.80	2
ICICI Bank	4,449.20	4
<b>FOREIGN BANKS:</b> Citibank	54.20	9
HSBC Bank	59.90	8
Standard Chartered Bank	100.80	7



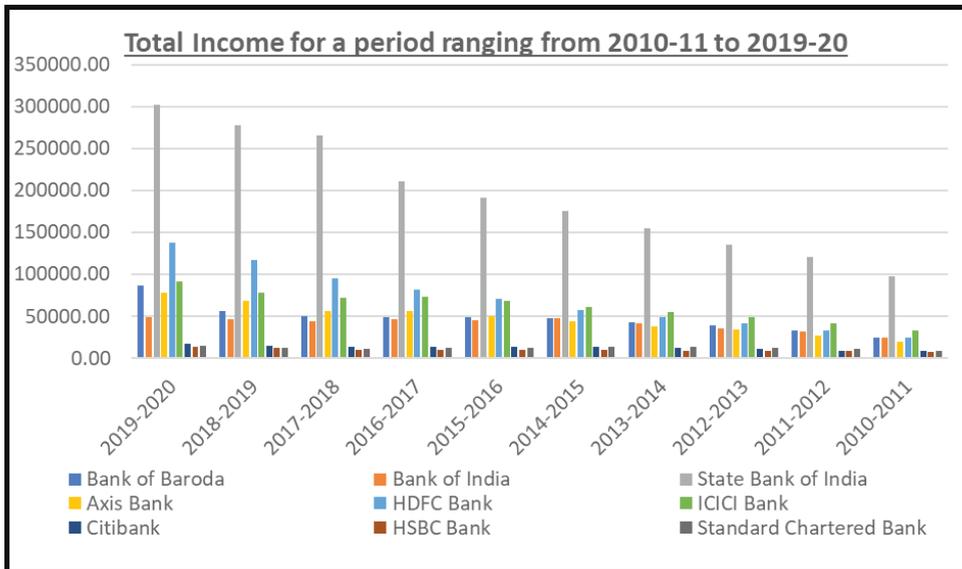
- On analysing bank networking growth, it is inferred that maximum growth in number of ATMs had been recorded for State Bank of India (19,896.1) followed by HDFC Bank (5,018.8). Least growth has been witnessed for Citibank (54.2).
- Under further analysis, it is observed that there has been a significant increase in the growth of number of ATMs during the period under study 2010-11 to 2019-20 for public and private sector banks, while the same is not significantly true for foreign banks.

➤ **Trend Analysis of Banks Based on Financial Performance Indicators**  
**Focus - Net Profits**



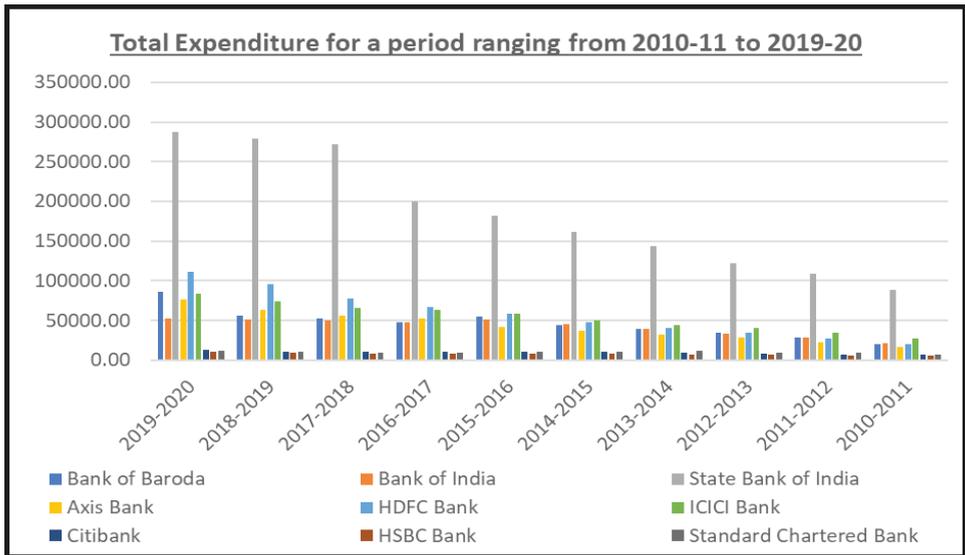
- Under analysis, it is inferred that there stands no stability in the net profits of the selected banks for the period of study.

**Focus - Total Income**



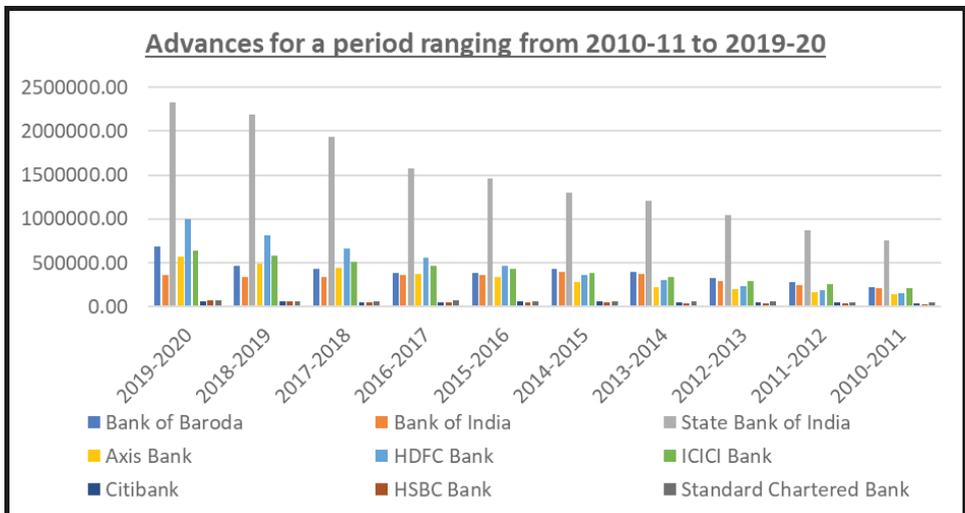
- Under analysis, it is inferred that there stands no stability in the total income of the selected banks for the period of study.

### Focus - Total Expenditure



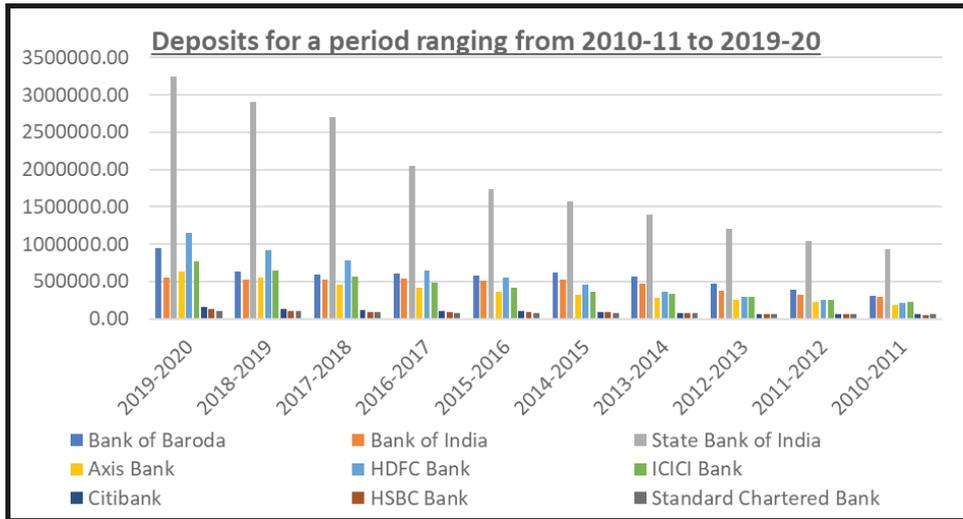
- Under analysis, it is inferred that there stands no stability in the total expenditure of the selected banks for the period of study.

### Focus – Advances



- Under analysis, it is inferred that there stands no stability in the advances made by the selected banks for the period of study.

## Focus – Deposits



- Under analysis, it is inferred that there stands no stability in the deposits made by the selected banks for the period of study.

### ➤ CAMEL ANALYSIS:

CAMEL is a globally accepted rating criteria deployed to analyse the financial soundness and the convergence of commercial banks operating in India.

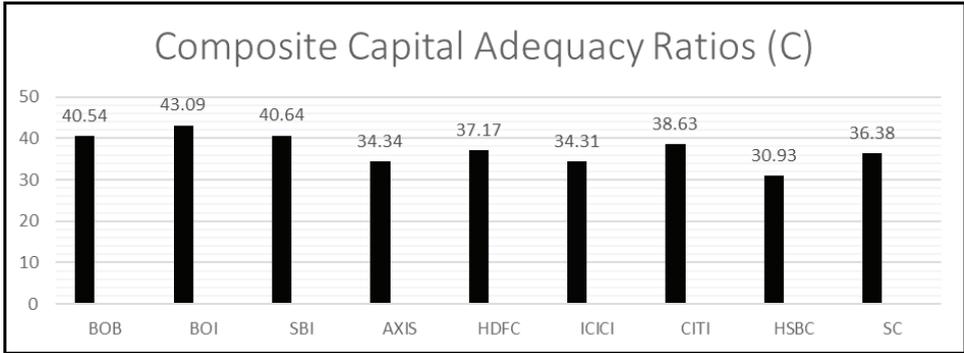
Under the CAMEL rating system, the banks are assigned performance ratings in five areas:

- C is Capital Adequacy Ratios
- A is Asset Quality Ratios
- M is Management Efficiency Ratios
- E is Earnings Capacity Ratios
- L is Liquidity Ratios

As a whole, the camel rating determined after the on-site evaluation provides a means of categorizing the bank on the basis of its overall health, financial status and measurement of financial, managerial, operational and compliance performance.

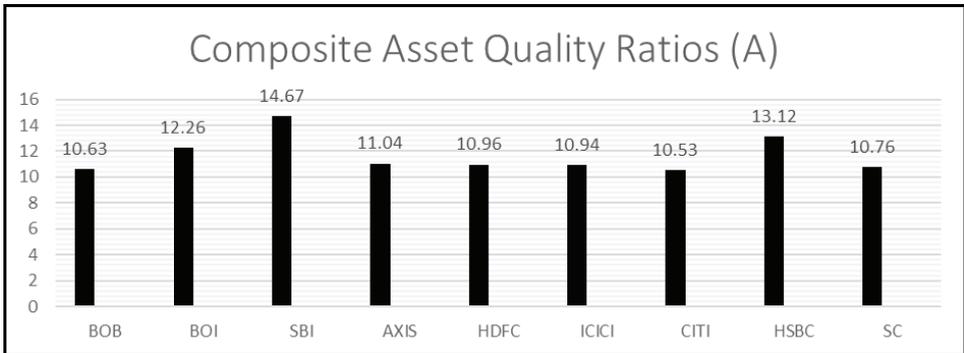
#### a) Capital Adequacy Ratios (C)

- Advances to Assets (C1)
- Government Securities to Investment (C2)
- Capital Adequacy ratio (C3)
- Debt-Equity ratio (C4)



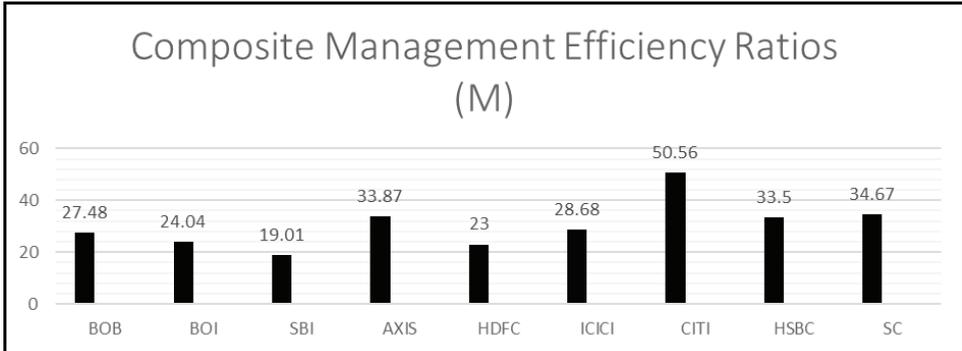
#### b) Asset quality ratios (A)

- i. Return on Advances (A1)
- i. Return on Investment (A2)
- ii. Non-Performing loans to Loans (A3)
- iii. Priority Sector Advances to Advances (A4)
- iv. Interest Income to Assets (A5)



#### c) Management Efficiency ratios (M)

- i. Profit per Employee (M1)
- ii. Business per Employee (M2)
- iii. Intermediation cost to Total assets (M3)
- iv. Return on Net worth (M4)



#### d) Earnings Quality ratios (E)

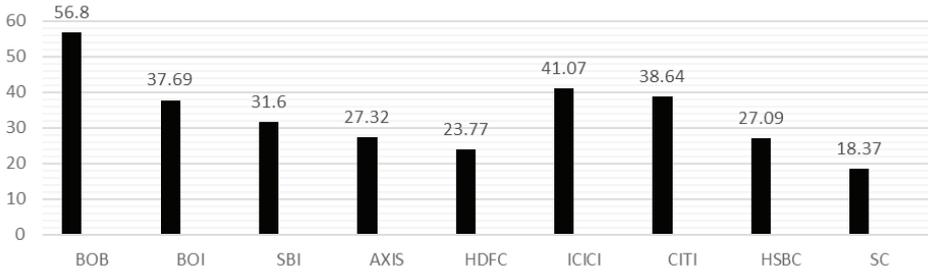
- i. Spread or Net Interest Income to Total Assets (E1)
- ii. Burden to Total Assets (E2)
- iii. Operating profit to Total Assets (E3)
- iv. Interest Income to Total Income (E4)
- v. Non- Interest Income to Total Assets (E5)



#### e) Liquidity ratios (L)

- i. Liquid Assets to Total Assets (L1)
- ii. Liquid Assets to Demand Deposits (L2)
- iii. Liquid Assets to Total Deposits (L3)
- iv. Government Securities to Total Assets (L4)

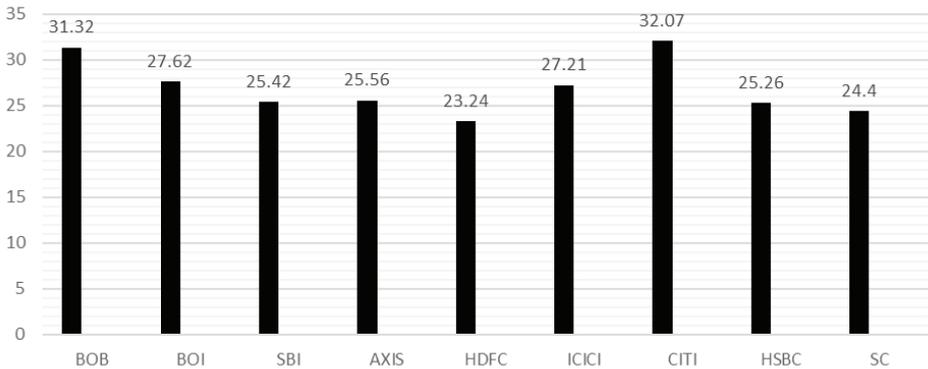
### Composite Liquidity Ratios (L)



### Composite CAMEL Ratios

Banks	C	A	M	E	L	Composite	Rank
BOB	40.54	10.63	27.48	21.15	56.80	31.32	2
BOI	43.09	12.26	24.04	21.01	37.69	27.62	3
SBI	40.64	14.67	19.01	21.15	31.60	25.42	6
AXIS	34.34	11.04	33.87	21.25	27.32	25.56	5
HDFC	37.17	10.96	23.00	21.31	23.77	23.24	9
ICICI	34.31	10.94	28.68	21.07	41.07	27.21	4
CITI	38.63	10.53	50.56	22.00	38.64	32.07	1
HSBC	30.93	13.12	33.50	21.67	27.09	25.26	7
SC	36.38	10.76	34.67	21.83	18.37	24.40	8

### Composite Camel Ratios



- Citibank counts to be the most financially efficient having resultant composite CAMEL ratio of 32.07%. Bank of Baroda is the second most

financially efficient having with composite CAMEL ratio of 31.32%. HDFC Bank is the least financially efficient with composite CAMEL ratio of 23.24%.

- ANOVA Testing conducted revealed that selected public, private and foreign banks are significantly different in all components of CAMEL Model.

## Conclusion

The assessment of the Indian banking sector is a significantly tough challenge. A bank's good financial health not only assures its depositors, but also ensures the shareholders, workers and the entire economy. Following this principle, frequent timely attempts have been made to calculate and efficiently manage the financial condition of each bank. So many considerations are demanded to be taken into consideration when making a distinction between a good and a poor functioning bank. Professionalism in the banking sector has also undoubtedly been strengthened by the restructuring of public sector banks and the advent of new private sector banks, as well as by increased competition from international banks.

In the presented research, banks were examined and evaluated based on their networking progress through the basis of number of branches and number of ATMs. Also, a trend analysis based on parameters of net profit, total income, total expenditure, advances and deposits was undertaken. Finally, the CAMEL method was used in the analysis to measure the relative financial firmness of the banks under study in terms of capital adequacy, asset quality, management efficiency, earning efficiency and liquidity position of the banks, which was thoroughly examined through ANOVA Testing, laying the foundation of the significant difference or no difference between the selected nine banks - Bank of Baroda, Axis Bank, Citibank, Bank of India, HDFC Bank, HSBC Bank, State Bank of India, ICICI Bank and Standard Chartered Bank.

The presented study is useful for the policy-makers, bankers and analysts, as it offers sufficient information on the determinants of financial success and operating efficiency of banks. The results of this report may prove to be of beneficial help to various users of the same. Researchers may also use the results as the basis for their future work in order to assess banks' productivity, profitability, progress and efficiency effectively.

## References

1. Kumar, Vinod, and Bhawna Malhotra. 2017. "A Camel Model Analysis of Private Banks in India." *EPRA international journal of Economic and Business Review* 5(7): 87-93.
2. Dr. Srinivasan, and Yuva Priya Saminathan. 2016. "A Camel Model Analysis of Public, Private and Foreign Sector Banks in India." *Pacific Business Review International* 8(9): 45-57.
3. Koundal, Virender, (2012), Performance of Indian Banks in Indian Financial System, *International Journal of Social Science & Interdisciplinary Research*, Vol. 1, Issue 9, September, pp. 204-213.

4. Kumar Das, S., and I. Drine, (2011), Financial Liberalization and Banking Sector Efficiency in India: A Fourier Flexible Functional Form and Stochastic Frontier Approach, *International Business and Management*, Vol. 2, Issue 1, pp. 42-58.
5. Mittal, Manish and Dhade, Aruna. (2007), "Profitability and Productivity in Indian Banks – A comparative study", *International Journal of Business Management*, Vol. 1, No.2, pp.137-152.
6. Annual Reports of selected banks under the study.
7. RBI. Annual Reports, Various issues

## Study on Women Entrepreneurship with Reference to Selected Women Entrepreneurs in Kolkata

Divyani Datta<sup>1</sup>

Post Graduate & Research Department of Commerce, Batch: (2019-2021)

### Abstract

*The growth story of most countries often leave behind a key demographic: women. Despite improvements in social parameters, growth is not reflected in terms of economic inclusion and development of women. Most women work as unpaid caregivers, household managers or in other home-based positions. Thus, women's potential remains as an untapped resource in the country. Women entrepreneurship over years has changed drastically and in the Indian context, there has been a record growth with more women pursuing their career in this direction. Unlocking entrepreneurship amongst women might be a complex effort, but one which provides an unprecedented opportunity to change the economic and social trajectory of a country and its women for generations to come.*

*The present study is intended to be partly descriptive and partly analytical and tries to highlight the standing of India in the global scenario of women entrepreneurs while putting forward the various government initiatives introduced to enhance entrepreneurship among Indian women. The study further collects primary data on selected women entrepreneurs in Kolkata to understand their motivations and constraints.*

**Keywords:** Entrepreneurship, Women Entrepreneurship.

### Introduction

Entrepreneurship among women has the power to create positive outcomes for individuals, societies and economies at large. Women encompass one-third of total entrepreneurs worldwide and with greater globalization and urbanization, the overall role and responsibility of women is increasingly seen to transform from domestic household towards financial independence. Women play an indispensable role in the context of building a nation. Women as entrepreneurs

---

1. This Dissertation was done by the scholar under the guidance of Dr. Amitava Roy

must be encouraged and motivated to take active part in diverse business activities. As per statistical data available across different recognised publications, it is observed that women occupy a larger share of the informal economy and the micro and small enterprise sector in India, helping in the acceleration of economic growth. They undertake the role of change makers both in their family and also in the society where they operate their entrepreneurial ventures. It inspires other members of the society to follow suit and take up such activities.

Women entrepreneurs are thus, the nation's assets because they are engaged in certain productive activity and further, they create job opportunities for others. This leads to reduction in poverty and minimizes the problem of rampant unemployment.

### Literature Review

Depending on the purpose and the specific objectives of the study, a comprehensive and concise literature review was conducted from recognized academic journals and proceedings from respected associations and organizations. The aim of conducting the literature review was to facilitate the development of required methodological strategies for the study, explore the relevant and existing academic evidence related to the topic of the study at hand and to identify the existing gap in the literature. The following table provides a glimpse of the same.

Global Perspective on Women Entrepreneurship	National Perspective on Women Entrepreneurship
Buttner & Moore. (1997) : <i>'Women's Organizational Exodus to Entrepreneurship : Self-Reported Motivations and Correlates with Success'</i>	Kollan & Parikh. (2005) : <i>'A Reflection of the Indian Women in Entrepreneurial World'</i>
Anna, Chandler, et al. (2000) : <i>'Women Business Owners in Traditional and Non-traditional Industries'</i>	Dwivedi & Dwivedi. (2011) : <i>'Women-Empowerment through Women Entrepreneurship'</i>
Jani, Alam., & Omar. (2011) : <i>'An Empirical Study of Success Factors of Women Entrepreneurs in Southern Region in Malaysia'</i>	Sharma, Ranjana. (2017) : <i>'Women Entrepreneurs In India - Emerging Issues And Challenges'</i>
The Organisation for Economic Co-operation and Development (OECD). (2017) : <i>'Policy Brief on Women's Entrepreneurship'</i>	Hans, V. Basil. (2018) : <i>'Women Entrepreneurship In India – Changes And Challenges'</i>

## Research Gap

Admittedly, there is not much literature available which “focuses upon the status of women entrepreneurs” of Kolkata. Counted few works of research and articles of academic interest have presented a study on women entrepreneurship through a survey perspective. Further, quality literature is lacking in conveying the journey of India as a country in development of women entrepreneurship. Standing of India in the global scenario of women entrepreneurs have been presented in only scarce number of academic researches, that too, with a deficiency of reader friendly presentation and supporting data evidences. Literature falls less to even throw light upon the role of Government of India in developing women entrepreneurship.

The current study becomes unique in terms of probing the gaps identified in the available literature reviewed and trying to fill out the deficiencies in academic content by putting them forward as objectives of this particular research study.

## Objectives

Every research study is prepared to meet certain objectives. Similarly, this particular study has also been undertaken keeping in mind the under mentioned objectives:

- To comprehend the progress of India in the global scenario of women entrepreneurship
- To understand the role of Government of India in promoting women entrepreneurship in the country
- To identify the motivations and challenges faced by women entrepreneurs in Kolkata by conducting a survey using a questionnaire

## Research Methodology

The study is partly descriptive and partly analytical in nature. Thus, the methodology adopted and information collected is based on secondary data collected from academic journals, relevant websites and pertinent research papers as well as primary data collected through a survey using a structured questionnaire to know about the motivations and challenges of women entrepreneurs in Kolkata.

The sample size has been kept at 100 and the sample area is Kolkata.

## Analysis and Interpretation

### • Progress of India in The Global Scenario of Women Entrepreneurship

Women entrepreneurship in India is still in its emerging phase. As of March, 2019, reported by PHD Chamber of Commerce and Industry, in the global scenario, about 126 million women have started or are running their businesses. There are approximately 8 million women in India who have started or are running their businesses. Moreover, if around 37% of formal enterprises are owned by women around the globe, 10% of formal enterprises in India are being

operated by women. The gender parity aspect of entrepreneurship showcased in the Global Entrepreneurship Monitor, 2018/2019 Global Report, in which India ranked 26 out of 48 countries and 32 out of 48 countries as per Female/Male Total Entrepreneurial Activity Ratio and Female/Male Opportunity Ratio respectively. As per the MasterCard Index for Women Entrepreneurs, India ranked 49<sup>th</sup> out of 58 countries under study in the year 2020, a significant improvement over maintaining an unchanged position of 52<sup>nd</sup> out of 57 countries in the previous three years.

- **Government effort towards promotion of women entrepreneurship**

From the days since Independence, India's approach towards development has been planned and very strategic. Women entrepreneurship has developed in India to a great extent by holding the hands of Five Year Plans, each having a different orientation and different initiatives underlined.

Also, The Government of India with the help of its two very able departments- Department for Promotion of Industry and Internal Trade and Ministry of Commerce and Industry has brought forward different initiatives for the development of women entrepreneurship under their "Start-up India" venture. The Start-up India- Women Entrepreneurship initiative works with the thought process that an increase in the presence of women as entrepreneurs can lead to the change in the demographic characteristics of business and foster faster economic growth of the country. The women-owned businesses enterprises play a pivotal role in the society, inspiring others and generating more opportunities for employment in the country.

Further, for providing credit and financial assistance to women entrepreneurs, the Government of India has also joined hands with various public sector banks to implement their vision of providing impetus to women entrepreneurship. These banks provide financial assistance to women entrepreneurs to meet their venture and working capital requirements through flexible norms for lending.

Despite the fact that the Government of India has introduced a range of schemes and provisions to provide financial assistance to women entrepreneurship ventures, it has been noted that very few women entrepreneurs avail such formal finance. This view is also supported by the primary data collected from a sample of hundred women entrepreneurs for the purpose of this research work. This opens up a future domain of research where the reasons which discourage women entrepreneurs to consider formal sources of finance in India can be explored.

- **Identifying the motivations and challenges faced by women entrepreneurs in Kolkata**

To know about the motivations and challenges of women entrepreneurs in Kolkata, a survey through a questionnaire was conducted. The first observation which came forward was regarding the age at which respondents started with their journey of entrepreneurship. Majority of the respondents, approximately 44%, noted to have started their venture between thirty to fifty years of age. Of all the respondents interviewed for the purpose of the study, the minimum

educational qualification is that of having passed Higher Secondary examination or its equivalent. Majority of the respondents stated that their primary source of motivation in starting an entrepreneurial venture was getting a source of additional income. Most of such respondents belong to the age group of below thirty years and started their business either in cake making or opening their own beauty parlours. 31% of the respondents who reported their main motivational reason to be pursuing a passion mostly belong to the age bracket of above 50 years and have entrepreneurship ventures in the lines of fashion boutiques and folk art emporiums. 23 out of 100 respondents also put forward financial independence to be their major reason of motivation in getting started with the journey of entrepreneurship. The study manages to throw light on an optimistic situation where more than 50% of the respondents stated that the general attitude of people towards their entrepreneurship journey was positive. As much as 85 out of 100 respondents denied themselves or the feasibility of their businesses ever being doubted because of their gender.

Maintaining a balance between work and domestic life becomes a major challenge for women entrepreneurs. Reflective of the earlier mentioned notion, 36 out of 100 respondents found striking a balance between work and personal life to be moderately difficult, followed by 28 out of 100 respondents finding such feat to be quite difficult. 16% claimed achieving such a balance very difficult as opposed to only 6 respondents, involved in cake making, not finding it difficult at all.

## **Conclusion**

With greater globalization and urbanization, the overall role and responsibility of women is increasingly seen to transform from domestic household towards financial independence.

A major factor acting as a key in explaining gender gap in entrepreneurship is the social and institutional context. To aid the development of women entrepreneurs and to ensure their greater participation in entrepreneurial activities, efforts in the required direction should be invested diligently. Certain suggestive measures might be useful in empowering woman entrepreneurs to seize various opportunities and face inevitable challenges in business such as need of creating mentoring programs, both within the educational system as well as the practical workplace, tie-ups between various government and non-government agencies and educational institutes to provide assistance towards the goal of entrepreneurship development mainly in lieu of planning business projects, greater need of formal policies centered on promoting the growth of women entrepreneurship and related networks within the business field, to name a few.

## References

1. Goyal, Meenu. & Parkash, Jai. (2011), "Women Entrepreneurship In India-Problems And Prospects", International Journal of Multidisciplinary Research, Vol.1 Issue 5, ISSN 2231 5780
2. United Nations Conference on Trade and Development (UNCTAD) (2013), "Survey On Women's Entrepreneurship And Innovation"
3. Sharma, Yogita. (2013), "Women Entrepreneur In India", IOSR Journal of Business and Management (IOSR-JBM), Volume 15, Issue 3, e-ISSN: 2278-487X
4. Mahajan, Shikha. (2013), "Women Entrepreneurship in India", Global Journal of Management and Business Studies, ISSN 2248-9878
5. Saurabh, Punit., & Shah, Hina. (2015), "Women Entrepreneurs in Developing Nations: Growth and Replication Strategies", Technology Innovation Management Review, (Volume 5, Issue 8)
6. K, Swarnalatha., & Anuradha, R. K. (2016), "Women Entrepreneurship in India Problems and Prospects", International Journal of Science and Research (IJSR), Volume 5 Issue 3, ISSN (Online): 2319-7064
7. The Organisation for Economic Co-operation and Development (OECD), (2017), "Policy Brief on Women's Entrepreneurship"
8. Sharma, Ranjana. (2017), "Women Entrepreneurs In India - Emerging Issues And Challenges", International Journal of Development Research, Vol. 07, Issue, 12, pp.17917-17923, ISSN: 2230-9926
9. Hans, V.Basil. (2018), "Women Entrepreneurship In India – Changes And Challenges", Sahyadri Journal Of Management, Volume 2, Issue 2, ISSN No. 2456 -9151

# An Empirical Analysis of Herding Behaviour in Indian Stock Market During COVID-19

Debangana Ray<sup>1</sup>

Post Graduate & Research Department of Commerce, Batch: (2019-2021),  
St. Xavier's College (Autonomous), Kolkata

## Abstract

*This paper is based on the empirical study of herding behaviour that can be observed in the Indian capital market during Covid-19 pandemic. Unprecedented times like these have led investors to make hasty decisions and commit cognitive errors, which lead to the infamous stock market crash in March 2020. This sudden and drastic fall is majorly attributed to the Chinese-origin virus named Covid-19 that has shaken the very foundations of the contemporary business world. One of the major challenges we face is quantifying and measuring the effect of human behaviour in financial community. Our present crisis has thus given us an opportunity to delve deep into the relatively new field of behavioural finance and economics, so as to explore the psychological anomalies that defy our traditional theories and demand for evolution.*

*This paper focuses on the investors reaction to financial crisis between 2019 and 2020 and examine whether they resort to herding behaviour as well as the volatility caused in the 2 major Indian Stock Markets, namely BSE and NSE, using the CAPM-based model called the Cross Sectional Absolute Deviation model and other statistical tools. The results suggested presence of herding behaviour in both BSE and NSE during 2020(post-Covid era) but not at a statistically significant level.*

**Keywords:** BSE, Covid-19, CSAD Model, Herding Behaviour, NSE.

## Introduction

Behavioural finance, a sub-topic under behavioural economics, suggests that psychological impacts and predispositions influence the financial practices of investors and monetary specialists. Investors, who aim to make benefits, should do a thorough and regular investigation of the market so as to make speedy

---

1. This Dissertation was done by the scholar under the guidance of Prof. Ankita Samanta

choices in a limited time. Thus, when confronted with complex circumstances, speculators regularly depend on cognitive alternate ways and may end up with a biased choice. Under such conditions, the choices taken can be unreasonable, abusing the fundamental standards of standard finance where it is assumed that investors will be always rational. Behavioural finance is a direct resistance to the Efficient Market Hypothesis (EMH).

One of the fundamental aspects of Behavioural finance that compromises rational behaviour is herding. Herd defined as “The behaviour of investors who tend to imitate or follow the behaviour of other investors” (Armansyah, 2018). Herding pattern brings about enormous number of investors purchasing and selling together the equivalent or similar comparative stocks over an all-inclusive period.

Our study focuses on measuring herding behaviour in Indian stock market during a worldwide unprecedented crisis of Covid-19 pandemic. Originated from Wuhan, China in November 2019, The World Health Organisation declared the contagion a pandemic on 11<sup>th</sup> March, 2020. India went into nationwide lockdown from 26<sup>th</sup> March and till then, over 10 million people in India tested Covid-19 positive and resulted in 146 thousand deaths. The Indian Stock markets were also heavily affected and became volatile. In our research we aim to detect herding pattern, if any, during this period, the extent of the behaviour and a comparative analysis with the pre-covid era.

## Literature Review

AUTHOR	PAPER	OBJECTIVES	FINDINGS
1. Christie and Huang (1995)	<b>Following the Pied Piper: Do Individual Returns Herd around the Market</b>	Created CSSD model to check the measurements of the deviations of individual stock returns from the average market returns	Presence of herding behaviour during the extreme phases of the market.
2. Chang et Al. (2000)	<b>An examination of herd behaviour in equity markets: An international perspective</b>	To create an advanced model- CSAD to identify non-linear relationship between individual stock returns and average market returns.	Recognizes sensitive herding pattern in both typical and pressure periods of the market.
3. Chiang et al. (2010)	<b>An empirical analysis of herd behaviour in global stock markets</b>	To identify presence of grouping conduct in worldwide business sectors	Different countries displayed different levels of herding or anti-herding behaviours.
4. Bansal et Al.(2016)	<b>An Examination of Herding Behaviour in an Emerging Economy – A Study of Indian Stock Market</b>	To measure various degrees of herding in Indian stock market(NSE) during bullish and bearish phases between 2008-2015.	No evidences of herd formation, even during extreme economic conditions.

AUTHOR	PAPER	OBJECTIVES	FINDINGS
5. Putri et al. (2020)	<b>Financial Behaviour during COVID-19: Cognitive Errors That Can Define Financial Future</b>	To study the financial impacts brought about by the crisis effect of the COVID-19 pandemic.	Presence of cognitive biases like over-confidence, representation bias, risk-aversion, herding behavior, and availability bias
6. Salvan et Al. (2020)	<b>Covid-19 Effect on Herding Behaviour in Indian Capital Market</b>	To study herding tendencies in Indian Stock market during Covid-19	COVID-19 has increased the herding tendencies in India.
7. Espinosa-Méndez et al. (2020)	<b>COVID-19 effect on herding behaviour in European capital markets</b>	Researched whether COVID-19 pandemic affected herding behaviour in Europe from 2000 to Mid-June 2020.	Discovered solid proof of herding pattern in European Stock Exchanges during the 2020 financial crisis.

## Research Gap

From the aforementioned reviewed literature, it is observed that: -

1. There is no study made yet to detect herding pattern in Indian stock market during the second half of 2020 during covid-19 crisis.
2. There still lies uncertainty of the extent of herding behaviour, whether critical or fractional, in Indian stock market.
3. A comparative analysis of the herding behaviour trends with respect to the pre and post covid-19 outburst in Indian stock exchanges.

## Objectives

This study focuses on the following objectives to explore the financial anxiety as a direct by-product of the 2020 pandemic: -

1. To identify (if any) the herding effect of investors in the Indian Stock Market due to Covid-19 period.
2. To measure the intensity of herd formation (if any) due to market distress in the said time framework and the volatility caused by it.
3. To run a comparative analysis and compare the herding behaviour with respect to the volatility of the market during the pre-Covid and Post-Covid outbreak phrases.

## Research Methodology

It is an empirical oriented study wholly based on secondary data that is obtained from BSE and NSE official websites.

Time Frame- The entire sample set of 40,849 daily observations of the closing market indices BSE and NSE as well as closing stock prices of 30 companies (BSE SENSEX) and 30 companies (NSE NIFTY50).

The whole timeframe can be grouped into 2 phases:

1<sup>st</sup> January 2019 to 31<sup>st</sup> December 2019: Pre-Covid Outbreak Era

1<sup>st</sup> January 2020 to 31<sup>st</sup> December 2020: Post-Covid Outbreak Era

The daily closing stock prices of all the companies as well the market indices of BSE and NSE stock exchanges converted into daily returns.

The Standard deviation of the market returns shall tell us about the volatility of the stock market

We shall be following the Cross-sectional Absolute Deviation (CSAD) model to detect the existence of herding behavior. It is an advanced modified version of Cross-sectional Standard Deviation.

## Analysis and Interpretation

### Significance of the Stock Market Returns

A return is the change in price of stocks over time and is expressed in percentage where a positive value suggests a profit while a negative return represents a loss in the value of the stocks. The returns of the daily stock price indices are computed as follows: -

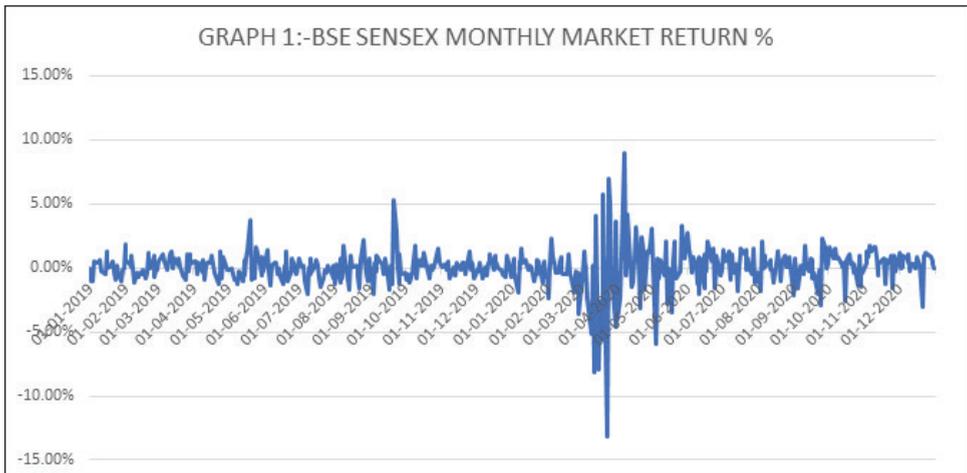
$$r_{it} = \ln \left( \frac{P_{it}}{P_{i,t-1}} \right)$$

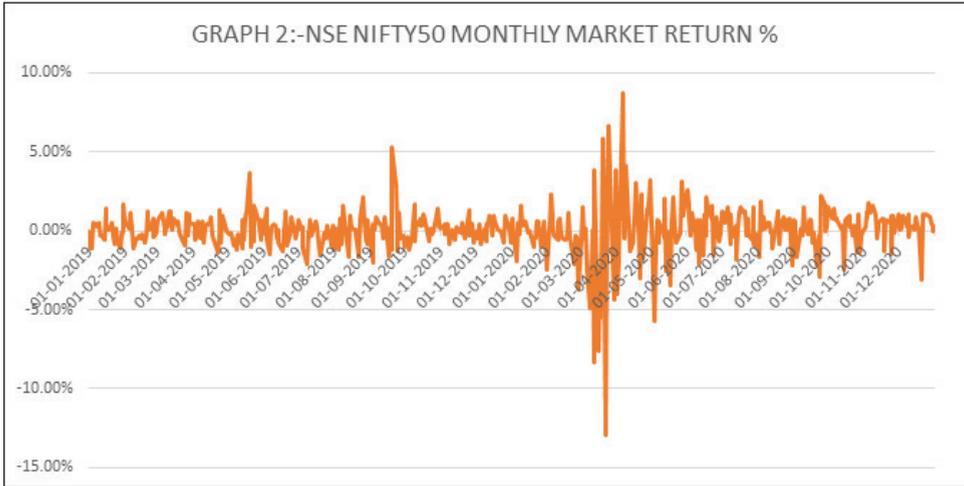
Where,

$r$  = return on index I,  $it$

$P$  = price on index I,  $i, t-1$

$P$  = price on index I at the end of the day  $t-1$ .





There is a drastic fall of return in March 2020, soon after WHO declared coronavirus as a global pandemic on 11<sup>th</sup> March and the subsequent Pan-India lockdown declared on 24<sup>th</sup> March, while both BSE and NSE stock markets joined the global sell-off and eventual market crash.

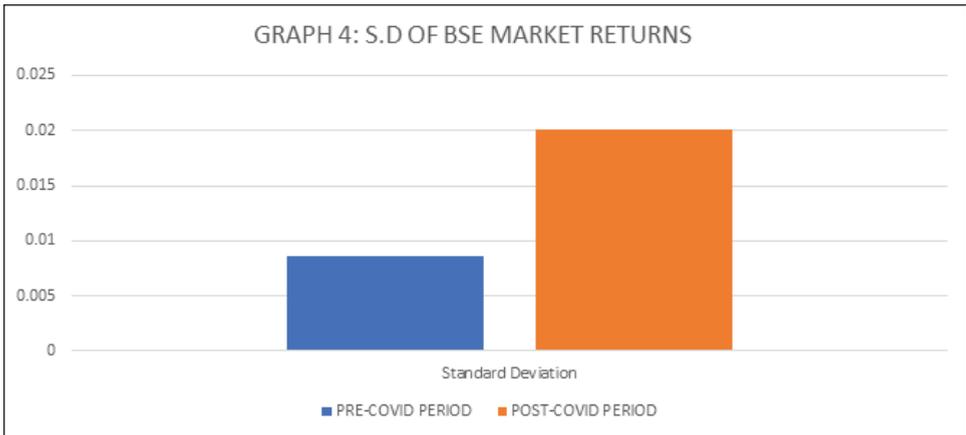
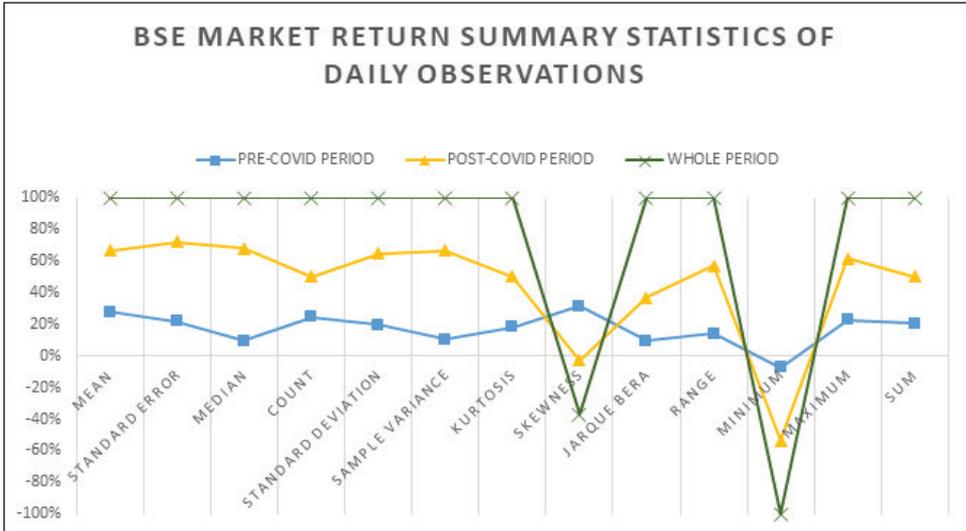
March was considered as the worst month in the stock Market since the 2008 Crash with NSE NIFTY50 nosediving up to 13% and BSE SENSEX fell as much as 23% leading to high volatility and instability in the market.

Despite a gloom of the mammoth market cap erosion in March, April 2020 induced optimism in investors as BSE Sensex rallied 14.42% while the NSE Nifty50 rallied 8%. We however don't see the much-anticipated hike with the generation of vaccine in the later 2020.

## Descriptive Statistics

### BSE Market Returns Performance Analysis

Column1	WHOLE PERIOD	PRE-COVID PERIOD	POST-COVID PERIOD
Mean	0.00067791	0.000566735	0.000785556
Standard Error	0.000697839	0.00055526	0.001265369
Median	0.001441136	0.000438459	0.00260465
Count	496	244	252
Standard Deviation	0.015541603	0.008673431	0.020087117
Sample Variance	0.000241541	7.52284E-05	0.000403492
Kurtosis	16.98590392	6.151884362	10.99110206
Skewness	-1.35748007	1.244503311	-1.354970288
Jarque Bera	6115.100101	910.1772602	2648.394119
Range	0.221274775	0.073849165	0.221274775
Minimum	-0.131525781	-0.020622086	-0.131525781
Maximum	0.089748994	0.05322708	0.089748994
Sum	0.336243362	0.138283262	0.1979601



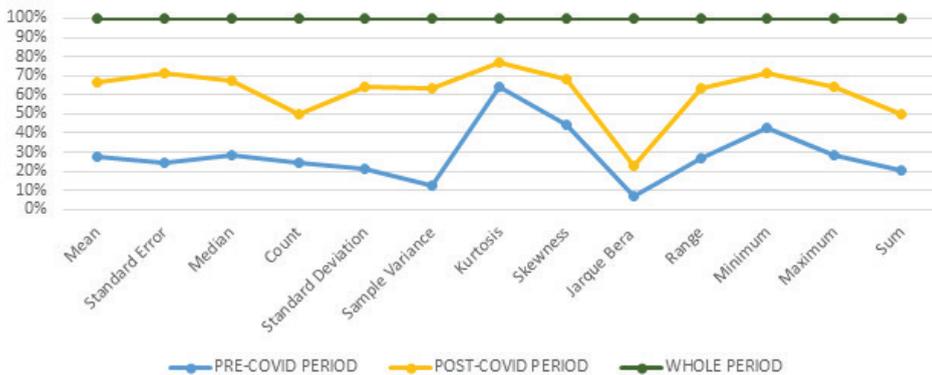
**Analysis of the BSE Sensex Market Return**

1. The high instability of BSE SENSEX market returns can be gauged by the abnormally high value of SD (Standard deviation) that is 0.015541603. The pandemic has caused this anomaly during early 2020. We can see SD IS 0.008673431 IN PRE-COVID period of 2019 showing relatively much more stationary than POST-COVID period of 2020 with a SD of 0.020087117 implying high volatility.
2. Skewness for market return is -1.35748007 which differs from 0 while kurtosis is 16.98590392 that is much higher than 3; therefore, the series indicates market return is in leptokurtic positions.
3. Jarque-Bera test shows very high for the market return of 6115.100101 implying that stock returns differ much significantly from the normal distribution.

TABLE 2: BSE MARKET CSAD SUMMARY STATISTICS OF DAILY OBSERVATIONS

	WHOLE PERIOD	PRE-COVID PERIOD	POST-COVID PERIOD
Mean	0.01321812	0.01097774	0.015387377
Standard Error	0.000273696	0.000230855	0.000450224
Median	0.011509176	0.010173557	0.013724638
Count	496	244	252
Standard Deviation	0.006095494	0.003606073	0.007147088
Sample Variance	3.71551E-05	1.30038E-05	5.10809E-05
Kurtosis	7.305700314	20.26962079	3.969826904
Skewness	2.364250373	3.339696261	1.806315445
Jarque Bera	1565.127512	148.3902991	310.9167435
Range	0.042006654	0.031146527	0.042006654
Minimum	0.003900579	0.005752547	0.003900579
Maximum	0.045907233	0.036899074	0.045907233
Sum	6.556187514	2.678568572	3.877618942

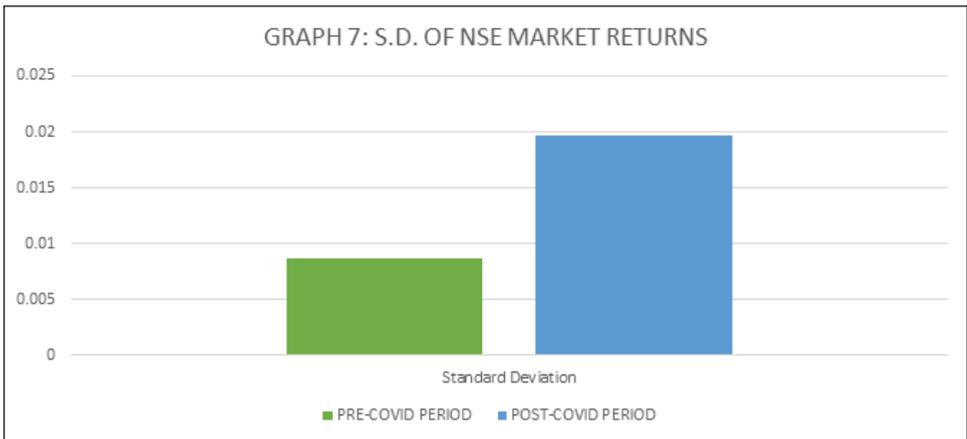
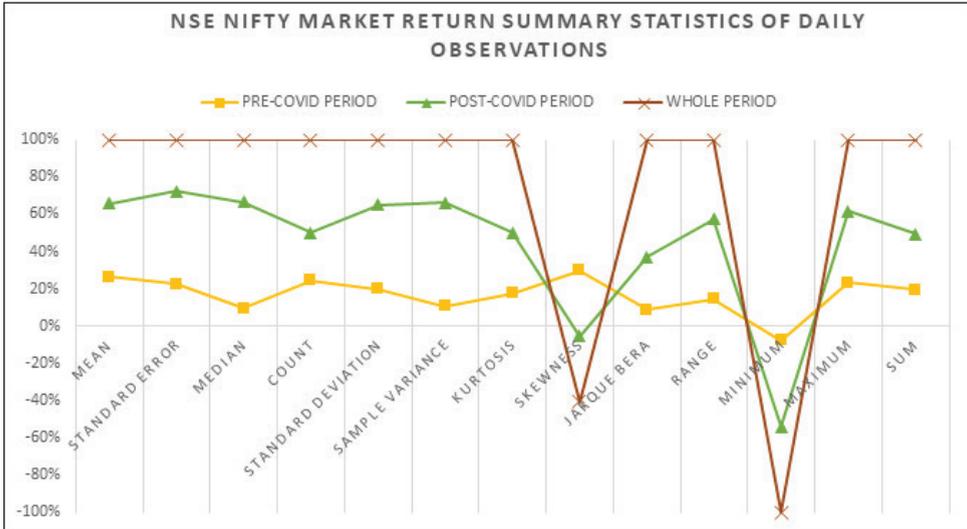
GRAPH 5 :BSE MARKET CSAD SUMMARY STATISTICS OF DAILY OBSERVATIONS



### NSE Market Returns Performance Analysis

The following tables show the descriptive summary statistics of daily market returns and return dispersion (CSAD) of NIFTY 50(National Stock Exchange) companies over a period of 2 years-1<sup>st</sup> January 2019 to 31<sup>st</sup> December 2020.

Column1	WHOLE PERIOD	PRE-COVID PERIOD	POST-COVID PERIOD
Mean	0.000618593	0.000484944	0.000716856
Standard Error	0.000685981	0.000557361	0.001234531
Median	0.001350618	0.000390255	0.002297636
Count	496	244	253
Standard Deviation	0.015277521	0.00870626	0.019636419
Sample Variance	0.000233403	7.5799E-05	0.000385589
Kurtosis	16.96266254	6.018262059	11.20830505
Skewness	-1.412027589	1.20062926	-1.423682903
Jarque Bera	6111.282303	866.9335041	2751.519254
Range	0.217436696	0.07457343	0.217436696
Minimum	-0.129804641	-0.021382338	-0.129804641
Maximum	0.087632054	0.053191092	0.087632054
Sum	0.306822064	0.118326326	0.18136445



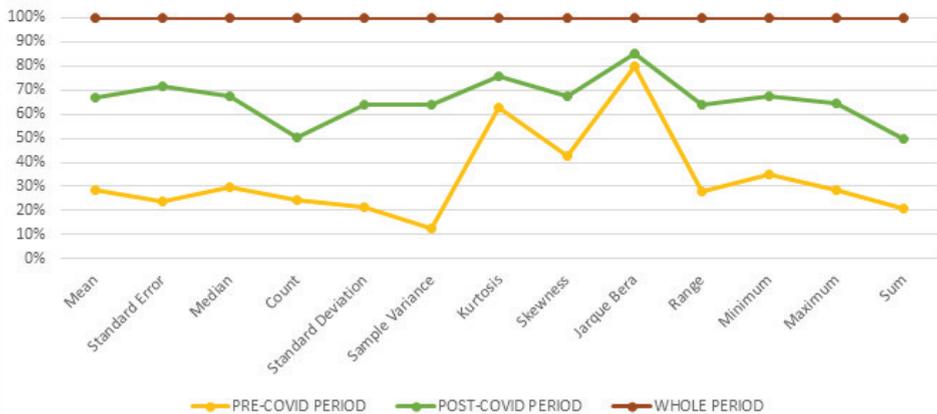
### Analysis of the NSE Nifty50 Market Return

1. The high volatility of NSE NIFTY 50 market returns is measured by Standard deviation that is 0.015277521 in early 2020 due to covid-19. We can see SD is 0.00870626 in PRE-COVID period of 2019 showing relatively much more stationary than POST-COVID period of 2020 with a SD of 0.019636419 implying high volatility.
2. Skewness for market return is -1.412027589 while kurtosis is 16.96266254, suggesting leptokurtic positions.
3. Jarque-Bera (JB) test show very high for the market return, i.e. 6111.282303 implying that stock returns differ much significantly from the normal distribution.

TABLE 4: NSE NIFTY MARKET CSAD SUMMARY STATISTICS OF DAILY OBSERVATIONS

Column I	WHOLE PERIOD	PRE-COVID PERIOD	POST-COVID PERIOD
Mean	0.013661469	0.011672138	0.01555389
Standard Error	0.000253364	0.000211749	0.000420519
Median	0.012169682	0.011071495	0.014380629
Count	496	244	253
Standard Deviation	0.005642694	0.00330763	0.006688759
Sample Variance	3.184E-05	1.09404E-05	4.47395E-05
Kurtosis	8.177784061	21.1882531	4.488947407
Skewness	2.470756848	3.287139051	1.897392466
Jarque Bera	1886.757335	10171.37284	719.8840962
Range	0.040218637	0.03078705	0.040218637
Minimum	0.006202838	0.00671834	0.006202838
Maximum	0.046421476	0.037505389	0.046421476
Sum	6.77608872	2.848001643	3.935134268

GRAPH 8: NSE NIFTY MARKET CSAD SUMMARY STATISTICS OF DAILY OBSERVATIONS



### The Cross-Sectional Absolute Deviation (CSAD) Model

To capture the asymmetric effects of the market, Chang and Zheng (2010) computed a new model to examine herding behaviour, using the CAPM model, Cross-Sectional Absolute Deviation (CSAD)

$$R_{i,t} - R_{m,t} = \beta_1 |R_{m,t}| + \beta_2 |R_{m,t}|^2 + \beta_3$$

Where,

$R_{m,t}$  = market return (equal-weighted average stock return) in the portfolio at time  $t$ .

$CSAD_t$  = measure of return dispersion calculated in the below equation ,

$$CSAD_t = \frac{1}{N} \sum_{i=1}^N |R_{i,t} - R_{m,t}|$$

Where,

$|R_{m,t}|$  = absolute value of market returns

and  $R_{i,t}$  = individual stock return of stock  $I$ .

The CSAD Model is a more advanced model of multiple regression that I shall be using to detect the herding behavior in the Indian Stock Market.

### Results of Csad on Nse Data for the Whole Period

#### 1. Regression Statistics-Table 5

Multiple R	0.715251653
R Square	0.511584927
Adjusted R Square	0.508600721
Standard Error	0.003959435
Observations	495

Table 6

Variable	$(Rm,t)^2$	$ Rm,t $	$\alpha$	Intercept
CO-EFFICIENT	-0.356428746	0.364378968	0.058681	0.0102979
STANDARD ERROR	0.376516161	0.030317884	0.012415	0.00027596
T-STATISTIC	-0.946649261	12.01861489	4.726762	37.3162326
P-VALUE	0.344282228	2.35887E-29	2.98E-06	1.4E-145

1. The coefficient of  $\beta_2$  that is  $|\beta_{2,0}|^2$  in the CSAD model here is -0.356428746, the negative value of which suggests that there is evidence of herding behaviour present in a non-linear market(here, NSE).
2. However, we also observe that the t-statistic, being -0.946649261 is not being satisfied at 5% significance and the p-value is 0.344282228, which is not less than 0.05. Hence we see that even though there are signs of herding behaviour, it is not statistically significant and thus we fail to reject the null hypothesis.

### Results of CSAD on Nse Data for the Pre-Covid Period

1. Regression Statistics: Table 7

Multiple R	0.609251068
R Square	0.371186864
Adjusted R Square	0.363293812
Standard Error	0.002634028
Observations	243

Table 8

Variable	$(\beta_2, \beta_2)^2$	$ \beta_2, \beta_2 $	$\beta_2$	Intercept
CO-EFFICIENT	6.886736432	0.094747	0.005909	0.010539
STANDARD ERROR	1.646581036	0.056656	0.022211	0.000317
T-STATISTIC	4.182446101	1.672327	0.266019	33.25872042
P-VALUE	4.04576E-05	0.095763	0.790453	7.72785E-92

The coefficient of  $\beta_2$  that is  $|\beta_2, \beta_2|^2$  is 6.886736432, the extreme positive value of which suggests that investors have been very rational and independent in nature while making decision for stock trading and have not been blindsided as to how the market is moving.

Thus, we do not reject the null hypothesis and conclude that there had been no herding behaviour in NSE before the pandemic had hit globally.

### Results of CSAD on NSE Data for the Post-Covid Period

#### 1. Regression Statistics: Table 9

Multiple R	0.720809614
R Square	0.5195665
Adjusted R Square	0.513754804
Standard Error	0.004658358
Observations	252

Table 10

Variable	$(\beta_2, \beta_2)^2$	$ \beta_2, \beta_2 $	$\beta_2$	Intercept
CO-EFFICIENT	-0.437819283	0.357767	0.059801	0.011345938
STANDARD ERROR	0.487670375	0.042022	0.016272	0.000462872
T-STATISTIC	-0.897777076	8.513705	3.67511	24.512065
P-VALUE	0.370175	1.63E-15	0.000291	3.28E-68

1. The coefficient of  $\beta_2$  that is  $|\beta_2, \beta_2|^2$  is -0.437819283, thus suggesting herding behaviour in NSE. Hence, we can derive some observations that during times of crisis, such as the global pandemic, investors ignore their own information and analysis and join the herd to follow the market trends. Such behaviour is driven by cognitive fear of losing money and making greater losses than others.
2. However, we also observe that the t-statistic, being -0.897777076 is not being satisfied at 5% significance and the p-value is 0.370175, which is not less than 0.05. Hence, we see that even though there are signs of herding behaviour, it is not statistically significant and thus we fail to reject the null hypothesis and that there is no strong evidence of herding pattern found via this research paper.

## Results of CSAD on BSE Data on the Whole Period

Regression statistics -Table 11

Multiple R	0.698276361
R Square	0.487589877
Adjusted R Square	0.484465425
Standard Error	0.00437661
Observations	496

Table 12

Variable	$(R_{m,t})^2$	$ R_{m,t} $	$\alpha$	Intercept
Co-efficient	-0.47108	0.381201117	0.07212378	0.009678454
Standard Error	0.4060882	0.033198834	0.0134588	0.000304307
T-TEST	-1.160044	11.48236454	5.35885486	31.80490846
P-VALUE	0.2465936	3.34674E-27	1.2893E-07	1.9662E-121

1. The coefficient of  $\beta_2$  that is  $|\beta_2|^2$  is -0.47108, the negative value of which suggests that there is evidence of herding behaviour present in a non-linear market which, in our case is the Bombay Stock Exchange.
2. However, we also observe that the t-statistic, being -1.160044 is not being satisfied at 5% significance and the p-value is 0.2465936 which is not less than 0.05. Hence, we see that even though there are signs of herding behaviour, it is not statistically significant and thus we fail to reject the null hypothesis.

## Results of CSAD on BSE Data For The Pre-Covid Period

### 1. Regression Statistics Table 13

Multiple R	0.628136402
R Square	0.394555339
Adjusted R Square	0.386987281
Standard Error	0.002823379
Observations	244

**Table 14**

Variable	$(R_{m,t})^2$	$ R_{m,t} $	$\alpha$	Intercept
CO-EFFICIENT	9.134260392	0.037358118	0.02149181	0.01004
STANDARD ERROR	1.75252202	0.06032048	0.02399397	0.0003
T-STATISTIC	5.212065975	0.61932726	0.895717342	29.846
P-VALUE	4.02545E-07	0.536288256	0.371301241	9.61504E-83

The coefficient of  $\beta_2$  that is  $|\beta_2|$  in the CSAD model here is 9.134260392, the extreme positive value of which suggests that investors have been very rational during the financial stability and independent in nature while making decision. Thus we do not reject the null hypothesis and conclude that there had been no herding behaviour in the Bombay Stock Exchange before the pandemic had hit globally.

## Results of CSAD on BSE Data for the Post-Covid Period

1. Regression Statistics of BSE data for the post Covid period:

Table 15

Multiple R	0.696828046
R Square	0.485569325
Adjusted R Square	0.479371365
Standard Error	0.005162718
Observations	253

Table 16

Variable	$(R_{m,t})^2$	$ R_{m,t} $	$\alpha$	Intercept
Co-efficient	-0.564432934	0.369880998	0.069600548	0.010960064
Standard Error	0.526202569	0.046017829	0.017519204	0.000512678
T-TEST	-1.160044	11.48236454	5.35885486	31.80490846
P-VALUE	0.2465936	3.34674E-27	1.2893E-07	1.9662E-121

The coefficient of  $\beta_2$  that is  $|R_{m,t}|^2$  in the CSAD model here is -0.564432934, the negative value of which suggests that there is evidence of herding behaviour present in a non-linear market which, in our case is the Bombay Stock Exchange during the post-covid era.

However, we also observe that the t-statistic, being -1.160044 is not being satisfied at 5% significance and the p-value is 0.2465936, which is not less than 0.05. Hence we see that even though there are signs of herding behaviour, it is not statistically significant and thus we fail to reject the null hypothesis and that there is no strong evidence of herding pattern found via this research paper.

## Findings

1. As per the average market returns of BSE and NSE, there has been a huge crisis in the financial markets, the worst after the 2007-08 crash, with the coronavirus advent in early 2020.
2. There had been high volatility caused globally, and in our research, the 2 Indian stock exchanges as well after WHO had declared covid-19 as a global pandemic and forced us to go onto nationwide lockdown. The volatility could be identified by the high values of standard deviation of the market returns.
3. As per the CSAD model, we calculated the multiple regression with CSAD being the dependent variable and the 3 coefficients being the independent variables. The coefficient of  $(R_{m,t})^2$  can imply that herding behaviour is present in the stock market if it is in negative value and here the values are -0.356428746 and -0.47108 respectively in NSE and BSE exchanges for the whole period.
4. We see that the  $\beta$  coefficient values pre-covid time frame had been positive, suggesting that the investors have been rational before the contagion had spread. But for both BSE and Neopost covid time frame faced negative  $\beta$  coefficient values, suggesting that the pandemic had caused panic amongst the investors and the market experienced turmoil along with grouping conduct.
5. However, from the research point of view and the empirical results derived from it we see that the t-statistic and p value are not satisfying the 5% significance. Hence, we can assume that even though there are some signs of herding behaviour being present in the markets, they are not statistically significant, that is not large enough to be reliable.
6. Therefore we have failed to reject the null hypothesis and conclude that is no herding behaviour in the Indian Stock Markets during 2019 and 2020 despite market crash due to Covid-19. This result is in contrast to the research made by Salvan *et al.* (2020) where the presence of herding behaviour in Indian Stock Market during 2020 is confirmed.

## Recommendations

With the second wave of covid-19 surge because of the new strain contagion and possible more phases of lockdown in the future, there is a lot more to research and analyse about the stock market movements and the cognitive errors made by investors subsequently. Our study hinted that even if it is on a minute level, there is indeed some herding behaviour occurring which might be statistically significant in the further empirical studies.

We shall also be requiring a multiple regression equation of the CSAD Model specifically formulated and modified according to the pandemic situation, which pick up more sensitive herding pattern that CCSD and the CSAD model might not be able to find and present.

We also need to probe into the qualitative aspects of the investors' cognitive biases that have been developed during the Covid-19 phases. More questions like what kind of investors, whether conservative or market leader/stock brokers guided

ones adapt to herding pattern more? Which industry sectors have been prone to herding behaviour? Is herding behaviour more during the bullish market or during the bearish markets? What are the factors that trigger herding behaviour during a natural crisis? How is the government responding to the financial crisis that is helping to mitigate the herding pattern? Can herding behaviour lead to a stock market crash? Are investors following the herd aware of their behavioural change and the consequences? Did the formulation and subsequent distribution of Covid Vaccine affect the behavioural biases?

The ultimate goal to probe into such factors is to have a more in-depth understanding of behavioural finance, especially herding behaviour, so as to educate people of the same and help to understand how such discrepancies can be minimised so as to have a more stable financial environment.

## References

- Allam, S., Abdelrhim, M., & Mohamed, M. (2020). The Effect of the COVID-19 Spread on Investor Trading Behaviour on the Egyptian Stock Exchange. *SSRN Electronic Journal*, 06. <https://doi.org/10.2139/ssrn.3655202>
- Ashish Kumar, Ms Bharti, Dr. Sanchita Bansal, D. (2016). An Examination of Herding Behavior in an Emerging Economy "A Study of Indian Stock Market. *Global Journal Of Management And Business Research*, .Retrieved from <https://journalofbusiness.org/index.php/GJMBR/article/view/2023>
- Banerjee, A. V. (1992). A Simple Model of Herd Behavior. *The Quarterly Journal of Economics*, 107(3), 797–817. <https://doi.org/10.2307/2118364>
- Chang, E. C., Cheng, J. W., & Khorana, A. (2000). An examination of herd behaviour in equity markets: An international perspective. *Journal of Banking & Finance*, 24(10), 1651–1679. [https://doi.org/10.1016/s0378-4266\(99\)00096-5](https://doi.org/10.1016/s0378-4266(99)00096-5)
- Chiang, T. C., & Zheng, D. (2010). An empirical analysis of herd behaviour in global stock markets. *Journal of Banking & Finance*, 34(8), 1911–1921. <https://doi.org/10.1016/j.jbankfin.2009.12.014>
- Christie, W. G., & Huang, R. D. (1995). Following the Pied Piper: Do Individual Returns Herd around the Market? *Financial Analysts Journal*, 51(4), 31–37. <https://doi.org/10.2469/faj.v51.n4.1918>
- Espinosa-Méndez, C., & Arias, J. (2020). COVID-19 effect on herding behaviour in European capital markets. *Finance Research Letters*, 101787. <https://doi.org/10.1016/j.frl.2020.101787>
- Ganesh, R., Naresh, G., & Thiyagarajan, S. (2017). The reflection of crowd behaviour in Indian bourses. *International Journal of Behavioural Accounting and Finance*, 6(2), 93. <https://doi.org/10.1504/ijbaf.2017.10007488>
- Mirza, N., Naqvi, B., Rahat, B., & Rizvi, S. K. A. (2020). Price reaction, volatility timing and funds' performance during Covid-19. *Finance Research Letters*, 36, 101657. <https://doi.org/10.1016/j.frl.2020.101657>
- S.C.B. Samuel Anbu Selvan, Ramraj. Covid-19 Effect On Herding Behaviour In Indian Capital Market--Palarch's Journal Of ArchaeologyOf Egypt/Egyptology 17(4), 2432-2440. ISSN 1567-214x

# A Study on the Financial Performance of Oil and Natural Gas Corporation Limited from 2015-16 to 2019-20

Arkatanu Chakraborty<sup>1</sup>

Post Graduate & Research Department of Commerce, Batch: (2019-2021)  
St. Xavier's College (Autonomous), Kolkata, West Bengal

## Abstract

*Financial performance analysis is the procedure of evaluating the outcome of an organisation's policies, strategies and operations in financial terms. It is used to evaluate and measure the overall financial robustness of an organisation over a specified period of time. Value based financial performance quantification is universally presented as a significant enhancement over the orthodox financial performance measures. Present days, top level executives have whirled their concentration to the strategies for escalating the value of companies. Modern financial performance yardsticks, specifically Economic Value Added (EVA), Market Value Added (MVA), Shareholder Value Added (SVA) and Value Added Statements (VAS), etc. are gaining popularity and are admired by many organisations. The ambition of this paper is to explore the application of EVA, MVA, SVA, and VAS as a measure of India's largest crude oil and natural gas Maharatna Company Oil and Natural Gas Corporation Limited (ONGC)'s financial performance and bring to light that have footprints on the financial performance of ONGC. This paper cynosure the subsequent footprints particularly financial leverage measures, dividend policies, disbursement on Corporate Social Responsibility, market price of shares on the financial performance of ONGC. This paper exclusively depends on published financial data collected from the website of ONGC and it doesn't compare with any other privatised and government owned oil companies.*

**Keywords:** EVA, MVA, ONGC, SVA, Value.

## Introduction

Finance is required for any activity; from starting up a new business to expanding an established business. Finance is required from a single individual

---

1. This Dissertation was done by the scholar under the guidance of Professor Ankita Samanta

to a large organisation. However, proper management of finance is needed to help an individual or an organisation to survive for the future. Clusters of financial data cannot help the users of financial statements; neither to predict future performance nor analyse past performance, research comes into the picture when it involves analyzing and measuring those data in terms of various tools and techniques. Analysing the financial performance of an organization or industry not only helps the users of financial reports to know the organization, in a deeper perspective but also helps the organisation itself, to forecast the future performance and develop suitable strategy accordingly. Every type of industry requires huge finance for any economic activities and at the same time it is also important to examine whether finance is properly managed and monitored. Among all the types of industry the oil & gas industry is one of the most important industries; which plays an indispensable role in our daily life and acts as a cornerstone behind the prosperity of India's economy. Oil and gas industry is facing few problems pertaining to capital structure positions; liquidity policy and negative growth rate in different value added measures. Thus, due to aforementioned facts it is important to study the financial performance of the oil and gas industry. Over the years across the Earth, especially India experienced incorporation of many private and public sector petroleum companies like Reliance Petroleum Limited, Bharat Petroleum Limited, Cairn India Limited, etc. Oil and Natural Gas Corporation Limited (ONGC) is one such public sector undertaking oil and natural gas company which was established in the year 1955, under the initiative of Pandit Jawarlal Nehru. Mr. Keshav Dev Malviya is the person who explored ONGC. ONGC is the mammoth oil and natural gas company in India whose contribution to India's domestic productions is nearly 75%. ONGC is the most cherished and profitable public sector undertaking listed in National Stock Exchange of India Limited

### Literature Review

Manivel (2018), in his paper "Impact of Leverage On Profitability of ONGC Ltd" showed the impact of operating leverage, financial leverage & combined leverage on the financial performance. With the help of correlation and student t test he found out that there is a positive correlation between operating, financial leverage and EPS nevertheless from the outcome of student t- test he rejected the hypotheses taken by him between the aforementioned leverage and financial performance.

Bhunia *et al.* (2015) in their paper "The Impact of Corporate Social Responsibility on Firm's Profitability- a Case Study on Maharatna Companies in India" attempted to show the relationship between CSR and PAT, CSR and EPS. Using different statistical tools and techniques, they found out that Maharatna companies especially ONGC, BHEL have a negative relationship between PAT and CSR while Maharatna companies particularly GAIL, SAIL have positive relationships between PAT and CSR. They also detected that if the expenditure on CSR is increased, profitability is declined for companies particularly BHEL, IOCL while the aforesaid relationship is conflicted for companies especially GAIL.

Davada (2011), in his study "Social performance through value added reporting" examined whether there exists significant association between Gross Value Added and total turnover, scrutinised different net value added ratios, and discovered that there exists a soaring level of correlation between turnover and gross value added. By conducting a student t-test, he observed that there remained significant correlation between total turnover and gross value added.

Petravicius *et al.* (2010), in their paper "Corporate performance and the measures of value added" have opted for different value approaches namely EVA, MVA, CVA of Jsc kauno tiekimas and came to denouement that MVA and CVA remained positive in 2004 and 2005 but decreased in 2005 and EVA is negative in 2004.

### Research Gap

- Oil and Natural Gas Corporation Limited is not separately studied in terms of value addition measures post launch of Good & Services Tax Act.
- The impact of various elements like dividend, financial leverage, etc on financial performance of ONGC is not studied in the last two financial years.

### Research Questions

- How much does ONGC achieve in terms of values?
- What are the elements that determine the financial performance of ONGC?

### Objectives

- To analyse the value addition of ONGC.
- To find out the impact of financial leverage measures and dividend policies on the financial performance of ONGC.
- To find out the impact of corporate social responsibility and market price of shares on the financial performance of ONGC.

### Research Methodology

For conducting this paper, a judgmental sampling technique is selected. The time frame taken is five years i.e. from 2015-16 to 2019-20. This research is completely based on secondary data. The data is entirely collected from annual reports of ONGC. For carrying out this research various statistical measures are used. With the help of jamovi version 1.6.15 and MS Excel the subsequent statistical tools were used:

- Karl Pearson's Coefficient of Correlation,
- Regression Statistics,
- Shapiro-Wilk Test,
- Student t test and
- Multicollinearity.

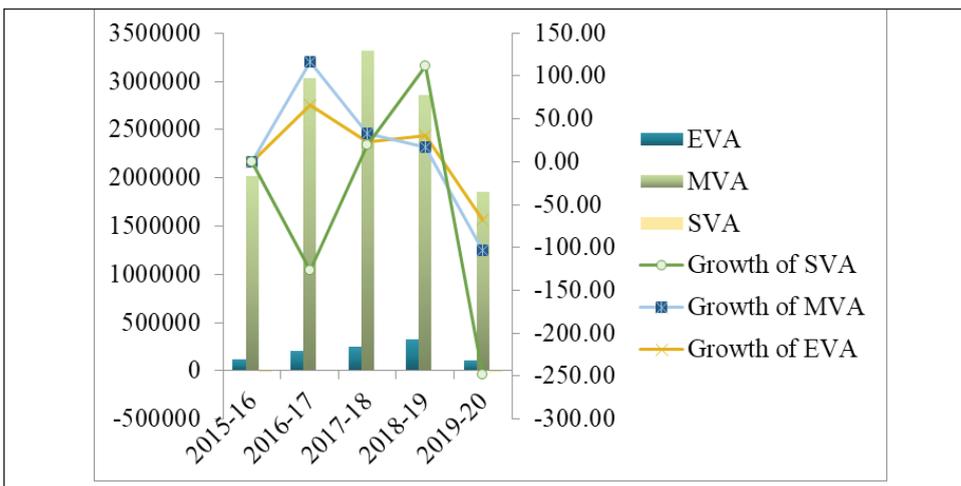
## Analysis and Interpretation

### EVA, MVA, SVA and their growth.

- Economic Value Added (EVA) is the measure of a company's economic profit and is defined as whatever profit is available after the costs of a company's capital are dwindled from operating profit.
- As defined by Stewart (1991) Market Value Added (MVA) is defined as the surplus of equity's market value over book value of equity.
- Shareholder Value Added (SVA) is defined as a measure of a company's value and worth to its shareholders contrasted with the weighted average cost of capital.

Years	EVA	MVA	SVA
2015-16	121474	2014630	-1493
2016-17	202451	3030428	2150
2017-18	249541	3315483	1867
2018-19	327182	2861523	3617
2019-20	105239	1853425	-1623

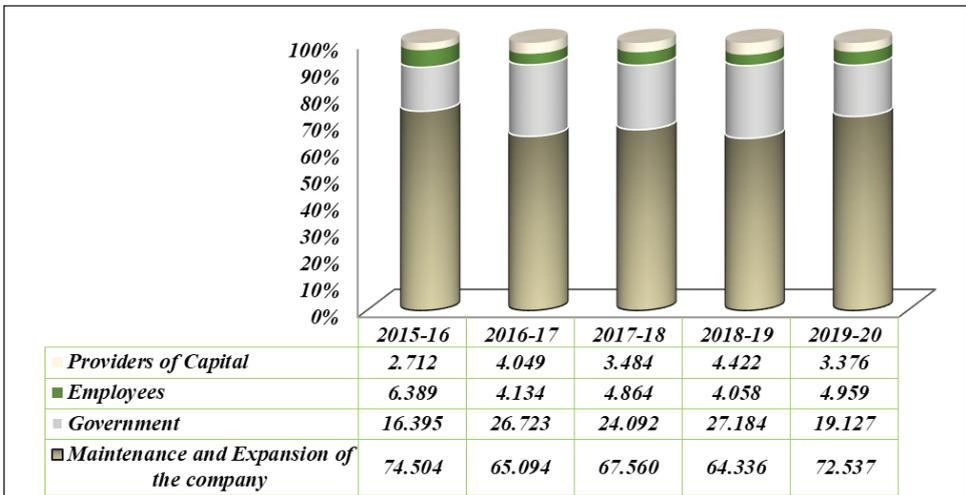
Years	Growth of EVA	Growth of MVA	Growth of SVA
2015-16	0.00	0	0
2016-17	66.66	50.42	-244.01
2017-18	23.26	9.41	-13.16
2018-19	31.11	-13.69	93.73
2019-20	-67.83	-35.23	-144.87



- From the aforesaid tables and figures following are the observations:
  - EVA and MVA have productive worth, SVA have bleak worth during the study span.
  - Negative growth rate in every value added measure in the financial year 2019-20.
  - Growth rate in all value added measures is seesaw.

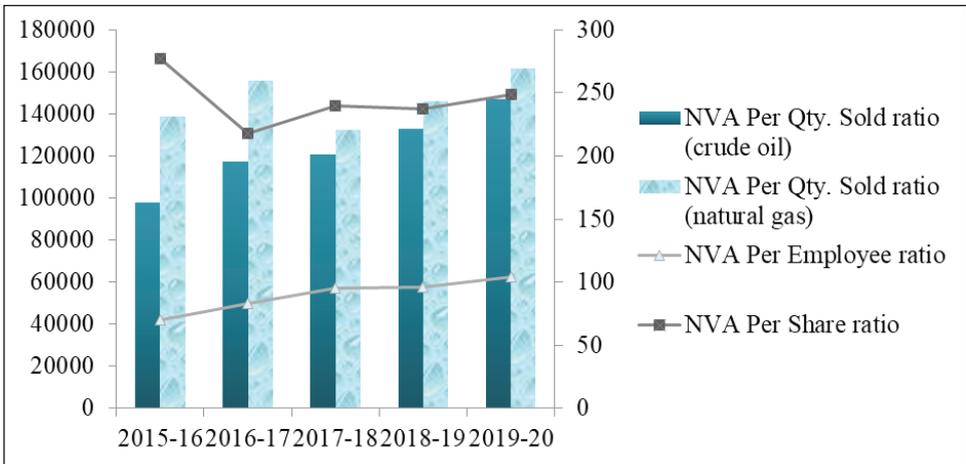
**Apportionment of Net Value Added and Pivotal Ratios**

Apportionment of net value added	2015-16	2016-17	2017-18	2018-19	2019-20
To pay employees	151322.64	115569.74	149868.62	121266.84	155371.81
To pay government	388329.96	747119.27	742339.16	812393.11	599230.02
To providers of capital	64240.22	113209.03	107366.10	132153.49	105765.52
To provide for maintenance and expansion of company	1764679.48	1819914.07	2081727.24	1922686.80	2272467.89
<b>Total</b>	<b>2368572</b>	<b>2795812</b>	<b>3081301</b>	<b>2988500</b>	<b>3132835</b>



- It was observed that during the span of study,
  - Greatest net value added is apportioned for maintenance and expansion.
  - Followed by the allotment to government.
  - Next, accompanying employees.
  - And rearmost to the providers to the capital.

	2015-16	2016-17	2017-18	2018-19	2019-20
Net Value Added to quantities sold ratio (crude oil)	98077.5	117176	120693	132822	146806
Net Value Added to quantities sold ratio (natural gas)	138513	155842	132415	145852	161486
Net Value Added to employee ratio	69.8138	83.0604	95.4998	96.2015	104.064
Net Value Added to share ratio	276.832	217.861	240.108	237.56	249.033

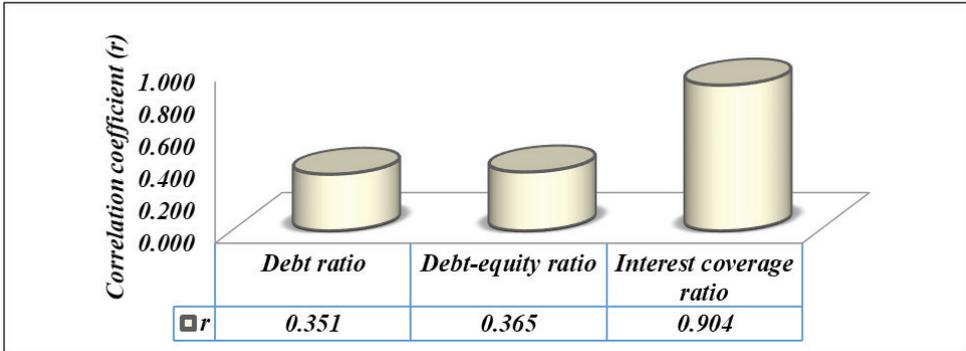


- From the above table and figure it is detected,
- Net Value Added per quantities sold ratio in terms of crude oil and natural gas is fluctuating and attained highest in the last financial year 2019-20.
  - Net Value Added per employee and share is rising over the last four financial years.

### Impact of Financial Leverage Measures on Financial Performance.

#### Correlation Matrix

		ROA	Debt Ratio	Debt-equity Ratio	Interest Coverage Ratio
Return on Assets (ROA)	Pearson's r	—			
	p-value	—			
Debt ratio	Pearson's r	0.351	—		
	p-value	0.563	—		
Debt-equity ratio	Pearson's r	0.365	-0.485	—	
	p-value	0.545	0.408	—	
Interest coverage ratio	Pearson's r	0.904	0.070	0.725	—
	p-value	0.035	0.911	0.166	—



- From the above table and figure it is observed that there is,
- Robust positive correlation between interest coverage ratio and return on assets.
  - Moderate positive correlation between debt ratio and ROA.

Summary Output				
Regression Statistics				
Multiple R	0.99970727			
R Square	0.99941462			
Adjusted R Square	0.9976585			
Standard Error	0.00075764			
Observations	5			
	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.0136288	0.001465958	-9.2968466	0.0682147
Debt ratio	-0.1025452	0.032640685	-3.1416374	0.1961839
Debt-equity ratio	-0.0950255	0.007184061	-13.227265	0.048038
Interest coverage ratio	0.89927795	0.030680184	29.3113615	0.0217108

- Hypothesis
- $H_{0A}$  -Debt ratio, debt-equity ratio & interest coverage ratio does not affect ROA.
  - $H_{1A}$  -Debt ratio, debt-equity ratio & interest coverage ratio does affect ROA.
  - Decision rule: If p-value  $\leq 0.05$ , Null hypothesis is rejected.

Explanation of the variables is tabulated below:

Concept	Variables	Nature	Measurement
Financial leverage measures	Debt ratio	Independent	Total Debt/Total Assets
	Debt-equity ratio	Independent	Total Debt/Total Equity
	Interest coverage ratio	Independent	EBIT/Interest charges
Financial performance	ROA	Dependent	Net Income/Total Assets

The regression model

$ROA=f(\text{Debt-ratio, debt-equity ratio, interest coverage ratio})$

Equation I

$$Y = -0.01 - 0.10 X_1 - 0.09 X_2 + 0.89 X_3$$

Here,

$Y=ROA$

$X_1=\text{Debt-ratio}$

$X_2=\text{Debt-equity ratio}$

$X_3=\text{Interest coverage ratio}$

- Here, multiple  $R=0.99$  which implies that 99% of the variation in dependent variable i.e. ROA can be explained by independent variables especially debt-ratio, debt-equity ratio & interest coverage ratio and remaining 1% remains unexplained. Thus, it can be said that the model has better goodness of fit.
- Debt-ratio does not affect ROA. Since p-value is 0.19 which is greater than equal to 0.05.
- Debt-equity ratio significantly affects ROA. Since p-value is 0.04 which is lesser than equal to 0.05. Thus it can be said that if the debt ratio rises by 1 ROA falls by 0.09.
- Interest coverage ratio significantly affects ROA. Since p-value is 0.02 which is lesser than equal to 0.05. Thus it can be said that if the interest coverage ratio rises by 1 ROA rises by 0.89.

Student t-test

ROA &	Correlation Coefficient (r)	Calculated value of t	Table value of t(n-2)
Debt-ratio	0.351	0.649	2.35
Debt-equity ratio	0.365	0.679	2.35
Interest coverage ratio	0.904	3.662	2.35

- After executing the Shapiro-Wilk Test, all the variables (ROE, DPS, DPR) have p-values  $\leq 0.05$ , so they follow normal distribution. Thus, student t-test is prepared to discover whether there exists significant correlation between DPS, DPR and financial performance.

- From the outcome of the student t-test it is explored,
  - There is no significant correlation between debt-ratio, debt-equity ratio and financial performance.
  - There is significant correlation between interest coverage ratio and financial performance.

**Multicollinearity**

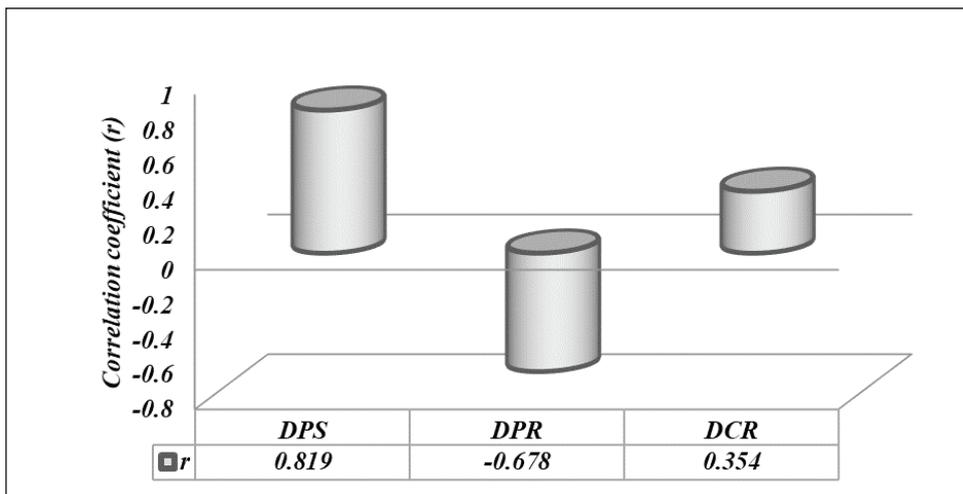
	VIF	Tolerance
Debt ratio	2.56	0.391
Debt-equity ratio	5.37	0.186
Interest coverage ratio	4.13	0.242

- From the aforementioned variables,
  - There exists no multicollinearity.

**Impact of dividend policies on financial performance.**

Correlation Matrix

		ROE	DPS	DPR	DCR
ROE	Pearson's r	—			
	p-value	—			
DPS	Pearson's r	0.819	—		
	p-value	0.090	—		
DPR	Pearson's r	-0.678	-0.243	—	
	p-value	0.208	0.693	—	
DCR	Pearson's r	0.354	0.776	0.196	—
	p-value	0.559	0.123	0.752	—



- From the above table and figure it is observed that there is,
- Concrete correlation between ROE and DPS, DCR and
  - Cynical correlation between ROE and DPR.

Summary Output			
Regression Statistics			
Multiple R	0.96543661		
R Square	0.93206785		
Adjusted R Square	0.7282714		
Standard Error	0.01977521		
Observations	5		
	Coefficients	Standard Error	t Stat
Intercept	-0.0687002	0.122871535	-0.5591223
DPS	0.03136284	0.015264559	2.0546184
DPR	-0.0775854	0.096027157	-0.8079528
DCR	-0.0130965	0.014579894	-0.8982568

➤ Hypothesis

- $H_{0B}$ - DPS, DPR and DCR does not affect ROE.
- $H_{1B}$ - DPS, DPR and DCR does affect ROE.
- Decision rule: If p-value  $\leq 0.05$ , Null hypothesis is rejected.

Explanation of the variables is tabulated below:

Concept	Variables	Nature	Measurement
Dividend policies	DPS	Independent	Total dividend/ Total number of shares
	DPR	Independent	Total dividend/Net Income
	DCR	Independent	Net Income/ Total Dividend
Financial performance	ROE	Dependent	Net Income/ Shareholder's equity

The regression model:

$$ROE=f(DPS, DPR, DCR)$$

Equation II

The estimated equation is-

$$Y = -0.06 + 0.03X_1 - 0.07X_2 - 0.01X_3$$

Here,

$Y = \text{ROA}$

$X_1 = \text{DPS}$

$X_2 = \text{DPR}$

$X_3 = \text{DCR}$

- Here, multiple  $R = 0.97$  which implies that 97% of the variation in dependent variable i.e. ROE can be explained by independent variables especially DPS, DPR and DCR and the remaining 3% remains unexplained. Thus, it can be said that the model has better goodness of fit.
- DPS affects ROE. Since t-stat is 2.05 which is greater than equal to 2. Thus it can be said that if the DPS rises by 1 then ROE rises by 0.03.
- DPR and DCR do not affect ROE. Since t-stat is -0.80 and -0.89 respectively which is less than equal to 2.

Student t-test

ROE &	Correlation coefficient (r)	Calculated value of t	Table value of t(n-2)
DPS	0.819	2.472	2.35
DPR	-0.678	-1.600	2.35

- After executing the Shapiro-Wilk Test, all the variables (ROE, DPS, DPR) have p-values  $\leq 0.05$ , so they follow normal distribution. Thus, student t-test is prepared to discover whether there exists significant correlation between DPS, DPR and financial performance.
- From the outcome of the student t-test it is explored,
  - There is significant correlation between DPS and financial performance.
  - There is no significant correlation between DPR and financial performance.

### Multicollinearity

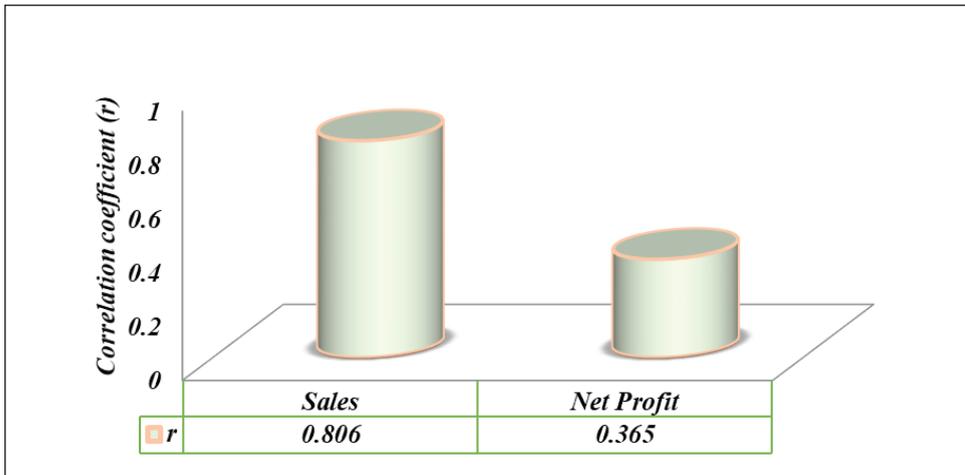
	VIF	Tolerance
DPS	4.27	0.234
DPR	1.76	0.567
DCR	4.18	0.239

- From the aforementioned variables,
  - There exists no multicollinearity.

### Impact of CSR expenditure on financial performance.

Correlation matrix

		CSR Expenditure	Sales	Net Profit
CSR Expenditure	Pearson's r	—		
	p-value	—		
Sales	Pearson's r	0.801	—	
	p-value	0.103	—	
Net Profit	Pearson's r	0.365	0.411	—
	p-value	0.545	0.492	—



- From the above table and figure it is detected,
  - That there is a positive vigorous and steady correlation between CSR expenditure and sales and CSR Expenditure and net profit respectively of ONGC.

Student t test

CSR Expenditure and	Correlation coefficient( $r$ )	Calculated value of t	Table value of $t(n-2)$
Sales	0.806	2.36	2.35
Net Profit	0.365	0.679	2.35

- After performing Shapiro-Wilk Test, all the variables (i.e. CSR expenditure, sales, net profit) have p-values  $\leq 0.05$ , so they follow normal distribution.
- Thus, student t-test is prepared to discover whether there exists significant correlation between CSR Expenditure and aforesaid variables.
  - From the outcome of the student t-test it is explored there is significant correlation between CSR Expenditure and sales since 'calculated value of

$t'$  is greater than 'table value of  $t'$ ' and there is no significant correlation between CSR Expenditure and net profit since 'calculated value of  $t'$ ' is lesser than 'table value of  $t'$ '.

### Multicollinearity

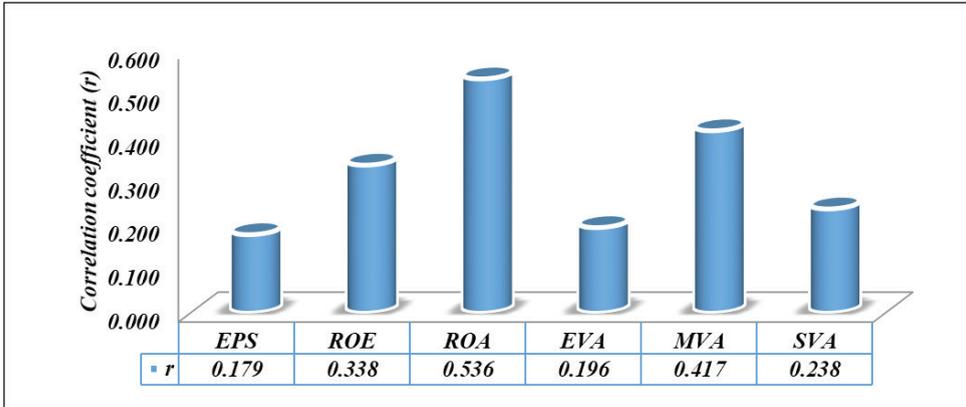
	VIF	Tolerance
Sales	1.20	0.831
Net Profit	1.20	0.831

- From the aforementioned variables,
- No multicollinearity exists.

### Impact of market price of shares on financial performance.

#### Correlation Matrix

		Market price of shares	EPS	ROE	ROA	EVA	MVA	SVA
Market Price of shares	Pearson's r	—						
	p-value	—						
EPS	Pearson's r	0.179	—					
	p-value	0.773	—					
ROE	Pearson's r	0.338	0.936	—				
	p-value	0.578	0.019	—				
ROA	Pearson's r	0.536	0.903	0.968	—			
	p-value	0.352	0.036	0.007	—			
EVA	Pearson's r	0.196	0.991	0.916	0.883	—		
	p-value	0.753	0.001	0.029	0.047	—		
MVA	Pearson's r	0.417	0.742	0.851	0.806	0.786	—	
	p-value	0.485	0.151	0.067	0.100	0.115	—	
SVA	Pearson's r	0.238	0.964	0.988	0.933	0.956	0.864	—
	p-value	0.700	0.008	0.002	0.021	0.011	0.059	—



- From the above table and figure it is observed that,
  - Among all the traditional and value added measures of financial performance, ROA and MVA respectively hold the strongest positive correlation with market price of shares.

#### Student t test

Market Price of Shares &	Correlation coefficient(r)	Calculated value of t	Table value of t (n-2)
EPS	0.179	0.315	2.35
ROE	0.338	0.622	2.35
ROA	0.536	1.1	2.35
EVA	0.196	0.346	2.35
MVA	0.417	0.795	2.35
SVA	0.238	0.424	2.35

- After executing Shapiro-Wilk Test, all the variables (i.e. EPS, ROE, ROA, EVA, MVA, SVA) have p-values  $\leq 0.05$ , so they follow normal distribution.
- Thus, a student t-test is conducted to ascertain whether there exists significant correlation between the market price of shares and the aforesaid variables.
  - From the outcome of the student t-test it is discovered there is no significant correlation between market price of shares and the aforesaid variables since 'calculated value of t' is lesser than 'table value of t'.

#### Multicollinearity

	VIF	Tolerance
EPS	8.11	0.1233
ROE	23.77	0.0421
ROA	15.86	0.0630

	VIF	Tolerance
EPS	8.11	0.1233
ROE	23.77	0.0421
ROA	15.86	0.0630
	VIF	Tolerance
EVA	12.51	0.0799
MVA	4.25	0.2352
SVA	18.85	0.0531

- From the aforementioned variables,
  - Multicollinearity endures in EVA and SVA.

## Conclusion

For the mission to accomplish the examination of financial performance of ONGC, I have evaluated value intensification measures, constructed Value Added Statements, framed pivotal ratios of Net Value Added and discovered crucial elements that affect the financial performance of ONGC.

Aforementioned yardsticks and elements bring to light, the subsequent stunning outcomes:

- With respect to the value escalation measures, ONGC is successful in sowing the seeds of positive worth of EVA, MVA but it is detected there is negative growth rate in the financial year 2019-20.
- From the construction of Value Added Statements, it is discovered extortionate Net Value Added is apportioned to maintenance and expansion of ONGC.
- From the discovery of crucial yardsticks that impact the financial performance of ONGC, it became crystal clear that,
  - The student t test unearthed that numerous ratios and constituents have significant correlation with the financial performance, while various ratios and constituents notwithstanding the productive correlation coefficient don't have significant correlation with the financial performance of ONGC.

Nevertheless, in India value added reporting is mandated, it is still becoming admired. This enactment contemplates a substantial concern for public attentiveness. At a future time, value added reporting will surely inaugurate the intertwining of the accounting and community since the value yielded is the outcome of the contingent of collaborating members from organisation to community.

## A Study on Impact of Merger and Acquisition on the Financial Performance of ONGC and HPCL

Adeeba Arfeen<sup>1</sup>

Post Graduate & Research Department of Commerce, Batch: (2019-2021)  
St. Xavier's College (Autonomous), Kolkata, West Bengal

### Abstract

*The present study was carried out with the aim of assessing the impact of mergers and acquisitions on the financial performance of the select oil and gas companies in India. The ONGC-HPCL merger was completed in January 2018. As a result, HPCL became a subsidiary of ONGC. The prime motive behind this acquisition was to scale-up the operations of the company. Even though the companies are merged, HPCL functions as a separate listed entity with its separate board of directors and senior management. The aim of this paper is to observe the consequence of the merger on both companies' financial results.*

*Oil prices affect the major functioning of our economy. It is important to understand the overall performance and to monitor their financial conditions. There are a lot of M&As and disinvestments happening in our country. This paper focuses on the analysis of the recent big merger in the oil and gas sector in order to understand the effect of the merger on the companies. The primary objective of the paper is to determine the impact of merger on the profitability, liquidity, solvency and shareholder's wealth of the acquiring company under the study and to highlight the comparison of financial performance of the companies under study. To compare the performance of the two companies, six years' data have been considered (2014-15 to 2019-20) and their financial ratios are compared. The study is based on secondary data which is taken from Annual Reports and Money Control. The sample size is less than thirty so paired samples t-test with a confidential level of 95% has been set to test the significant difference between pre and post financial performance.*

**Keywords:** Financial Performance, Hpcl, Mergers and Acquisitions, Oil and Gas Companies, ONGC.

---

1. This Dissertation was done by the scholar under the guidance of Prof. Ankita Samanta

## Introduction

On January 28, 2018, Oil and Natural Gas Corporation Limited (ONGC) purchased a 51.11 percent stake in Hindustan Petroleum Corporation Limited (HPCL) in an all-cash deal worth Rs 36,915 crore. ONGC and HPCL's total market value is estimated to be around Rs3,11,925 crores. The primary goal of this transaction was to expand the company's operations. Despite the fact that the entities are combined, HPCL will operate as a separate listed company with its own board of directors and senior management. The aim of this paper is to examine the effect of a merger on both companies' financial results.

Oil and Natural Gas Corporation Limited (ONGC) is an Indian state-owned oil and gas company established on June 23, 1993. It is one of Asia's biggest and most active oil exploration and production firms. It supplies roughly 30% of India's crude oil requirements. In February 1994, ONGC was reorganised as a limited company under the Company's Act, 1956, as a result of the Indian government's adoption of the New Economic Policy in July 1991, which sought to deregulate the key sectors with partial disinvestment. In the year 2002-03, it diversified into the downstream sector, by attaining MRPL from the A.V. Birla Group. It started contesting in the international marketplace via its subsidiary, ONGC Videsh Ltd. ([www.ongcindia.com](http://www.ongcindia.com))

HPCL was established in 1974 by the merger of two companies, namely ESSO Standard Refining Company of India Limited and Lube India Limited. The Indian Government took over CORIL in 1976. In 1978 it was merged with HPCL. In 1979, the Kosan Gas Corporation amalgamated with HPCL. As a result, HPCL was created by the merger of four distinct organisations at different times. It captures over 18% market share in India. It recorded an annual gross sale of Rs 2, 86,250 crore and Profit after tax of Rs 2,607 crore during the financial year 2019-20.

## Literature Review

Borodin et al. (2020), in their paper "Impact of mergers and acquisitions on companies' financial performance", investigated the effect of mergers and acquisitions on the financial results of US and European companies. They discovered that the selected companies' financial results remained positive both before and after the M&A transactions.

Sheik et al. (2019), in their paper "Financial Analysis and Performance of Oil and Natural Gas Corporation- for the period of 2012 to 2017", studied the financial position, profitability and financial performance of ONGC. They found that the turnover, current ratio and the liquidity ratio of the company showed a downward trend.

Ansari (2018), in his paper "An Evaluation of Financial Performance of Select Oil and Gas Companies in India" tried to find out the influence of cash flow, working capital and capital structure on the performance of the company. He concluded that the companies showed a growth trend during the period of study and the financial performance was satisfactory.

Ansari *et al.* (2018), in their article “An analytical study of impact of merger & acquisition on financial performance of corporate sector in India”, studied the impact of mergers and acquisitions on the profitability, liquidity and leverage positions of select companies in India. The findings indicated that the financial performance of the select companies has not changed significantly as a result of the merger.

Mubeen *et al.* (2017), in their paper “Impact of Mergers and Acquisitions on Financial Performance a study of Select Indian Companies”, aimed to analyse the impact of mergers and acquisitions on profitability, growth and liquidity position of the select acquirer companies in India. They found that the profitability and liquidity position of the companies deteriorated post-merger.

Ahmad (2016), in his paper “Analysis of Financial Performance of Hindustan Petroleum Corporation Limited” tried to study the liquidity, solvency, efficiency and profitability position of the company and their impact on the Return on Investment. He concluded that the company’s ability to meet the current obligation was not satisfactory.

Kushwah (2016), in his paper “Impact of mergers and acquisitions and private sector banks: A study from financial perspective” studied the impact of the merger on profitability, liquidity and leverage position of selected banks. He concluded that the deregulation in the banking sector has shown a remarkable growth pattern. He also suggests that an improvement of accounting standards and disclosure practices would enhance more transparency in the financial market and produce more reliable data.

Rani *et al.* (2015), in their paper “Financial performance analysis of mergers and acquisitions: evidence from India” studied the impact of merger on financial performance using profitability, liquidity, efficiency and leverage ratios. They found that there is significant improvement in the profitability, efficiency, expense and liquidity of the acquiring firms in the post-M&A period.

Trivedi *et al.* (2013), in their paper “A Study on Mergers & Acquisitions in Oil & Gas Sector in India and Their Impact on the Operating Performance and Shareholders’ Wealth” compared the results of acquiring companies’ financial performance and shareholder value before and after the merger. They came to the conclusion that financial output and the wealth of the acquiring company’s shareholders deteriorates after the takeover, and mergers and acquisitions do not generate immediate shareholder wealth.

Garg (2011), in her paper “Financial Evaluation of Oil and Natural Gas Corporation”, analysed the income, profitability and employment position of ONGC. She found out that the company showed a positive trend and an increasing net profit ratio in the evaluating years.

Sinha *et al.* (2010), in their journal “Measuring Post Merger and Acquisition Performance: An Investigation of Select Financial Sector Organizations in India”, they analysed the changes in the companies’ roles as well as the changes in their performance before and after the merger. They discovered a substantial shift in shareholder profits, but no significant change in the firms’ liquidity status.

Bose (2006), in his paper "Merger and Acquisition: A study in Indian context" analysed the evolution of M&A in global as well as Indian scenarios. He concluded that M&A can be very successful in India if certain proactive actions are taken and strategies are adopted at the right time.

### Research Gap

The following research gaps have been observed after reviewing the above-mentioned literature:

- i. It is difficult to find a comprehensive study on the merger of Indian Oil Companies.
- ii. Previously research was based on old data.

### Research Questions

The aim of the study is to answer the following questions:

- Has ONGC improved their financial performance after the merger?
- Has HPCL improved their financial performance after the merger?

### Objectives of the Study

- i. To determine the impact of merger on the profitability, liquidity, solvency and shareholder's wealth of the acquiring company under the study.
- ii. To highlight the comparison of financial performance of the companies under study.

### Hypotheses

The following null hypotheses are constructed with the aim of testing them.

HYPOTHESES	
$H_{01}$	There is no significant difference in the mean score of profitability indicators in the select companies, pre and post M&A.
$H_{02}$	There is no significant difference in the mean score of liquidity indicators in the select companies, pre and post M&A.
$H_{03}$	There is no significant difference in the mean score of solvency indicators in the select companies pre and post M&A.
$H_{04}$	There is no significant difference in the mean score of efficiency indicators in the select companies, pre and post M&A
$H_{05}$	There is no significant impact on the shareholders wealth after the merger.

### Research Methodology

#### Data Period

To compare the performance of the two companies, three years before the merger and three years after the merger (2014-15 to 2019-20) financial ratios are being

compared. The year of merger is taken in the post-merger period for comparison purposes.

### **Data and Sources of Data**

The research is entirely based on secondary data. The study is based on secondary data which is taken from Annual Reports and Money Control.

### **Tools and Techniques used for the study**

For the purpose of carrying out the research, six years of data have been considered for analysis. The sample size is less than thirty so paired samples t-test with a confidential level of 95% has been set to test the significant difference between pre and post financial performance and normality has been assumed.

SPSS and Ms-Excel were used to analyse the data that was collected. SPSS was used to conduct the hypothesis testing using paired sample t-test.

The performance of the two merging companies has been evaluated on the following financial standards:

- A. Profitability Ratios
  - a. Net Profit Margin (NPM)
  - b. Return on Equity (ROE)
  - c. Return on Asset (ROA)
  - d. Return on Capital Employed (ROCE)
- B. Liquidity Ratios
  - a. Current Ratio (CR)
  - b. Quick Ratio (QR)
- C. Solvency Ratio
  - a. Debt to Equity Ratio (DER)
  - b. Interest Coverage Ratio (ICR)
- D. Efficiency Ratio
  - a. Asset Turnover Ratio (ATR)
  - b. Inventory Turnover Ratio (ITR)
- E. Shareholders Wealth Indicator
  - a. Basic Earnings per Share (EPS)
  - b. Book Value per Share (BVPS)
  - c. Dividend per Share (DPS)

## Analysis and Interpretation

For the fulfilment of Objective (i)

Hypothesis being tested		Sig. Value	H <sub>0</sub> Accepted/Rejected
<b>H<sub>01</sub></b> There is no significant difference in the mean score of profitability indicators in the select companies, pre and post M&A.			
NPM	ONGC	0.802	Accepted
	HPCL	0.847	Accepted
ROA	ONGC	0.540	Accepted
	HPCL	0.823	Accepted
ROE	ONGC	0.850	Accepted
	HPCL	0.715	Accepted
ROCE	ONGC	0.300	Accepted
	HPCL	0.849	Accepted
<b>H</b> There is no significant difference in the mean score of liquidity indicators in the select companies, pre and post M&A.			
CR	ONGC	0.006	Rejected
	HPCL	0.118	Accepted
QR	ONGC	0.005	Rejected
	HPCL	0.223	Accepted
<b>H<sub>03</sub></b> There is no significant difference in the mean score of solvency indicators before and after M&A			
DER	ONGC	0.023	Rejected
	HPCL	0.636	Accepted
ICR	ONGC	0.422	Accepted
	HPCL	0.997	Accepted
<b>H<sub>04</sub></b> There is no significant difference in the mean score of efficiency indicators before and after M&A.			
ATR	ONGC	0.553	Accepted
	HPCL	0.517	Accepted
ITR	ONGC	0.313	Accepted
	HPCL	0.944	Accepted
<b>H<sub>05</sub></b> There is no significant difference in the mean score of shareholders' wealth indicators before and after M&A.			
EPS	ONGC	0.990	Accepted
	HPCL	0.094	Accepted
BVPS	ONGC	0.031	Rejected
	HPCL	0.061	Accepted
DPS	ONGC	0.388	Accepted
	HPCL	0.173	Accepted

The findings of the study for the fulfilment of objective ii

- In terms of NPM, ONGC performed better than HPCL with an average of 20.6% and 1.97% in the post-merger phase. However, both the companies show a decline in their performance.
- In terms of ROA, ONGC performed better with an average of 6.7% in contrast to HPCL which has an average of 5.14% after the M&A. Both the companies show a decline in their performance.
- In terms of ROE, HPCL performed better than ONGC with an average of 19% and 10% after the M&A. Both the companies show a decline in their performance after the M&A.
- In terms of ROCE, both the companies show an improvement while HPCL performs better than ONGC with a mean of 17.55% and 13.37% in the post-merger phase.
- In terms of CR, both the companies show a decline in their performance after the M&A.
- In terms of QR, both the companies show a decline in their performance after the M&A.
- In terms of DER, both the companies show an increase in the ratio after the M&A.
- In terms of ICR, both the companies show a decline in the ratio after the M&A. ONGC performed better than HPCL with means of 15.72% and 11.48% in the post-merger phase.
- In terms of ATR, both the companies show a decline in the ratio after M&A. HPCL has a very high turnover of 251% compared to ONGC which has a turnover of 32.6%.
- In terms of ITR, both the companies show a decline in the ratio after the M&A.
- In terms of basic EPS, both the companies show a decline after the M&A. HPCL has performed better than ONGC with mean EPS of Rs.32.86 and Rs.15.69 respectively.
- In terms of BVPS, both the companies show a decline after the M&A. HPCL has a better performance than ONGC with mean BVPS of Rs.14.21 and Rs.6.2 respectively.
- In terms of DPS, both the companies show a decline after the M&A. HPCL has a better performance than ONGC with mean DPS of Rs.177.33 and Rs.155.51 respectively.

## Conclusion

We can conclude that, there is no such significant impact in the event of the merger on the companies. The M&A didn't bring any significant change in their performances.

In respect of all the standards taken for this study, we see a decline in the majority of them in the post M&A phase. ONGC has performed better with respect to NPM and ROA and ICR. HPCL has a better ATR, EPS, DPS and BVPS. ROCE has improved significantly for both the companies. CR and QR positions are the same for both the companies. ONGC was a debt free company, it incorporated little debt after the merger.

The companies' performances were rising until 2018-19 after which it dropped significantly in FY2019-20 due to the overall economic downturn. International Monetary Fund (IMF) MD Kristalina Georgieva (thehindu.com), "The Indian economy experienced some abrupt slowdown in 2019 due to turbulence in non-banking financial institutions and major reform measures such as GST and demonetisation, but it is not in a recession". Even though we notice a downfall it can be said that the companies will perform significantly better in future once the economy recovers.

## References

1. Ahmad, I. (2016). Analysis of Financial Performance of Hindustan Petroleum Corporation Limited. *IJRMEC*, 6(4), 1-14. [http://indusedu.org/pdfs/IJRMEC/IJRMEC\\_749\\_54572.pdf](http://indusedu.org/pdfs/IJRMEC/IJRMEC_749_54572.pdf)
2. Ansari, M. (2018). An Evaluation of Financial Performance of Select Oil and Gas Companies in India (Doctoral thesis, University of Mysore). Retrieved from <http://hdl.handle.net/10603/256853>
3. Ansari, M. A., & Mustafa, M. (2020). An analytical study of impact of merger & acquisition on financial performance of corporate sector in India. *Journal of Management Research and Analysis*, 5(2), 113–116. <https://doi.org/10.18231/2394-2770.2018.0018>
4. Borodin, A., Ziyadin, S., Islyam, G., & Panaedova, G. (2020). Impact of mergers and acquisitions on companies' financial performance. *Journal of International Studies*, 13(2), 34-47. DOI: 10.14254/2071-8330.2020/13-2/3
5. Bose, S. (2006). Merger and Acquisition- A Study in the Indian Context (Doctoral Thesis, University of Kalayani). Retrieved from <http://hdl.handle.net/10603/210002>
6. Business Standard. (n.d.). Business Standard. Retrieved April 20, 2021, from <https://www.business-standard.com/company/o-n-g-c-6068/financials-ratios>
7. ETEnergyWorld. (2018, February 1). ONGC completes Rs 36,915 crore HPCL acquisition, becomes first integrated oil major. *Energy World*. Retrieved from <https://energy.economicstimes.indiatimes.com/news/oil-and-gas/ongc-completes-rs-36915-crore-hpcl-acquisition-becomes-first-integrated-oil-major/62725587>
8. Garg, N. (2011). Financial Evaluation of Oil and Natural Gas Corporation (Doctoral Thesis, Mahatma Gandhi Kashi Vidyapith University). Retrieved from <http://hdl.handle.net/10603/291181>
9. Hindustan Petroleum Corporation Ltd. (HPCL) (<https://www.hindustanpetroleum.com/>)

10. Hindustan petroleum CORPORATION FINANCIAL Ratios, HPCL Liquidity RATIO, Debt, QUICK, current ratio. (n.d.). Retrieved April 20, 2021, from <https://m.moneycontrol.com/stock/HPC/financials/financials-ratio>
11. Indian economy experienced abrupt slowdown in 2019, but it's not in a recession: IMF MD. (2020, February 1). The Hindu. <https://www.thehindu.com/business/indian-economy-experienced-abrupt-slowdown-in-2019-but-its-not-in-a-recession-imf-md/article30709350.ece>
12. Kushwah, R. (2016). Impact of mergers and acquisitions and private sector banks: A study from financial perspective (Doctoral Thesis, Jiwaji University). Retrieved from <http://hdl.handle.net/10603/200556>
13. Mantravadi, M. P. (2007). Impact of mergers and acquisitions on operating performance of firms in India. <http://hdl.handle.net/10603/125391>
14. Mubeen, S. & Nagaraju, Y. (2017). Impact of Mergers and Acquisitions on Financial Performance a study of Select Indian Companies. *Adarsh Journal of Management Research*, 10(2), 46-55. DOI: 10.21095/ajmr/2017/v10/i2/141487
15. Oil and Natural Gas Corporation Ltd. (ONGC) (<https://ongcindia.com/wps/wcm/myconnect/en>)
16. Oil and Natural Gas Corporation Financial Ratios, ONGC Liquidity ratio, Debt, Quick, Current Ratio. Moneycontrol. (n.d.). Retrieved from <https://m.moneycontrol.com/stock/ONG/financials/financials-ratio>.
17. Sheik, M. N., & Poongodi, T. (2019). Financial Analysis and Performance of Oil and Natural Gas Corporation- for the period of 2012 to 2017. *JAC: A Journal of Composition Theory*, 12(12), 864-874. <http://www.jctjournal.com/gallery/94-dec2019.pdf>
18. Sinha, N., Kaushik K.P., & Chaudhary, T. (2010). Measuring Post Merger and Acquisition Performance: An Investigation of Select Financial Sector Organizations in India. *International Journal of Economics and Finance*.
19. Trivedi, A., Desai, J. & Joshi, N. A. (2013). A Study on Mergers & Acquisitions in Oil & Gas Sector in India and Their Impact on the Operating Performance and Shareholders' Wealth. Shri Chimanbhai Patel Institutes Working Paper Series No. CPI/MBA/2013/0002, Available at SSRN: <https://ssrn.com/abstract=2202333>.

# A Study on Change in Stock Price and Stock Market Participants Behaviour towards Stock Split

**Kumar Satyam<sup>1</sup>**

Post Graduate & Research Department of Commerce, Batch: (2019-2021)  
St. Xavier's College (Autonomous), Kolkata, West Bengal

## Abstract

*In today's era where stock market is becoming attractive day-to-day, each and every prospect of business and trading environment is getting more and more complex. Stock market is a market which provides a platform for purchase or sale of existing securities. There are several factors which leads to change in stock price of the company. It results in ultimate profit or loss to stock market participants. Many companies tend to exercise corporate activities so as to maintain and boost the liquidity of the stocks. One of the corporate actions is Stock Splits. Stock splits has become very common now-a-days and it is used by every type of listed companies (small, medium or large caps).*

*This paper aims to analyse the change in stock price due to stock split in India. It also tries to analyse the behaviour of the investors and other stock market participants around the stock split date. The research is done to find out whether there is any significant impact of stock split on the average abnormal returns of the stock on the ex-split date. Also, the research aims to observe that how the stocks behave around the stock split date.*

**Keywords:** Abnormal Returns, BSE 500 index, Corporate Action, Stock Splits, Event Study.

## Introduction

Finance is life blood to any industry and availability of adequate finance is thus, very important for the survival and growth of an entity.

Under stock exchange, the companies' security price tends to change over a period of time. Any action or event initiated by a public company that brings or has potential to bring an actual change to the securities (equity or debt) issued

---

1. This Dissertation was done by the scholar under the guidance of Prof. Ankita Samanta

by the company is termed as Corporate Actions. Although these corporate actions are agreed by Board of Directors of the company and authorized by the shareholders. Corporate action decisions are taken for the welfare of stakeholders and increasing the company's profitability.

The following table shows some of the examples or types of Corporate Action are as follows:

**Table 1: Examples of Corporate Action**

Example	Motive
1. Stock Split	For influencing share price.
2. Buy Back	For influencing share price.
3. Mergers & Acquisition	For Corporate restructuring.
4. Spin-offs	For Corporate restructuring.
5. Bonus Issues	For returning profits to shareholders.
6. Right Issues	For returning profits to shareholders.

etc.

Stock Split is one of the corporate actions performed by the company's Board of Directors to increase the total number of shares that are outstanding by issuing more shares to current shareholders. Under this one share is split into many, say, 1 share of Rs 500 splits into 5 shares of Rs 100 each. It acts as a tool for the company for regulating the stock prices. Suppose in case the share price of a company increases beyond a limit, it may become less tradable, for example if the stock price of the company rises from Rs 50 to Rs 1000 over the years, it is possible that it might go out of range of many investors. The stock Split in the ratio 2:1, 3:1, 3:2, etc are common but the company can exercise the split in any ratio.

## Literature Review

Literature review tells about the study already done on Stock Split.

Burnwal *et al.* (2019) in their research, "Announcement Effect of Stock Split on Behavior and Market Liquidity of Shares: A study", they investigated the effect of stock split announcement on share price behavior of some large cap companies and also their market liquidity in India.

Babu *et al.* (2018) in their research, "Impact of Corporate (Stock Split) Action on Stock Price in India", they attempted to analyze the stock split announcement's impact on stock price. Event study and T-test were used for research.

Chakrabarti *et al.* (2017) in their research, "Impact of stock splits on Returns: Evidence from Indian Stock Market", they attempted to assess the effect of

return of stock after the stock split announcement and actual split in Indian context during 2010 to 2015.

Parab *et al.* (2016) in their research, "Impact of Stock Split Prices Announcements on Stock Prices and Liquidity: Empirical Evidence from India", they aim to test whether stock split is done to maintain the stock prices with a normal price range and whether it improves stock liquidity.

Naidu *et al.* (2013) in their research, "An Empirical Study on Price Pressure and liquidity effect of Stock Split Announcement- Evidence from Indian Market", they studied Nifty stocks from 1995 to 2011 that went through stock split.

Raja *et al.* (2012) in their research, "Stock Splits and Price Behavior: Indian Evidence", they studied BSE-100 companies which went through corporate action of stock split and its impact on stock price.

## Research Gap

The topic "A Study of Change in Stock Price and Behavior Analysis of Stock Market Participants towards Stock Split" covers a vast area. The studies on Stock Split done so far are based on the event study for a specified period applicable on all types of stocks, irrespective of their prices. The generalized findings from the statistical analysis are assumed as a universal phenomenon.

## Research Questions

- i. What is the impact of stock split on Market Price of share?
- ii. Is it better to buy shares before or after record date of stock split?

## Objectives of the Study

- a) To give a brief overview about Stock Split.
- b) To determine the Abnormal returns, Cumulative Abnormal Returns of the sample companies.
- c) To calculate Average Abnormal Return and Cumulative Average Abnormal Returns of selected companies.
- d) To test ex-split's impact on stock average abnormal returns.

## Hypothesis of the Study

$H_0$	There is no significant impact on stock average abnormal return of ex-split date ( $R=0$ ).
$H_1$	There is significance impact on stock average abnormal return of ex-split date ( $R\neq 0$ ).

## Research Methodology:

This paper is totally based on secondary data. Sample is collected from the year 2019 in which companies announced the split in the ratio of 10:5. Out of 16, data

of 8 companies were available for research purpose. All these companies belong to different sector.

In order to calculate Expected Return from respective stock, Regression is used and BSE 500 index is used for Market Return. Abnormal Return is given by the difference between Stock Expected return and Stock Actual returns during 21 days' event period. Student t-test is used for determining the significance of stock split announcement on stock abnormal returns.

### Data Analysis & Interpretation:

This paper aims to provide meaning to the information collected and with this information determining the conclusions, hypothesis, significance and implications of the finding.

Following are some of the formulas used for data analysis: -

1. Simple regression model is given by:

$$\text{Normal/Expected Return}(E) = \alpha + \beta \cdot R_M$$

where,  $\alpha$  = Alpha coefficient of stock with index

$\beta$  = Beta coefficient of the stock with index

$R_M$  = Expected return of Index

2. Abnormal Return is calculated by:

$$AR = R - E$$

where, R = Actual Return

AR = Abnormal Return

3. Average Abnormal Return (AAR) is calculated by:

$$AAR = \sum() / n$$

where, t = the number of securities in the study

n = the number of stocks in the class

4. Student t-test is given by:

$$\text{Student } t = AAR / S.E$$

AAR = Average Abnormal Return

S.E = Standard error of Average Abnormal Return

5. Standard Error is calculated by:

$$S.E = \sigma /$$

where,  $\sigma$  = Standard Deviation of stock

n = the number of stocks in the class

6. Level of Significance at 5% is 2.365 (Degree of freedom =7)

The event study is of 21 days period. The first day is -10<sup>th</sup> day (10<sup>th</sup> day before event day), 0<sup>th</sup> day is the event date and 10<sup>th</sup> day (10<sup>th</sup> day after the event day) is the last day of event.

**Table 2.1: Abnormal Returns of sample company's stock around event day**

Day of Event	Sadhana	ISL Consulting	Nitin Casting	Madhav Copper	Master Trust	PG Industry	IST Ltd.	Guj Cotex
-10	-2.297	-0.128	2.569	-1.976	0.055	0.347	-0.377	-0.215
-9	-1.456	4.617	1.388	0.302	0.066	0.271	0.575	0.182
-8	-1.449	-0.140	-0.250	-4.375	0.103	-4.862	3.116	-0.118
-7	-1.232	3.967	-0.401	-0.336	4.942	-1.689	-5.081	0.129
-6	-1.520	3.074	9.546	2.378	0.074	0.277	-2.772	-0.136
-5	2.760	2.262	3.833	-1.762	0.075	5.004	5.905	-0.126
-4	3.049	4.399	-0.616	1.127	0.083	0.271	-4.387	-0.089
-3	-1.443	4.575	-2.323	-5.251	0.092	-4.396	7.381	-0.186
-2	-0.764	4.633	-0.846	1.198	0.102	-3.465	1.059	-0.211
-1	-0.424	-3.988	-3.050	-0.087	4.898	0.324	-3.986	0.019
0	-1.419	4.452	-0.037	4.188	0.047	0.310	0.121	4.907
1	0.413	3.359	-0.163	3.945	0.067	0.329	1.505	4.184
2	1.282	3.268	1.464	1.356	-0.096	-1.476	0.262	4.485
3	2.156	-0.091	-0.188	0.469	0.087	-4.397	2.425	-0.243
4	2.699	-0.076	-0.941	-0.276	-1.770	-3.517	0.224	4.014
5	-1.331	-0.118	2.291	-1.063	-3.668	0.279	14.890	0.098
6	-2.112	4.663	0.176	1.422	0.071	0.303	-5.206	-0.037
7	-4.790	-0.127	-0.284	0.283	0.074	-2.565	-4.023	4.970
8	-3.596	-0.065	-0.027	0.825	0.448	0.293	0.325	4.447
9	-3.942	-0.032	-0.296	-5.033	0.068	0.381	-3.047	0.003
10	-4.165	-0.005	-0.293	2.927	4.930	0.320	-1.672	0.193

### Interpretation

Table 2.1 shows the Abnormal returns of sample companies. The highest abnormal return 14.89 recorded in IST Ltd. on 5<sup>th</sup> day post record or event day and lowest abnormal return -5.251 in Madhav Copper on 3<sup>rd</sup> day before the day of event. On the 0<sup>th</sup> day i.e., the event day most of the stocks abnormal returns are in positive except two stocks. Pre-split most of the stocks abnormal return are in positive which tends to become negative after event date.

So, it is observed that investors were gaining favourable return but post-split date investors lost the money in most of the cases. It is also observed that each company has minimum 8 negative abnormal return except Master Trust which has only 3 negative abnormal return during 21 days event window.

It is noted that abnormal return is positive on starting day (-10<sup>th</sup> day) in 3 stocks out of 8 sample stocks and on last date (10<sup>th</sup> day) 4 stocks shows positive abnormal return. Three of the sample stock's abnormal return started as negative

and ended with negative, two stock started as negative and abnormal return and ended as positive, one stock started as positive and ended as negative and remaining 2 stock started and ended with positive abnormal return.

**Table 2.2: Cumulative Abnormal Return of sample company around event day**

Day of Event	Sadhana	ISL Consulting	Nitin Casting	Madhav Copper	Master Trust	PG Industry	IST Ltd.	Guj Cotex
-10	-2.297	-0.128	2.569	-1.976	0.055	0.347	-0.377	-0.215
-9	-3.753	4.490	3.957	-1.674	0.121	0.271	0.198	-0.033
-8	-5.202	4.350	3.708	-6.048	0.224	-4.862	3.314	-0.150
-7	-6.434	8.316	3.306	-6.384	5.166	-1.689	-1.767	-0.021
-6	-7.954	11.390	12.852	-4.006	5.240	0.277	-4.539	-0.158
-5	-5.194	13.652	16.685	-5.768	5.314	5.004	1.366	-0.284
-4	-2.145	18.051	16.070	-4.641	5.397	0.271	-3.021	-0.373
-3	-3.588	22.626	13.746	-9.892	5.489	-4.396	4.360	-0.559
-2	-4.352	27.258	12.900	-8.694	5.590	-3.465	5.419	-0.769
-1	-4.776	23.270	9.850	-8.781	10.489	0.324	1.433	-0.750
0	-6.195	27.722	9.813	-4.593	10.535	0.310	1.553	4.157
1	-5.781	31.081	9.651	-0.648	10.602	0.329	3.058	8.341
2	-4.499	34.349	11.115	0.709	10.506	-1.476	3.321	12.827
3	-2.343	34.259	10.927	1.177	10.593	-4.397	5.745	12.584
4	0.356	34.182	9.986	0.901	8.822	-3.517	5.969	16.598
5	-0.975	34.064	12.277	-0.161	5.155	0.279	20.859	16.696
6	-3.086	38.728	12.453	1.260	5.226	0.303	15.652	16.659
7	-7.876	38.601	12.168	1.543	5.301	-2.565	11.629	21.629
8	-11.472	38.536	12.141	2.369	5.749	0.293	11.954	26.076
9	-15.414	38.504	11.846	-2.664	5.816	0.381	8.907	26.079
10	-19.579	38.499	11.553	0.263	10.746	0.320	7.235	26.272

### Interpretation

Table 2.2 shows the Cumulative abnormal returns. Sadhana Nitrochem's Cumulative abnormal return started with -2.297 with highest 0.356 on 4<sup>th</sup> day after split and it ended with -19.579 on 10<sup>th</sup> day post the event. ISL Consulting stock Cumulative abnormal return started with -0.128 and it reaches highest 38.728 on 6<sup>th</sup> day after event day and finally ended with 38.499 on 10<sup>th</sup> day after the event. Nitin Casting and Master Trust stock has only positive cumulative abnormal return throughout the 21 days event period. Guj Cotex started with -0.215 and ended with 26.272 with highest cumulative abnormal return 26.079 on 9<sup>th</sup> day after ex-split and lowest -0.769 on 2<sup>nd</sup> day before ex-split date.

On the event day most of the stocks Cumulative abnormal return is positive and this trend followed in next two days after the record date and before the record date also. It is also noted that the cumulative abnormal return is behaving differently in each case.

**Table 2.3**

Day of event	AAR	CAAR	Standard Deviation	Standard Error	T-Value
-10	-0.253	-0.253	1.396	0.494	-0.512
-9	0.743	0.491	1.639	0.579	1.283
-8	-0.997	-0.506	2.417	0.855	-1.166
-7	0.037	-0.469	2.971	1.051	0.035
-6	1.365	0.896	3.561	1.259	1.084
-5	2.244	3.140	2.505	0.886	<b>2.534*</b>
-4	0.480	3.620	2.444	0.864	0.555
-3	-0.194	3.426	4.024	1.423	-0.136
-2	0.213	3.639	2.151	0.761	0.280
-1	-0.787	2.852	2.748	0.972	-0.810
0	1.571	4.423	2.340	0.827	1.899
1	1.705	6.128	1.720	0.608	<b>2.803*</b>
2	1.318	7.447	1.760	0.622	2.119
3	0.027	7.474	1.942	0.687	0.039
4	0.045	7.518	2.233	0.790	0.056
5	1.422	8.941	5.329	1.884	0.755
6	-0.090	8.851	2.631	0.930	-0.097
7	-0.808	8.043	2.859	1.011	-0.799
8	0.331	8.374	2.028	0.717	0.462
9	-1.487	6.887	2.022	0.715	-2.081
10	0.280	7.166	2.565	0.907	0.308

**Average Abnormal Return, Cumulative Average Abnormal Return, Standard Deviation, Standard Error, T-Value of sample companies around event day**

### Interpretation

\*5% level of significance 2.365

Table 2.3 gives the value of Average Abnormal Return (AAR), Cumulative Average Abnormal Return (CAAR), Standard Deviation (SD), Standard Error (SE) and T-value. AAR is highest on 5<sup>th</sup> day before event date i.e., 2.244 and its lowest value is -1.487 on 9<sup>th</sup> day after the stock split date. In 21 days, event window there are 7 negative and 14 positive AAR value. It is observed that AAR tends to decline from starting day to end day of event which further implies that

shareholders build the position in the stock till the event day and then sold the position after event day. CAAR highest value is 8.941 on 5<sup>th</sup> day after the event and then it starts declining and ended at 7.166 on 10<sup>th</sup> day after event day. It is noted that standard deviation from AAR is highest on 5<sup>th</sup> day after ex-split date with value 5.329 and the remaining days in 21-day event window standard deviation is not highly deviated.

AAR are not significant on the event day at 95% Confidence level or 5% level of Significance. Only on -5<sup>th</sup> day and 1<sup>st</sup> day average abnormal returns are significant at 5% level of significance.

## Conclusion

In today's corporate world, corporate action like stock split have become very ordinary. The popularity of stock split is increasing day-by-day. Many companies have the mind-set that rise in liquidity may arise in lower price change. The investors preferring lower stock prices are usually uniformed and are good for stability of market.

Those companies whose stock price has cross the popular trade price range prefers stock split as this higher price reduces stock liquidity. In order to overcome this liquidity issue, the company announces stock split that makes the shares tradeable and affordable.

Further, in this paper it is concluded that all the sample stock behaves differently to other stocks throughout the event period, but behaving almost same on event day and next day to event i.e., most of the stock have positive abnormal return on 0<sup>th</sup> day and 1<sup>st</sup> day.

The most important conclusion is that average abnormal returns are not significant at 5% level of significance on the event date. Average Abnormal returns are not significant at 5% level of significance in 21 days event period except two days.

It is concluded that the corporate action of stock split does not provide any direct monetary advantages. However, it may be said that stock splits make the stock more attractive for common investors for trading because the stock price tends to decrease in the ratio of split in most of the cases.

## References

1. Burnwal, A., & Rakshit, D. (2019). Announcement Effect of Stock Split on Behavior and Market Liquidity of Shares: A study. *Journal of Xi'an University of Architecture & Technology*, *XI(XII)*, 659-671. <http://www.xajzkjdx.cn/gallery/69-dec2019.pdf>
2. Babu, M. S., & Nagendra, M. (2018). Impact of Corporate (Stock Split) Action on Stock Price in India. *International Research Journal of Business and Management*, *XI (5)*, 120-126.  
[https://www.researchgate.net/profile/Nagendra\\_Marisetty2/publication/344902838\\_Impact\\_of\\_Corporate\\_Stock\\_Split\\_Action\\_on\\_Stock\\_Price\\_in\\_India/links/5f983edc299bf1b53e49cbdf/Impact-of-Corporate-Stock-Split-Action-on-Stock-Price-in-India.pdf](https://www.researchgate.net/profile/Nagendra_Marisetty2/publication/344902838_Impact_of_Corporate_Stock_Split_Action_on_Stock_Price_in_India/links/5f983edc299bf1b53e49cbdf/Impact-of-Corporate-Stock-Split-Action-on-Stock-Price-in-India.pdf)

3. Chakrabarti, B.B., Gogoi, S.D., Faiz, M., Rathod, R.Y. (2017). Working Paper Series 798, Indian Institute of Management. [https://www.iimcal.ac.in/sites/all/files/pdfs/wps\\_798.pdf](https://www.iimcal.ac.in/sites/all/files/pdfs/wps_798.pdf)
4. Umesh, N. P., Pranab, P.P., & Reddy, Y.V. (2016). Impact of stock split announcements on Stock Prices & Liquidity: Empirical Evidence from India. *Management Today*. 6(4). 180-185. <http://www.indianjournals.com/ijor.aspx?target=ijor:mgt&volume=6&issue=4&article=005>
5. Naidu, G., & Suresha, B. (2013). An empirical study on price pressure and liquidity effect of stock split announcement - Evidence from Indian market. *International Journals of Marketing and Technology*. 3(1). 138-156. <http://www.indianjournals.com/ijor.aspx?target=ijor:ijmt&volume=3&issue=1&article=009>
6. Raja, A., & Shukla, J, H. (2012). Stock Split and Price Behaviour: Indian Evidence. *Parikalpana - KIIT Journal of Management*, 8. 45-54. [https://www.researchgate.net/profile/Abhay\\_Raja/publication/270109741\\_Stock\\_Splits\\_and\\_Price\\_Behaviour\\_Indian\\_Evidence/links/54af8c1d0cf2b48e8ed66cad/Stock-Splits-and-Price-Behaviour-Indian-Evidence.pdf](https://www.researchgate.net/profile/Abhay_Raja/publication/270109741_Stock_Splits_and_Price_Behaviour_Indian_Evidence/links/54af8c1d0cf2b48e8ed66cad/Stock-Splits-and-Price-Behaviour-Indian-Evidence.pdf)
7. Splits. (2021). *Money Control*. Retrieved from <https://www.moneycontrol.com/stocks/marketinfo/splits/index.php>
8. S&P BSE SENSEX. (2021). *Yahoo Finance*. Retrieved from <https://in.finance.yahoo.com/quote/%5EBSESN?p=%5EBSESN&.tsrc=fin-srch>
9. Event Calendar. (2021). *Yahoo Finance*. Retrieved from <https://in.finance.yahoo.com/calendar?day=2021-04-20>

# An Empirical Study on Real Estate Market: Slowdown to Lockdown

**Debaghya Chowdhury<sup>1</sup>**

Post Graduate & Research Department of Commerce, Batch: (2019-2021)  
St. Xavier's College (Autonomous), Kolkata, West Bengal

## Abstract

*The Real Estate sector in India has been one of the most stressed sectors in India for nearly a decade now; plagued with sky high square feet rates and rising unsold housing units the developers are currently walking on wafer thin margins. There however exists high similarity in the build up to this crisis in India to that of USA, rising interest rates leading to making the home mortgage value higher than the actual home value. The Indian market has also had its own roadblocks in the last decade which are the introduction of Goods and Service Tax, Real Estate Regulation (Development) Act, and Demonetisation which has further halted the growth of this sector. But the impact of the corona virus and the enforced pandemic has however turned out to be a boon for the failing sector. The work from home culture and few positive policy changes undertaken by the latest governmental budget means the sector has started to rise from the bottomed out state it was in.*

*This paper aims to find the factors that has been the driving force in the sector's revival and the elements a homebuyer looks at while purchasing a property to further enhance its growth while also finding the links with the GFC.*

**Keywords:** Real Estate, Housing, Global Financial Crisis, Lockdown

## Introduction

Once the most bullish market of all Indian investment markets, Real Estate, have had a slow and steady fall from its glory days. So why did this sector which was considered a must-have in your portfolio and probably the most secure asset for almost every citizen come to such extent that realtors started to give down payment options as low as a rupee to just write off their unsold inventory? In

---

1. This Dissertation was done by the scholar under the guidance of Dr. Samrat Roy

2009 post the Global Financial Crisis, key drivers of growth slowed down which includes export, investment. Under this lack of investment both foreign and domestic i.e. bank credit started to dry up, which affected the Housing market worst of all. The economy in spite of these continued to grow, prompted by government spending and a non-bank financial company led credit boom. This high leverage growth propelled the whole sector to some extent but then came the most adverse environment for the real estate sector, The Triple Trauma: RERA, Demonetization and GST. Then again the credit boom provided by the NBFCs financed unsustainable levels of real estate inventory accumulation, inflating a bubble where the profit margins of the existing players looked so lucrative non real estate developers started to enter the industry finally leading to a burst in 2019 which was very similar to the one in US (2007). Consequently, leading to a slowdown; consumption as a result has now plunged, causing growth to collapse. As a result, real estate companies are trapped in an adverse interest-growth dynamic. And as a result this is now created a risk aversion behavior among the investors, hence is leading to high interest rates which in turn are depressing growth, and generating more risk aversion. Standard remedies are unavailable to the government now. With the invasion of COVID19 the whole issue was thought to be more gravely complicated however things are looking quite opposite, where everyone says that the market has already bottomed out and can only go up from here.

## Literature Review

The findings in a report published in the nation's only non-brokerage real estate research company Liases Foras (2019) emphasized on the fact that developers need to scale up their sale by an average 2.5 times to stay afloat by meeting its liquidity demands. The in-depth analysis pointed out how the unsold inventory has been growing unprecedentedly and how fast they need to work on to offload these stuck projects.

Josh Felman and Arvind Subramanian (2019) in their paper 'India's great slowdown: What happened?' published in Centre of International Development, Harvard University, examined the pattern of growth in the 2010s and said standard explanations cannot account for the long slowdown, in the economy, followed by a sharp collapse. They explained, in the immediate aftermath of the Global Financial Crisis (GFC), export growth slowed sharply as world trade stagnated, while investment fell victim to a homegrown Balance Sheet crisis, which came in two waves, demonetization and GST shocks. This NBFC credit boom financed unsustainable real estate inventory accumulation, inflating a bubble that finally burst in 2019. Consequently, consumption too has now sputtered, causing growth to collapse.

According to Ms. Jaya G. Prabhu Parrikar (2019) the house prices in India have risen enormously in the recent past resulting in property buying becoming unaffordable to a large section of population. Therefore, her study aims to identify the macroeconomic factors that can influence the House Price Index in India. The study attempts to investigate the linkage between GDP, interest

rates, housing credit, exchange rate and inflation with House Price Index by employing correlation and multiple regression analysis, Johansen co integration test.

According to Dr. D.D. Chaturvedi and Ms. Meenakshi Sharma (2013) in their research paper titled, "Economic recession and Indian Real estate - Hopes and Implications", pointed out the major factors that affected the Indian real estate market post the 2008 Global Financial Crisis and turned the once high flying golden era of growth into stagnation due to lack of proper flow of foreign direct investment in the industry.

According to Christophe Jaffrelot (2020) in his article for Institut Montaigne had said that how India's overall economy had performed in the last 5 year time span where it had shown a constant and steady decline where most of its growth driving factors had posted negative or near to zero growth, many sectors were also affected by various other factors like external and internal shocks like demonetization, GST, anti-agrarian policies, and other overall structural roadblocks which were self-inflicted.

As per the findings of popular print media Mint (2019) the real estate condition of India is far worse than was anticipated, and not only the developers or buyers are stuck but also all the related stakeholders are stuck in this puddle of irregularity plagued industry.

An analysis report published by the world giant auditing firm Price Waterhouse Coopers in the month of September in 2018, portrayed in depth the impact the implementation of GST had on the real estate sector as a whole.

### Research Gap

- Most of the papers give their point of view on either the GFC or the Indian upcoming recession as a whole, but not a comparative analysis.
- Secondly the papers which identified the factors influencing the real estate price considered either the investing or consumption point of view, but not both.
- Finally no relevant research paper has been published to analyse the post covid19 impact and expected outcome of the real estate sector.

### Research Questions

- Is Indian real estate crisis leading the nation in the same paths as that of USA?
- What are the factors that influence an investor's buying decision?
- What factors affected and successfully predicted the Movement of HPI pre and post pandemic?

### Objectives

- Comparative analysis of the real estate crash that lead to the GFC and that of India in the last 7-8 years, to conclude if India was headed in the same way.

- Find factors that influence the real estate buying decision from the point of view of both investor and consumer.
- Another objective is to analyse the factors influencing the House Price Index (HPI) and their respective trends pre and post COVID19 enforced pandemic

## Research Methodology

For the analysis of the secondary data the test that I have used is Trend Analysis, which is used to estimate the relationship between a dependant variable and one or more independent variables. In my study I have chosen eight independent variables and one dependant variable House Price Index, on which I will use trend analysis to find out if there is any significant relationship between them and if the factors followed the same path.

The test used to analyse my primary data is the Chi Square Test of Independence, which is used to find if two variables in a contingency analysis are related. Here I have used it to find the level of interrelation between age of the respondents and the factors that they consider are important for deciding on putting their money in a real estate either for consumption purpose or investment purpose. The hypothesis were as follows-

$H_0$  or Null Hypothesis is that there is no relationship between the age of the respondents and their chosen factor for investing in real estate

$H_1$  or Alternative Hypothesis is that there exists significant relationship between the age of respondents and their chosen factor for investing in real estate.

The decision factor for the same was that the p-value i.e. the Asymptomatic significance of the Pearson Chi Square should be less than 0.05 to accept the Alternate Hypothesis ( $H_1$ ) at 5% level of significance or be less than 0.1 to accept Alternate hypothesis at 10% level of significance and reject the Null Hypothesis ( $H_0$ ). If the value is otherwise, then, accept the Null Hypothesis ( $H_0$ ) and reject the Alternate Hypothesis ( $H_1$ )

## Analysis and Interpretation

The analysis and the interpretation of the data can be presented in two segments, one based on the primary data and another on the secondary data

### Primary Data

The Primary data that forms part of this analysis has been collected from a population of 102 people living in and around Kolkata. The main motive of this analysis was to find the factors that affect the purchasing pattern of the buyers among the various age groups. The factor with respective significance is shown below-

Consumption Factors		
Significant at 5% level	Significant at 10% level	Insignificant
Amenities	Loan Leverage	-
Location	Interest Rate	-
-	Community	-

Investment Factors		
Significant at 5% level	Significant at 10% level	Insignificant
Rental Yield	Return on Investment	-
Market Conditions	Govt. Policies (Budget)	-
Interest Rate	-	-

Hence I can conclude that all the factors considered by me are either significant at 5% level or at 10% level in influencing the buyer's willingness to buy a real estate for investment or consumption purpose.

Furthermore, I conducted a factor analysis of the questions in the questionnaire to check the correlation among them. The questionnaire qualified for factor analysis with a KMO value of 58.2%, hence the result of the factor analysis and component classification is as follows-

Component				
Govt. Measure	Market Movement	Real Estate Feat	Sectorial Pref.	Outliers
Investbud	Investroi	Consumeloc	Wouldinv	Purposeinvest
Investint	Investri	Consumeame	Sectorgrowth	Consumeloam
Consumeint	Investmrkcon0			Consumecomm

### Secondary Data

This analysis is based on the secondary data collected from various sources which includes quarterly data of 2019 and 2020 for House Price Index along with GDP, CPI, Interest Rate, Exchange rate, Housing Credit rate, Unemployment rate, Inflation and Sensex. The quarterly data of 2019 is the pre pandemic and that of 2020 is considered post pandemic metric, for analysing for any patterns of similarity among the movements of HPI with the 8 chosen factors. The analysis graphs are as follows-

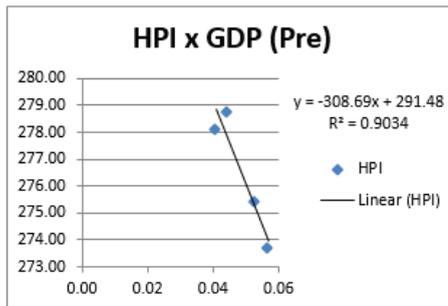


Figure 4.5: Correlation between HPI and GDP (Pre pandemic)

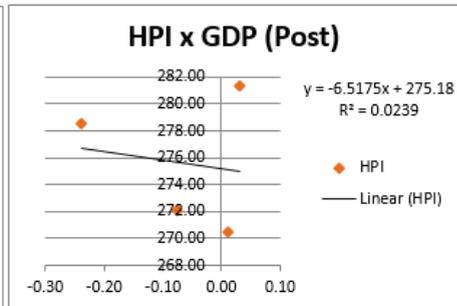


Figure 4.6: Correlation between HPI and GDP (Post pandemic)

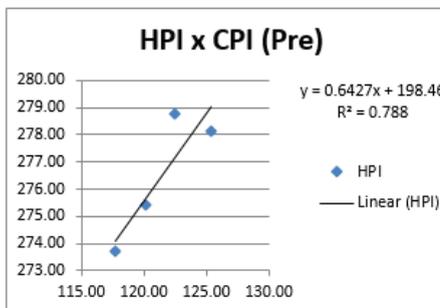


Figure 4.7: Correlation between HPI and CPI (Pre pandemic)

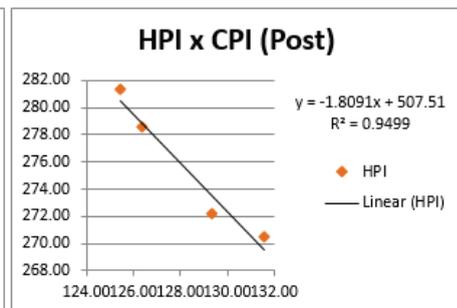


Figure 4.8: Correlation between HPI and CPI (Post pandemic)

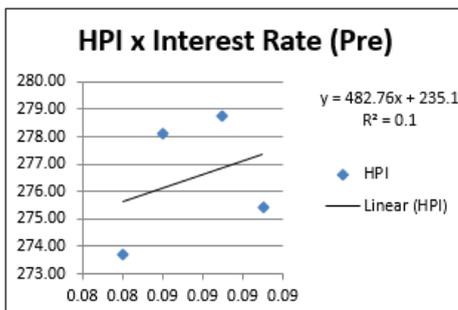


Figure 4.9: Correlation between HPI and Int Rate (Pre pandemic)



Figure 4.10: Correlation between HPI and Int Rate (Post pandemic)

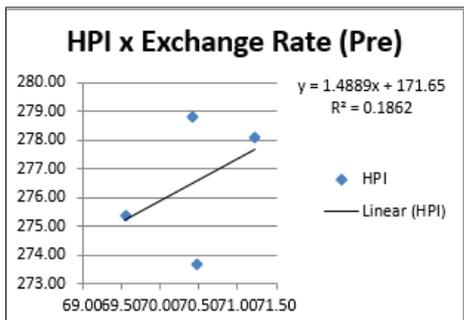


Figure 4.11: Correlation between HPI and Exchange Rate (Pre pandemic)

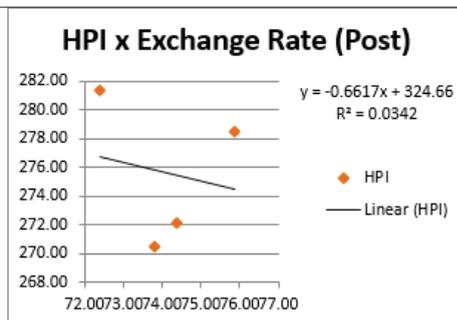


Figure 4.12: Correlation between HPI and Exchange Rate (Post pandemic)

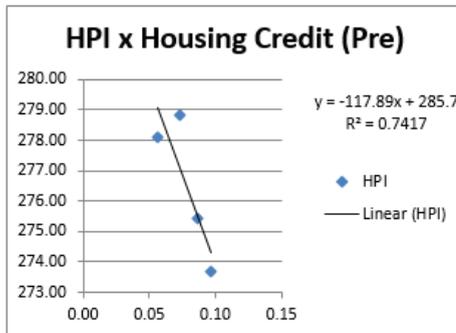


Figure 4.13: Correlation between HPI and Housing Credit (Pre pandemic)

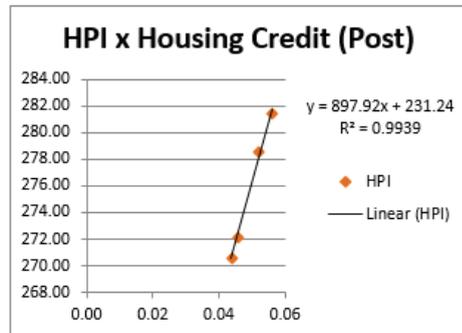


Figure 4.14: Correlation between HPI and Housing Credit (Post pandemic)

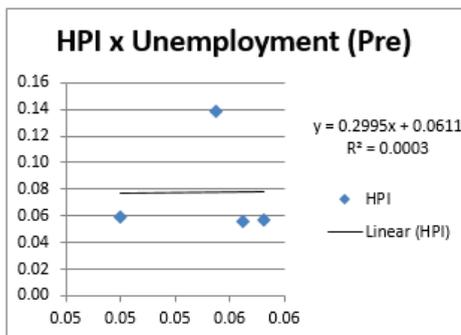


Figure 4.15: Correlation between HPI and Unemployment (Pre pandemic)

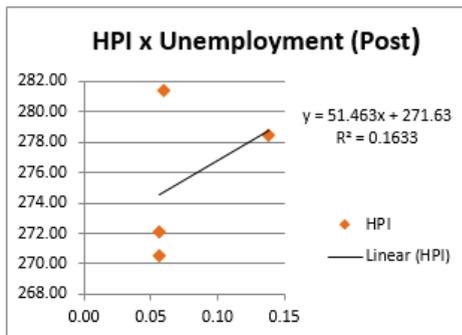


Figure 4.16: Correlation between HPI and Unemployment (Post pandemic)

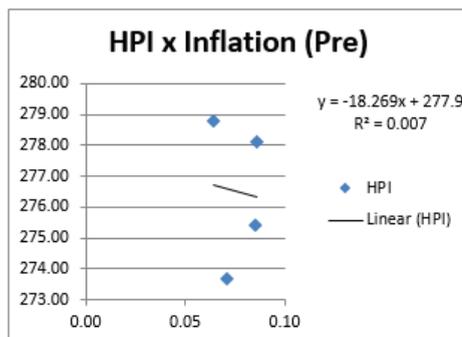


Figure 4.17: Correlation between HPI and Inflation (Pre pandemic)

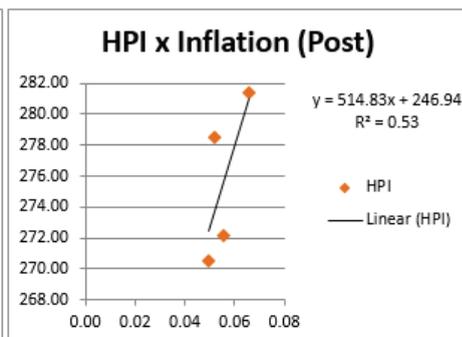


Figure 4.18: Correlation between HPI and Inflation (Post pandemic)

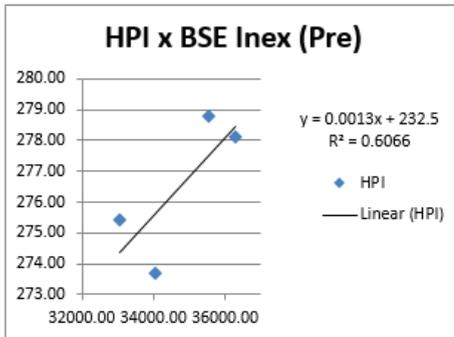


Figure 4.19: Correlation between HPI and Sensex (Pre pandemic)

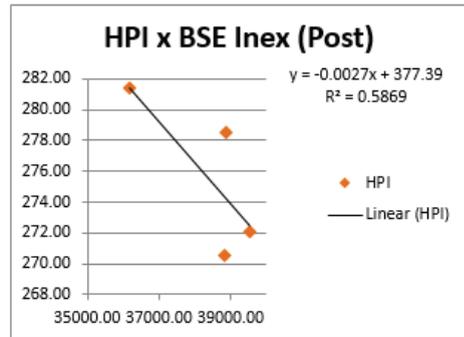


Figure 4.20: Correlation between HPI and Sensex (Post pandemic)

Post trend analysis of the secondary data I found out that there are various factors of the eight that I chose which influence the movement in House Price Index (HPI). Each of their impact is summarised as follows-

Factors	Pre Pandemic (Q1 – Q4 2019)	Post Pandemic (Q1 – Q4 2020)
GDP	-Negatively correlated -To great extent explained HPI movement	-Correlation changed drastically -Many outliers -Couldn't explain HPI movement
CPI	-Positively correlated -Explained HPI movement up to 80%	-Negatively correlated -Improved HPI movement up to 95%
Interest Rate	-Too many outliers -Couldn't explain HPI movements	-Greatly positively correlated -Improved HPI movement explanation up to 94%
Exchange Rate	-Many outliers in data set -Couldn't explain HPI movements	-Outliers increased even more -Ability to explain HPI movement further deteriorated
Housing Credit	-Negatively correlated -Explained HPI movements to great extent of 74%	-Positively correlated -Improved HPI movements to a near optimal 99%
Unemployment	-Many outliers -Impossible to explain HPI movements	-Same as pre period

Factors	Pre Pandemic (Q1 – Q4 2019)	Post Pandemic (Q1 – Q4 2020)
Inflation	-Many outliers -No significant explanation of HPI movements	-Some outliers -Improved HPI movement prediction to 53%
BSE Index	-Very less positive correlation -Explained HPI movements to a extent of 60%	-Very small negative correlation -HPI movement explanation went down slightly to 59%

## Conclusion

This study of mine has opened various avenues of interpretation of the current real estate market that is prevalent in India. The study was based on three broad objectives on which I aimed to throw some light on the housing crisis along with some factors that affect this sector and also some on the revival of this stagnant sector. Based on my set objectives and findings my conclusions drawn can be stated as follows.

Firstly, I want to talk about the comparison of this Indian Housing Slump with that of the US Housing crisis of 2008. Post a decade long housing bloom, when the real estate sector started to collapse during 2015-16, and minor cracks started to show up on the once shining armour of every Indian investor's portfolio obvious comparisons are bound to be made with a similar case in a developed nation. Hence my first objective was a theoretical analysis of both the nations' crisis and the outcome that, India who once was walking in the same direction as it's western counterpart, has now, post re-affirmative government policies and a reversal of the bear market has shown that the real estate market is supposed to be bottomed out by mid-2021, which means there is only one place to go now, i.e. up. Thus concluding that this India has been a strong defendant of its crown jewel this time and shown the world how it's done by laying paths for the sector's revival.

Secondly, a key feature of real estate is that it doesn't follow the regular demand supply mechanism due to its dual nature of being used as an investment alternative and also a consumption alternative, hence I analysed the factors that influenced the different age groups on their real estate buying behaviour. Based on the findings I can conclude all the factors of each investment and consumption need is significant at either 5% or 10% level of significance. Be it Return on Investment for a investing mind-set purchaser or the location and community of the real estate for a consumption centric buyer. Considering consumption needs the age group of 20-30 i.e. the people who are about to earn their livelihood have mostly chosen Location, Amenities and Interest Rates on home loan, while the older i.e. 31-51 category mostly went for the Community and the Loan Leverage. Now if I focus on the Investment needs, irrespective of age of respondent, Return on Investment, Rental Yield formed the top factors to

be considered. Thus all of the chosen factors appealed significantly to some part of population or other.

Lastly, my objective was to find a set of factors which would be able to explain the movements in the House Price Index, and can help me in plotting a future trend for housing prices. After performing trend analysis of each factors with the HPI we can see that factors like Unemployment and Exchange Rate has not been very effective in explaining the movements ion the HPI over the last 24 months or 8 quarters, while others have been able to explain the deviation pre and post the virus enforced pandemic

## References

1. Chaturvedi, D. D. C.,& Sharma, M. S. (2013). Economic Recession and Indian real Estate-Hopes and Implications. *The Global eLearning Journal*, Vol 2 <https://globelearningjournal.files.wordpress.com/2012/08/economic-recession-usa.pdf>
2. Jaffrelot, C. J. (2020), From slowdown to lockdown, India's economy and the COVID-19 shock, *Institut Montagne*, (Policy Brief; Article) <https://www.institutmontaigne.org/en/blog/slowdown-lockdown>
3. Housing White Paper, (2019). Developers need to scale up sales by 2.5x times to stay afloat. *Liason Foares*, Volume 15, February 2019. <https://www.liasesforas.com/admin/WhitePaper/36/WhitePape>
4. Vashist, G. V. & Chaudhry, O.C. (2019). How to solve India's real estate crisis?. *Mint, EPaper*, 20 December 2020. <https://www.livemint.com/news/india/how-to-solve-india-s-real-estate-crisis>
5. Parrikar, J. P. (2019). The influence of macroeconomic factors on housing prices in India; an emperical study. *Indian Journal of Economics and Development*, Vol,7(3). <https://www.researchgate.net/publication/332110668>
6. Subramanian, A. S., & Felman, J. S. (2019). India's Great Slowdown: What Happened? What's the Way Out? *Center for International Development (CID) Faculty Working Paper*, Harvard University, 1(370). <https://www.hks.harvard.edu/centers/cid/publications/faculty-working-papers/india-gre-at-slowdown>.
7. Verick, S. V. & Islam I. I.,(2013) The Great Recession of 2008-2009: Causes, Consequences and Policy Responses. *Institute for the Study of Labour, Bonn (IZA Discussion Paper No. 4934)W2* <http://ftp.iza.org/dp4934.pdf>
8. Thakur, M. S. (2018). Effect of RERA on profitability of Indian Rear Estate Developers. *International Journal of Management and Applied Science*, ISSN: 2394-7926. [http://www.iraj.in/journal/journal\\_file/journal\\_pdf/14-504-154295508593-99.pdf](http://www.iraj.in/journal/journal_file/journal_pdf/14-504-154295508593-99.pdf)
9. Price Waterhouse Coopers (2018). Impact of GST on Real Estate. *Monthly economic analysis report*, September, 2018. <https://www.pwc.in/assets/pdfs/trs/indirect-tax/sectoral-updates/impact-of-gst-real-estate-sector.pdf>
10. Various print and online media sources like Mint, Economic times, The Hindi etc.
11. Various data reservoirs like World Bank, Reserve Bank of India, Fred Economic Reserve etc.
12. Some government websites like Ministry of Statistical and Program Implementation and Ministry of Housing and Urban Affairs.

# The Relationship between Economic Growth and Foreign Direct Investment

**Sahil Rampal<sup>1</sup>**

Post Graduate & Research Department of Commerce, Batch: (2019-2021)  
St. Xavier's College (Autonomous), Kolkata, West Bengal

## Abstract

*One of the key features of the modern economy is the rapid growth of FDI in both developed and developing nations. In the last two decades the rate of FDI flows has beaten all other economic indicators across the world. The developing nations prefer FDI as it not only complements domestic savings and foreign reserves but also encourages growth through technology transfer, skill development, improved innovation and competition. FDI, thus, has emerged as a tool for global economic integration.*

*This paper investigates the relationship between foreign direct investment and economic growth from a public policy perspective. First, a multiple linear regression was run upon foreign direct investment and a few of its determinants such as transport, health, information and communication technology, banking and governance. It was found that foreign direct investment does not share a statistically significant relationship with individuals using the internet and government effectiveness, while all the others were statistically significant.*

*Later, a multiple linear regression was run upon foreign direct investment, gross capital formation and per capita income. Here, it was found that both foreign direct investment and gross capital formation shares a statistically significant relationship with per capita income.*

**Keywords:** Foreign Direct Investment, Gross Capital Formation, Per Capita Income.

## Introduction

The roots of development economics can be traced as far back as the 17th century. Our story however only goes back to 1932 when JM Keynes recognised that the

---

1. This Dissertation was done by the scholar under the guidance of Prof. Ankita Samanta

nature of the relationship between savings and investment were of an identity and not an equilibrium.

The savings investment identity in an open economy is a simple but important construct in our quest to explore the relationship between foreign investments and economic growth. Let us try and see why:

$$Y = C + I + G + (X - M)$$

$$\text{or, } Y - C - G - (X - M) = I$$

$$\text{or, } (Y - T - C) + (T - G) + (M - X) = I$$

$$\text{or, } S (\text{Private}) + S (\text{Public}) + (M - X) = I$$

$$\text{or, } S (\text{National}) + (M - X) = I$$

From the above identity, we are able to recognise that domestic savings are insufficient to finance domestic investments. The difference between investment needs and domestic savings are met by foreign savings ( $M - X$ ). It is important to remember that  $Y$  represents output and growth in output or economic growth is a function of investment which in turn is influenced by foreign savings.

Robert Solow and Trevor Swans' pioneering work on economic growth, popularly known as The Solow Growth Model, which earned them the Sveriges Riksbank Prize in Economic Sciences in 1987, defined the production function as one where output per capita is dependent on capital per worker.

The Solow Growth model also presents to us the idea of a steady state equilibrium, wherein, a nations' capital stock rises to a point where the annual level of investment meets the annual rate of depreciation. The only method to move from a steady state to a higher steady state is through an increase in the level of investment, which as defined by Solow is a function of the savings rate in an economy.

## Literature Review

Foreign Direct Investment is one of the most popular themes for research both nationally and globally. A review is crucial to understand the scope, strength and limitations of previous research works to improve the reliability and genuinity of this study.

Sabir *et al.* (2018): This study investigated the impact of institutional quality on Foreign Direct Investment. They empirically concluded that the degree of corruption control, political stability, rule of law and government effectiveness has a positive impact on FDI within Asian economies. This study was carried out using the Generalised Method of Moments on a panel data of sample countries between 1996-2017.

Pandya (2017): This paper studied the relationship between FDI and economic growth in Australia. He examined the relationship between FDI and economic growth of Australia through regression analysis and concluded that FDI plays a big role in the improvement of economic growth and development in any country.

Baijal (2017): The paper titled, "FDI Inflows: Road to India's Rapid Development" concluded that 70 percent of foreign portfolio and institutional investors were making gains. It also highlighted that foreign investors were dissatisfied with the infrastructure while 42 percent highlighted the quality of power and 54 percent rated the condition of roads and highways badly.

Lavigne (2016): The paper titled, "Impact of Foreign Direct Investment on India Economy: A Sectoral Level Analysis" showed that economic growth in India between 1991-2016, primarily focused on sectors such as Pharmaceuticals, Metals & Services.

## Research Gap

This study was initiated after a careful study of methods, findings and observations of previous research. In the study of FDI, most studies attempted to look at regulatory bottlenecks. Very few researchers have however focused on the impact that policy making has on FDI inflows.

The present study is attempting to address this by focusing on the policy making aspect of FDI and limiting its focus to the macroeconomic factors impacting FDI flows between 1991 and 2019.

## Objectives

The objectives of this study are:

- 1) Trend Analysis of Foreign Direct Investment Inflows into India,
- 2) To determine the relationship between FDI as a % of GDP and a few select determinants of FDI and,
- 3) To determine the relationship between FDI and Economic Growth.

## Research Methodology

First, five determinants of FDI were chosen for this study, namely, Political Stability, Transparency, Government Effectiveness, Rule of Law, Control of Corruption, Life Expectancy at Birth, Health Expenditure as a % of GDP, Domestic Credit to the Private Sector as a % of GDP, Individuals using the Internet and Investment in Transport with Private Participation. These were treated as a set of independent variables. Foreign Direct Investment as a % of GDP was treated as the dependent variable. The dataset was obtained from the databases available at the World Bank. A linear multiple regression was later run on the above dataset.

Second, a multiple linear regression was run using Gross Capital Formation (GCF) and Foreign Direct Investments as a % of GDP as independent variable and GDP per capita (constant 2010 USD) as the dependent variable.

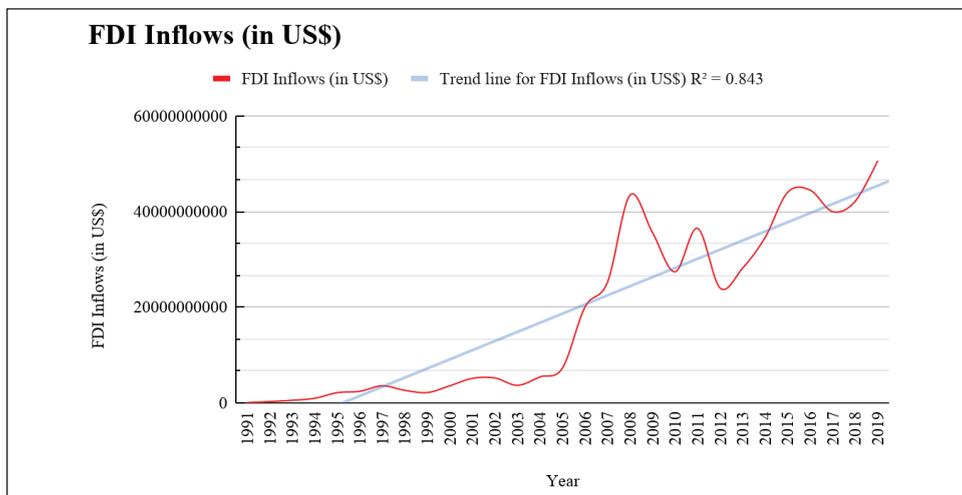
## Analysis and Interpretation

### A) Trend Analysis

India has emerged as a global foreign investment hotspot. The ongoing pandemic has wreaked havoc on economies across the world, however, in the same time period, foreign capital inflow into India has increased by over 40%. A strange anomaly, yet one that reaffirms India's status as an emerging global economic powerhouse.

FDI Inflows into India have witnessed exponential growth since the beginning of the millennium, a trend which continued till the global financial downturn of 2008. In 1992, India received a meagre investment of one billion and the share of global FDI flows was just 0.2 percent. In contrast, by 2008, FDI inflows into India accounted for almost 3 percent of global flows.

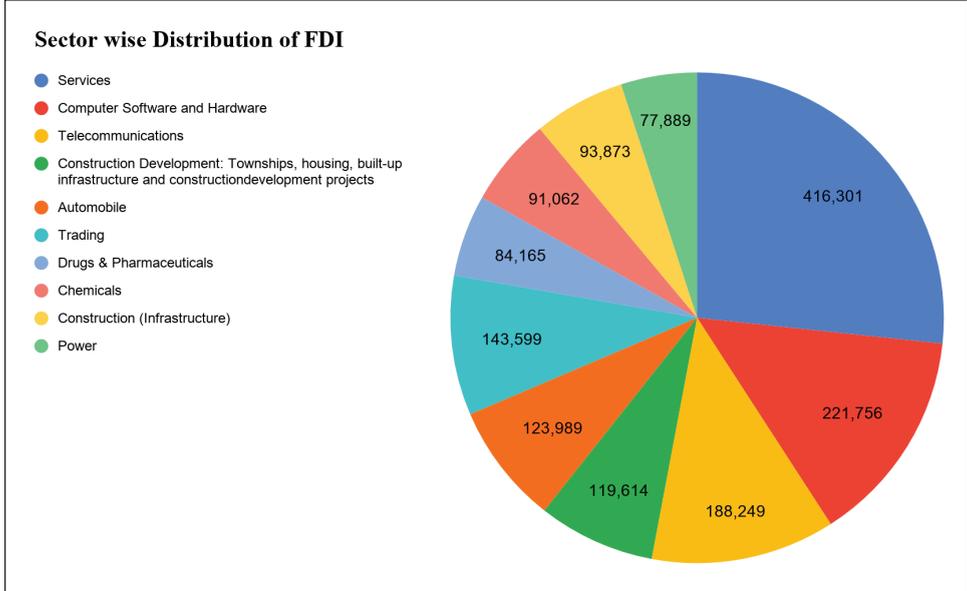
Post 2008 and with the onset of the global financial crisis, foreign capital inflows into India declined from 47 billion USD to 28 billion USD and our share of global capital flow fell from 3 to nearly 2 percent. While the global crisis is a major contributing factor for the erratic flow of foreign capital into India, other local factors range from policy challenges, a sluggish domestic economy, tax structure and political stability.



### Sectoral Distribution of FDI

Industries in any nation can be roughly divided into three categories namely, agriculture, manufacturing and services. It has been well acknowledged that despite a rich history and much promise, India's manufacturing sector has fallen far behind the expectations heaped upon it. The share of manufacturing in India's GDP has never exceeded 19%, whereas in contrast Brazil has peaked above 34%, China above 40% and Malaysia above 31%.

Services, in contrast, contribute almost 54 percent to India's GDP. It is therefore not surprising that services, telecommunications, computer software and hardware and trading attract 40% of the total capital inflows in India.



### Sources of FDI Inflows

India has significantly expanded its investing partners from 15 in 1991 to over 140 countries today. We also have 85 such countries with whom we have a Double Taxation Avoidance Agreement. The DTAA is one of the major drivers of investments from Mauritius, which accounts for over 30 percent of all investments in the country.

Singapore is also a major investor in India, accounting for around 20 percent of all foreign capital inflows in the country. The analysis of sources of foreign capital in India shows that around 87 percent of all foreign inflows are accounted for by just ten nations.

**Table 1: Top Ten Sources of FDI Inflows into India (In ₹ Crores)**

Serial	Country	Amount of FDI Inflows	Percentage
1	Mauritius	738,156	32
2	Singapore	505,946	20
3	Japan	173,332	7
4	Netherlands	162,251	7
5	United Kingdom	140,370	6
6	United States of America	146,372	6
7	Germany	65,477	3

Serial	Country	Amount of FDI Inflows	Percentage
8	Cyprus	51,544	2
9	United Arab Emirates	39,310	2
10	France	36,825	2

## Regional Distribution of FDI Inflows

**Table 2: Top Ten State Wise Distribution of FDI Inflows (in ₹ crores)**

Serial	Region	Amount of FDI Inflows	Percentage
1	Mumbai	713,990	30
2	New Delhi	484,219	20
3	Bengaluru	225,510	9
4	Chennai	173,896	7
5	Ahmedabad	117,149	5
6	Hyderabad	106,242	4
7	Kolkata	31,119	1
8	Kochi	12,934	0.5
9	Chandigarh	11,647	0.5
10	Bhopal	11,542	0.5

(Source: Reserve Bank of India)

The regional distribution of foreign investment inflows into India highlights a skewed picture as shown in Figure 1. It can be clearly observed that 75 percent of all capital inflows are distributed among just six regions. It can also be observed that a majority of these regions are in the Northern, Western and Southern parts of the country.

This regional disparity is also a representation of the causal relationship between FDI and Economic Growth as regions with higher economic development are able to attract greater FDI and greater FDI flows leads to higher economic development.

## B) Relationship Between FDI and Determinants of FDI

Our research question is: Can we explain the outcome variable, foreign direct investments as a percentage of GDP, with the given set of independent variables: Political Stability, Transparency, Government Effectiveness, Rule of Law, Control of Corruption, Life Expectancy at Birth, Health Expenditure as a % of GDP, Domestic Credit to the Private Sector as a % of GDP, Individuals using the Internet and Investment in Transport with Private Participation?

## Determining How Well the Model Fits

**Table 3: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.854 <sup>a</sup>	.730	.430	.78640

a. Predictors: (Constant), POL, EXP, TRANSPORT, GOVTEFF, CC, INTERNET, TRANS, DOM CREDIT, ROL, LIFE

The R value represents the multiple correlation coefficient. R can be used to measure the quality of the prediction of the dependent variable, foreign direct investment as a percentage of GDP. A value of 0.854 indicates a good quality of prediction.

The R Square value represents the coefficient of determination. R Square can be used to determine the proportion of variance in the dependent variable that can be explained by the independent variables. A value of 0.730 means that our independent variables can explain 73% variability of our dependent variable, foreign direct investments as a percentage of GDP.

The Standard Error of 0.78640 measures the precision of the model. It is the standard deviation of the residuals. On average, our estimates of foreign direct investment as a percentage of GDP would be wrong by 0.78640.

## Statistical Significance

**Table 4: ANOVA<sup>b</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	15.052	10	1.505	2.434	.005 <sup>a</sup>
	Residual	5.566	9	.618		
	Total	20.618	19			

a. Predictors: (Constant), POL, EXP, TRANSPORT, GOVTEFF, CC, INTERNET, TRANS, DOM CREDIT, ROL, LIFE

b. Dependent Variable: FDI

The F ratio in the ANOVA table represents whether the overall regression model is a good fit for the data. The table above depicts that the independent variables statistically significantly predict the dependent variable,  $F(10,9) = 2.434$ ,  $p(0.005) < 0.05$ .

## Statistical Significance of the Independent Variables

Table 5: Coefficients<sup>a</sup>

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	-28.745	34.500		-.833	.426
	TRANSPORT	.018	.045	.112	2.408	.003
	INTERNET	-.137	.094	-1.431	-1.457	.179
	DOM CREDIT	.022	.106	.217	2.211	.000
	EXP	.250	.418	.276	2.598	.005
	LIFE	.527	.607	1.311	2.867	.008
	CC	.250	4.461	.025	2.056	.012
	ROL	5.501	5.581	.755	2.986	.035
	GOVTEFF	-.322	2.321	-.041	-.139	.893
	TRANS	1.686	3.883	.168	2.434	.004
POL	2.763	1.818	.474	3.520	.000	
a. Dependent Variable: FDI						

The t and corresponding p values from the table tell us that investment in transport with private participation, domestic credit to the private sector as a % of GDP, health expenditure as a % of GDP, life expectancy at birth, control of corruption, rule of law, transparency, political stability are significant but, individuals using the internet and government effectiveness are not. This means the explanatory variables, individuals using the internet and government effectiveness are not useful in the model when the others are present.

### Estimated Model Coefficients

*The general form of the equation is:*

Predicted foreign direct investment as a percentage of GDP = -28.745 + 0.18 (Transport) - 0.137 (Internet) + 0.022 (Dom Credit) + 0.250 (Health Expenditure) + 0.527 (Life) + 0.250 (CC) + 5.501 (RoL) - 0.322 (Govt Eff) + 1.686 (Trans) + 2.763 (Pol)

Constant -28.745 is the predicted value of foreign direct investment as a percentage of GDP if all the independent variables are held to be 0. That is, we would expect a negative 28.745 foreign direct investment as a percentage of GDP if transparency, rule of law et al are held to be 0.

The regression coefficients provide the expected change in dependent variable for one unit change in independent variable. This means for every one unit change in rule of law there is a 5.501 increase in FDI as a percentage of GDP while for every one-unit increase in government effectiveness, there is -0.322 reduction in FDI as a percentage of GDP.

### C) Relationship Between FDI and Economic Growth

Our research question for the multiple linear regression is: Can we explain the outcome variable, GDP per capita (constant 2010 USD) with the given set of independent variables: gross capital formation (GCF), foreign direct investments as a percentage of GDP.

#### Determining How Well the Model FITs

**Table 6: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.866 <sup>a</sup>	.882		
a. Predictors: (Constant), GCF, FDI				

The R value represents the multiple correlation coefficient. R can be used to measure the quality of the prediction of the dependent variable, GDP per capita (constant 2010 USD). A value of 0.866 indicates a good quality of prediction.

The R Square value represents the coefficient of determination. R Square can be used to determine the proportion of variance in the dependent variable that can be explained by the independent variables. A value of 0.882 means that our independent variables can explain 88.2% variability in GDP per capita (constant 2010 USD).

#### STATISTICAL SIGNIFICANCE

**TABLE 7: ANOVA<sup>b</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	1182719.911	2	591359.955	2.884	.004 <sup>a</sup>
	Residual	5331832.434	26	205070.478		
	Total	6514552.345	28			
a. Predictors: (Constant), GCF, FDI						
b. Dependent Variable: GDPPC						

The F ratio in the ANOVA table represents whether the overall regression model is a good fit for the data. The table shows that the independent variables statistically significantly predict the dependent variable,  $F(2,26) = 2.884$ ,  $p(0.004) < 0.05$ .

#### Statistical Significance of the Independent Variables

**Table 8: Coefficients<sup>a</sup>**

Model B	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	Std. Error	Beta				
1	(Constant)	-11.047	514.157			
	FDI	4.617	88.819	.011	2.052	.009
	GCF	36.405	19.011	.419	2.915	.007

a. Dependent Variable: GDPPC

The t and corresponding p values from the table tell us that foreign direct investment as a percentage of GDP and Gross Capital Formation are both significant.

### **Estimated Model Coefficients**

*The general form of the equation is:*

Predicted GDP per capita (constant 2010 USD) =  $-11.047 + 4.617 (\text{FDI}) + 36.405 (\text{GCF})$

Constant -11.047 is the predicted value of GDP per capita if all the independent variables are held to be 0. That is, we would expect a negative 11.047 GDP per capita if GCF and FDI as a % of GDP are held to be 0.

The regression coefficients provide the expected change in dependent variable for one unit change in independent variable. This means for every one unit change in gross capital formation there is a 36.405 increase in GDP per capita while for every one-unit increase in FDI as a % of GDP, there is 4.617 increase in GDP per capita.

Similarly, standardised coefficients called beta weights are useful to rank the predictor variables based on their beneficence (irrespective of sign) in explaining the outcome variable.

### **Conclusion and Recommendations**

From the above analysis we can safely conclude that Foreign Direct Investment Inflows and Economic Growth do share a positive relationship in the Indian context between 1991-2019. Based upon the analysis above, a few policy recommendations are made.

GCF is found to have the greatest amount of positive impact on per capita income. Thus, the government must strive to increase the rate of GCF in our country. It can be increased by investing in physical capital, human capital, infrastructure and research and development.

FDI also has a high impact on the per capita income. FDI as our data has shown is positively impacted by investments in transportation, domestic credit to the private sector as a % of GDP, health expenditure as a % of GDP, life expectancy, control of corruption, rule of law, transparency and political stability.

The strategy to increase economic growth in India therefore, must follow a two pronged policy approach:

#### **a) Infrastructural**

The government should undertake and also encourage the private sector to equally participate in building the infrastructural capacity of the nation. For this to materialise, the government must undertake an expansionary fiscal policy, especially that of increasing government expenditure into transport, health, human resource development and research and development to name a few.

Investments into healthcare in a post SARS-CoV-2 world is expected to lead the economic recovery and subsequent growth in our country. A focused approach into building the healthcare systems in our nation is something that must be adopted urgently.

### **b) Governance**

Governance is the foundation upon which economic development shall be built. Rule of Law, Control of Corruption, Political Stability and Transparency will ensure stakeholders have trust and confidence required to invest in our country. Simplification of legal structures is crucial to control corruption, establish rule of law and ensure transparency. Equally, importance should be placed upon proper implementation.

### **References**

1. Aggrawal, Pradeep (2014), "Foreign Direct Investment in South Asia: Impact on Economic Growth and Local Investment."
2. Agrawal, Gaurav (2015), "Foreign Direct Investment and Economic Growth in BRICS Economies: A Panel Data Analysis." *Journal of Economics, Business and Management*, vol. 3, ser. 4, pp. 421–424.
3. Dunning J.H (1993), "Multinational Enterprises and the Global Economy", Workingham, England, U.K, Addison Wesley publishing company, 1993.
4. Gola, Kali Ram, et al (2013), "Role of Foreign Direct Investment in the Development of Indian Economy" *Gyanpratha - Accman Journal of Management* 5(1), 1-10
5. Guruswamy Mohan, Sharma Kamal, Mohanty Jeevan Prakash, Korah Thomas J (2005), FDI in India's Retail Sector: More Bad than Good? *Economic and Political Weekly*, pp. 619-623
6. International Monetary Fund (1993), "Balance of Payment Manual", New York.
7. Malhotra, B (2014), "Foreign Direct Investment: Impact on Indian Economy." *Market Economy*, London Vol.12, No. 4-5, pp. 1 -19

**Section 2**

**Marketing**



## Perception of Consumers towards Online Food Delivery Safety Amidst Pandemic: A Study Based on Kolkata

Priyanka Paul<sup>1</sup>

Post Graduate & Research Department of Commerce, Batch: (2019-2021)  
St. Xavier's College (Autonomous), Kolkata, West Bengal

### Abstract

*Covid-19 has certainly changed the functioning of many industries. Food industry is one of the big industries which has incurred a huge loss due to its closure of dine in services. This industry which was once at a peak was sitting idle due to less staffs and alternatives for a time being. But as it is said 'Time heals everything', the food industries also adapted to the sudden changes and those who were not offering the delivery services came at the service of the consumers. The hospitality industry adjusted itself and made it possible for different restaurants to serve the customers online via different food ordering applications for the customers to stop them going out and making food available to them even in this stressful time. Feeling hungry? Let's order a pizza was skeptical on the consumer's part when it came to online food ordering because understandably the ample number of questions in the minds of the consumers kept on bothering them because the fear of catching the virus was something always on one side of their minds. This research paper aims to discuss the consumer's perception towards online food delivery safety amidst pandemic and will provide insights about changes the consumers expect from the service delivery providers in order to have the safety assurance. The analysis of the data collected from the respondents who have idea about online food delivery services in the city of Kolkata is the main focus of the study. The survey was taken over 200 respondents to do a thorough analysis of the study. The main purpose is to know the factors which are considered by the consumers during the pandemic while ordering food online and the consideration of no- contact delivery feature opted by them while they order food. To fulfill the objectives, data from various parts of Kolkata were collected and analyzed.*

**Keywords:** Consumer's Preference, Covid-19 Pandemic, Food Delivery Safety, No-contact Delivery, Online Food Ordering.

---

1. This Dissertation was done by the scholar under the guidance of Dr. Sumanta Dutta

## Introduction

The term 'perception' can be characterized as the capacity to determine meaning. With regards to showcasing, it alludes to the way wherein a shopper offers significance to the promoting upgrades. The way wherein a shopper sees the showcasing boosts (i.e., any or the entirety of the components of the advertising blend) has a course on his whole purchasing choice interaction, directly from issue acknowledgment or recognizable proof of a need to post-buy conduct, and influences his general conduct. The showcasing improvements could relate to all of the components of the promoting blend.

The use of innovation in each business has developed up as energetically as it made everything look conceivable. Electronic info-medium particularly the smart telephones have brought different elements of commercial center on the double. This incorporates fields, for example, client relationship with the board, inventory network and logistics management, secure payment also, productive settlements systems the business resembles E-ticketing, amusement, voyaging, learning etc. These are on the whole conceivable due to the dynamic utilization of information and its transmission from different people to different clients. A dominant part of individuals really appreciate eating restaurant's food simply because of its taste. Opposite, restaurant proprietors additionally appear to be sharp about keeping up their Food taste and nature of serve to client each time. Consequently on different segment levels, prepping of E-business explicitly in delivery of value food to the client at his will and inside his predefined time became essential rules.

Technology has undoubtedly contributed in the emergence of many online food delivery service providers such as Zomato, Swiggy, Food Panda etc. but Covid 19 pandemic has certainly led to many changes in the way of serving the consumers by them. Also consumers feared online food ordering keeping the spread of the virus in mind but the service providers adapted to the sudden changes and modified their functioning by introducing no contact delivery feature and changes in the way of serving the consumers to provide them with safety assurance. In the light of the topic a review of relevant literatures are presented below to begin the discussion.

## Literature Review

Tibhuvan (2020) in his research paper "A study on consumer's perception on food apps" conducted in Mumbai examined the factors that have influenced the consumer's perception towards online food delivery apps. 143 respondents were taken into corporation and survey method was used for conducting this research. Questionnaires were circulated to various segments on the basis of age, gender and income and quantitative as well as qualitative method was used for analysis of the data collected. The study found out that in the consumer's point of view the food apps are the fastest and the most efficient way of ordering the food as compared to the traditional way of ordering via phone. It also found out that food apps have changed the perception of consumers about ordering

the food online and the level of satisfaction that is achieved by using the app. The research drew the information that there is a proper connectivity, prompt response to the customer's complaints and ease of tracking the order therefore a lot of consumers prefer ordering via apps.

Moondra, Mangwani, Deshpande, Bundela & Namdev (2020) in their study "Impact of online food delivery on customers" conducted in Indore analysed the awareness of consumers regarding the mobile food apps, expectations of the consumers while ordering from a new food application, awareness of consumers regarding the electronic ordering process and the sites used by customers the most for the purpose of ordering food. The paper did not mention the numbers of responses studied for the purpose of data collection. The primary data was collected through a set of questionnaire and secondary data was collected using magazine applications and websites. The study revealed that responses above 40 yrs of age were not at ease with online food ordering and instead preferred going outside for lunch whereas students preferred ordering online. Time efficiency and ease of ordering were factors because of which people preferred online ordering. People were comfortable in paying cash on delivery more than paying digitally but customers who wished to enjoy the ambience of the restaurants were hesitating in ordering the food online.

Zhao & Bacao (2020) in their study "Factors determining customer continually using food delivery during 2019 novel coronavirus pandemic period" conducted in Lisboa (Portugal) examined the various factors that influence the continuity of food delivery amidst the pandemic. They examined 532 respondents for their research and circulated the questionnaires online to conduct the survey for the study. The first part of the questionnaire consisted of the demographic information whereas the second part of the questionnaire comprised of various indicators of the variables studied. SPSS and AMOS were the tools used for the analysis of the data collected. The study found out that the satisfaction was the most significant factor, also the perceived task and technology fit, performance expectancy, trust, confirmation and social influence had a direct or an indirect impact on the usage continuity intention of the consumers.

Shah & Prusty (2019) in their research "A study on factors affecting customer's perception and attitude towards food app services" conducted in Surat examined the factors affecting the attitude of customers regarding food delivery service apps, the preferred food delivery service applications by the consumers and the factors that restrain consumers from using online food delivery services. 150 responses were collected using non probability convenience sampling method for the same purpose. A descriptive design was used for this purpose of study and a mix of primary and secondary data was collected for its analysis. Close ended structured questionnaire was used for collection of primary data and journals, magazines, periodicals and websites were used as sources of secondary data. Various statistical tools were used for the analysis of the collected data. The study revealed that the food ordering applications are easy and convenient to use, it is economical and wide options of the restaurants are present on them and the delivery is speedy when food are ordered via the applications. These are

some factors that influence the consumers to order online. Discounts offered, comfort and the taste same as when having at the restaurants attract the users to use food applications and have food at their doorsteps.

Chai & Yat (2019) in their study “Online food delivery services: Making food delivery the new normal” conducted in Malaysia analysed the contributing factors towards online food delivery services among urbanites. The objective of their study was to investigate the relationship of several antecedents such as perceived ease of use, time saving orientation, convenience motivation and privacy and security having the behavioral intention towards the online food delivery services among the Malaysian urban dwellers. 302 responses were collected for the study. They adopted a quantitative method to conduct the research and used cross sectional survey for data collection. The questionnaire was circulated through Google doc and direct distribution was made to some of the respondents. The research conducted by them revealed the positive effect of time saving orientation, convenience motivation and privacy and security towards the behavioral intention of the online food delivery services and this was analysed using the SmartPLS 3.0 software and structural equating model.

### **Research Gap**

The perception of consumers towards online food delivery safety is a topic of interest in the prevalent situation. Many authors have tried to get some insights on perception of consumers towards the online food delivery services through various quantitative and qualitative techniques but no such attempt has been made to study the perception of consumers towards online food delivery safety amidst pandemic. Other than that, no attempt has been made to investigate the factors which influence the perception of consumers while ordering food online during the pandemic.

Present study is undertaken to analyze the perception of consumers towards online food delivery safety during the pandemic and various factors that influences their perception.

### **Research Questions**

1. What are the factors that the consumers look for when ordering online food during the pandemic?
2. Is there any relationship between the occupation of consumers and the frequency of ordering food online?
3. Which food delivery service provider is preferred by consumers the most during the pandemic?
4. Is there any relationship between the preferred food delivery app preference and no contact delivery feature?

## Research Objectives

1. To study the factors that the consumers look for when ordering food online during the pandemic.
2. To examine the relationship between occupation of consumers and frequency of ordering online.
3. To find out the most preferred online food delivery service provider during the pandemic.
4. To examine the relationship between food delivery app preference and no contact delivery feature.

## Research Methodology

A descriptive research design is used for the purpose of this study and both primary and secondary data is collected for the same. Primary data is collected with the help of a well structured closed ended questionnaire which covers the objectives of the research. Whereas secondary data is collected to find information about various online food delivery service provider and the safety protocols they follow, etc from various portals and websites. Both qualitative and quantitative method is undertaken for the analysis of data. Qualitative method is used for analyzing of the literature whereas quantitative method will be used for collection and analysis of data through the survey method. For the research, the survey method is used and data is collected from a sample size of 200 respondents on the basis of non probability convenience sampling. The sample unit is the people who are aware about online food delivery services in the city of Kolkata.

## Analysis and Interpretation

### Reliability Statistics:

Reliability analysis is conducted to check the consistency of the data that was collected through the questionnaire distributed to 200 respondents in the city of kolkata. The consistency of the data was formulated using cronbach's alpha where it was found out to be .714 which infers that the data consistency is good and it is positively reliable.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.714	.684	14

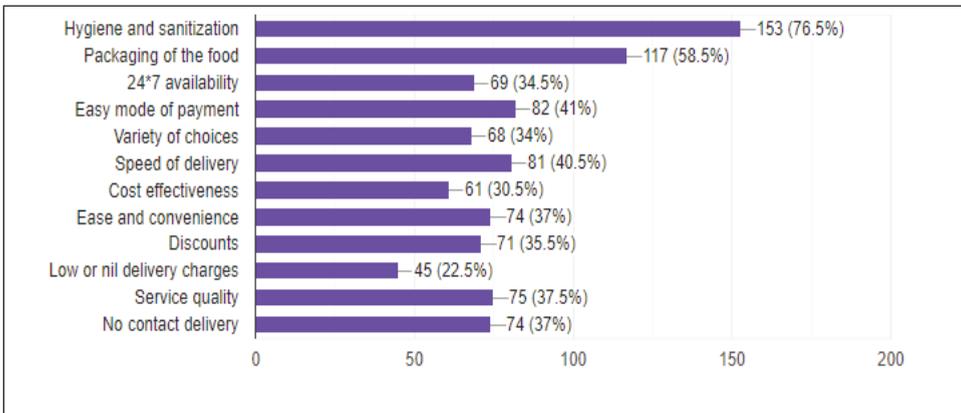
Demographic profile such as gender, age, occupation and marital status along with the multiple tick questions were excluded for the calculation of cronbach's alpha.

## Analysis I

To study factors that the consumers look for when ordering food online during the pandemic.

**Table 1: Factors influencing consumer's decision to order food online during the pandemic**

Factors of Consideration	No. of Respondents
Hygiene and sanitization	153
Packaging of the food	117
24*7 availability	69
Easy mode of payment	82
Variety of choices	68
Speed of delivery	81
Cost effectiveness	61
Ease and convenience	74
Discounts	71
Low or nil delivery charges	45
Service quality	75
No contact delivery	74



**Figure 1: Factors influencing consumer's decision to order food online during the pandemic**

**Inference-** From the given graph we can see that the hygiene and sanitization factor followed by packaging of the food, the no contact delivery feature, ease and convenience and service quality are some of the most considered factors by the consumers when they order food online during the pandemic. Also, we have to keep in mind that an individual respondent may be influenced by different factors simultaneously. So, overlapping may occur in this case.

**Analysis II**

To test the hypothesis that frequency of orders have a relationship with the occupation of the consumers.

**Hypothesis I:**

**Null hypothesis** = There is no significant relationship between occupation of the consumers and frequency of orders.

**Alternative hypothesis** = There is a significant relationship between occupation of the consumers and frequency of orders.

To analyze the frequency of orders according to the occupation of the consumers, We run the Chi-square test of independence through the cross tabs and we evaluate the significance level by checking the Pearson’s Chi-square value. We here apply the non-parametric test for the testing of the hypothesis since both the variables involed here are categorical in nature and they do not follow normal distribution. If we find that the p-value is less than 0.05, we can infer that the alternative hypothesis is accepted and hence, the null hypothesis will be rejected.

**Table 2: Occupation\* Frequency of the orders**

Occupation * Frequency of Orders Cross tabulation							
Count							
Daily							Total
		At least once a week	At least once a month	Occasionally	Never		
Occupation	Studen Student	0	25	23	63	3	114
	Home maker	0	2	0	3	3	8
	B Business owner	0	0	1	3	1	5
	Profes Professional	4	27	4	30	5	70
	part tPa Part time worker	0	0	0	2	1	3
Total		4	54	28	101	13	200

Source: (Researcher’s own compilation)

**Table 3: Chi-Square Test**

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pear Pearson Chi-Square	42.809 <sup>a</sup>	16	.000
Likelihood Ratio	40.356	16	.001
Linear-by-Linear Association	2.567	1	.109
N of Valid Cases	200		

Source: (Researcher's own compilation)

**Inference:** From the above table we can interpret that the significance value is 0.000 which is less than 0.05 therefore, we will reject the NULL HYPOTHESIS and accept the ALTERNATIVE HYPOTHESIS. Hence, concluding that there exist a highly significant relationship between the occupation of the consumers and the frequency of orders they make. To be specific the students make most of the purchase using online food delivery platforms.

### Analysis III

To find out the most preferred online food delivery service provider during the pandemic

**Table 4: The most preferred online food delivery platform**

Online Food Delivery Platforms	No. of Respondents
Zomato	101
Swiggy	67
Food panda	3
Individual restaurant's app	16

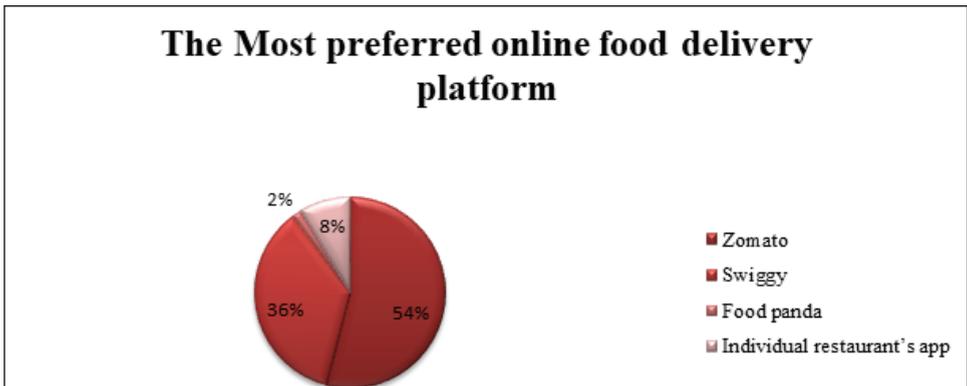


Figure 2: The Most preferred online food delivery platform

**Inference** – From the chart it can be inferred that majority of the respondents who have ordered food online prefer zomato to order the food followed by swiggy.

**Analysis IV**

To test the hypothesis that the preferred online food delivery platform have a relationship with the no contact delivery feature opted by the service providers.

**Hypothesis II:**

**Null hypothesis** = There is no significant relationship between food delivery app preference and no contact delivery feature.

**Alternative hypothesis** = There is a significant relationship between food delivery app preference and no contact delivery feature.

To analyze the preference of food delivery app according to the no contact delivery feature opted by the service providers, We run the Chi-square test of independence through the cross tabs and we evaluate the significance level by checking the Pearson’s Chi-square value. We here apply the non-parametric test for the testing of the hypothesis since both the variables involed here are categorical in nature and they do not follow normal distribution. If we find out that the p-value is less than 0.05, we can infer that the alternative hypothesis is accepted and hence, the null hypothesis will be rejected.

**Table 5: Preferred platform\* No contact delivery**

Preferred Platform * No Contact Delivery Cross tabulation					
Count					
CCC		No Contact Delivery			Total
Yes		No	May be		
Preferred Platform	Zomato	72	4	25	101
	Swiggy	44	8	15	67
	Food panda	1	1	1	3
	In Individual restaurant’s app	5	8	3	16
Total		122	21	44	187

Source: (Researcher’s own compilation)

**Table 6: Chi-Square Test**

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	30.646 <sup>a</sup>	6	.000
Likelihood Ratio	25.099	6	.000
Linea Linear-by-Linear Association	6.974	1	.008
N of Valid Cases	187		

Source: (Researcher's own compilation)

**Inference:** From the above table we can interpret that the significance value is 0.000 which is less than 0.05 therefore, we will reject the NULL HYPOTHESIS and accept the ALTERNATIVE HYPOTHESIS. Hence, concluding that there exist a highly significant relationship between the preference of the food delivery app and no contact delivery feature. To be specific when the consumers use online food delivery app they prefer the app which offers no contact delivery during the pandemic.

## Conclusion

The online food ordering system is very helpful for the consumers to get food delivered at their doorstep and for the service providers as well since, they get to serve the consumers even during the time of pandemic. This study was to find the perception of consumers towards online food delivery safety amidst pandemic. The consumers are seeking for at most safety norms to be followed by the online food delivery service providers since they have a fear of ordering online due to safety reasons involved in it.

After immense analysis it could be seen that the factors like hygiene and sanitization, safe packaging of food, service quality and no contact delivery opted by the service providers were given due importance and was considered by the consumers when going to order food online during the pandemic.

It was found out that there was a significant relationship between the occupation of the consumers and their frequency of ordering food online. Students and professionals used online food services the most. Majority of them either ordered once in a week or they ordered occasionally from the online food delivery service providers.

Zomato was seen to be the most preferred app by the consumers amidst the pandemic. Since majority of the consumers knew that zomato opts for no contact delivery feature, the safety sensitive consumers preferred ordering from zomato. Therefore, a highly significant relationship was found out between the most preferred food delivery app and no contact delivery feature.

Also, people who didn't order in past were willing to order food in near future because of the no contact delivery feature opted by the service provider. Hence it can be concluded by saying that after the outbreak of covid-19 consumers have become more hygiene and sanitization sensitive and prefer online food delivery platforms which opts for no contact delivery in serving the consumers.

## References

1. Anib, A., A, G. and R, S. (2019). "Consumers preference towards swiggy digital food application service: An analytical study with special reference to Ernakulam city", *International journal of innovative technology and exploring engineering*, 8(68), April2019, 791-797, doi-2278-3077.
2. Beliya, A., Kujur, R., Verma, M., Nagwanshi, k., Saha, S., Uikey, N. and Bhat, A.(2019). "Satisfaction of consumers by using online food services", *International journal of humanities*, 8(4), June-July2019, 35-44, doi-2319-3948.
3. Chai, L. and Yat, D. (2019). "Online food delivery services: making food delivery the new normal", *Journal of marketing advances and practices*, 1(1), 632-77.
4. Das, J. (2018). "Consumer perception towards online food ordering and delivery services: An empirical study", *Journal of management*, 5(5), September-October2018, 155-163, doi-http://www.iaeme.com/JOM/issues.asp?JType=JOM&IType=5
5. Gawande, N., Pachagare, G. and Deshmukh, A. (2019). "A study of customer perception about online food ordering services in Amravati city", *International journal of latest technology in engineering, management and applied science*, 8(4), April2019, 114-116, doi-2278-2540.
6. Ghadiyali, S. and Parashar, N. (2017). "A study on customer's attitude and perception towards digital food app services", *Amity journal of management*, January-June2017.
7. Jacob, A., Sreedharan, N. and K, S. (2019). "Consumer perception of online food delivery apps in Kochi", *International journal of innovative technology and exploring engineering*, 8(752), May2019, 302-305, doi-2278-3075.
8. Jeneefa, H. and Rajalakshmy, M. (2019). "A study on consumer satisfaction and preference towards online food ordering applications", *Journal of emerging technologies and innovative research*, 6(3), 132-138, doi-2349-5162.
9. Kedah, Z., Ismail, Y., Haque, A. and Ahmed, S. (2015). "Key success factor of online food ordering services: An empirical study", *Malaysian management review*, 50(2), July-December2015, 19-36.
10. Moondra, C., Mangwani, H., Bundela, A. and Namdev, K. (2020). "Impact of online food delivery on customers", *International research journal of engineering and technology*, 07(04), April-2020, 2362-2364, doi-2395-0056.
11. Rathode, S. and chaudhary, M. (2018). "Consumer's perception on online food ordering", *International journal of management and business studies*, 8(4), October-December2018, 12-17, doi-2230-9519.
12. Shah, B. and Prusty, R. (2019). "A study on factors affecting consumer's perception and attitude towards food app services", *International multidisciplinary research journal*, 5(2), December2019, 1-11, doi-2455-4624.

13. Tribhuvan, A. (2020). "A study on consumers perception on food apps", *International journal of advance research and innovative ideas in education*, 6(4), 208-243, doi-2395-4396.
14. Vinaik, A., Goel, R., Sahai, S. and Garg, V. (2019). "The study of interest of consumers in mobile food ordering apps", *International journal of recent technology and engineering*, 8(1), May2019, 3424-3429, doi-2277-3878.
15. Zhao, Y and Bacao, F. (2020). "Factors determining customer continuingly using food delivery appa during 2019 novel coronavirus pandemic period", *International journalof hospitality management* 91, 1-12, doi- <https://doi.org/10.1016/ijhm,2020.102683>

# Impact of Service Quality on Customer Satisfaction of the Selected Banks in Dhanbad During COVID-19 Pandemic

**Shreya Singh<sup>1</sup>**

Post Graduate & Research Department of Commerce, Batch 2019-2021 (MCMM)  
St. Xavier's College (Autonomous), Kolkata, West Bengal

## Abstract

*The study attempts to assess the impact of service quality on customer satisfaction of the selected banks in Dhanbad during Covid-19 pandemic. To attain this objective, questionnaire designed was categorized under five dimensions of the SERVEQUAL model. The sample consists of 200 respondents selected on basis of convenience. This study was quantitative in nature and both primary and secondary data were used. The collected data was analyzed with the help of SPSS version 22. Multiple regression analysis was used to investigate the relationship between dependent and independent variables. The results of the regression test showed that offering quality service has positive impact on overall customer satisfaction. The finding of the study indicated that, the service quality level of banks does not meet the expectations of the customer. Low service quality leads low customer satisfaction. Based on this, in order to improve performance of the bank, the researcher suggested that, the bank should prepare complaint handling mechanisms especially for the pandemic period and provide relevant training for its front line employees.*

**Keywords:** Banking Sector, Customer Satisfaction, Dhanbad, Service Quality, SERVQUAL.

## Introduction

Service sector has been a key driver of India's economic growth. It contributed 53.39% to India's gross value added at current price in FY20. In today's fast changing business environment, companies are finding it difficult to retain customers not because of the price they charge for their product but due to underwhelming quality of product and service offered by them. Harris et al.

---

1. This Dissertation was done by the scholar under the guidance of Dr. Sumanta Dutta

(1996) stated that for any service organization to survive in the market it is important to offer high quality of services to their customers. Banking sector is one of the key sectors in India's service industry. In the service sector there are lot of complaints from customers regarding not getting the expected quality for what they pay. This is because the quality of services is poor. Service quality is one of the most important factors that need attention of a firm to gain competitive advantage. Parasuraman (1988) created SERVQUAL model that defines service quality on basis of five factors by measuring the difference between customers' expectation and perceptions regarding service quality.

Clemes (2008) stated that customer satisfaction is another crucial factor in the banking industry. The nature of the banking industry is such that it requires constant contact with customers who require customized solutions for their variety of needs. Customer satisfaction has an effect on market shares of the company and customers' loyalty. Customer service quality and customer satisfaction has been a topic of interest for many researchers and many empirical and conceptual studies have been conducted on them. Parasuraman et al. (1985) proved that service quality is a predictor of customer satisfaction using SERVQUAL instrument. Service quality and customer satisfaction are important elements of the service-profit chain. According to Shanka (2012), excellent service quality is necessary for business to earn profit and survive. Organization's profitability will be negatively impacted if service quality of the organization is poor.

### **Literature Review**

Hussaen et al. (2020) examined the gap between service quality and perception of customers in the banking sector of Sri Lanka during the covid-19 pandemic. The primary objective of the study was to determine the quality of service and customer satisfaction in banking sector of Sri Lanka. SERVQUAL model was used for analysing the various dimensions of service quality namely tangibility, assurance, empathy, reliability and responsiveness. It was a quantitative research and data was collected from both primary and secondary sources. A well structured questionnaire based on the SERVQUAL model was adopted to collect the primary data. Cluster sampling was used and sample size was 400. It included customers of both private and public sector banks. The findings of the study revealed that all five dimensions of service quality had positive impact on the customer satisfaction in both public sector and private sector banks. It was also revealed that reliability dimension of service quality had the most influence on customer satisfaction followed by empathy.

Khatab et al. (2019) examined the influence of banks' service quality on customer satisfaction in Kurdistan. The objective of the research was to study the impact of various dimensions of service quality - assurance, reliability, empathy and responsiveness on customer satisfaction. The study was based on primary data. A structured questionnaire was used to collect data from 384 respondents who had their accounts in various private and public sector banks in Kurdistan. 77.3 % of the sample comprised of males whereas 22.7 % were females. The researcher used convenience sampling for the purpose of data collection. The outcome

of the study revealed that all dimensions of service quality have a significant positive impact on customer satisfaction. The most influential dimension was seen to be empathy and the least influencing was reliability.

Moghavvemi et al. (2018) examined the service quality and customer satisfaction of both foreign and local banks in Malaysia. The independent variable was service quality which was judged on 5 dimensions- Convenience, knowledge and staff competency, image, core product and internet banking. The dependent variable was customer satisfaction. Primary data was collected with the help of a structured questionnaire from 748 bank customers on basis of convenience sampling. It included 48% males and 52% females. The outcome of the research revealed that customer experience of perceived overall service quality has positive impact on customer satisfaction in both local and foreign banks. It was also seen that customers of foreign banks showed higher level of overall satisfaction than customers of local banks.

Prasad & Prasad (2017) assessed the service quality delivered by selected banks in rural areas of Karminagar district of Telangana using SERVQUAL model. The objective of this study was to measure customer satisfaction by analysing the gap between expected service quality and perceived service quality of the selected banks. The study was descriptive in nature. It involved collection of both primary and secondary data. Primary data was collected from the customers of HDFC banks in Karminagar district of Telangana. The number of respondents was 168 comprising of farmers, employees and business people. The result stated that tangibility and empathy were the major factors responsible for customer satisfaction regarding the service quality of the bank.

Agbemabiese et al. (2015) investigated the influence of service quality on customer satisfaction in the Indian Banking sector. The objective of the study was to examine the impact of service quality dimensions on customer satisfaction. It considered five dimensions of service quality for the purpose of study- tangibility, empathy, assurance, responsiveness and reliability. The study was quantitative in nature. The sample frame was three branches of Ghana commercial bank. The sample size was 120. It comprised of 40 customers from each of the three branches. Purposive sampling technique was used in order to select respondents. A well-structured questionnaire was used to collect primary data. Secondary data was collected through books, journals and newsletters. The results revealed that customers had higher Expectations regarding the tangibility dimension of service quality. It was also found out that customers' expectation of all dimensions of service quality was higher than their perception. The research finally concluded that customer satisfaction is influenced by level of total service quality.

## **Research Gap**

Different authors have undertaken research for studying the influence of service quality on customer satisfaction in the banking sector. However, all these researches involved studying the service quality of banks during normal circumstances.

No such attempt has been made in India as of now to investigate the influence of service quality on customer satisfaction in banking sector during the time of Covid-19. The five dimensions of service quality- tangibility, reliability, assurance, empathy and responsiveness of SERVQUAL model were influenced by the pandemic. When social distancing is a norm, it is important to study how efficient is the Indian banking sector in providing interpersonal services to the customers.

### **Research Questions**

The study was guided by the following research questions:

1. What is the level of service quality in banks of Dhanbad during the Covid-19 pandemic?
2. What is the relationship between service quality and customer satisfaction?

### **Research Objectives**

1. To examine customers' expectations and perceptions of service quality provided by the selected banks of Dhanbad during Covid- 19 pandemic.
2. To determine the impact of perceived service quality dimensions on customers' satisfaction.

### **Hypothesis of the Study:**

The following null hypotheses were tested to answer the problem statement and consequently address the 2nd objective of the study-

Ho1: There is no significant impact of tangibility on customer satisfaction of selected banks in Dhanbad during Covid- 19 Pandemic.

Ho2: There is no significant impact of reliability on customer satisfaction of selected banks in Dhanbad during Covid- 19 Pandemic.

Ho3: There is no significant impact of responsiveness on customer satisfaction of selected banks in Dhanbad during Covid- 19 Pandemic.

Ho4: There is no significant impact of assurance on customer satisfaction of selected banks in Dhanbad during Covid- 19 Pandemic.

Ho5: There is no significant impact of empathy on customer satisfaction of selected banks in Dhanbad during Covid- 19 Pandemic.

### **Research Methodology**

This research is descriptive and cross sectional. To understand the impact of service quality dimensions on customer satisfaction causal research design will be used. A quantitative research approach was utilised in this study with the well-structured survey questionnaire based on the SERVQUAL model. Convenience sampling method was used to distribute 200 questionnaires to the customers of 5 branches of State Bank of India and 4 branches of Bank of Baroda. The sample comprised of 104 males and 96 females. Questionnaire was based on

SERVQUAL model (Parasuraman et al., 1985, 1988, 1991). A total of 22 attributes were categorised under five dimensions as follows: tangibility (four attributes), reliability (five attributes), responsiveness (four attributes), assurance (four attributes) and empathy (five attributes).

## Data Analysis and Interpretation

### Reliability Statistics

**Table 1: Reliability Statistics**

Cronbach's Alpha	N of Items
.964	48

Source: (Researcher's own Compilation)

To determine the reliability of the instrument, Cronbach's alpha was used to measure the total number of 48 items distributed to service quality expectations, service quality perceptions and customer satisfaction. The result shows .964. Hence we can conclude that the instrument is highly reliable.

### Analysis of SERVQUAL Score of the 22 Paired Attributes

**Table 2: Gap mean differences between customers' expectations and perceptions of service quality**

	Parameter	Expectations (mean)	Perception (mean)	Gap (P-E)	T	Sig. (P-value)
	<b>Tangibility</b>					
1.	modern-looking equipment and fixtures	3.97	2.90	-1.07	-13.71	.000
2.	visually appealing physical facilities	3.84	2.80	-1.04	-12.28	.000
3.	Materials associated with my bank's service (such as ATM card, debit cards, catalogues, or statements) are visually appealing	3.97	3.06	-0.91	-11.29	.000
4.	Staff of bank are neat in appearance	3.93	2.84	-1.09	-12.80	.000
	<b>Average tangible gap score</b>	<b>3.93</b>	<b>2.90</b>	<b>-1.03</b>	<b>-13.80</b>	<b>.000</b>
	<b>Reliability</b>					
5.	Bank staff provides the promised service	4.19	2.75	-1.44	-15.98	.000

6.	Bank staff is dependable in solving customers' problems	4.12	2.76	-1.36	-14.98	.000
7.	Performs the service right in first time	4.16	2.61	-1.55	-15.75	.000
8.	Provides service in promised time	4.25	2.50	-1.75	-17.51	.000
9.	The bank maintains error free records	4.16	2.86	-1.30	-14.83	.000
	<b>Average reliability gap score</b>	<b>4.17</b>	<b>2.70</b>	<b>-1.47</b>	<b>-17.80</b>	<b>0.00</b>
	<b>Responsiveness</b>					
10.	Bank staff keeps the customers informed exactly when services will be performed	4.20	2.56	-1.64	-16.91	.000
11.	Bank staff responds promptly	4.10	2.56	-1.54	-16.61	.000
12.	Willingness to help customers	4.21	2.54	-1.67	-18.68	.000
13.	Readiness to respond to customers' enquiries	4.19	2.58	-1.61	-17.19	.000
	<b>Average responsiveness score</b>	<b>4.18</b>	<b>2.56</b>	<b>-1.62</b>	<b>-18.70</b>	<b>.000</b>
	<b>Assurance</b>					
14.	Behaviours of bank staff instil confidence in Customers	4.05	2.81	-1.24	-14.37	.000
15.	Make the customers feel safe in transactions	4.44	3.48	-0.96	-12.32	.000
16.	Bank staff is courteous	4.15	2.80	-1.35	-16.05	.000
17.	Bank staff is knowledgeable	4.19	3.02	-1.17	-14.65	.000
	<b>Average assurance gap score</b>	<b>4.21</b>	<b>3.03</b>	<b>-1.18</b>	<b>-16.89</b>	<b>.000</b>
	<b>Empathy</b>					

18.	Bank staff gives individual attention	4.03	2.50	-1.53	-15.61	.000
19.	Caring employees	4.08	2.51	-1.57	-17.11	.000
20.	Bank staff has customers' best interest at heart	4.06	2.63	-1.43	-15.31	.000
21.	Bank staff understands the needs of customers	4.17	2.61	-1.56	-16.69	.000
22.	Convenient operating hours	4.28	2.94	-1.34	-15.46	.000
	<b>Average empathy gap score</b>	<b>4.12</b>	<b>2.64</b>	<b>-1.48</b>	<b>-17.94</b>	<b>.000</b>

Correlation is significant at  $p < .01$  (two-tailed)

Source: (Researcher's own Compilation)

### Inference

All the 22 attributes showed a negative SERVQUAL gap score which indicates that customers' perception of service quality was less than customers' expectation. With the help of paired t- test it was observed that for all 22 attributes  $p < 0.01$ . This difference according to the paired t-test is significant at 1% level of significance. This indicates a statistically significant difference on all the 22 attributes examined. Responsiveness showed the highest gap score (-1.62,  $p < 0.01$ ), followed by empathy (-1.48,  $p < 0.01$ ), reliability (-1.47,  $p < 0.01$ ) and assurance (-1.18,  $p < 0.01$ ). Tangibility indicated the least gap score (-1.03,  $p < 0.01$ ). The grand mean gap score for the overall attributes was -1.35 with  $p < 0.01$  indicating that the overall service quality provided by selected banks in Dhanbad is below customers' expectations. Therefore, the banks need to improve their service quality.

### Analysis of impact of service quality dimensions on customer satisfaction

**Table 3: Model Summary**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.855 <sup>a</sup>	.730	.723	.58086
a. Predictors: (Constant), Tangibility, Reliability, Responsiveness, Assurance, Empathy				

Source: (Researcher's own Compilation)

### Inference

In Table 3 the model summary of the regression analysis shows  $r = .855$ ,  $r^2 = .730$  and a standard error of .58086. According to the value of R Square, it can be stated that 73% of variations in the dependent variable i.e. customer satisfaction can be explained by the independent variables i.e. five dimensions of service quality (tangibility, reliability, responsiveness, assurance and empathy)

**Table 4: ANOVA**

ANOVA <sup>a</sup>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	177.243	5	35.449	105.065	.000 <sup>b</sup>
	Residual	65.455	194	.337		
	Total	242.697	199			
a. Dependent Variable: Customer satisfaction						
b. Predictors: (Constant), Tangibility, Reliability, Responsiveness, Assurance, Empathy						

Source: (Researcher's own Compilation)

### Inference

Table 4 above provides the ANOVA test of the model which specifies customer satisfaction as a function of, tangibility, reliability, responsiveness, assurance and empathy. ANOVA tells overall goodness of fit of the model. On the basis of the table we can conclude that overall regression model was significant,  $F(5,194) = 105.065$ ,  $p < 0.01$ ,  $R \text{ Square} = 0.73$ .

**Table 5: Regression Coefficients**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.351	.151		-2.332	.021
	Tangibility	.216	.075	.175	2.874	.005
	Reliability	.273	.114	.248	2.401	.017
	Responsiveness	.099	.107	.095	.927	.355
	Assurance	.158	.087	.133	1.822	.070
	Empathy	.316	.116	.278	2.718	.007
a. Dependent Variable: Customer satisfaction						

Source: (Researcher's own Compilation)

### Inference

According to the table 5 we can see that the significance value for tangibility, reliability and empathy are 0.005, 0.017 and 0.007 respectively. Since they are less than 0.05 we reject the null hypothesis and accept the alternative hypothesis. Hence it can be said that tangibility, reliability and empathy have significant impact on customer satisfaction. The significance value for responsiveness and assurance are 0.355 and 0.70 respectively. Since they are greater than 0.05 we accept the null hypothesis and reject the alternative hypothesis. Hence it can

be said that responsiveness and assurance do not have a significant impact on customer satisfaction.

## Conclusion

This study examined the impact of service quality on customer satisfaction during Covid- 19 pandemic. On the bases of the analysis given in the previous section, the following conclusion is drawn.

The banks in Dhanbad fail to meet the expected level of service quality in all the five dimensions (tangibility, reliability, responsiveness, assurance and empathy). The customers are particularly dissatisfied with the responsiveness of the staff in the selected banks during the pandemic. The customers perceive that there is a lack of willingness among the employees to handle their queries. Another issue resulting in customer dissatisfaction is lack of empathy by the bank employees during the pandemic. Through regression analysis it was found out that tangibility, reliability and empathy have significant impact on customer satisfaction. Hence banks should focus mainly on these three variables, during the pandemic, in order to improve the service quality and in turn increase the satisfaction of customers.

Bank management ought to have good understanding of customers' expectations from the bank in terms of service quality. The bankers need to identify cost-effective ways of closing service quality gaps in order to improve the service quality levels. From the gap analysis table, the maximum gap score is observed in the dimension of responsiveness followed by empathy. Hence the banks should train their employees so that they become more responsive and empathetic towards the needs of the customers. Banks can introduce a complaint handling system in order to be more responsive to the problems faced by customers during the pandemic.

## References

1. Agbemabiese, G., Anim, P., and Nyanyofio, J. (2015). "Service Quality and Customer Satisfaction in the Ghanaian Banking Industry (A Case of Ghana Commercial Bank)", *European Journal of Business and Management*, Vol.7, No.3, 2015, 123-140, DOI: <https://www.researchgate.net/publication/271841435>
2. Clemes, M., Gan, C., Kao, T., and Choong, M. (2008). "An empirical analysis of customer satisfaction in international air travel", *Innovative Marketing*, Vol.4, 49-62, URL: [https://businessperspectives.org/pdfproxy.php?item\\_id:2229](https://businessperspectives.org/pdfproxy.php?item_id:2229)
3. Hariss, S., and Cone, D. (1996). "Service Learning Practice: Developing a Theoretical Framework", *Michigan Journal of Community Service Learning*, 31-43, URL: <http://info.wartburg.edu/Portals/0/CCE/Developing%20a%20theoretical%20framework.pdf>
4. Hussain, A., Sivathmajasarma, J., Abeysekara, A., Hansani, H., Thelijjagoda, S., and Madhavika, W. (2020). "Service Quality and Customer Satisfaction in Banking Sector during COVID-19 – An Empirical Analysis of Sri Lanka", *Global Journal of Management and Business Research: B Economics and Commerce* Volume 20 Issue 11, 23-29, URL: <https://journalofbusiness.org/index.php/GJMBR/article/view/3270>

5. Khatab, J., and Othman, B. (2019). "The Influence of Service Quality on Customer Satisfaction: Evidence from Public Sector and Private Sector Banks in Kurdistan/Iraq", *International Journal of Advanced Science and Technology*, Vol. 28, No. 20, 865-872, URL:[https://www.researchgate.net/publication/338456868\\_The\\_Influence\\_of\\_Service\\_Qualty\\_on\\_Customer\\_Satisfaction\\_Evidence\\_from\\_Public\\_Sector\\_and\\_Private\\_Sector\\_Banks\\_in\\_KurdistanIraq](https://www.researchgate.net/publication/338456868_The_Influence_of_Service_Qualty_on_Customer_Satisfaction_Evidence_from_Public_Sector_and_Private_Sector_Banks_in_KurdistanIraq)
6. Moghavvemi, S., Lee, S., and Lee, S. (2018). "Perceived overall service quality and customer satisfaction: A comparative analysis between local and foreign banks in Malaysia", *International Journal of Bank Marketing*, DOI: <https://doi.org/10.1108/IJBM-06-2017-0114>
7. Prasad, E., and Prasad, G. (2017). "Service Quality and Customers' Satisfaction in HDFC Bank: A Study of Selected Private Rural Banks in Karimnagar District of Telangana State", *Pacific Business Review International* Volume 9 Issue 1, 55-66, URL: [http://www.pbr.co.in/2017/2017\\_month/May/07.pdf](http://www.pbr.co.in/2017/2017_month/May/07.pdf)
8. Shanka, M. (2012). "Bank Service Quality, Customer Satisfaction and Loyalty in Ethiopian Banking Sector", *Journal of Business Administration and Management Sciences Research* Vol. 1(1), 01-09, URL: [https://www.researchgate.net/profile/Mesay\\_Sata\\_Shanka2/publication/281823265\\_Bank\\_Service\\_Quality\\_Customer\\_Satisfaction\\_and\\_Loyalty\\_in\\_Ethiopian\\_Banking\\_Sector/links/57fbd2e908ae329c3d497c9f/Bank-Service-Quality-Customer-Satisfaction-and-Loyalty-in-Ethiopian-Banking-Sector.pdf](https://www.researchgate.net/profile/Mesay_Sata_Shanka2/publication/281823265_Bank_Service_Quality_Customer_Satisfaction_and_Loyalty_in_Ethiopian_Banking_Sector/links/57fbd2e908ae329c3d497c9f/Bank-Service-Quality-Customer-Satisfaction-and-Loyalty-in-Ethiopian-Banking-Sector.pdf)
9. Parasuraman, A., Zeithmal, V. and Berry, L. (1986). "A Conceptual Model of Service Quality and its Implications for Future Research", *Journal of Marketing*, vol.49, URL: [https://edisciplinas.usp.br/pluginfile.php/2491773/mod\\_resource/content/1/Conceptual%20Model%20of%20Service%20Quality%20and%20Its%20Implications%20for%20Future%20Research.pdf](https://edisciplinas.usp.br/pluginfile.php/2491773/mod_resource/content/1/Conceptual%20Model%20of%20Service%20Quality%20and%20Its%20Implications%20for%20Future%20Research.pdf)
10. Parasuraman, A., Zeithmal, V., and Berry, L. (1988). "SERVQUAL: A Multiple-Item Scale For Measuring Consumer Perception Of Service Quality", *Journal Of Retailing*, Vol. 64, 12-40, URL: [https://www.researchgate.net/publication/225083802\\_SERVQUAL\\_A\\_multiple-Item\\_Scale\\_for\\_measuring\\_consumer\\_perceptions\\_of\\_service\\_quality](https://www.researchgate.net/publication/225083802_SERVQUAL_A_multiple-Item_Scale_for_measuring_consumer_perceptions_of_service_quality).

## The Impact of Advertisement Campaigns by Audio Streaming Services on Consumer Preference and Response During the COVID-19 Pandemic: A Study in Four Major Metropolitan Cities

**Rebanto Roy<sup>1</sup>**

Post Graduate & Research Department of Commerce, Batch: (2019-2021)  
St. Xavier's College (Autonomous), Kolkata, West Bengal

### Abstract

*During the onset of the digital revolution, marketing has played a crucial role in disseminating the information pertaining to technology and innovation. Audio consumption for the last 70 years has rapidly increased especially in its form. This has been further fueled by the advent of social media and the Internet. This research paper is a descriptive research where 317 respondents contributed their perspectives towards the ever-growing audio streaming industry. This industry is growing at a phenomenal rate and establishing a new way to consume music and other audio services. The study aims to identify: a) To assess the impact of promotional activities b) To recognise the impact of income levels of consumers over paid subscriptions. c) To identify whether the usefulness of various advertisements d) To acknowledge the consumer behaviour towards advertisement campaigns e) To analyse whether consumer perception of advertisements helps curbing digital piracy. The anomalies lie on whether or not there has been a shift from consumer misbehaviour to consumer awareness, commodity-based substitution has conformed itself into a service-based substitution and whether or not there has been a sharp rise in consumer responsiveness towards the adoption of audio streaming services in the face of temptation provoked by music piracy. This study enables us to discover new behavioural and attitudinal patterns of Indian consumers adopting and utilising audio streaming services. Specifically, marketing variables like advertisements and other promotional activities, as to whether or not they do impact audio consumption in this country. It not only provides insightful details about the Indian urban but also help marketers to utilise the data more effectively and monetise out of it. Especially when there are comparatively few organised studies undertaken to adhere to the Indian context.*

---

1. This Dissertation was done by the scholar under the guidance of Dr. Shivaji Banerjee

*Marketers will be able to profitably use the data in formulating better plans to expedite customer satisfaction.*

**Keywords:** Advertisement, Audio, Music, Services, Streaming.

## **Introduction**

The digital revolution has been an extraordinary one ever since the Internet Boom back in the 1990s. We have harnessed the power of digital media platforms and used it to connect ourselves with the world that we know and the one we are not aware of. In a time where the 5G Network is already in the process of being widespread and the IoT(Internet of Things) playing a significant role in making our lives simpler and more integrated, we are already equipping ourselves for a new normal.

We are once again ushering into a New Age after the Covid-19 pandemic with the hope of venturing forth many more diversifications in various tenets. The biggest takeaway from this pandemic is that we have to better defend ourselves from the ambiguity and uncertainty this world has to offer and promise a future of equitable and sustainable development.

One of the major setbacks yet opportunistic tenet which we have seen further evolve in our lives is that of entertainment. Entertainment has prospered during the pandemic graciously due to access to Internet streaming. This has allowed users to increase their reliance on digital platforms like OTT platforms and has done away with traditional forms of entertainment. The ease of accessibility makes all the difference due to the existence of a well-equipped digital era. Earlier, the higher prices of traditional and material forms of music like vinyl, cassettes and CDs raised the issues of affordability. But not anymore due to the availability of such streaming services.

However, with greater accessibility comes even greater responsibility. That has not been observed for quite a few years ever since music could be distributed illegally due to consumer misbehaviour. Nevertheless, with social media platforms and their integration with music streaming services, things have been changing for the better.

## **Literature Review**

Miao *et al.* (2020) recommend in their paper the use of recommender systems to better interpret the consumers' tastes and preferences. The system suggested aims to fill the void between the users' psychological demand and little use of such recommendation systems. The novelty framework's architecture proposes to enhance the audio experience of a user by choosing the next song based on their historical preference and feedback represented by likes and dislikes.

Gary Sinclair and Julie Tinson (2016) in their study explored the relevance of the concept of psychological ownership concerning music streaming services. The results helped them in pointing out the different characteristics of psychological ownership concerning adopting music streaming services like manipulability, control and choice.

Cesareo & Pastore (2014) in their paper highlights factors such as sybaritic and financial benefits and moral judgement and their impact on the ongoing digital piracy culture worldwide. The results were alarming since a positive correlation was established between the economic and hedonic benefits and the buying behaviour towards pirated goods.

## Research Gap

After carefully scrutinizing various literature, one thing is for certain that there is an insufficiency of research in this area of expertise that needs to be further explored with the Indian scenario. Very little research work has been able to analyse this change in the mind of Indian consumers and how they are responding to music streaming services. This industry is forecasted to grow exponentially in the next few years. Hence, there is a need to grasp the ever-changing consumer attributes simultaneously.

## Research Questions

1. Do promotional activities via different marketing channels by audio streaming services have an impact on consumer's adoption and frequency of usage?
2. Does the impact of income levels of consumers over paid subscriptions?
3. Do various advertisements affect the choice of the audio streaming platform?
4. Is there a holistic consumer behaviour towards advertisement campaigns run by audio streaming services?
5. Does consumer perception of advertisements play an important role in curbing digital piracy?

## Objectives

1. To assess the impact of promotional activities via different marketing channels by audio streaming services on consumer's adoption and frequency of usage.
2. To recognise the impact of income levels of consumers over paid subscriptions.
3. To identify whether the usefulness of various advertisements affects the choice of the audio streaming platform.
4. To acknowledge the holistic consumer behaviour towards advertisement campaigns run by audio streaming services.
5. To analyse consumer perception of advertisements playing an important role in curbing digital piracy.

## Research Methodology

<b>Research Design</b>	Descriptive Research Design
<b>Data Collection</b>	Primary Data obtained via a structured questionnaire sent online to people from various age groups from 15 and above.
<b>Population</b>	Kolkata, Mumbai, Delhi and Bangalore
<b>Sample Size</b>	317 respondents
<b>Sampling Technique</b>	Non-Probabilistic Sampling- Convenience Sampling
<b>Techniques of Data Analysis</b>	Non-Parametric Test- Chi-square test of Independence using SPSS, Percentage analysis, pie charts and stack bars. Parametric Test: Pearson Correlational Analysis

## Analysis and Interpretation

The following analyses and their subsequent interpretations have been made:

- It has been established that there exists a positive relationship between the effectiveness of advertisement campaigns, as per the respondents and their frequency of usage of these services during the COVID-19 Pandemic. This has revealed that these promotional activities are impacting consumer usage and are engaging them more to adopt audio streaming services which are relatively new in the context of the Audio Industry.
- A paradoxical result has come into notice concerning this study. Usually, a consumer's level of income indicates whether or not they opt for a paid subscription plan. However, the very opposite has been observed that there is no impact of income levels over the choice of purchasing a paid subscription plan. Thus, there is no significant relationship between the two variables.
- As per a correlational analysis, factors determining the usefulness of an advertisement by audio streaming services is directly related to consumer's choice of audio streaming platform preference. Positive relationships have been observed with factors that authenticate the effectiveness of an advertisement like being trustworthy, informative, believable and convincing is vital for an advertisement to attract customers to choose a specific audio streaming platform.
- Out of the total 317 respondents, 141(45%) were Male and 56 (37%) were Female.
- The majority of the respondents (78%) in this study are from Kolkata. The rest are from Bangalore, Mumbai and New Delhi.
- Maximum respondents in this study are within the age bracket of 15-25 which comprises the urban youth population in these metropolitan cities.
- Maximum respondents belong to the monthly income group of Rs. 1,00,001 or more, which comprise 158 respondents.
- Students represent the majority of respondents; 215 respondents out of 317.

- A landslide majority of people have been availing of audio streaming services during the COVID 19 Pandemic.
- JioSaavn has the clear majority with a hefty 97 respondents, 31% of the sample size. They are followed by Gaana (26%), Spotify (19%) and Youtube Music (17%). It is to be noted that not a single respondent considers Amazon Music as their most preferred service. It should also be taken into consideration that Spotify and Youtube Music, being relatively new players (entry in 2018 and 2019 respectively) in the Indian Market have made a striking impact in terms of consumer preference.
- The majority of the respondents (107) spend 1-2 hours behind audio streaming. While the rest also frequents the usage of these services. A general observation out of this sample survey can be made that consumers spend considerable hours behind these services.
- Respondents prefer using Smartphones (77%) while accessing these services. It is to be noted that none amongst the sample population opted for Smart TVs.
- Social Media Advertisements and TV Advertisements are major sources of respondents to know about these services in the first place with 52% and 44% respectively. These responses are a clear indication of the fact that Traditional Advertisements (e.g. billboards, posters, etc.) are losing their awareness abilities amongst the urban population since none of them mentioned it as their source of service awareness.
- Amongst the respondents, paid subscribers are a little shy of half of the total respondents.
- 46% of the respondents believe that advertisements are ineffective in contrast to just 7% who think that they are effective.
- Respondents, on a majority basis, strongly agree with the usefulness of New Album Release Ads and Podcast Ads. The effectiveness of Sponsored Playlist Ads, Sponsored Ads and Display Ads is also crucial to know since they are on repetition when a non-paid subscription is opted for.
- A decent majority of the people Agree (103) respondents and 106 respondents for the Beginning and End respectively), that an advertisement should be placed either at the start and/or at the last portion of the audio file.
- 79% and 16% of the respondents Strongly Agree and Agree respectively to the statement that Advertisements deployed by these services are annoying while streaming any audio file.
- 27% of the sample population remain Neutral that these advertisements compel us to buy a subscription for these services.
- 46% of respondents Agree that these advertisements and promotional activities will deter the reliance on digital piracy, specifically audio piracy. This helps us to comprehend the statement of consumer awareness towards consumer misbehaviour in a better way since the majority agree that advertisements will be able to make a difference.

- Respondents Agree with the factors of advertisements being Trustworthy (148), Informative (162), Believable (124) and Convincible (114). We observe that respondents are agreeing to these factors to ensure the effectiveness of these advertisements.

## Conclusion

This research delves fresh into the mindset of consumers, their preferences, behaviour, attributes etc. concerning the advertisements organized and run by audio streaming services.

To sum it up, these findings provide indispensable insights into consumer behaviour in response to the various advertising campaigns run by various audio streaming services. This data can be effectively and efficiently utilised to know how these services should henceforth go about their promotional activities.

In a nutshell, this study provides interesting knowledge regarding consumers' perception towards advertisement campaigns and well they are receiving them. The ulterior motives of these advertisements are more or less getting fulfilled given the rise in consumer experience and expectations. These pertinent details will prove to be invaluable for marketers in audio streaming services since they are always keen to know more about what and how their customers are operating and at what capacity. Indian consumers need to realise the true potential of this new normal scenario of consuming music.

Given the times of the pandemic, these services have been given their due respect in terms of meeting the consumers' needs and expectations. These platforms have been able to steeply increase their profits while other industries continue to resist the brunt of unconventional courses of actions. There is more clarity now about this study of how different variables are interrelated to each other and which have direct or inverse relationships. Consumer attributes can be targeted accordingly and thereby ensure smooth delivery of advertisements across all channels to create substantial brand awareness and its subsequent usage.

## References

1. Alberto, P., Ludovica, C. (2014), "Consumers' attitude and behaviour towards online music piracy and subscription-based services", *Journal of Consumer Marketing*, 31/6/7(2014), 515-525, doi: 10.1108/JCM-07-2014-1070.
2. Dezhuang, M., *et al.* (2020). "Humming-Query and Reinforcement-Learning based Modelling Approach for Personalized Music Recommendation", *Procedia Computer Science*, vol.176(2020). 2154-2163, doi: 10.1016/j.procs.2020.09.252.
3. Gary, S., Julie, T. (2016). "Psychological Ownership and music streaming consumption", *Journal of Business Research*, vol. 71(2017), 1-9, doi: 10.1016/j.jbusres.2016.10.002.

## A Study on the Effectiveness of Online Education Among College Students in Kolkata

**Sourya Chakrabarty**<sup>1</sup>

Post Graduate & Research Department of Commerce, Batch: (2019-2021)  
St. Xavier's College (Autonomous), Kolkata, West Bengal

### Abstract

*It was just night before the new year when the first official case of the Covid-19 was registered. India registered its first case on 30th January 2020. One month later, on the 22nd March, the country observed a public curfew followed by a stringent lockdown policy across the country. The hotspots seemed to have even tougher lockdown rules. For a primarily agrarian economy, treading on the path to a fully digital country, the tremors of the pandemic were felt across all the sectors. Transportation of food grains across the country, tackling the plight of the migrant workers across the country, education, healthcare, infrastructure, services- every sector seemed to be a challenge for the government. With all forms of socialization on a halt, online education seemed to be the last resort to avoid disruption of education along with all levels.*

*However, the transition from the online to offline modes posed a lot of challenges and would take multi-pronged efforts to make it a success. This paper tries to explore the effectiveness of online education in terms of level from various perspectives. India has already had a clear structure of the digital divide, with a large section of the society devoid of Internet services. Does online education marginalise the already marginalized? What is the effect of online education on the physical and mental health of students? Is it as effective as the offline mode when it comes to understanding concepts? The paper tries to explore the answers to these questions, taking into account the college students in and around Kolkata.*

**Keywords:** Covid19, Education, Online Education, Kolkata, Digital Country.

---

1. This Dissertation was done by the scholar under the guidance of Prof. Rishen Mukherjee

## Introduction

India has traditionally been an agrarian economy, with the agricultural sector contributing to the majority of the entire Gross Domestic Product of the Indian economy. Unlike most of the economies which have gone through the agriculture-industry-services paradigm shift, India has directly gone from being engrossed in agriculture to being one of the Industrial Technology hubs of the world, with the services sector contributing to over 60% of the country's GDP today.

It was during February when the world took proper notice of the grave consequences and threats that the virus posed. India, which was already on its way to overtake China in terms of population, had to face an array of challenges related to infrastructure, management, healthcare, corporate and education sectors, given its class stratification. India has been an epicenter of offline education for ages. Not having many options left to counter the disruption brought about by the pandemic, India had to quickly shift from the offline modes of education and look for solutions in online education. However, only the privileged have had the opportunity to enroll themselves in any form of online courses. Firstly, a proper internet connection, followed by an uninterrupted service is not uniformly available across the country. For the majority of the Indian population, devoid of internet connectivity, online classes seem as if they were a dream. According to data presented by the Telecom Regulatory Authority of India in 2018, the total internet density in the country stood at about 49 per cent. However, the major challenge was the fact that rural India was digitally marginalised, accounting for only 25% of the population having access to the Internet, as compared to the more privileged urban sections of the Indian society accounting for over 98%. There is a clear digital divide across the country, across places of residence, gender, social class in the country, which makes the implementation of online education all the more challenging.

It was just right before the new year when the first official case of the Covid-19 was registered. India registered its first case on 30th January 2020. One month later, on the 22nd of March, the country observed a public curfew followed by a stringent lockdown policy across the country. The Covid-19 Hotspots had even more stringent lockdown rules, with extremities like limiting outings for even going out to buy the daily groceries. For a primarily agrarian economy, treading on the path to a fully digital country, the tremors of the pandemic were felt across all the sectors. Transportation of food grains across the country, tackling the plight of the migrant workers across the country, education, healthcare, infrastructure, services- every sector seemed to be a challenge for the government. With all forms of socialization on a halt, online education seemed to be the last resort to avoid disruption of education along with all levels. However, the transition from the online to offline modes posed a lot of challenges and would take multi-pronged efforts to make it a success. This paper aims to investigate the effectiveness of online education in terms of level from various perspectives.

## Literature Review

Jena P.K. (2020) conducted an exploratory study to explore some of the impacts of positive and negative effects of the Covid-19 pandemic on the Education sector of India. It discusses the various steps undertaken by the government to digitise education, to prevent disruption during the pandemic. The researchers collected information from various reports, journals and websites. They concluded that even though many steps are being undertaken to digitise education that has resulted in a more dynamic form of learning, India is yet to counter the class divide and come up with measures for those who are not privileged enough to access this new form of education.

Gupta A. & Goplani M. (2020) through their study, focused on the effects of the various lockdown stringencies imposed by the Government, in consultation with the MHRD on the various educational institutions in India. The objectives of the paper are to explore the effects and analyse the actions undertaken by the government for the safety of the educational institutions and related stakeholders through the correspondence of relevant authorities. The study is descriptive and analytical where the data has been collected from the various official websites, newspapers, E-news, articles, and discussions with teachers. The authors conclude that the MHRD has been quite successful in implementing the lockdown policies on the educational institutions, keeping in mind the safety of the students as well as the staff, and India has rapidly shifted from the regular offline mode of teaching to online teaching as a coping mechanism to resolve the disruption caused by the pandemic.

Dhawan S. (2020) undertook this study to explore the importance of online education and analyse the Strengths, Weaknesses, Opportunities and Challenges (SWOC) of online education in India. The study was undertaken to explore the growth of Ed-Tech startups and online learning, to carry out a SWOC analysis on the various online education policies and implementation in India. The research methodology used for the study included an in-depth SWOC analysis and was based completely on secondary data. This exploratory research was done by obtaining data from journals, reports, search engines, company websites and scholarly articles. The paper concluded that while the pandemic has forced us to lean towards technology as a measure to check the disruption in education during the pandemic, we must rely on continuous innovation in this field to enhance the experience. The innovation must also include new ways of learning, with a combination of both online education with various offline methods. It also concluded that we need better levels of preparedness and that institutions should make contingency plans for any sort of disruption in education.

Teymori A.N., & Fardin M.A. (2020) aimed to discover the effectiveness of online education in Iran post Covid-19 in various schools and colleges. Data were retrieved from various portals like PubMed, Medline, Elsevier, and Science Direct electronic databases were searched for relevant studies that have been conducted since 2002, and the data was analysed to retrieve the efficiency,

specific instructional strategies and summarized the experiences for teachers who might be using the technologies in the future. The study was conducted on the presupposition that online education can be a proper mechanism for coping with the Covid-19 outbreak and its disruption in the education sector in Iran. They concluded that the importance of online education has been more apparent than before, and pointed towards the importance of proper infrastructures required for online education in Iran. They also concluded that the learning experience should be a mix of traditional and modern methods of teaching and that social networking tools like Whatsapp and Youtube may also be used to enhance the learning experience.

Haleem A., Javaid M. *et al.* (2020) undertook a qualitative study to explore the possible opportunities as the result of the pandemic in the field of research. It also seeks to provide awareness about the possible research areas and offers some suggestions for the future of research in a post-pandemic world. The study breaks down the effects of the pandemic on the various sectors, thereby coming up with possible topics on which research is expected to be undertaken. The areas include information technology, environment, medicine, biological warfare, sociological and psychological issues. The authors conclude that the pandemic has posed a very challenging task for all the researchers all over the globe and continues to disrupt fieldwork across various disciplines.

Sun, A., & Chen, X. (2016) used a qualitative approach by reviewing 47 papers before 2008 on online learning and focusing on how various theories, assessments and practices apply to the online form of learning. The research was done by undertaking the theoretical framework developed by Garrison and his colleagues and by classifying the findings into three major themes- evolution of online education, affection online learning and effective online teaching. The qualitative content approach was employed for data analysis. Based on the findings, they concluded that online education is dependent on several factors like well-designed course content, motivating interaction between the instructor and learners, well-prepared and fully-supported instructors. creation of a sense of online learning community and rapid advancement of technology.

Baig M.A (2011) studied an experimental design carried out to study the effectiveness of online classes, compared to Face-to-face(F2F) classes. The researcher used a sample of 20 tenth-grade students of Aurangabad (an equal number of boys and girl subjects) with the objectives of making a comprehensive study about achievements in teaching physics through an Online learning environment and F2F learning environment among tenth-grade students. They concluded that the Online Learning Environment is highly effective and facilitates the comprehension and assimilation of concepts in Physics. From the scores obtained it can be inferred that girls and boys have achieved equally when taught through an online learning environment and suggested that online education should be encouraged more to encourage sharing of learning objects and discuss them with peers.

Hrastinski, S. (2009) planned to provide a theory with the presupposition that to enhance the experience of online education, it is always advised to enhance online learner participation. The researcher argued that online education is a complex process of taking part and maintaining relations with others, and is supported by both physical and psychological tools. The researcher also argued that to judge the effectiveness of online education, mere writing or talking is not enough as parameter. The paper formed a platform for further exploration of this theory.

Smart K.L, & Cappel J.J. (2006) examined the perception of the students when online elements were integrated into two Undergraduate courses, where students had to complete online modules before class discussion. The data was obtained using an online learning unit offered by Information Technology Training Initiative (ITTI) at the Michigan Virtual University (MVU) from the website [www.mivu.org](http://www.mivu.org). For the study, students were enrolled in one of the two courses in a University in the Mid-West US- 1. An IS course (Business Communications or 2- An Elective Course (Business Computer Graphics). They concluded that students in an elective course rated the online modules significantly better than those in a required course. They also concluded that the institutions and the instructors should be selective in the way they integrate online modules into traditional courses. The largest dissatisfaction factor seemed to be the time taken to complete the online modules.

## Research Gap

For our research, we have reviewed International and National papers, most of which are focusing on the effects of the Covid-19 pandemic on the education sector in general. My study focused specifically on college students and the way online education in India, specifically in West Bengal, has been implemented by the colleges and their effectiveness on college students. India's federal structure translates to various state governments going about various policies in shaping up education policies. Hence, we are focusing on college students in and around Kolkata to reduce the gap.

## Research Objectives

- To determine the impact of Online education on college students in and around colleges in Kolkata
- To explore the impact of Online education on the physical and mental health of students
- To study the relation between internet connectivity and the effectiveness of online education.
- To study the relation between Internet penetration and online education in India.
- To explore the effectiveness of Online education in terms of inclusivity of the marginalised classes in India.

## Research Gap

For the purpose of our research, we have reviewed International and National papers, most of which are focusing on the pandemic known as Covid-19 on the way the college students are learning via online mediums, judging their effectiveness from various angles like mental, physical fatigue, retention, freedom of communication. Our study has been focused specifically on college students and the way online education in India, specifically in West Bengal, has been implemented by the colleges and their effectiveness based on the perception of college students. India's federal structure translates to various state governments going about various policies in shaping up education policies.

## Research Methodology

Research Design	Descriptive Research Design
Data Collection	Data obtained through a structured questionnaire sent online to students of different colleges across Kolkata
Population	The Students of Colleges in and around Kolkata
Sample Size	The data from 181 respondents have been recorded and analyzed
Sampling Technique	Non-Probabilistic Sampling- Convenience Sampling
Techniques of Data Analysis	Non-parametric Test- Chi-square test of independence, Pearson's R value using SPSS

## Hypothesis Formulation

1. Null Hypothesis: There is no significant relationship between internet connectivity and the effectiveness of online classes.
2. Null Hypothesis: There is no significant relationship between the platform used to participate in online education and the factors affecting the comfort level of students obtaining education via online classes.
3. Null Hypothesis: There is no significant relationship between the family income of the college students and the internet disruptions faced by them during online classes

## Analysis of Data

### Reliability Analysis

Reliability Statistics	
Cronbach's Alpha	N of Items
.667	15

## Analysis: Hypothesis 1

Factors	Asymptotic Significance	Level of Significance	Result	Inference
How much the respondents are able to grasp the concepts taught in Online classes	0.001	.05	Accept Alternate Hypothesis	There is a significant relationship between Internet connectivity and the ability to grasp the concepts taught online.
How effective is online education for practical subjects	.461	.05	Accept Null Hypothesis	There is no significant relationship between internet connectivity and the practical subjects taught online in online classes.
How effective is online classes for conceptual subjects	.001	.05	Accept Alternate Hypothesis	There is a significant relationship between internet connectivity and effectiveness of online classes in conceptual subjects.
The ability to retain the concepts taught in online classes.	.017	.05	Accept Alternate Hypothesis	there is a significant relationship between Internet connectivity and the ability to retain the concepts taught in online classes.

## Analysis: Hypothesis 2

Factors	Asymptotic Significance	Level of Significance	Result	Inference
How mentally fatigued do the students feel after participating in online classes	.91	.05	Accept Null Hypothesis	There is no significant relationship between the platform used for online classes and the degree of mental fatigue that the students experience after online classes.
How Physically fatigued do students feel after participating in online classes	.136	.05	Accept Null Hypothesis	There is no significant relationship between the platforms used for online classes and the degree of physical fatigue after participating in online classes.
Difficulty in communicating thoughts during online classes	.446	.05	Accept Null Hypothesis	there is no significant relationship between the platform used and the difficulty in communicating thoughts to the professors during online classes.
How comfortable students are sitting in front of the devices used for online classes	.950	.05	Accept Null Hypothesis	There is no significant relationship between the level of comfort of students sitting in front of their devices and the platforms used for online classes.

## Analysis: Hypothesis 3

<b>Income * How often face internet disturbances Crosstabulation</b>					
		Count			
		How often face internet disturbances			
		At times	Almost Everyday	Not at all	Total
Income	Below 10000	9	0	2	11
	10001-20000	29	13	1	43
	20001-30000	49	19	5	73
	30001-40000	20	8	1	29
	40001-50000	11	4	1	16
	Above 50000	8	0	1	9
Total		126	44	11	181

<b>Symmetric Measures</b>					
		Value	Asymptotic Standard Error	Approximate T	Approximate Significance
Interval by Interval	Pearson's R	-.026	.079	-.353	.725
Ordinal by Ordinal	Spearman Correlation	-.017	.073	-.225	.823
N of Valid Cases		181			

## More Observations

Many colleges like Jadavpur University, for example, have deployed their alumni associations for the collection of funds to donate them for the purpose of buying and donating internet service packages to the marginalized students. Many colleges have also made it mandatory to record classes in some departments for the students who cannot afford to attend the classes in real time and have the fear of losing out on valuable information. They have also provided smart phones and internet connection to some students across various departments to empower them to join the online classes. Colleges like Rajabajar Science College have tried to prepare summary lessons for every class and send it across to the class groups so that students who are missing out, can stay updated after every class.

- Over 44% of the respondents have shown high levels of motivation, ranging from 5-7 on a scale of 1-10.
- Around 68% of the total respondents have believed that on a scale of 1-5, they can get the drift of concepts on a range of 2-3.

- Only 6% of the total respondents have said that they do not experience any sort of internet disturbances during online classes, with over 69.8% believing that they have disturbances at times, and 24.2% saying they experience disturbances almost every day
- On a scale of 1-10, almost 22.1% respondents have said that they experience mental fatigue around 8, 18.8% at 9, and 18.8% at 10.
- 64.3% of the respondents have believed that online classes are limiting their creative thinking capabilities. Another 59.1% students have said that they find it extremely difficult to communicate their thoughts with the professors during the online classes.
- When it comes to practical subjects, more than 82% respondents have collectively believed that online classes cannot replicate the settings of an actual class.
- Around 68% of the respondents believe that they find it extremely difficult to sit in front of their devices for online classes, ranging their responses from 1-5 on a scale of 1-10.

## Conclusion

If we go by the hypotheses and the results obtained through SPSS, we can see from the first hypothesis about the existence of a significant relationship between internet connectivity and the

ability to grasp the concepts taught online and measuring how fruitful or futile education is in case of conceptual subjects. Internet connectivity and the ease with which the students retain the concepts taught online. Hence, severe infrastructural changes need to come up with special efforts to provide public internet for students, especially from those who come from marginalised backgrounds, and the network providers must also work in tandem to provide better internet in

terms of connectivity, fewer disturbances.

The second observation is the fact that while online education has become the last resort to ensure the continuity of education, it has significantly affected the mental and physical health of students. Educational institutions must ensure that they keep in mind, and not overburden the students with hours of online classes. Another major observation from the questionnaire is the fact that students feel their creative thinking capabilities have been severely affected due to online classes. As a result, the professors should try to deploy more creative methods of teaching, which will ensure creativity in the two-way flow of communication. However, due to the limitations posed by the mechanism of online education, this challenge will be a big hurdle to cross. Students have also indicated that they face difficulty in communicating their thoughts through online mediums. More emphasis should be given to encourage the students to communicate throughout the duration of the classes, as much as possible.

## References

1. Pravat Ku Jena. Impact of Pandemic COVID-19 on Education in India. Purakala. 2020b; 31(46):142-149.
2. Gupta A. & Goplani M. (2020). Impact of Covid-19 on the educational institutions in India. Purakala (UGC Care Journal), Vol-31-Issue-21-May-2020.
3. Dhawan S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis, <https://doi.org/10.1177/0047239520934018> , Volume: 49 issue: 1, page(s): 5-22.
4. Teymori A.N., & Fardin M.A. (2020). COVID-19 and Educational Challenges: A Review of the Benefits of Online Education, Annals of Military and Health Sciences Research 8(3): inpress, DOI: 10.5812/amh.105778.
5. Haleem A., Javaid M. *et al.* (2020). Areas of academic research with the impact of COVID-19. The American Journal of Emergency Medicine, Vol. 38, Issue 7, P1524-1526.
6. Sun, A., & Chen, X. (2016). Online education and its Effective Practice: A research review. Journal of Information Technology Education: Research, 15, 157-190.
7. A Critical Study of Effectiveness Of Online Learning On Students' Achievement, i-manager's Journal of Educational Technology, Vol. 7 | No. 4, 10.26634/jet.7.4.1391.
8. Hrastinski, S. (2009). A theory of online learning as online participation. Computers & Education, 52(1), 78-82. <http://dx.doi.org/10.1016/j.compedu.2008.06.009>.
9. Smart K.L, & Cappel J.J. (2006). Students' Perceptions of Online Learning: A Comparative Study, Journal of Information Technology Education: Research 5:201-219.
10. <https://timesofindia.indiatimes.com/city/kolkata/digital-divide-impact-on-college-unive-classes/articleshow/77249019.cms>
11. <https://www.igauge.in/news/2020/4/covid-19-a-wake-up-call-for-indian-internet-serviceproviders>
12. [https://en.wikipedia.org/wiki/History\\_of\\_education\\_in\\_the\\_Indian\\_subcontinent#:~:text=The%20history%20of%20education%20began,\(in%20India\)%20Before%20Christ](https://en.wikipedia.org/wiki/History_of_education_in_the_Indian_subcontinent#:~:text=The%20history%20of%20education%20began,(in%20India)%20Before%20Christ).
13. <https://www.businessinsider.in/business/startups/news/india-edtech-in-charts-how-theshift-to-online-learning-meant-money-valuation-and-users-for-the-likes-of-byjusunacademy-andothers/articleshow/80040270.cms#:~:text=2020%20gave%20the%20biggest%20boost,to%20%24225%20billion%20by%20FY25>.
14. <https://inc42.com/datalab/the-future-of-education-indian-startups-chase-10-bn-edtechmarket/>