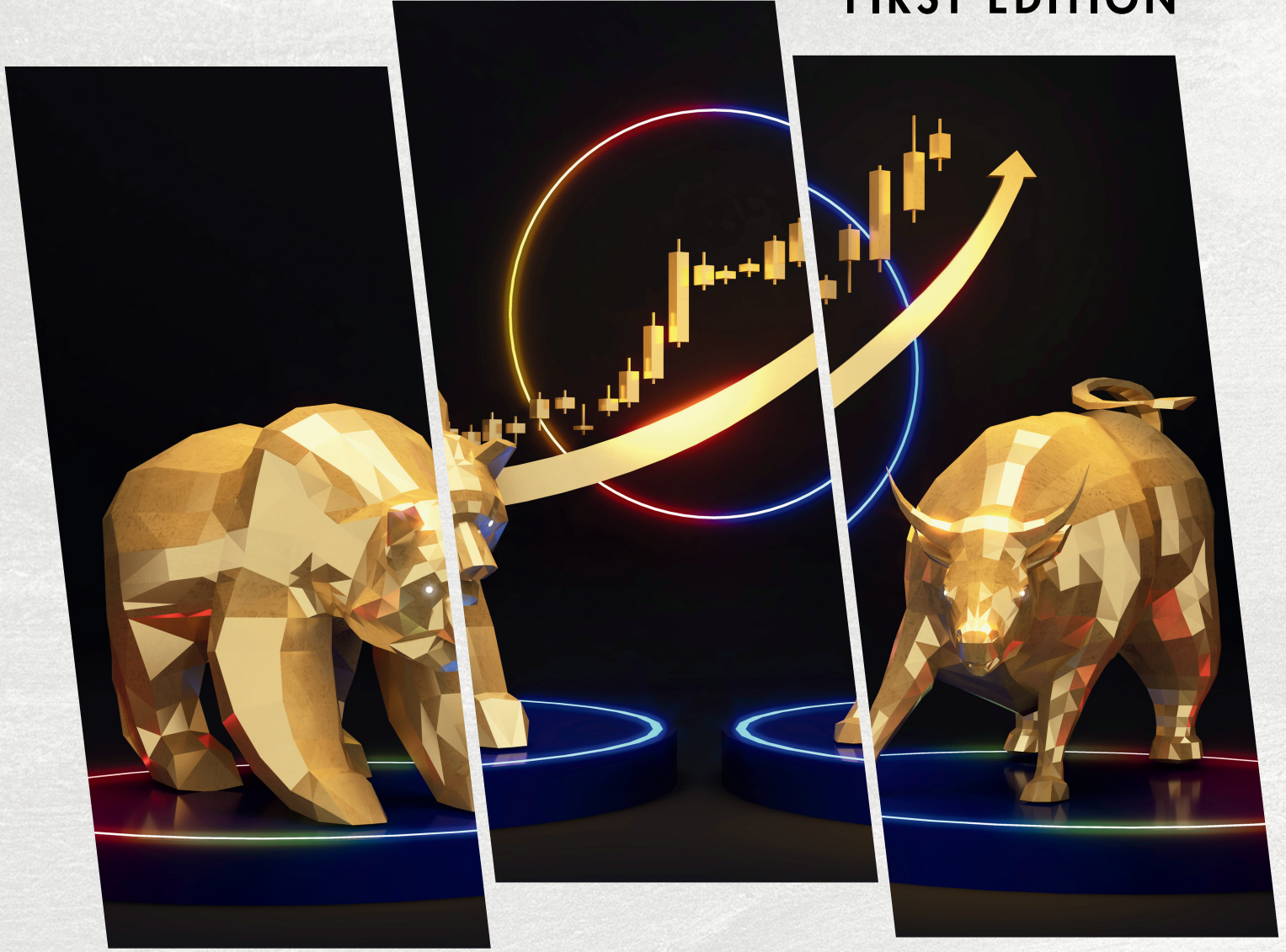


FIRST EDITION



Annual Research Journal of the BBE Department
Aryabhatta College

शोध ARTHIKA

2025

ARYABHATTA COLLEGE

Established in the academic session of 2014-15, Aryabhatta College is a distinguished constituent of the University of Delhi. Formerly known as Ram Lal Anand College (Evening) since its inception in 1973, the institution is strategically located in South Campus, Anand Niketan. Nestled amidst the serene surroundings of the Aravali range, it enjoys proximity to the University of Delhi's South Campus, offering an enriching academic environment conducive to holistic learning.

Aryabhatta College offers a diverse range of undergraduate programs in Humanities, Arts, Commerce, and Social Sciences, catering to both male and female students. With a current enrollment of approximately 2,200 students, the college is committed to academic excellence and holistic development. The institution places a strong emphasis on research, critical thinking, and interdisciplinary learning, ensuring that students are well-prepared to meet the challenges of the evolving global landscape.

Guided by a vision to become a leading educational institution, Aryabhatta College is dedicated to fostering socially responsible citizens, visionary leaders, and innovative thinkers.

The college actively promotes sustainability initiatives, community service programs, and skill development opportunities, ensuring that students develop a strong sense of ethical and social responsibility.

Aryabhatta College remains steadfast in its mission to provide a transformative educational experience, shaping the leaders and innovators of tomorrow.

BUSINESS ECONOMICS DEPARTMENT

The Business Economics Department at Aryabhata College, since its establishment alongside the college in 2015, has cultivated a thriving environment for intellectual exploration and collaborative learning. The Business Economics Society is a close-knit group of students driven by a shared passion for understanding and influencing the future of business and economics. This society serves as a dynamic force, consistently seeking innovative ways to enrich the learning experience for its members. A testament to this dedication is the annual publications of Buzznomics and research journal which provides a tangible platform for students to showcase their academic work and contribute to the broader academic discourse.

The Business Economics Society is not simply a collection of economics enthusiasts; it functions as a family, united by a common goal of building a better future through diverse learning experiences. Since its inception, the society has been actively working towards this aim, undertaking a variety of initiatives. "Roister," the society's flagship event, stands as a prime example of its commitment to excellence. Beyond this, the society regularly organizes seminars, alumni meets, and, more recently, industrial trips, demonstrating its dedication to providing a well-rounded learning experience. The department and the society work in tandem to foster critical thinking, encourage research, and promote a deeper understanding of the complex interplay between business and economics, equipping students to navigate the challenges of the modern economic landscape.

ABOUT JOURNAL

The annual journal of the Business Economics Department at Aryabhata College, serves as a vital platform for student research and academic expression. It embodies the department's commitment to fostering critical thinking and promoting a deeper understanding of the complex relationship between business and economics. Through this publication, students have the opportunity to showcase their analytical skills, research prowess, and insightful perspectives on contemporary economic and business issues.

The journal's focus is on providing a forum for students to engage with complex issues, explore innovative ideas, and contribute to the ongoing dialogue within the field. Each volume builds upon the success of previous editions, promising an even richer collection of articles, analyses, and research papers. " The journal not only highlights the remarkable talent and knowledge of the students within the department but also serves as a valuable resource for the wider academic community, including students, faculty, and anyone interested in gaining insights into the perspectives and research being conducted at Aryabhata College.

The publication reinforces the importance of research in undergraduate education and provides a tangible demonstration of the students' intellectual curiosity and dedication to their field. It encourages students to delve deeper into their chosen areas of study and contribute meaningfully to the discourse surrounding business and economic issues.

PRINCIPAL SIR MESSAGE

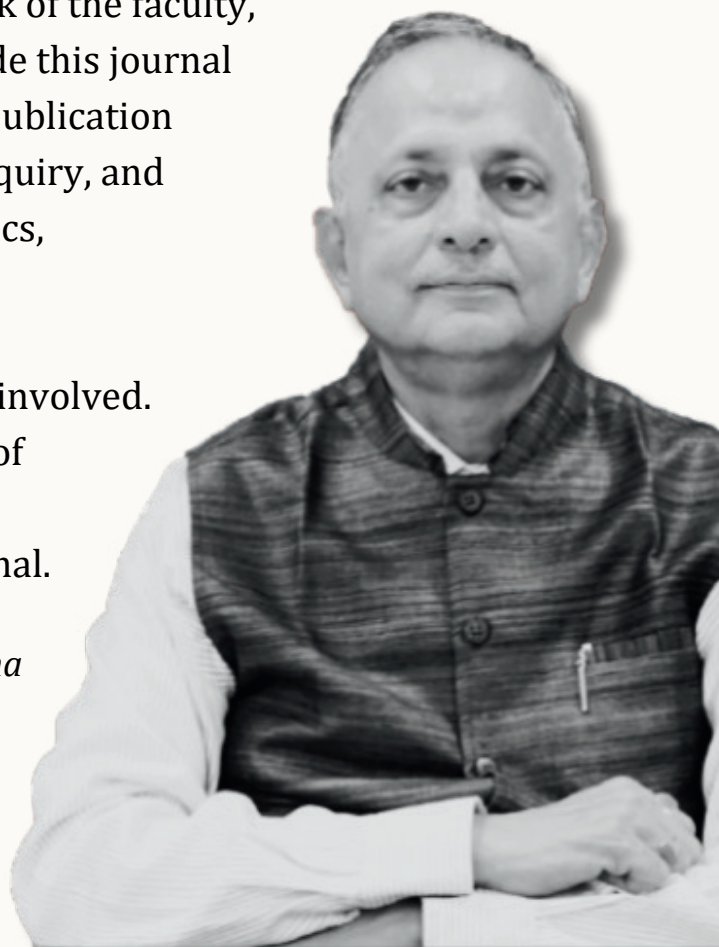
It gives me immense pleasure to extend my heartfelt congratulations to the Department of Business Economics on the launch of the first edition of its Research Journal. This inaugural issue marks a significant milestone in fostering scholarly engagement and advancing the study of economics and business.

Through this journal, the department has not only created a platform for academic research but also encouraged deeper exploration of the critical economic issues shaping the business landscape and society at large. The contributions featured in this edition reflect a rich diversity of thought, innovation, and analytical insight—qualities essential for addressing today's complex challenges.

I commend the dedication and hard work of the faculty, researchers, and students who have made this journal a reality. It is my sincere hope that this publication will continue to evolve, inspire future inquiry, and serve as a valuable resource for academics, practitioners, and policymakers alike.

Congratulations once again to everyone involved. I look forward to the continued success of the Department of Business Economics and future editions of the Research Journal.

~ Prof. Manoj Sinha



TEACHER-IN-CHARGE MESSAGE

"Research is to see what everybody else has seen, and to think what nobody else has thought."

– Albert Szent-Györgyi

It is with great pride and pleasure that I introduce the latest edition of our department's Annual Research Journal. This ongoing publication continues to showcase the intellectual curiosity, originality, and academic rigor of our researchers. Each edition brings forward new perspectives, fresh ideas, and thoughtful inquiry that reflect the evolving interests and dedication of our department.

The journal stands as a symbol of our commitment to nurturing a vibrant research culture in amongst members of Aryabhata College community. I congratulate all contributors, faculty mentors, and the editorial team for upholding the high standards of scholarship and collaboration.

Let this journal serve as both a platform and a motivation for future scholars. I look forward to seeing this initiative grow, evolve, and inspire many more academic pursuits in the years ahead.

~ Ms. Gayatri Yadav



EDITORIAL ADVISORY MESSAGE

"Research means that you don't know, but are willing to find out"

-Charles F. Kettering

With great pride and enthusiasm I welcome you to this first edition of our Business Research Magazine. In an era where innovation drives economies and knowledge shapes strategy, we remain committed to being a platform where rigorous research meets real-world impact.

Our goal has always been to bridge the gap between academic inquiry and business practice. In these pages, you'll find contributions from scholars, practitioners, and students who are future leaders who challenge conventional wisdom, explore emerging trends, and offer data-driven insights that empower decision-makers across industries.

This issue features a rich array of articles that delve into topics such as sustainable business models, digital transformation, strategic leadership, and market dynamics in a globalized world. Each piece reflects our shared commitment to excellence, relevance, and forward-thinking.

As Editorial advisory head, I thank our contributors, reviewers, and readers for your continued support. Together, we shape a publication that not only informs but also inspires.

-Dr. Surbhi Jain



EDITOR-IN-CHIEF NOTE

I am feeling immense pride and immense joy to introduce to all of you the very first edition of शोधarthika, the journal of research of the Department of Business Economics. This publication reflects a major step in our progression towards building the culture of scholarship, research-oriented learning, and intellectual development. As Editor-in-Chief, I am deeply privileged to lead this initiative that unites the analytical minds and creative energies of our researchers, faculty, and students.

This is not a mere compilation of scholarly papers—it is a stage for new ideas, critical analyses, and insightful contributions to the ever-changing landscape of business and economics. Each article in this journal is the result of hard work, keen analysis, and love of knowledge.

I sincerely thank all authors, teachers, and my team who made this vision a reality. May this journal continue to inspire inquiry, innovation, and a spirit of academic curiosity in the years to come.

*~ Tannu Singhal
(2nd year)*



DEPUTY EDITORS NOTE

The launch of शोधarthika marks not just the beginning of a journal, but the beginning of a collective journey—one grounded in exploration, discussion, and the excitement of discovery. As Deputy Editors, we've had the unique opportunity to witness the transformation of raw ideas into meaningful academic contributions.

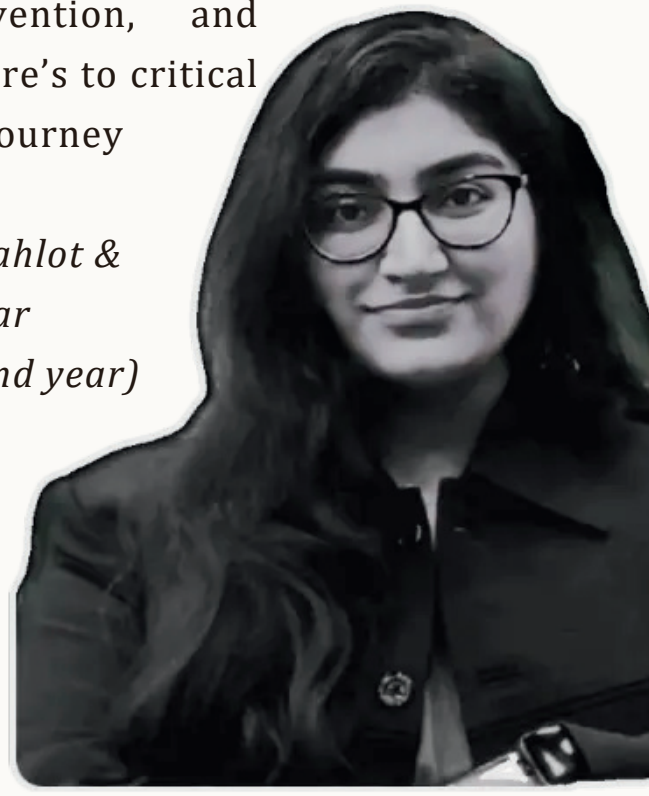
This edition brings together a wide range of perspectives within business economics, showcasing the curiosity, commitment, and creativity of our authors. From empirical studies to theoretical reflections, each paper encourages readers to think deeper and ask further questions.

We are grateful to the faculty, student contributors, and peer reviewers who helped shape this issue with their insights and dedication. Most importantly, we hope this journal becomes more than just a publication—it should be a space that nurtures

dialogue, challenges convention, and motivates future research. Here's to critical thinking, bold ideas, and the journey ahead.

~ Vanshika Gahlot &
Mohit kumar

(2nd year)



DESIGNER NOTE

Being part of the Shodharthika magazine design team has been a truly enriching experience. Having mostly worked independently on past projects, collaborating with a dedicated and creative team was a refreshing and inspiring change. This journey has taught me the value of teamwork and the strength that comes from collective effort.

A special thanks to Tannu, our Editor-in-Chief, whose calm and sincere leadership kept the team focused and motivated throughout. From late-night online meetings to brainstorming sessions, every moment contributed to shaping the magazine into what we envisioned. I cannot emphasize enough how incredible our

team was. The synergy, commitment, and mutual respect we shared made the entire process not just smooth but genuinely enjoyable.

I would also like to extend my heartfelt gratitude to the entire editorial committee, our faculty members, and our Teacher-in-Charge for their constant support and guidance. A big thank you to all the research paper contributors who submitted such insightful work within tight timelines — your dedication forms the core of this magazine.

As we present Shodharthika, I hope it reflects the passion and hard work poured into it. May this initiative continue to grow and inspire, carrying forward the legacy with each new edition.

~ *Raj Ranjan*
(2nd year)



EDITORIAL BOARD



Mr. Ravi karar, Editorial advisory

I am delighted to present the first issue of our Research Magazine, a platform dedicated to advancing knowledge, sparking innovation, and encouraging meaningful dialogue across disciplines. As members of the editorial board, I am committed to maintaining the highest standards of academic integrity, relevance, and originality

Mr. Sarv pallav, Editorial advisory

I am proud to present the first edition of our Business Research Magazine, showcasing a collection of thought-provoking and impactful studies. Each contribution reflects our commitment to promoting quality research and fostering academic excellence. I thank our authors, reviewers, and readers for their continued support and collaboration.



MEMBERS

PRATYUSH KUMAR

1st year

VIDYA

1st year

MANNAT LAKHINA

1st year

VIDUSHI TANWAR

1st year

MEMBERS

RISHABH AGRAWAL

1st year

SRISHTI GARG

2nd year

KANAK SHARMA

1st year

SHRIA AGGARWAL

2nd year

CONTENT

S. No.	TOPICS
1	Economic Inequalities in India
2	INFLATION MATCHING RETURNS – Disproportionate Utility
3	Decision-Making of College Students Regarding Mobile Phones in the Indian Market
4	Behavioral Impact of "Buy Now, Pay Later" on Consumer Spending & Financial Behavior Patterns
5	Behind The Stream: Understanding Consumer Choice Behaviour on Netflix

CONTENT

S. No.	TOPICS
6	Board Diversity as a Driver of Firm Performance: Evidence and Insights
7	ESG Reporting and Financial Performance in an Emerging Market
8	AI in the workplace: Assessing economic benefits and addressing employee concerns in India and Globally
9	The Invisible Workforce: How AI is Redefining Employment Across Industries

Economic Inequalities in India

(1)Bharat (2) Himanshu Bharti (3)Prince Rai

Aryabhatta College, University of Delhi

Abstract

This research paper focuses on the Economic Inequalities that exist within India, their social and economic implications as well as the policies that are intended to reduce this inequality. If we take a broader perspective, it is clear that inequality within India has heightened in the past few decades although India has been growing and transforming economically. This apparent contradiction is attributed, to inequality in education, health care, employment opportunities, and geography, among others. Education and Employment are prime factors that play a significant role in contributing towards economic growth and inequality. The paper will focus on the use of case studies and statistical numbers to show how globalization and the rapid spill of liberal policies have worsened the already present divide. Critically looking at the issue of inequality, the research will also focus on the impact of government policies such as welfare schemes, taxation policies and affirmative action in eliminating the ever increasing disparities. Finally, it emphasizes the need for inclusive growth models and proposing a roadmap for reducing economic inequalities to ensure a more just and balanced society in India. Based on the findings, it implores the importance of relevant policies ensuring equity of growth such that every citizen is provided with equal rights to resources and opportunities,

Key Words

Economic Inequality, Income Disparity, Social Inequality, Economic Growth, Wealth Distribution, Economic Reforms

Introduction

Economic inequality has become a significant issue in India, despite the country's impressive economic growth in recent decades. As one of the swift-growing economies globally, India has seen substantial increases in GDP, industrialization, and technological progress. However, this growth has not been evenly shared, with the benefits primarily accruing to a small segment of the population,

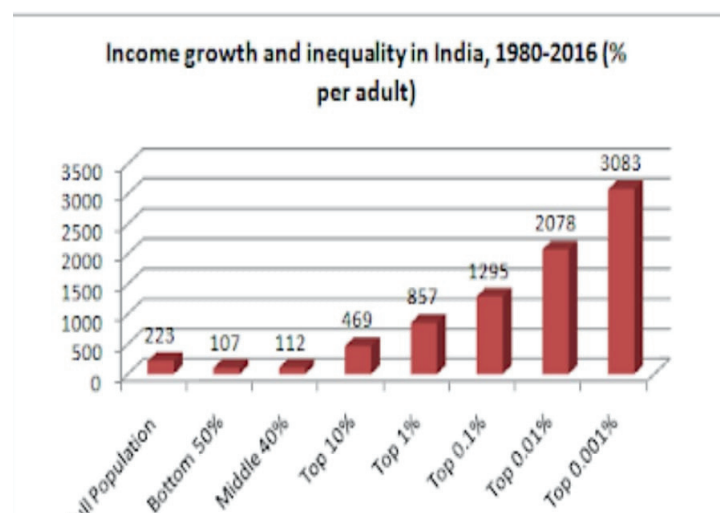
leaving many behind. The gap between urban and rural areas is getting broader, with rural communities facing challenges such as limited access to essential services, education, and job opportunities. Moreover, marginalized groups, including Dalits, Adivasis, and women, continue to face discrimination and obstacles that impede their socioeconomic advancement. The concentration of wealth is another critical

leaving many behind. The gap between urban and rural areas is getting broader, with rural communities facing challenges such as limited access to essential services, education, and job opportunities. Moreover, marginalized groups, including Dalits, Adivasis, and women, continue to face discrimination and obstacles that impede their socioeconomic advancement. The concentration of wealth is another critical

Causes of Economic Inequality in India

1. Historical Factors

- **Colonial Legacy:** The British colonial administration extracted wealth from India, depleting resources and creating a system where certain regions (e.g., Bengal Presidency, Bombay) were developed as administrative and



and trade hubs, while others were neglected. This led to regional disparities that persist even today.

- **Additionally, the exploitative revenue systems (e.g., Permanent Settlement) entrenched economic inequality by favouring landowners over farmers**

2. Structural and Regional Disparities

- **Urban-Rural Divide:** Urban areas receive the majority of investments in infrastructure, education, and healthcare. Consequently, cities like Delhi, Mumbai, and Bengaluru enjoy higher per capita income, while rural regions struggle with limited job opportunities and low agricultural productivity.

3. Caste System and Social Hierarchies

- **Marginalized Communities:** Scheduled Castes (SCs), Scheduled Tribes (STs), and Other Backward Classes (OBCs) have historically faced systemic discrimination, limiting their access to education, land, and jobs.

4. Education Inequality

- **Access to Quality Education:** Government schools in rural areas often lack resources, trained teachers, and infrastructure, while urban private schools cater to the elite. This disparity creates a skill gap between rural and urban youth, affecting employability.

5. Gender Inequality

- **Pay Gap:** Women in India earn approximately 20–30% less than men for the same work, according to various studies. They are also overrepresented in low-paying jobs such as domestic work and informal labour.

Government policies aimed at reducing inequalities

1. Economic Policies

- **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA):** o Guarantees 100 days of wage employment annually to rural households. o Focuses on creating durable assets, reducing poverty, and empowering rural workers, especially women.

- **Skill India Mission:** o Aims to train and upskill youth through initiatives like Pradhan Mantri Kaushal Vikas Yojana (PMKVY) to enhance employability.

- **Start-Up India & Stand-Up India:** o Encourages entrepreneurship by providing funding, mentorship, and simplified compliance processes. o Stand-Up India specifically supports women and SC/ST entrepreneurs

2. Taxes and Subsidies

Taxes are levied on people with higher income and subsidies and welfare benefits are provided to people from the lower income groups.

3. Education Policies

a) Right to Education (RTE) Act, 2009

- Ensures that children aged 6 to 14 years receive free and mandatory education.
- Reserves 25% of seats in private schools for children from economically weaker sections.

b) National Education Policy (NEP) 2020

- Promotes equitable access to quality education, emphasizing regional language instruction, digital inclusion, and scholarships for disadvantaged students.

c) Mid-Day Meal Scheme

- Provides free meals to school children to improve enrolment, attendance, and nutritional levels among economically weaker sections

4. Social Welfare Policies

a) Food Security

- **National Food Security Act (NFSA), 2013:** Provides subsidized food grains to over 67% of India's population.

b) Housing Schemes

- **Pradhan Mantri Awas Yojana (PMAY):** Aims to offer affordable housing solutions for low income individuals in both urban and rural areas.

5. Women-Centric Policies

a. Beti Bachao Beti Padhao:

- Aims to improve child sex ratio, promote girl child education, and prevent genderbased discrimination.

b. Women Reservation in Panchayats:

- Ensures 33% reservation for women in local self-government bodies, empowering them

politically and socially.

Challenges in Implementation

Despite these policies, challenges like corruption, bureaucracy, lack of awareness, and regional disparities hinder effective implementation. Bridging gaps in execution and ensuring accountability are crucial for achieving equitable outcomes

Policy Suggestions

1. Income Redistribution

a. Progressive Taxation Reform

- Increase taxes on higher-income brackets while reducing tax burdens for low-income households.

b. Strengthen Minimum Wage Laws

- Update and enforce minimum wage policies across sectors, ensuring fair pay for workers in informal and unorganized sectors.

2. Employment and Skill Development

a. Boost Job Creation

- Incentivize private sector investments in labour-intensive industries like manufacturing, construction, and agriculture.
- b. Enhance Vocational Training
- Expand skill development programs like Skill India to rural areas with a focus on future-oriented industries such as AI, robotics, and coding.

3. Urban-Rural Gap Reduction

- Invest in basic infrastructure such as roads, electricity, water, and sanitation to develop rural areas.

4. Gender Equality

a. Women-Centric Policies

- Provide financial incentives for hiring women in formal and informal sectors.
- b. Encourage Women's Education
- Provide scholarships, vocational training, and leadership programs to empower girls and women.

Research Methodology

To analyze economic inequalities in India, a survey was conducted targeting individuals from diverse socioeconomic backgrounds across urban and rural regions. The participants were of the age group (18-35) used for the survey.

Mode of Data Collection

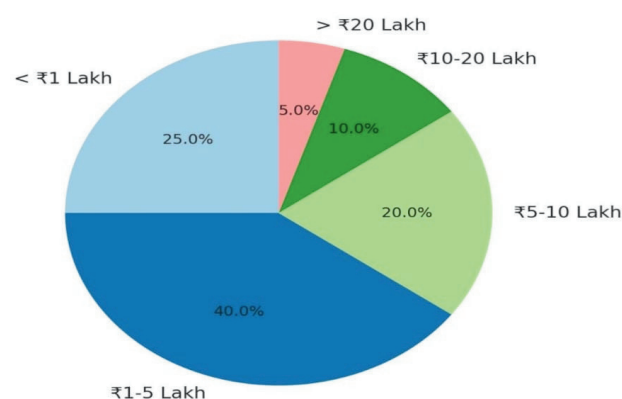
Google forms were used to collect data and online platforms like WhatsApp and Instagram were used.

Survey Questions

- Participants were asked to anonymously disclose their annual household income by selecting one of the following categories:

1. Less than ₹1 Lakh
2. ₹1-5 Lakh
3. ₹5-10 Lakh
4. ₹10-20 Lakh
5. Greater than ₹20 Lakh

Income Distribution in India



- The participants were asked to rate their access to basic resources (e.g., healthcare, education, clean water, and housing)?

The options provided in the survey were:

1. Excellent (Access to all resources is readily available)
2. Good (Access to most resources is available, with some challenges)
3. Average (Access to basic resources is limited or inconsistent)
4. Poor (Limited or no access to basic resources)
5. Very Poor (No access to basic resources)

Based on the survey the results of peoples access to basic resources were

Option	Percentage
Excellent	10%
Good	25%
Average	35%
Poor	20%
Very Poor	10%

Limitations

We took a sample size of just 108 members.

Conclusion

Economic inequality remains a significant challenge in India, hindering social progress and sustainable development. This research highlights the causes of inequality, including unequal access to education, healthcare, and employment opportunities, systemic discrimination, and the concentration of wealth within a small segment of the population. While government policies like MGNREGA and PM-KISAN have made some progress in addressing these challenges, their effectiveness is often limited by implementation gaps and unequal distribution of benefits. To bridge the economic divide, this study emphasizes the need for targeted investments in education, healthcare, rural employment generation, and grassroots initiatives to empower marginalized communities. Addressing economic inequality is not just a matter of fairness but a necessity for fostering unity and ensuring India's long-term growth and stability.

References

1. Piketty, T. (2014). *Capital in the Twenty-First Century*. Harvard University Press.
2. Dreze, J., & Sen, A. (2013). *An Uncertain Glory: India and Its Contradictions*. Princeton University Press.
3. Atkinson, A. B. (2015). Inequality: What Can Be Done? *Journal of Economic Inequality*, 13(1), 19-31.
4. Chakravarty, S. R., & Pal, R. (2013). Measuring Economic Inequality in India: A Theoretical and Empirical Analysis. *Indian Economic Review*, 48(2), 223-240.

5. NITI Aayog. (2021). *SDG India Index and Dashboard 2020-21*.
6. Reserve Bank of India. (2022). *Handbook on the Indian Economy*. Online Resources
7. Oxfam India. (2023). *Survival of the Richest: The India Supplement*. Retrieved from <https://www.oxfamindia.org>
8. World Bank. (2023). *Poverty and Shared Prosperity Report*. Retrieved from <https://www.worldbank.org> Policy Papers
9. Basu, K. (2005). Inequality, Globalization and Poverty: Their Relationship and What Can Be Done? *World Development*, 34(8), 1361-1373.
10. Bhalla, S. S. (2017). *The New Wealth of Nations: India's Rise in the Global Economy*. Observer Research Foundation Policy Briefs.

INFLATION MATCHING RETURNS – Disproportionate Utility

(1) PARTH MALHOTRA

Aryabhata College, University of Delhi

I. Abstract

This research examines how inflation affects different income groups particularly in terms of consumption patterns, investment growth and financial benefits. While inflation-matching interest rates appear equal, they disproportionately benefit the wealthy by preserving and compounding their wealth, whereas lower-income groups struggle as inflation negatively affects their purchasing power. The study highlights how compounding increases financial inequality enabling the rich to achieve greater real utility from inflation-adjusted returns. By analysing the relationship between inflation, interest rates and wealth accumulation this paper provides a clearer understanding of how these factors contribute to economic disparity.

Inflation and Consumption Behaviour

Inflation affects people differently based on what they consume. The poor tend to spend a higher proportion of their income on normal and inferior goods that experience higher inflation rates than the general inflation rate whereas the rich spend more on luxury and diversified goods that are less affected by inflation. This difference in the consumption pattern highlights that inflation affects people with different income differently. The consumption behaviour of rich varies significantly since the goods purchased by the rich are not standardised. They vary by quality as well as the cost of the goods.

Impact of Inflation-Matching Returns

When an investment offers an interest rate equal to inflation the rich benefit from the absolute value of the returns due to the larger amount they invest. They are able to preserve or grow wealth despite inflation.

The poor however see a little to no benefit from such returns because the small amount of interest they receive does not cross the higher inflation on essential goods they consume. For them the interest does not improve their real purchasing power leaving them effectively the same.

This is mainly because of the difference in the consumer behaviour as well as the difference in inflation of goods produced by the rich and the poor.

The data shown below shows the increase in expenditure of individuals based on their income and inflation.

Also, it clearly shows how the poor are more impacted by the inflation.

It is estimated that inflation in 2021 will require the average U.S. household to spend around \$3,500 more in 2021 to achieve the same level of consumption of goods and services as in recent previous years (2019 or 2020). Moreover, it estimate that lower income households spend more of their budget on goods and services that have been more impacted by inflation. Lower-income households will have to spend about 7 percent more while higher-income households will have to spend about 6 percent more.

The below data is backed up by the US BUREAU OF LABOUR STATISTICS.

Table 1: Increase in the total consumption expenditure in dollars and in percentage

Consumption Bundle	Income Group (%)	Increase in Expenditure (\$)	Increase in Expenditure as a share of initial expenditure (%)
2019	0-20	2,064	6.8
2019	20-40	2,879	6.9
2019	40-60	3,505	6.9
2019	60-80	4,441	6.8
2019	80-90	5,533	6.7
2019	90-95	6,627	6.4
2019	95 and Above	8,326	6.0
2020	0-20	2,160	6.8
2020	20-40	2,858	6.9
2020	40-60	3,468	6.9
2020	60-80	4,351	6.8
2020	80-90	5,257	6.7
2020	90-95	6,164	6.3
2020	95 and Above	7,636	6.1

We can infer from the data that poor are more affected by the inflation as compared to the rich.

Real Utility Disparity

Even when inflation adjusted interest is provided the utility derived from it is much greater for the rich. The rich can buy the goods which are considerably less affected by the inflation or buy goods with a better branding or quality.

The poor on the other hand remain financially still as the interest fails to cover the rising costs of normal goods.

As it can be observed from the following graph -

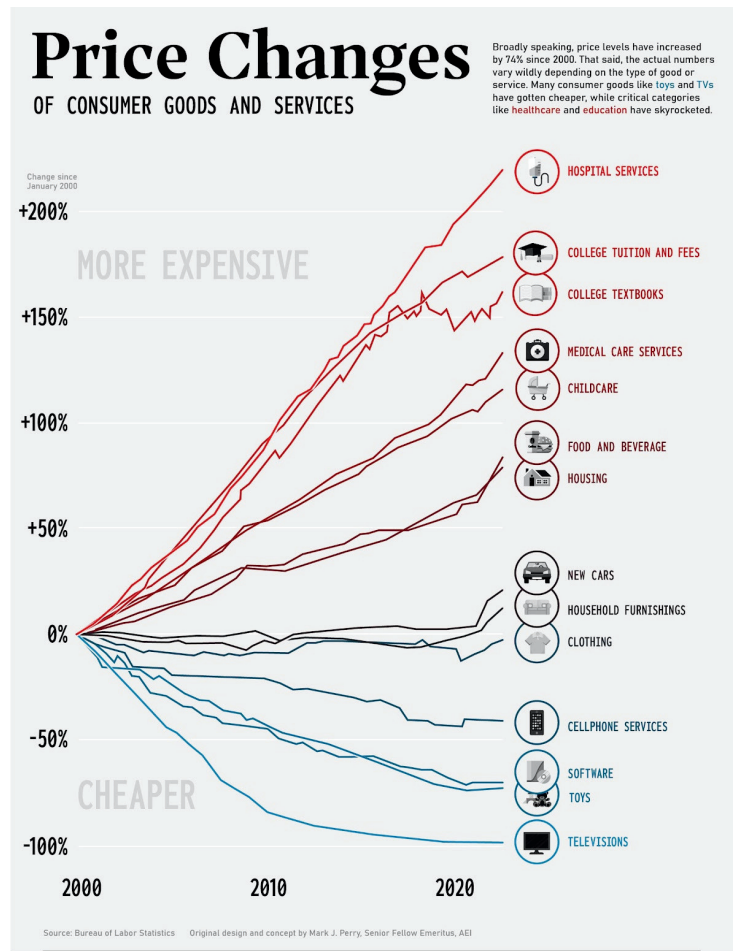
The cost of normal goods and services is the most affected by inflation which are the major goods consumed by the poor. While new cars do not show high inflation rate.

For example the tuition fees and the textbooks fees reported negative affect of inflation while it being a good consumed both by the poor and the rich.

The study reported the disproportionate affect of inflation on the poor as stated above.

The graph below is published by the US Bureau of Labour Statistics.

It is successful in showing how normal goods and services are more affected by the inflation.



Mathematical Implication

The disparity in utility suggests that inflation-matching investments benefit the rich by providing more wealth preservation and growth while they leave the poor unaffected or even worse off due to the higher inflation on necessities.

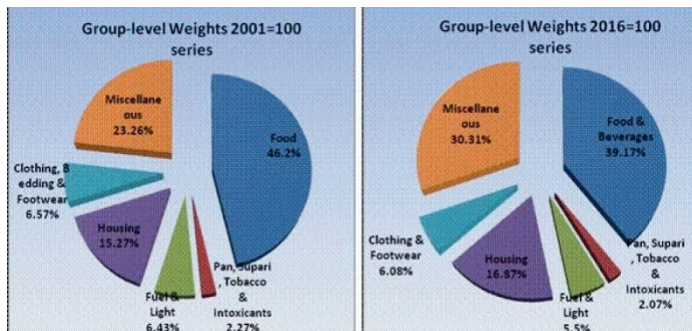
The Indian government uses the Consumer Price Index (CPI) to measure inflation by tracking price changes in a basket of goods and services consumed by the average household focusing on necessities like food, housing and transportation.

However, it is less accurate for the rich because it emphasises normal and inferior goods rather than premium brands or higher quality versions of the same goods which wealthier individuals are more likely to purchase.

There is always a good that can be substituted by another due to disproportionate inflation across

different goods. For example, a consumer may switch to a relatively cheaper alternative when the price of a preferred good rises effectively minimising the impact of inflation on their consumption.

However the Consumer Price Index (CPI) already accounts for this substitution effect meaning it adjusts for the negative impact of inflation when measuring overall price levels. This adjustment works in favour of consumers who have the flexibility to choose alternatives, a privilege that poorer individuals often lack, as their consumption is concentrated on necessities with fewer substitutes. Consequently, the inflation experienced by wealthier individuals who primarily consume premium goods is not fully captured by CPI leading to an understated measure of their true inflation burden.



While inflation matching interest rates may seem equitable on paper their real world impact is highly unequal disproportionately benefiting the rich and doing little for the poor especially in terms of increased purchasing power or financial growth.

The Argument

Consider a Fixed Deposit which matches the rate of inflation. The interest earned on small capital would be consistent with the time value of money while interest earned on large capital would not be consistent with the time value of money. The utility provided by the interest on large capital is going to be more than the utility of the interest provided by the interest on the small capital invested in the Fixed Deposit. Yes, it is obvious if we talk about the quantity which is measured by the cardinal utility. But it is also true for the ordinal utility.

Simply because inflation majorly considers the rise on the cost of normal goods. While normal goods should not be the sole factor to determine the time value of money.

It must be noted that there is no absolute rate of inflation. Similarly there is no absolute time value of money. It holds considerable number of assumptions which makes it inaccurate in real life. It is intuitive to say that the Fixed Deposit as mentioned above would not provide any actual increase in utility because the rate of interest is matched equal to rate of inflation..

This is proven to be absolutely true for the poor whose major consumption rely on normal and inferior goods. But for the rich the utility provided on the large capital is more than the original utility because of the difference in consumption of goods.

The lesser affect of inflation on rich as compared to the poor makes the inflation matching interest fixed deposit favourable.

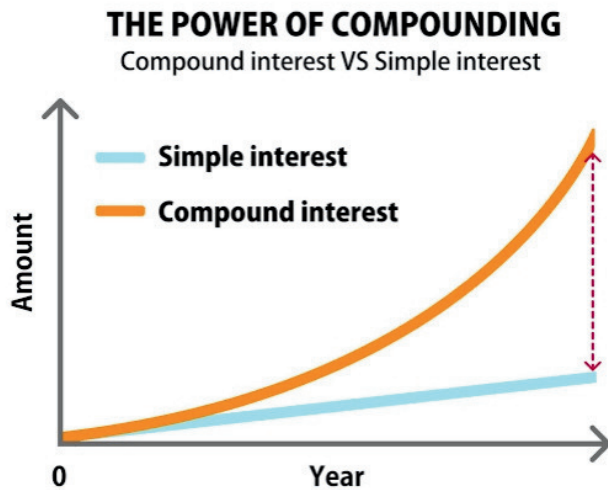
It is interesting to note that how the same investment instrument with same interest provides difference in the utility earned.

Power of Compounding and Time Value of Money

As discussed above, the rich benefit from the Inflation matching interest fixed deposit but it is to be noted that the benefit is marginal even though the inflation is not standardised or absolute.

The same marginal benefit can exponentially increase over time by compounding. Compounding allows your interest to earn interest which leads to greater growth over time.

As time progresses, compounding's effect grows exponentially leading to a larger cumulative return. While Fixed Deposits giving an inflation matched interest rate might not seem like an investment providing any increase in the utility but it does increase the utility if the capital investment is large and that little increase in utility will grow exponentially after compounding as shown by the graph too.



Reference

1. Nick Routley (2023) - Visual Capitalist - Consumer Price Inflation, by Type of Good or Service (2000-2022).
2. Mariko Paulson (2021) - The Wharton School, University of Pennsylvania - Budget Model and Impact of Inflation.
3. Don Hofstrand (2023) - Iowa State University - Extension , Perpetuity and Outreach .
4. Kara Greenberg (2023) - Investopedia - Banking Crisis and Inflation easing.

Conclusion

Inflation-matching returns may seem fair at first, but they actually make wealth inequality worse. The wealthy benefit from these returns because their wealth grows over time through interest and investments, while inflation does not hurt them as much. The poor, however, struggle because inflation reduces their buying power, making it harder to afford basic things. The rich can also avoid some of the effects of inflation by switching to less expensive goods or services, while the poor have to pay more for necessities with no other options. Wealthy individuals see their money grow faster because of compounding, while the poor see little or no real benefit. The Consumer Price Index (CPI), which tracks inflation, also underestimates the inflation the wealthy face since it mostly tracks regular goods, not expensive, premium items that the rich buy. This creates a false picture of inflation, making it look less severe for the wealthy. Lastly, the way inflation and interest rates affect people is not the same for everyone. Those with higher incomes and different spending habits are not as affected by inflation as those with lower incomes. This shows that inflation, interest rates, and the way wealth grows only make financial inequality worse, highlighting the need for better policies to understand and fix these issues.

Decision-Making of College Students Regarding Mobile Phones in the Indian Market

(1) AVANTIKA

(2) MANYA VARMANI

(3) MEHEER BESOYA

(4) YASHVARDHAN SHARMA

Aryabhata College ,University of Delhi

ABSTRACT

Purpose of this study is to understand how college students in India make decisions regarding purchase of mobile phones more specifically in pre-purchase, during purchase and post purchase stages. Information was gathered by a closed set of questions with focus on factors like price consciousness, brand equity and product attributes, channel and place factors, and finally, perceived satisfaction. This differentiation gave a picture of respondents' route in the university to suggest how their course discipline, educational goals, and perceived priorities affected their preferences. Commerce students acted primarily with value-for-money and cost minimization in mind while Humanities students cared most about design, looks and the prestige of the manufacturing company (Apple). On the other hand, Technical students went for performance and specifications focusing more on companies like OnePlus and Xiaomi. The study also highlights customers' satisfaction as the key to loyalty, to which Apple and OnePlus are excellent examples of the retention of customers. The present research provides the mobile phone brands with the competitive understandings of college students in India and helps them to build specific communication strategies to better reach this vast and complex segment.

INTRODUCTION

Technological advancement in the society has steered mobile phones from being mere communication gadgets into tools for education, entertainment, and social interaction, as well as time management since students are involved herein study.

This is mainly because of the high technological improvements in mobile phones and enhanced simplicity that has made its use customary in people's lives. Furthermore, the devices provide the audience of college students with an opportunity to find information, communicate with friends and peers, perform academic work, and participate in other spheres of life including social networks and entertainment. Thus, to help marketers and manufacturers who are targeting this influential mobile phone-consuming segment, it is most crucial to gain an insight into the factors that influence their purchase decisions.

Significance of Decision-Making in Consumer Behavior

The role of decision-making in consumer decision-making is very important since clients utilise decision making while making their choices. Several phases make the decision-making process in consumer behaviour diverse where the consumers weigh, search, and select specific products or services. However, the decision making is even more elaborate for college students with issues to do with financing, technological requirements, peer pressure, and brand image. Due to usage of phones especially for calling and browsing the internet in relation to their courses or any other activities, phone purchase is a major investment to students. As such, it is important that manufacturers assess the factors that determine their decision making in the purchase, an evaluation that could come in handy for manufacturers who wish to respond to students' preferences appropriately.

This study specifically focuses on the three major stages of the mobile phone purchasing decision-making process: pre-purchase, on-purchase, and post-purchase.

Pre-purchase Factors

This is one of the three factors that occur prior to the buying of a mobile phone. It is the step where consumers become aware of a need or want for a new phone and start looking at available choices in the market. For college students, there are various pre-purchase considerations. Price sensitivity tends to be high, as costs are a factor depending on whether the student is living on a shoestring or financed by their parents. Brand image also plays a role, since students tend to equate mobile phone brands with quality, reliability, and increased social status. Moreover, technical details like the camera resolution, battery life, memory space, and processor power matter, particularly for students who use their phones for both school and entertainment activities. Finally, word of mouth matters a lot, with most students making choices based on what their friends, classmates, or social media influencers are using or recommending.

On-purchase Factors

The on-purchase stage deals with the choice factor when the student makes a decision to buy a mobile phone. This is affected by many influential factors. One of these key factors involves the purchase channel, which essentially describes the media on which the phone is acquired—whether digitally or in person at a storefront. Online websites are likely to have greater numbers of choices and competitive rates, whereas retail outlets enable students to have actual contact with the device prior to purchasing, influencing the perceived value of the choice.

Another significant consideration is payment terms. With many college students having a limited budget, the ultimate buying decision might be influenced by the presence of financing terms, discounts, or trade offers.

These rewards are generally factored in at the final phase of the purchase process. Customer experience also comes into play. Good experiences with wise sales staff or well-organized, easy-to-use online shops may sway a student to favor one seller or brand over another.

The majority of students want a buying experience that is easy and not overly stressful.

Post-purchase Factors

The post-purchase stage entails the consumer's judgment of the product once it has been purchased. Product satisfaction is one of the fundamental elements of this stage.

Students determine if the mobile phone is satisfactory in performance, durability, and usability. This judgment is important in deciding their overall satisfaction with the purchase.

Another essential element is after-sales service. Having access to good customer care, warranties, and repair facilities has an important influence on student satisfaction.

These facilities are an assurance that post-purchase problems are solved in an efficient manner, which can strengthen the positive attitude toward the brand.

Lastly, word-of-mouth is an important factor here. Students tend to spread their experiences among friends, relatives, and social groups, which may have an impact on future buying behavior among these groups. Feedback shared—positive or negative—may decide brand loyalty and the possibility of repeat purchase.

Target Demographic: College Students and Academic Disciplines

This paper examines the selected demographic group of college students whose adoption of mobile phones has been observed to be growing and manifests unique behaviours according to major fields of study. However, the demographic is diverse because preferences differ with academic interests, understanding, and practice of technology, and lifestyles. For instance, the priorities of students from different educational backgrounds can greatly influence their decision-making. While purchasing, Commerce Students have been observed to be inclined towards price consciousness, preferring to secure value for their money, tends to look at cost-plus-gain analysis, and the resale value.

On the contrary, Humanities Students may have a preference for Style design, brand image and appeal since these features may be associated with perception of identity. Whereas, Technical Students will likely have the interest to see details that concern performance like speed of the processor, software adaptability for coding, programming, and other technical operations.

This research will seek to find out how these academic differences affect decision making by evaluating whether and how students from Commerce, Humanities and Technical disciplines make decisions on the purchase of mobile phones. By classifying the respondents based on their academic achievement the study will give a distinct picture of how each category thinks, what they value and how they make decisions about their purchases.

Study Objectives and Research Scope

The primary objective of this study is to analyse the mobile phone decision-making process of Indian college students by examining three key stages: pre-purchase, on-purchase, and post-purchase. It is therefore the intention of this study to map out these stages in full detail with special emphasis given to gender and academic discipline in the process of purchasing. The present study proposes a self-structured questionnaire that was conducted on college students across India on their mobile phone purchases in terms of preferred brand, expected features, and level of satisfaction. To capture these determinants of mobile phone consumption the questions covered in the survey range over issues like the effect of price, brand, technical features, purchase process, and post purchase consumption experience. The result derived from this study could be beneficial to the mobile phone manufacturers and marketers in the country as well as for academicians and policy makers who study youth consumer behaviour in the growing mobile computing market in India. This study will contribute to the literature by presenting findings based on both quantitative and qualitative data for the purpose of enhancing the understanding of the marketing methodologies in order to adjust tactical marketing procedures and create campaigns for attracting the college students.

Methodology

Research Design

Due to the contingent nature of the research, a quantitative research methodology was used in order to uncover the decision-making process of Indian college students in the purchase of a mobile phone. It enables the accumulation of factual information that may be quantified so that the prevalence and association may be carried out. _

Sample Selection and Sample Size

The survey was distributed among students from various academic disciplines, including Commerce, Humanities, and Technical courses, specifically from Aryabhatta College. A total of 50 responses were received and to have a wide cross sectional view of the college inputs from different fields of discipline were included in the sample in order to obtain a diverse spectrum of attitudes towards the buying of mobile phones.

Data Collection Method

The primary data was collected by administration of a Google Form survey focusing on factors affecting purchase of mobile phones. The questionnaire was structured into three major categories, Pre-purchase Factors (Budget Related issues, brands' familiarity, and information sources), On-purchase Factors (Cost related issues mainly; issues on how and where to get the platforms, how to get them at cheaper prices or perhaps where to find discounts or promotional offers) and Post-purchase Factors (Questions that assess the level to which customers are satisfied, how loyal the customers are to a brand and the efficiency of a firm's after-sales services). The questions were designed with an intention to determine the impact of price sensitivity, technical features, design, brand association and purchase channels on students' buying behaviour.

Data Analysis

In order to analyse the data, the responses were categorised based on the students' course they are offering. This segmentation enabled the analysis of variations and trends concerning particular students. Data was then descriptive analysis to examine core trends, and then subsequently a detailed interpretation of the findings against each academic discipline was done.

Limitations

The major drawback in the study is that the sample was limited to 50 respondents, thus the study cannot generalise the findings to the total college students in India. Studies in the future could recruit more participants and girls from more Universities for higher validity of the results gotten.

Form Used to Collect Data:

<https://forms.gle/YwNWUVuXEYoz2mV9>

Critical Analysis

Pre-Purchase Factors

Mobile Brands Currently Used

The three most favored brands of mobile phones among college students—Samsung, OnePlus, and Apple—reflect a clear trend of market segmentation based on demographic and academic considerations. OnePlus is generally favored by male students, especially those pursuing technology-oriented courses like Computer Science. In this case, the reason is mainly because of OnePlus's reputation for providing top-notch hardware performance and a close-to-stock Android OS, which is favored by technology enthusiasts for clean software and powerful specifications. The self-branded "flagship killer" reputation of OnePlus also adds to its popularity as it provides

premium features with relatively low costs—a perfect combination for price-conscious students.

Samsung, in contrast, has widespread popularity among both male and female respondents. Its popularity is based on the wide range of its product line, covering all price ranges and serving a wide variety of income groups. Samsung's established market presence, powerful brand name, and reliable customer support lead to feelings of trust among students. These attributes make Samsung a secure and affordable choice, particularly for people who prioritize reliability and a recognized brand.

Apple is a more popular choice among female students, based on the statistics. The brand's keen emphasis on high-end design, easy-to-use interface, and integrated system of devices appeals to students who consider style, brand image, and intuitive use important. While Apple products are usually more expensive, they appeal to students who value style, ease of use, and post-purchase care. The gender bias might also be due to studies that show female consumers prefer brands that are easy to use, brand loyal, and provide good after-sales service—all where Apple leads.

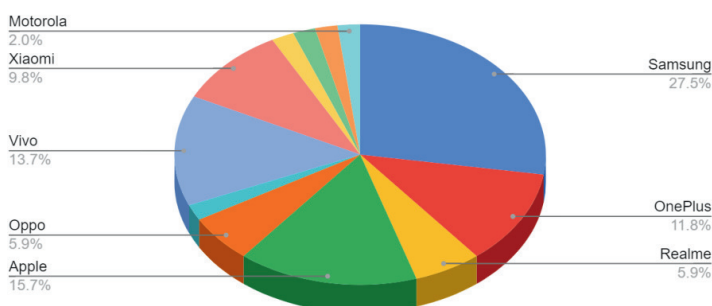
Key Decision-Making Factors

Some key factors go into the decision-making process of college students while buying mobile phones. Price continues to be the key driver, with students preferring phones priced between ₹20,001–₹30,000 INR. Aspirational brands such as Apple continue to be sought after, but this price point indicates an overall prudent attitude based on economic imperatives like allowances or restricted sources of income. This trend is particularly marked among Commerce and Economics background students, who are more price-sensitive and have a huge concern with value for money.

Brand image also plays an important role in purchase decisions. Well-established brands such as Apple and Samsung dominate as they have established a history of reliability and effective after-sales service. OnePlus, although relatively newer, is bridging the gap to these industry giants with its "flagship killer" reputation—providing high-end features at affordable prices, which greatly resonates with cost-sensitive but technology-inclined students.

Camera capabilities and performance are also a key consideration, especially among women students and students of Humanities subjects such as English and History. With the growing popularity of visually-oriented social media like Instagram, the demand for quality photography is imperative. Apple and OnePlus are among the brands that lead the way in this area, with Apple usually dominating in image quality as a whole.

Current Phone Brand Used by Students



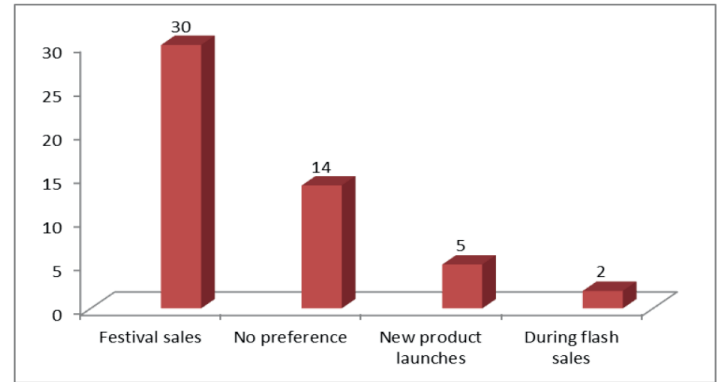
Source: Excel

The Operating System (OS) is also a critical factor in brand choice. Android leads because of its flexibility, customization capabilities, and presence across different price points. iOS, while restricted to Apple hardware, is loved for its refined interface and built-in services such as iMessage and FaceTime. Notably, iOS users are typically more brand-loyal and less prone to switch brands than Android users, who have more options within the ecosystem.

On-Purchase Factors

Online Shopping is the most popular channel among college students, with big Indian websites such as Flipkart and Amazon at the forefront. This is owing to several benefits that include the convenience of being able to easily compare specs, reading customer reviews, and getting cheaper prices—attributes greatly prized by technologically oriented students, especially those pursuing technical courses. Discounts and flash sales equally impact purchase decisions. Festival discounts and special offers on online stores are particularly appealing to Commerce background students who go in search of low-cost purchases. A few students, however, find brand-specific stores such as the Apple Store more appealing for the genuineness of the product as well as the guarantee of quality after-sales services. Apple consumers in particular tend to visit these stores regularly to avail themselves of the support and warranty facilities. The timing of sales is usually synchronized with festival shopping and new product launches. Festival sales in sales events like Diwali are the most sought-after opportunities for purchasing mobile phones at reduced prices. Price-sensitive groups of Commerce and Economics streams keep a close watch on such sales in order to

make timely purchases. Conversely, new product launches get the attention of students from technology streams like Computer Science, who aspire to keep themselves abreast of the latest technology.



Source: Excel

Post-Purchase Factors

Post-purchase satisfaction differs between brands. Apple and OnePlus users tend to have high levels of satisfaction, citing ease of use, frequent software updates, and good customer service. OnePlus's close-to-stock Android experience is especially attractive to tech enthusiasts who appreciate system optimization and performance. Samsung and Xiaomi users are more likely to report neutral or mixed sentiments. Samsung's high-end phones fare well, but its mid-range phones are criticized for slow performance and poor battery life. Xiaomi, although inexpensive and good-looking, attracts criticism for long-term performance problems like overheating and progressive slowing down of the device.

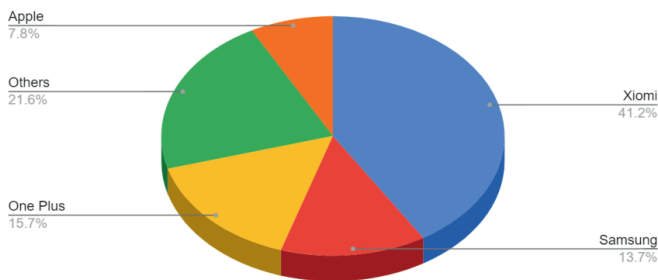
In terms of brand loyalty, Apple is the leader. Apple device users are generally more loyal because of the integration of the brand into an ecosystem and the status of being an Apple product owner. On the other hand, Xiaomi users are

most likely to switch brands.

Discontent with performance and the perception of Xiaomi as a budget brand lead most students to move to more stable alternatives such as Samsung or OnePlus when their financial condition improves.

As can be seen 75% of the respondents claimed that after sales service was a factor which they considered while making their decisions. This entails issues such as warranty, customer support and software upgrade. After-sales service is slow, but steady as a drum most necessary where technical students are involved such as Computer Science. When they experience software and hardware hitches in most cases they would prefer an immediate fix.

Brand Switching Dynamics



Source: Excel

Analysis by Course

Commerce and Economics Students

Students of Commerce and Economics are generally very price-conscious, appreciating the accessibility of a product over its quality. This implies that they tend to use rational, analytical factors like cost-benefit analysis to consider prospective purchases to ensure they get the best value for their money. Generally, this segment tends towards mid-segment phones priced between ₹20,001 and ₹30,000, with brands such as Xiaomi and budget

Samsung being the favored choices. These students are very brand-loyal towards discount stores and festival offers, hence e-commerce sites like Flipkart and Amazon being their go-to shopping platforms. In addition to that, they desire a combination between price and functionality, searching for phones with excellent functionality that can last at least two or three years before its performance slows down. Even though they consider top brands such as Apple, the price-conscious nature often disallows them to spend money on top-of-the-range devices except for when they manage to grab a good offer. Appearance is secondary to this sector; they care more about acquiring a functional, quality product supported by good after-sales services.

Humanities Students (English, History, etc.)

Humanities students, for example, English or History students, have a much greater focus on aesthetics and camera quality because these are the things that are of interest to them in visual arts, social media, and content creation. For these students, mobile phones are not just communication devices but also status symbols. They are attracted to brands like Apple, which provide sleek, glossy designs that symbolize prestige. Rear and front camera performance is imperative for creative students, particularly because they spend time on social media sites such as Instagram, where the quality of photos matters. Therefore, Apple and Samsung, due to their high-quality camera performances, become particularly desirable. Most Humanities students pride themselves in the social prestige accompanying the ownership of high-end phones, particularly Apple phones, due to their prestige associations. As a result of this, Humanities students will be more inclined to overstretch

their budgets to buy a phone that matches their social or personal image, instead of merely considering the cost.

Technical Students (Computer Science, etc.)

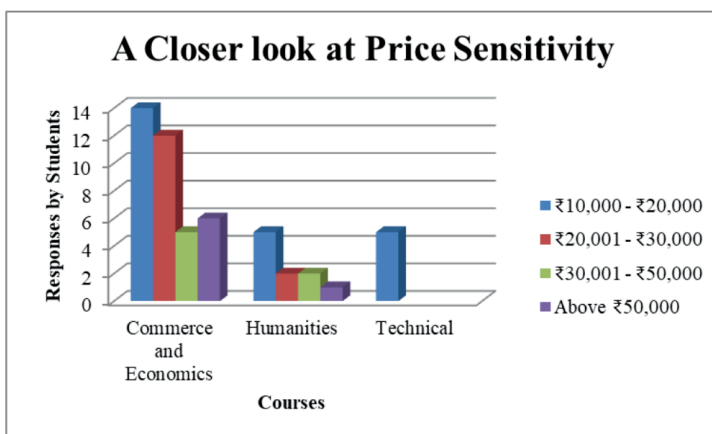
Technical students, especially those pursuing Computer Science or Engineering, are more concerned with performance and specifications rather than aesthetics and brand image.

These students have a preference towards brands such as OnePlus and Xiaomi, which deliver high performance for lower prices against premium brands like Apple. For technical students, performance drivers like RAM, speed, and battery life are essential, as they tend to multitask, load heavy applications, and utilize heavy software. Furthermore, these students value the customizability provided by Android since it supports more customization than iOS. OnePlus and Xiaomi, which provide customizable Android skins and greater RAM options, suit this audience's needs. While technical students appreciate high-end specifications, they are also cost-conscious, looking for devices that provide flagship-grade performance without the premium price of more established brands. Technical students are less influenced by brand image and looks compared to Humanities students, instead looking at the technical capabilities and functionality of the device.

Interpretation

From the analysis of the given data, some specific buying patterns for college students are obvious, and they are directly connected to the academic profiles of the target audience. Mid range brands such as Xiaomi and OnePlus that provide the best technological worth, student type Commerce and Economics possess an analytical inclination with effective balance on the monetary worth. Purchasing decisions are very sensitive to price and most consumers confirmed that they would love to make their purchases during discounts. This behaviour is indeed consistent with the academic training in economic analysis when approaching cost/benefit scenarios, further testing rationale and value-driven behaviour.

Mobile phones were said to be purchased based on particular subjective qualities that Humanities students perceived to be out of reach when using their current phones. To them, a phone is not merely an item to call and communicate but the status symbol and the reflection of one's personality. This is why brands like Apple are so appealing, they look high end and have high quality cameras – attributes are important for students who use their phones so much for social media and content creation. These students will spend even more money on such brands because their image is in line with such brands' image. It can be seen that there is a shift from a rational decision making choice model that takes into consideration efficiency the functional aspects and performance characteristics of a product, to; an affective choice mode that is associated with looks and image of the product.



Through our data, students in Technical disciplines for instance Computer Science demonstrated more practicality in choosing between the types of phones. RAM, processing power and battery power among other factors are very influential in the decisions made since these are key features required to support multiple operations and high end applications. This class is interested in OnePlus and Xiaomi since both companies have invested much in performance at an affordable price. But these students also have a propensity of going for the Android devices rather than iOS devices because the latter provides a number of options that the students have expertise in and prefer; customization and flexibility of devices. The general trust in online shopping platforms for all the groups can be understood as representative of the digital oriented college students of the present generation. The flexibility of getting anything delivered at their doorstep, the choice offered by the two market giants – Amazon and Flipkart – and the possibility of getting anything at a cheaper price easily add to the attractiveness especially if the products are purchased during festive sales. These practices mean that students are ready to make large, irreversible purchases online relying on the openness of the Internet platforms, comparing customer reviews, products, and return policy. However, for specific brands like Apple, students still like to buy the product from its brand exclusive shops where they feel the products are genuine and are assured of after sale services. Last but not least, it is evident that the level of brand loyalty seems to have a strong correlation with post purchase satisfaction. Mobile phones, the best example of one such product; students who buy Apple and OnePlus have higher loyalty because they are satisfied with the brand's performance as well as its user

experience and after-sales services. On the other hand, the customer expenditure on the products is high in the Xiaomi users who, although induced by cheaper prices of the product, get performance-related issues with time and are thus more willing to switch to a different brand. This suggests that though price is considered during the choice, satisfaction remains the vital effect, which influences the loyalty level and the degree at which students will continue to patronise the brands. Consequently, the key conceptual decision-making determinants of college students include the academic background, price sensitivity, and preferences for particular features. Finally, concerns with the price to performance ratio seem to be universally appreciated; however, the degree of appreciation or consideration given to aspects such as aesthetic designs, the technicality of the work and product brand differs more massively across different disciplines. It also implies that there is a need for mobile brands targeting the students to develop clear differentiated marketing strategies to suit the different segments of students due to the differences in their preferred choices, but all preferred brands that are affordable with good performance and good looks.

Observation

Brand Preference

Analysing the results of the survey, the most popular mobile brands identified among college students are Samsung, OnePlus and Apple. These brands dominate the market by offering a variety of products, within lots of product categories, and having well-built brand images. Samsung has been admired by its efficiency in providing models that suit the diverse income earners apart from the budget earners. The reason why it can cater for wide ranges of students is because of the flexibility in the mode of

delivery of the information it has adopted. OnePlus has a quite large fan base among tech-savvy students especially those of Computer science (technical) backgrounds. On account of its high core specification niche and its corporate strategy aligned with offering excellent value for money. That is why students in such fields' students are focused on the aspects like the speed of a processor, RAM, and device performance – all of these aspects make OnePlus appealing. Apple is more costly than Samsung and Oneplus, but students go for it since it has a better brand image, design and ease to use. It is especially widespread among students of humanities courses where brand recognition and design play a particularly important role. Despite Xiaomi's competitive pricing, it shows lower brand loyalty compared to the premium brands, likely due to performance issues that arise over time.

Price Sensitivity

College students in the study are sensitive on price affecting the choice for mobile phones with a majority opting for brands that cost ₹20,001–₹30,000. Finally, and most significantly, Commerce and Economics students consider the price aspects of mobile phones and the benefits that come with the phones most of the time. They prefer brands which are giving the high-performance product at an affordable price like Xiaomi, One plus more preferred than Apple. But again the level of price sensitivity is comparatively low among Humanities students who are always ready to spend a little extra for getting a brand like Apple and so on. The observation also reveals that, on average, Technical students are price-sensitive and prefer buying mid-end phones having the best technical features for their money.

Purchasing Channels

According to the respondents, the two most used purchasing channels are Amazon and Flipkart. The given E-Commerce platforms attract such value Propositions as ease in comparisons, plentiful information from other customers and discounts which goes well with price sensitive students. Increased sales during festivals such as diwali add on to the overall attractions of online shopping and many students, as they pointed out aptly, plan their purchases for maximum price advantage during festivals. Among students, Commerce students were most likely to actively engage in purchase during sale periods owing to their capacity for appreciating value for money deals. There lies a huge difference between Humanities and Technical students in this aspect, brands such as Apple, after sales service becomes a big issue and brand specific outlets for select brands, and authenticity becomes key issues as opposed to discount sales.

Importance of Specifications

It is worthy to notice from the analysis how the students' from Technical Backgrounds such as Computer Science also give technical consideration into their decision. These students are keen on features like processor, memory, battery, operating system among others. Popular mobile brands among these users are OnePlus and Xiaomi, as these companies know how to provide the maximum performance of a device at a relatively reasonable price. But Humanities students are more inclined and revered with aesthetics and camera and at times even trade-off raw technicality for these two things. In this regard, Apple products are equally well constructed, well blended and above all, well endowed with quality cameras to merit attention from the students who take them

Post-Purchase Satisfaction and Brand Loyalty

The level of satisfaction post purchase creates a very strong influence on brand loyalty.

From the results obtained, Apple users have the highest satisfaction and customer loyalty dating from brand friendliness, frequent software updates, and better after-purchase support services. OnePlus also has good satisfaction rates especially from technical students due to the fact that the company focuses on performance. Samsung customers describe moderate levels of satisfaction, main mid-tier models do not always live up to the expectations in terms of long term use, battery life in particular. Xiaomi users who are least loyal to the Xiaomi brand are also the lowest purchase motivation of the Xiaomi brand is the price factor. From the Xiaomi using students, a significant number indicated an intention to dump the phone in other brands citing issues in the phone's performance as well as the software among other things.

Conclusion

From the results of this research, an understanding of Indian college students' mobile phone purchase behaviour and the effect of academic background on their decision-making process is gained. The Commerce and Economics students are mostly inclined towards the aspects of price and cost-benefit analysis hence are most likely to buy Xiaomi and OnePlus brands that are technically very strong but cheaper. This segment targets economic rationality and tries to achieve the optimal value, which determines its actions mostly, rationally and with a focus on costs.

Humanities students, in turn, pay more attention to the design and branding and choose Apple as the best option because of its exquisite image, easy navigation, and much better camera than that of Samsung. For these students, the smartphone is more than an instrument for communication but also a symbol of social status and therefore, brand prestige appears to be a very influential parameter. Users with a technical background in our research, being particularly Computer Science students, tend to look at performance and technical features as reflected by OnePlus and Xiaomi phones that offer good hardware technology and advanced technology at mid-end prices. This group places seriousness and rationality inside a phone, thus, their choice of mobile correlates with how academic and multifunctional they are.

Post-purchase satisfaction plays a pivotal role in determining brand loyalty across all student groups. Brands like Apple and OnePlus lead in terms of customer retention, with high levels of satisfaction reported in areas such as product performance, after-sales service, and long-term reliability. While Xiaomi has gained popularity due to its low-priced smartphones, it has a lower level of brand loyalty – users complained that the phone's performance deteriorates over time and that is why they switch to other brands. This means that although at the initial stages the decision to purchase is based on the price, long-term positive satisfaction and longer product life affect customer retention directly.

Therefore, it is recommended that mobile phone manufacturers targeting the college student group should base its marketing strategies on segmentation techniques that capture the differences in the students' needs across colleges. Of course, brand image and price can still be classified as top priorities, but technical characteristics, design, brand recognition, and satisfaction gained after the transition to a brand's products are also critical factors that determine students' choice and brand loyalty. Knowing these disparities, mobile brands can better reach out and catch the interest of this particular target group that is the students to not only position themselves in the market but also prepare for more competitors that are bound to spring up in the future.

References

- Nandi, D. S. (2015). Consumer Style Inventory-- Assessing the Decision Making Style of Young Indians--A Study on Mobile Phones. SSRN.
- Mohan, A. (2014). Consumer behaviour towards smartphone industry in Indian market (Doctoral dissertation, Dublin Business School).
- Ganlari, D. (2016). A study on consumer buying behavior of mobile phones. Journal of Management in Practice (Online Only), 1(1).

Behavioral Impact of "Buy Now, Pay Later" on Consumer Spending & Financial Behavior Patterns

(1) Vidya (2) Pratyush Kumar

Department of Business Economics
Aryabhata College ,University of Delhi ,South Campus

ABSTRACT

"Buy Now, Pay Later" (BNPL) is a payment option that allows consumers to purchase items and pay for them later, often in installments. This model has gained popularity in recent years, particularly among younger shoppers. The behavioral impact of BNPL on consumer spending and financial habits is significant. While it can make purchases more accessible, it may also lead to impulsive buying, as the immediate financial burden is delayed.

Consumers might spend more than they can afford, causing issues like debt accumulation or missed payments. Additionally, the ease of BNPL can bridge the gaps between short-term gratification and long-term financial responsibility, affecting budgeting and saving habits. Overall, BNPL influences both spending patterns and financial decision-making, with potential risks to financial stability if not managed carefully.

INTRODUCTION

The global financial environment has changed as a result of the digital revolution, and new payment methods that put ease and flexibility first have emerged. Buy Now, Pay Later (BNPL) is one of them that has become incredibly popular. With interest-free payment plans and easy e-commerce platform integration, BNPL has grown in popularity, especially among Gen Z and Millennials. Customers looking for low-barrier access to short-term loans are drawn to BNPL, in contrast to standard credit cards. This study examines the variables influencing the adoption of BNPL, the alterations in consumer behavior that result from this, and the broader

ramifications for the financial and retail industries. It aims to determine the risks and possibilities associated with BNPL and provide consumers, providers, and regulators practical suggestions.

OBJECTIVES

1. To examine the psychological reasons promoting BNPL usage, evaluate financial literacy problems.
2. To find out the impact of the "Buy Now, Pay Later" (BNPL) approach on customers, focusing on higher debt accumulation, credit ratings, and spending patterns.

LITERATURE REVIEW

Consumer Preferences

According to McKinsey & Company (2023), BNPL appeals to young consumers who prefer simple and transparent payment methods over credit cards.

Psychological Consequences:

According to Arnold and Choi (2022), psychological triggers such as the temptation of delayed payments and immediate pleasure might contribute to unplanned purchase.

Regulatory Issues:

The Reserve Bank of India (2023) states that BNPL lacks proper regulatory guidelines, which may raise concerns about consumer protection and unregulated growth

Economic Effects

According to Deloitte Insights (2023), merchants using BNPL have greater conversion rates and average order values, while BNPL promotes retail growth.

METHODOLOGY

This research will take a mixed-methods approach, including both quantitative and qualitative research:

4.1 Google Forms :Forms will be distributed to BNPL consumers from various demographics in order to collect information on spending habits, financial knowledge levels, and usage trends.

4.2 Secondary Data : It includes industry reports, academic papers, and regulatory documents.

ANALYSIS

5.1 BNPL Users Demographics

Age Group:

The age group most likely to use BNPL is 18-24 (55%), followed by 25-34 (30%).

Income Group:

The majority of users are middle-class individuals with incomes between ₹20,000 and ₹50,000, which reflects BNPL's accessibility to non-traditional credit seekers.

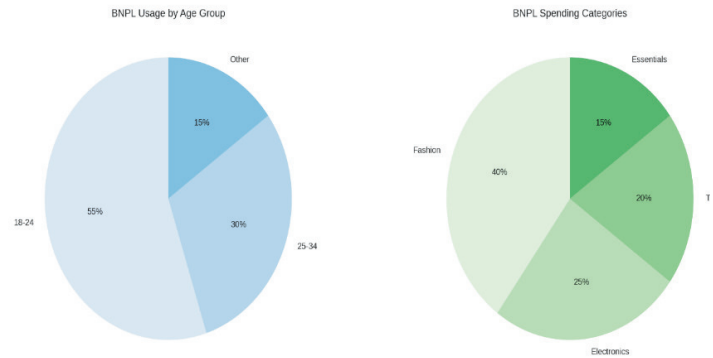
5.2 Spending Categories

BNPL is primarily used for discretionary spending.

Fashion: 40%, Electronics: 25%, Travel: 20%, Essentials: 15%

5.3 Financial Risks

(i) 65% of users reported missing payments, leading to penalties.



(ii) 40% of respondents admitted to a lack of awareness about repayment terms, highlighting gaps in financial literacy.

The graphic depicts the important BNPL indicators using two pie charts: age distribution and spending categories. The risk metrics indicate important concerns:

Key Risk Metrics:

(i) 65% of users reported missing payments

(ii) 40% of users lack awareness about repayment terms.

DISCUSSION

6.1 Benefits of BNPL

The BNPL service has changed many aspects of life in different ways:

Consumer Access: BNPL simplifies credit access, particularly for young consumers and those who are unable to obtain traditional credit options. Unlike credit cards, BNPL does not have strict eligibility requirements, allowing even low-income earners or those with a limited credit history to use the service.

Retail Growth Acceleration: The integration of BNPL into retail platforms results in increased consumer spending; conversion rates and average order values rise significantly.

Retailers typically see a 30% increase in sales after adopting BNPL. According to McKinsey (2023), BNPL reduces cart abandonment rates by nearly 50% for e-commerce businesses.

Cash Flow Management:

BNPL enables consumers to buy anything they want and then pay for it over time, eliminating the burden of immediate expenses. This is especially useful during a recession or when making large purchases like electronics or household equipment.

6.2 Risks and Challenges

Encourage Impulsive Purchases: Customers are encouraged to spend more than they can afford by BNPL's perceived affordability and convenience of usage. According to psychological research by Arnold & Choi (2022), postponed payment schemes cause the brain's reward circuits to become active, which increases impulsivity and decreases self-control.

Debt Accumulation and Default Rates: Missed payments, late fees, and confusing repayment terms all contribute to a deadly debt cycle. This eventually leads to long-term financial troubles in young consumers who lack sufficient financial expertise. According to the Reserve Bank of India (2023), the default rate among BNPL subscribers is increasing due to the absence.

ANALYSIS AND INSIGHTS**Impact of BNPL on Financial Practices**

The rise of BNPL has revolutionized financial practices by providing a more accessible and user-friendly credit option than traditional credit cards. BNPL offers rapid credit with simpler application and approval processes than credit cards, aimed at younger generations and under-banked consumers. McKinsey & Company (2023) reports that "the interest-free term and integration with e-commerce platforms have made it popular."

Although BNPL provides easily accessible funding, there are risks involved. For instance, many customers may experience financial difficulties since they are unaware of the repayment plans. Therefore, increasing consumer knowledge is necessary to make BNPL consumers as prepared as possible to handle their duties.

Behavioral Patterns and Impulse Spending

The ability of BNPL to postpone the psychological suffering associated with payment is what gives it its behavioral effect. Deferred payments reduce the immediate "pain of paying," allowing for greater spending on things that are optional (Arnold and Choi, 2022). According to Statista, fashion, technology, and travel accounted for over 60% of BNPL service usage, making them the most popular usage categories (2023). Additionally, this promotes a culture of "spend now, worry later" among customers, particularly among younger ones who might lack the self-discipline to stick to a budget. By educating the customers about what is and is not necessary, this behavior is checked.

Consumer Debt Piling and Failure Counselling Trends

Using BNPL frequently makes it simple to accumulate many installment debts, which leads to financial difficulties. Nearly two-thirds of BNPL users reported missing payments that result in further fines, according to the Reserve Bank of India (2023). This shows the urgent need for tools that might assist people with their finances, such repayment dashboards and reminders.

In order for lenders to assess borrowers' overall debt commitments and prevent excessive borrowing, authorities can also address this issue by implementing mandatory credit reporting of BNPL transactions.

TECHNOLOGICAL ADANCEMENTS

1. AI for Responsible Lending

Artificial intelligence is changing the way BNPL services are delivered. AI systems, which are based on real-time credit rating, only allow payment plans to be issued to consumers who are capable of affording to pay. According to Accenture (2023), at-risk borrowers will be highlighted based on algorithms that predict, allowing a provider to give favorable choices with flexible repayment terms.

2. Blockchain Incorporation

Blockchain technology has significant potential for increasing the transparency and security of BNPL transactions. Blockchain ensures accountability among providers, consumers, and regulators by maintaining immutable records of all transactions. This will also reduce disagreements over hidden fees or repayment conditions, as proposed by Deloitte Insights (2023).

3. Mobile Platforms and Gamification

BNPL providers are using gamification to keep customers engaged and encourage timely repayments. Features like rewards for on-time payments and interactive financial literacy programs are especially popular with younger users. Klarna's Annual Report (2023) emphasizes the importance of making financial tools more accessible and fun to help promote responsible borrowing.

SOCIAL CULTURAL AND ECONOMIC IMPLICATIONS

The BNPL model doesn't just affect how people handle money, it also changes social norms and the way people approach spending. It alters how we think about what we can afford, debt, and even our lifestyles, making things more convenient while influencing how we view our day-to-day lives.

1. Shifts in Attitudes Towards Debt

Historically, debt was seen negatively, particularly in underdeveloped countries. However, BNPL has changed people's perceptions of borrowing, making it a normal and accepted practice. According to Deloitte Insights (2023), 65% of BNPL users globally view it as a budgeting asset rather than a kind of debt.

2. Influence on Festivals and Seasonal Shopping

BNPL has changed the way people shop during festive seasons in culturally rich countries like India. A Statista study (2023) found that 40% of purchases made on e-commerce platforms during Diwali 2023 were paid for using BNPL, highlighting its growing popularity over traditional payment methods. With discounts and cashback offers, many customers use BNPL to buy electronics and jewelry.

3. Social Media and Peer Pressure

Social media users on platforms such as Facebook, Instagram, and TikTok promote BNPL lifestyles, making it attractive to consumers. Influencers that promote luxury things encourage their followers to spend money in a similar way.

4. Benefits of Financial Inclusion

BNPL is crucial for improving financial inclusion, especially in developing economies where traditional credit options are often out of reach. In countries like India and other Southeast Asian regions, BNPL usage has surged thanks to advancements in digital payments and widespread smartphone access (Statista, 2023). For first-time borrowers, BNPL serves as a stepping stone into formal credit by helping them build a credit history with lenders.

5. Managing Risks

Although BNPL helps promote inclusion, it also puts economically vulnerable groups at risk. Young people and low-income consumers are more likely to miss payments due to a lack of financial literacy.

Regulators and BNPL providers need to collaborate on creating educational campaigns and clear terms to protect these at-risk groups.

EDUCATIONAL AND PROFESSIONAL USES OF BNPL

BNPL is becoming increasingly popular in education and employment fields, enabling individuals to participate in their personal and professional growth without immediate financial impact. This move demonstrates BNPL's ability to provide access to previously unattainable prospects for many.

Funding for Online Courses and Certifications

With the growth of digital learning platforms like Coursera, Udemy, and edX, education has become more accessible. BNPL further supports this by offering flexible payment options. A Statista survey (2023) found that 30% of people enrolled in professional certification programs or degree courses chose to use BNPL to pay for their fees.

For example:

Enrollments in tech-focused certifications like data analytics, cybersecurity, and software development increased by 40%, with many people using BNPL to pay for them (Financial Times, 2023).

Partnerships between BNPL companies and educational institutions—like Simpl teaming up with Indian edtech platforms, have made it easier for both students and professionals to access learning opportunities

On Building One's Career

BNPL isn't just limited to education, it also helps people grow professionally by making it easier to pay for things like workshops, conferences, specialized tools, or memberships in professional groups.

For example:

Freelancers and self-employed people often rely on BNPL to buy important tools like laptops and software subscriptions that help them stay productive and competitive.

According to industry reports, people who used BNPL to cover work-related costs saw their careers improve by 25% within the next two years (World Bank, 2022).

BNPL has been a big help for students from low-income families because it gives them a way to afford things like study materials, gadgets, and even housing. In rural parts of India, BNPL use has gone up by 55% for buying textbooks and online learning tools, which is helping bridge the gap between what families can afford and access to good education (Reserve Bank of India, 2023).

Despite its benefits, the use of BNPL in education presents significant issues because of: (i) The risk of failure by young users as a result of their lack of financial awareness.

(ii) Using BNPL too often for everyday expenses can build up over time and make people's financial situations even more stressful.

Education providers should work with BNPL providers to promote budgeting and repayment awareness through focused marketing initiatives in order to lessen these problems.

ETHICAL AND ENVIRONMENTAL ISSUES

Environmental Impact of Overuse

BNPL's convenience leads to increased consumption in industries like fast fashion and electronics, which heavily contribute to environmental degradation. For example,

(i) Fast Fashion: According to Statista, 40% of BNPL transactions involve clothing purchases, which contribute up to 10% of global carbon emissions.

(ii) E-Waste: Every year, around 50 million tons of electronic waste are generated globally, and part of that comes from people upgrading their phones more often because of Buy Now, Pay Later (BNPL) options (Financial Times, 2023).

These are methods to speed the transition to an ethical and sustainable BNPL

To address these difficulties, BNPL providers can take the following activities based on ethical and environmental goals:

(i)Promoting Responsible Spending: Introduction of features such as spending caps or warnings on excessive debt.

(ii)Transparency & Education: Clear communication of terms of repayment, interests, and penalties in a language that the average user can understand. Financial literacy modules in BNPL apps could also be incorporated for gamified learning about budgeting and debt management.

(iii)Green BNPL Initiatives: Companies such as Klarna lead by example in terms of carbon offsets on transactions. Forming alliances with eco-friendly brands and providing rewards for making sustainable purchases can enable BNPL to be a catalyst for positive change.

(iv)Regulatory Authority to Ensure Fair Practice: In order to safeguard consumers and advance sustainable practices, governments and a regulatory oversight agency should each do their share:

One strategy to safeguard customers and advance sustainability is to implement clear disclosure for all BNPL suppliers.

imposing interest rate and penalty limitations to prevent exploitation in the surrounding area.

ESG (Environmental, Social, and Governance) factors are integrated into BNPL activities for marketing objectives so that the company fully supports overall sustainable goals (World Bank, 2022).

Global Trends And Outlook

Expanding Markets

BNPL is experiencing growth in emerging markets, as it serves younger groups that are ignored by traditional financial institutions. According to the World Bank, BNPL's growth in such countries would be 25-30% per year beginning in 2022, owing to innovations in digital payments.

Sustainability in BNPL Models

Sustainability is becoming a major focus for BNPL operators, who are reaching out to more ecologically concerned businesses for cooperation. For example, reducing carbon footprints and encouraging sustainable consumer consumption are gaining traction. According to Accenture (2023), "introducing BNPL services with integrated ESG might improve its reputation and attractiveness."

Regulatory Changes.

To support the proper growth of BNPL, regulators around the world are implementing frameworks to supervise the industry. Mandatory credit reporting, interest ceilings, and fee transparency are among the measures under consideration to strike a balance between innovation and consumer safety (Reserve Bank of India, 2023).

Future Implications And Recommendations

For Consumers

Consumers are required to use responsible borrowing tactics and distinguish between necessary and unnecessary purchases. The process of educating consumers about the terms and circumstances of BNPL services, such as payback period and price structure, is also a major challenge. Maintaining a budget and doing expense analyses can help to lessen the likelihood of debt accrual and default.

For Providers: BNPL suppliers will face a difficult task in providing sustainable offerings. They should integrate user-friendly features such as automatic payback reminders and financial literacy modules onto their platform to educate users about borrowing wisely. Providers can then win their users' trust by employing appropriate marketing tactics and making payback terms clear and straightforward. Collaboration with authorities and consumer advocacy groups will contribute to the development of systems that strike a balance between profitability and consumer protection.

For Regulators: The BNPL market is increasing rapidly. Regulators must therefore take active measures to control this sector. Equality, responsibility, and consumer protection requires a comprehensive regulatory structure. This can be accomplished by implementing credit reporting for all BNPL transactions, which will ensure transparency and prevent excessive borrowing. To safeguard customers, particularly those with limited financial literacy, authorities may establish limits on interest rates, fees, and penalties.

Technological Developments: The BNPL ecosystem will be greatly improved by technological advancements. Personalized repayment plans, real-time creditworthiness assessments, and fraud detection will all be enhanced by the integration of artificial intelligence. Blockchain technology has the potential to improve transparency for all parties involved, lower transaction risks, and further secure data. While resolving current issues, such developments can strengthen, secure, and improve the use of BNPL systems, build trust, and promote wider adoption.

Conclusion

The BNPL model will have both positive and negative effects. However, the BNPL model has the advantage of being "practical, short-term-expense management," since it allows students to purchase

textbooks, other devices, and everyday necessities from retailers that they would prefer not to pay for in full up front.

Students with limited financial resources may find this flexibility especially helpful as it allows them to budget appropriately and handle current obligations. However, BNPL also has a number of dangers.

Due to BNPL, it is simple to postpone payments, and impulsive purchasing is on the rise. Students purchase unnecessary items.

If such excessive spending is not reined in, it can lead to stress and debt that may be difficult to pay back. Furthermore, it's possible that the majority of students are unaware of the terms of repayment, any additional costs, or the consequences of missing payments.

The chance of getting into debt cycles is increased by this ignorance as well as a lack of experience with personal financial management. In conclusion, BNPL offers immediate financial relief and increased access to funds, but if not used sensibly, it can also promote bad spending patterns and unstable personal finances.

To prevent long-term financial difficulties, students should prioritize appropriate use and be aware of the possible repercussions.

REFERENCES

1. McKinsey & Company. (2023). The Rise of Digital Payments and Consumer Finance. Retrieved from www.mckinsey.com, p. 12-15.
2. Deloitte Insights. (2023). BNPL Trends and Consumer Behavior. Available at www.deloitte.com, p. 8-10.
3. Arnold, T., & Choi, D. (2022). Psychological Triggers Behind BNPL Adoption. *Journal of Consumer Psychology*, 45(3), 203–214, p. 204-207.
4. Reserve Bank of India (RBI). (2023). Digital Payment Systems and BNPL: Opportunities and Risks. Retrieved from www.rbi.org.in, p. 5-9.
5. Statista. (2023). Consumer Preferences for BNPL Services in India. Available at www.statista.com, p. 14-16.

Behind The Stream: Understanding Consumer Choice

Behaviour on Netflix

(1) Kshitij Gumber (2) Janvi Arora , (3) Jiyaa (4) Sanchit Gupta
BBE, Aryabhata College

I. ABSTRACT

Introduction

This research explores how pricing, user experience, and influencer marketing influence consumer behaviour in the context of Netflix. It examines how these factors shape subscription decisions, engagement, and loyalty among users, highlighting Netflix's strategies to attract a diverse audience and optimise its platform in a competitive digital streaming landscape.

Problem Statement:

This study investigates how Netflix adapts to increased competition in the streaming industry by employing strategies that extend beyond traditional content offerings. It focuses on the company's evolving business models, customer engagement strategies, and innovative marketing efforts to attract and retain a diverse subscriber base. The research aims to identify the factors contributing to Netflix's enduring market leadership and long-term success.

Objectives of Study:

The objectives of this research are as follows:

- To analyse the reasons behind Netflix users' preference for lower-cost subscription plans and how various factors like device use and viewing habits affect these choices.
- To evaluate the role of UX in influencing Netflix's user engagement.
- To analyse the impact of Netflix's pricing models on subscription rates and retention.
- To explore the influence of social media influencer marketing on content discovery and viewership on Netflix.

Research Questions:

1. How do device preferences and affordability influence Netflix users' choices of Basic and Mobile plans?
2. How do promotional offers and perceived value impact Netflix subscribers' decisions to start and maintain subscriptions?
3. How do user interface features affect Netflix subscriber retention and satisfaction?
4. How do social media influencers and user-generated content impact engagement and content discovery on Netflix?

Research methodology:

We conducted a Google Forms survey with 70 Delhi University students aged 17 to 24 to analyse factors influencing Netflix subscription decisions. Using a ranking scale method, we prioritised these factors based on average rankings and visualised the results with bar graphs to capture user preferences and demographics effectively.

We conducted a Google Forms survey with 70 Delhi University students aged 17 to 24 to analyse factors influencing Netflix subscription decisions. Using a ranking scale method, we prioritised these factors based on average rankings and visualised the results with bar graphs to capture user preferences and demographics effectively.

Implications:

1. Netflix's focus on affordability and user experience positions it well to attract and retain budget-conscious users, especially in emerging markets.
2. Personalised content recommendations and a clean user interface are crucial for maintaining high user engagement and satisfaction.
3. The growing influence of social media influencers over traditional word-of-

Recommendations:

The research recommends that Netflix continue prioritising affordable subscription plans while exploring new pricing tiers to cater to diverse financial segments. Enhancing user experience through improved personalised recommendations and a more intuitive interface will further boost engagement and retention. Strengthening partnerships with social media influencers, especially on platforms like Instagram and YouTube, is advised to attract younger audiences and enhance content discovery. Additionally, Netflix should invest in expanding its original content library and diversifying genres to meet evolving global preferences and maintain its competitive edge.

Conclusion:

This study explores factors affecting Netflix subscription choices, focusing on demographics, subscription types, user experience, pricing, and influencer marketing. Younger viewers prefer affordable plans like Mobile, while families and higher-income users opt for premium options. A user-friendly interface is essential, and tiered pricing accommodates diverse financial situations. Influencer endorsements significantly enhance engagement among younger audiences. Ultimately, Netflix's success relies on balancing affordability and user experience, with continuous innovation necessary to remain competitive.

II. Introduction

As defined by Schiffman and Wisenblit, "Consumer Behaviour is the study of consumers' actions during searching for, purchasing, using, evaluating, and disposing of products and services that they expect will satisfy their needs". Consumer behaviour involves understanding how people decide which products or services to buy, how they make those purchases, and their experiences after using the product. In simpler terms, it explores the motivations behind why consumers opt for specific products or services over others. Several factors can influence these decisions, including pricing, ease of use, and external influences like recommendations from others, including influencers. Gaining insights into consumer behaviour is essential for businesses to design effective marketing strategies and optimise their product offerings. Our research focuses on the impact of three key factors—pricing, user experience and interface, and influencer marketing—on consumer behaviour. We aim to explore how these variables shape purchasing decisions in the context of digital streaming platforms. By analysing Netflix, a global leader in the streaming industry, we seek to understand how these factors influence consumer choices and overall engagement with subscription services.

Netflix, a dominant force in the streaming industry, has drastically altered how people consume entertainment. Since its start in 1997 as a DVD rental service, Netflix has evolved into a global leader in digital streaming, boasting over 200 million subscribers worldwide. By embracing online streaming in 2007 and offering an expansive library of films, TV shows, documentaries, and original content, Netflix has changed the way consumers engage with media, influencing viewing habits on a global scale.

As the popularity of streaming platforms continues to grow, it becomes crucial to understand what motivates consumers to subscribe to Netflix, stay engaged, and remain loyal to the service. This paper focuses on three critical factors that significantly impact consumer behaviour: pricing, which refers to the strategies companies use to set the cost of their products or services; user experience (UX), encompassing how users interact with a product, including ease of use and satisfaction; and influencer marketing, a strategy that leverages social media personalities to promote content and drive engagement. These elements shape everything from subscription decisions to content discovery.

Netflix's pricing strategy plays a vital role in attracting a broad range of customers, offering flexible plans that accommodate various budgets. In addition, Netflix's emphasis on user experience, with personalised recommendations, easy navigation, and an intuitive interface, ensures high user satisfaction and retention. Furthermore, influencer marketing has become a key factor, as social media influencers play a crucial role in promoting Netflix content, particularly among younger audiences.

Through examining these factors, this paper aims to provide a clearer understanding of how Netflix can optimise its platform to maintain growth and keep consumers engaged in an increasingly competitive digital entertainment landscape.

III. Problem Statement

As the streaming industry becomes more competitive, platforms like Netflix must continually adapt to shifting consumer

preferences and behaviours. This study examines how Netflix navigates this challenge by employing various strategies that go beyond traditional content offerings. By focusing on the company's approaches to attracting and retaining a diverse subscriber base, this research explores how Netflix maintains its market position amidst intense competition. Key areas of focus include the company's evolving business models, customer engagement strategies, and innovative marketing efforts. Through this exploration, the study aims to uncover the factors that contribute to Netflix's ability to stay ahead in an ever-evolving industry. Insights from this research will provide a deeper understanding of how Netflix sustains its leadership and ensures long-term success.

IV. Objectives Of Study

The objectives of this study are:

- To analyse the reasons behind Netflix users' preference for lower-cost subscription plans and how various factors like device use and viewing habits affect these choices.
- To evaluate the role of UX in influencing Netflix's user engagement.
- To analyse the impact of Netflix's pricing models on subscription rates and retention.
- To explore the influence of social media influencer marketing on content discovery and viewership on Netflix.
- By addressing these objectives, the research aims to deepen the understanding of consumer behaviour and its various factors which impact consumer decisions to subscribe and engage with content on Netflix.

V. RESEARCH QUESTIONS

- How do device preferences, content consumption patterns, usage frequency, and affordability influence Netflix users' choice of subscription plans, particularly the popularity of lower-cost options like the Basic and Mobile plans?
- How do promotional offers, perceived value, and pricing options impact Netflix subscribers' decisions to start and maintain their subscriptions?
- How do user interface and experience features of Netflix influence subscriber retention and overall user satisfaction?
- How do social media influencers and user-generated content, such as memes, affect consumer engagement and content discovery on streaming platforms like Netflix?

VI. Research Methodology

Our research methodology is based on primary data collected through a Google Forms survey conducted among 70 respondents, consisting of 54 Netflix users and 16 non-Netflix users. The respondents were students from Delhi University (DU), aged 17 to 24. This age range was selected because it represents the primary demographic for online streaming services, with students in this age group more likely to engage with platforms like Netflix due to their accessibility and entertainment preferences.

The survey employed a ranking scale method, where respondents ranked factors influencing their Netflix subscription decisions from 1 (most important) to 5 (least important). This method allowed us to prioritise factors according to user preferences and identify patterns in their decision-making behaviour.

To determine the most and least important factors, we used the simple average method, which averaged the rankings across all responses. This method was chosen for its simplicity and effectiveness in providing a clear overview of respondents' preferences, with lower average values indicating higher importance.

We used bar graphs to visualise the

relative importance of the different factors influencing Netflix subscriptions, which allowed us to clearly see the trends in ranking. Bar graphs were employed to present demographic details, helping to give a clear breakdown of the respondent group based on age and Netflix usage.

By using the ranking scale method and visualising the results through these graphs, we gathered nuanced insights into the relative importance of various factors and a clear understanding of the demographic profile of our respondents. This structured approach enabled us to effectively analyse the key drivers behind Netflix subscription decisions.

VII. Critical Analysis

Our research focuses on college students from Delhi University (DU) aged 17 to 24, a key demographic for streaming platforms like Netflix. This age group is particularly relevant as young adults are more likely to engage with online streaming services due to accessibility, affordability, and the desire for personalised entertainment experiences. The sample includes students from various colleges within DU. This range of respondents provides a broad representation of Netflix's target audience in this age bracket.

Demographic Analysis:

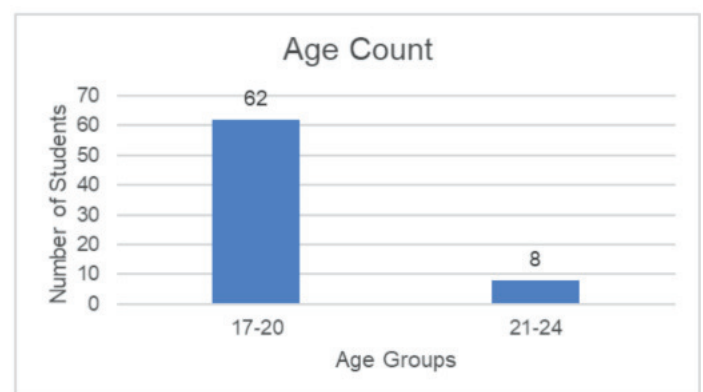


Figure 1

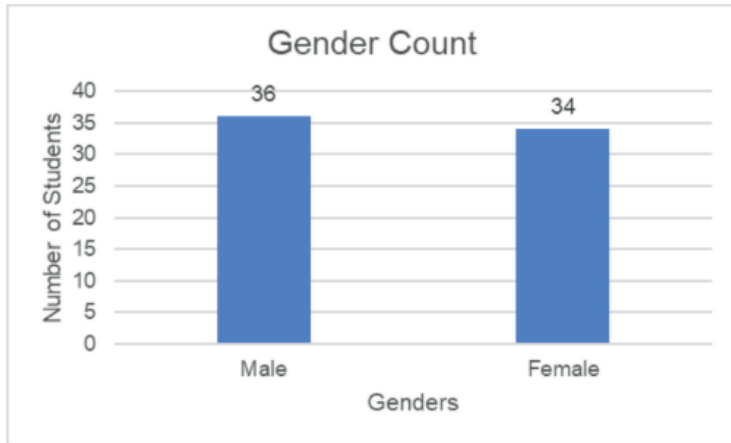
**Figure 2**

Figure 2 displays the gender breakdown of respondents, with 34 i.e. 48.58% of the sample identifying as female and 36 i.e. 51.42% of the sample as male. This near-equal distribution ensures that the insights gathered represent a balanced perspective, reflecting the diverse preferences and behaviours of both genders in relation to Netflix usage.

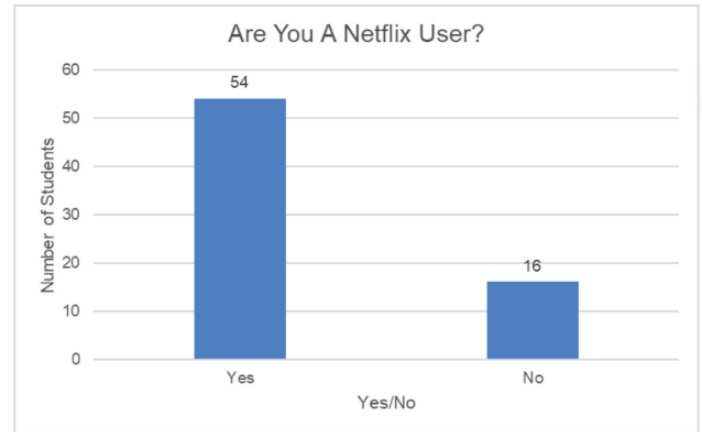
**Figure 4**

Figure 4 shows the Netflix usage among the respondents, with 54 out of 70 i.e. 77.14% of the sample using Netflix and 16 respondents i.e. 22.86% of the sample not using the platform. While no further data was collected from non-Netflix users, this distribution highlights a strong preference for Netflix among the majority of the respondents. The higher number of Netflix users may reflect the platform's popularity among college students in the 17-24 age group.

Subscription-Based Analysis:

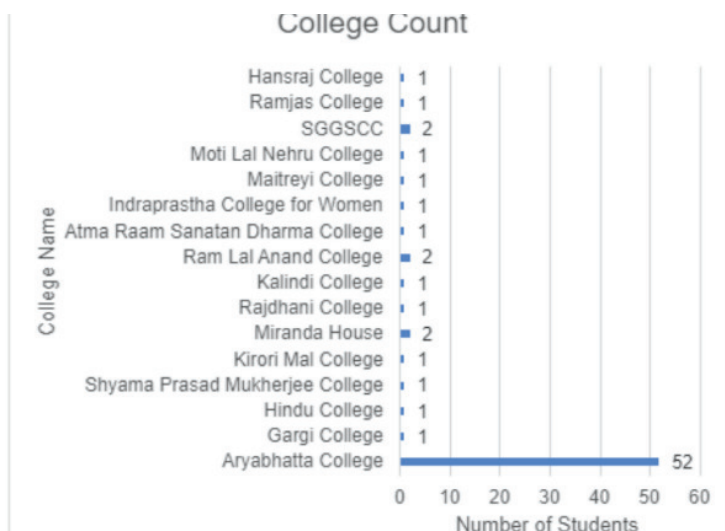
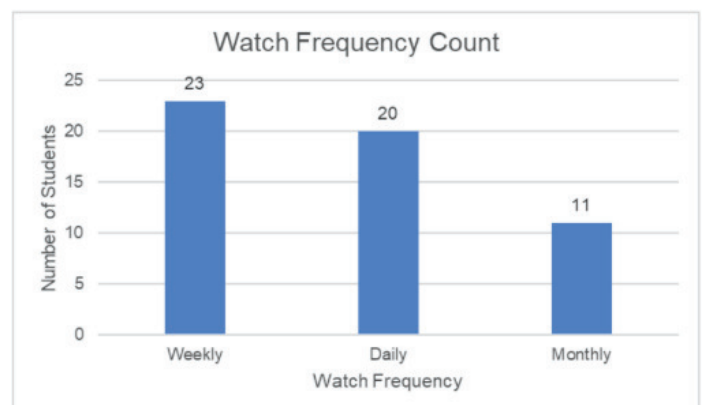
**Figure 3****Figure 5**

Figure 5 illustrates the frequency of Netflix usage among the respondents. Out of 70, 54 respondents are Netflix Users and out of those 54 Netflix Users, 23 i.e. 42.6% of Netflix Users, reported watching Netflix weekly, 20 i.e. 37.03% of Netflix Users, use it daily, and 11 i.e. 20.37% of Netflix Users, access it monthly. This shows that a significant portion of users engage with the platform regularly, with daily and weekly usage dominating. These patterns suggest that Netflix is an integral part of many students' entertainment routines, particularly for those who use it daily or weekly.

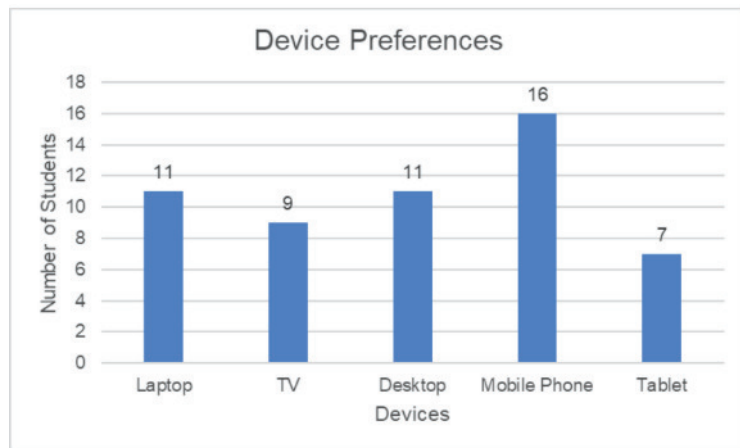


Figure 6

Figure 6 illustrates the device preferences for Netflix users among the respondents. The data shows that mobile phones are the most favoured device, with 16 respondents i.e. 29.63% of Netflix Users, selecting them. Both laptops and desktops are equally preferred, with 11 users each i.e. 20.37% of Netflix Users preferring each device. TV follows with 9 users i.e. 16.67% of Netflix Users, and tablets are the least popular option, with 7 respondents i.e. 12.96% of Netflix Users opting for them.

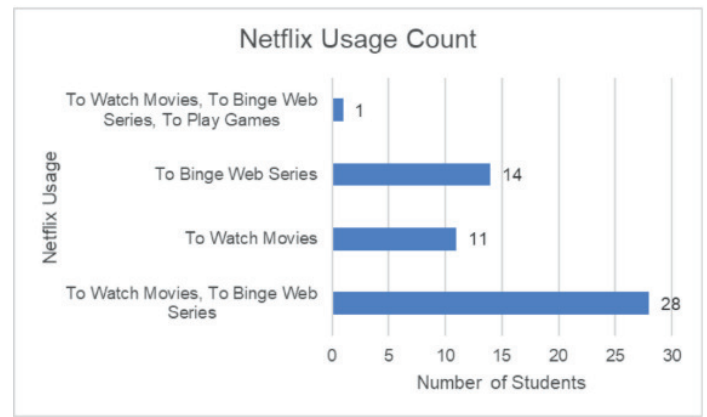


Figure 7

Figure 7 shows the type of content consumed by Netflix users. The majority, 28 i.e. 51.85% respondents, use Netflix to watch both movies and binge web series, while 14 solely binge web series, and 11 exclusively watch movies. Interestingly, only 1 individual engages in all the three activities—watching movies, bingeing web series, and playing games on Netflix. This highlights that while Netflix is primarily used for streaming movies and series, gaming remains a minor activity among this demographic.

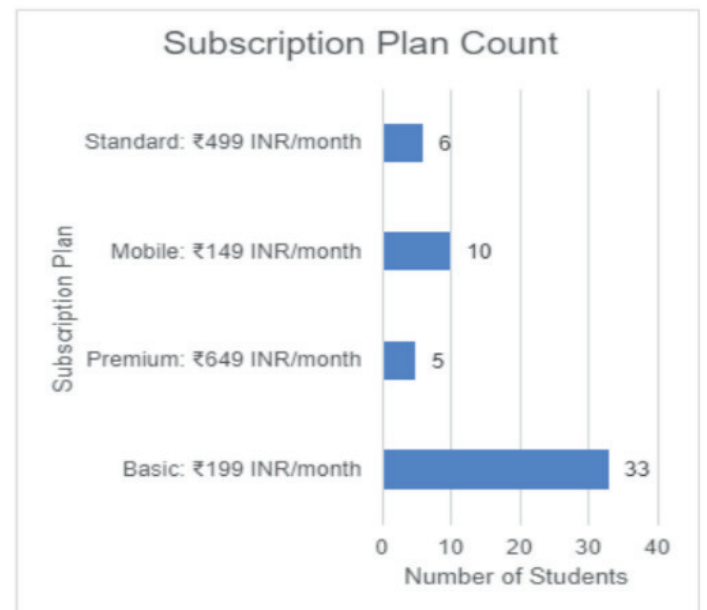


Figure 8

Figure 8 displays the distribution of Netflix subscription plans among respondents. The majority, 33 out of 54 i.e. 61.11% of Netflix users, subscribe to the Basic plan priced at ₹199 INR per month, indicating its popularity due to affordability. The Mobile plan, at ₹149 INR per month, follows with 10 subscribers i.e. 18.52% of Netflix Users, while the Standard plan, at ₹499 INR per month, has 6 users i.e. 11.11% of Netflix Users. Only 5 respondents i.e. 9.26% of Netflix Users, subscribe to the Premium plan, which costs ₹649 INR per month. The data shows that lower-priced plans are preferred, reflecting the importance of affordability in choosing a Netflix subscription.

Interface-Based Analysis:

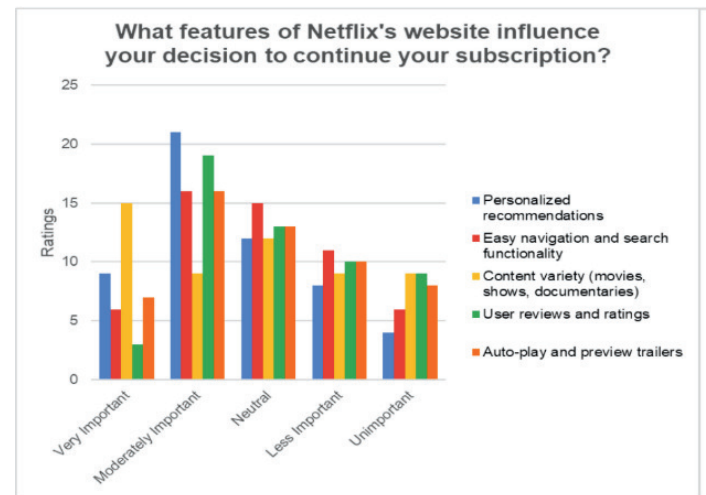
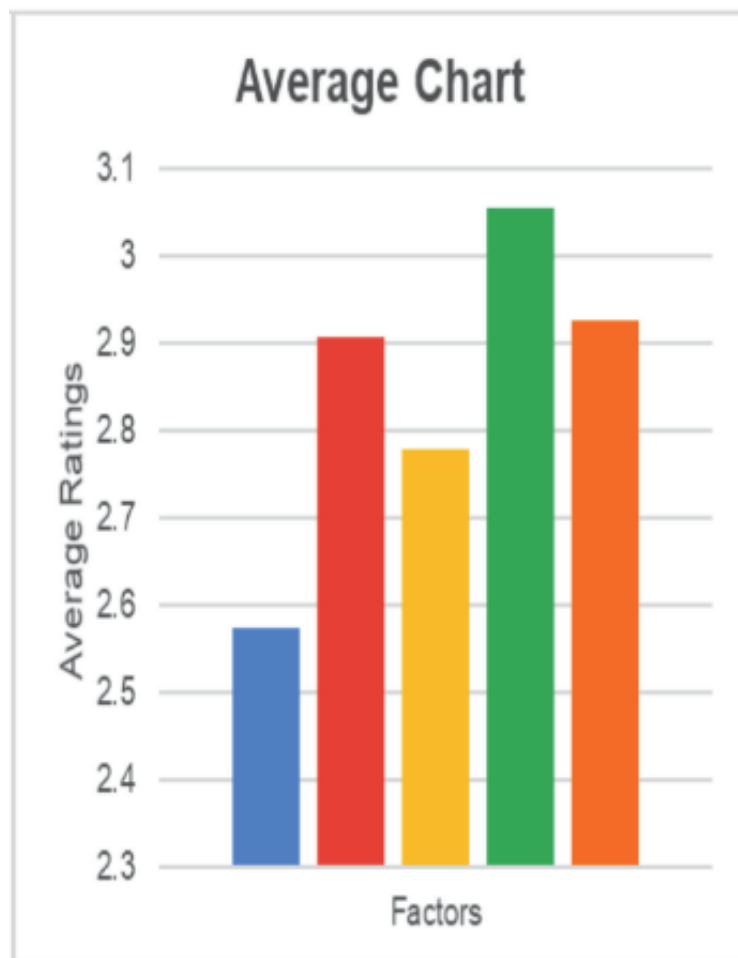


Figure 9

In the first question of this section of our survey, the respondents were asked to rank the features of Netflix's website which influence their decision to continue their subscription (Personalised Recommendations, Easy Navigation and Search Functionality, Content Variety (movies, shows, documentaries), User Reviews and Ratings, Auto-play and Preview Trailers). Figure-9 shows the count of the rankings of factors done by respondents where 1 indicates "Very Important" and 5 indicates "Unimportant" as well as the average values of the rankings of factors. The calculation of averages is done using the Simple Average Method where the minimum average value indicates the most important factor and the maximum average value indicates the least important factor. The calculation shows that Personalised Recommendation is coming out to be a very important factor with an average of 2.57 while User Reviews and Ratings stands at an average of 3.06 making it an unimportant factor. The main reason for the above insights are that Personalised Recommendations are highly valued by Netflix users. As the service tailors its content suggestions based on individual preferences, it keeps users engaged by providing relevant content. This reduces the time that users spend searching for shows and increases their satisfaction.

Whereas, while User Reviews and Ratings are helpful for some subscribers, they do not appear to be a primary deciding factor in whether users continue their subscriptions. This focused on content and recommendations rather than having the exact same layout when switching between devices. While important for convenience, users may already expect a baseline of consistency and are more concerned with features that directly impact content discovery and usability.

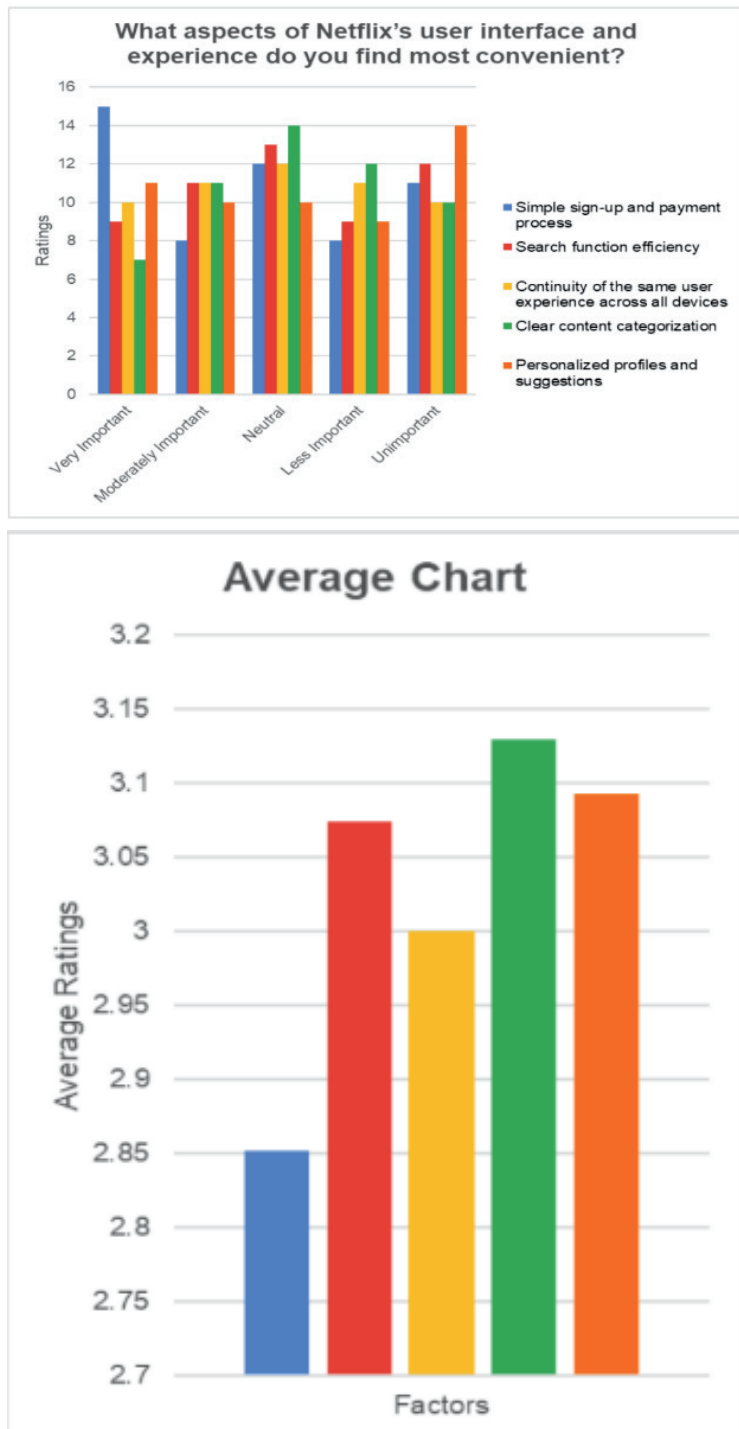


Figure 11

In the third question of this section of our survey, the respondents were asked to which aspects of Netflix's user interface and experience they find most convenient (Simple sign-up and payment process, search function efficiency, Continuity of the same user experience across all devices, Clear content categorization, Personalised profiles and suggestions). Figure-11 shows the count of the rankings of factors done by respondents where 1 indicates "Very Important" and 5 indicates "Unimportant" as well as the average values of the rankings of factors. The calculation of averages is done using the Simple Average Method where the minimum average value indicates the most important factor and the maximum average value indicates the least important factor. The calculation showed that Simple Sign-up and Payment Process is coming out to be a very important factor with an average of 2.85 while Clear Content Categorization stands at an average of 3.13 making it an unimportant factor. The main reason for the above insights are that a Simple Sign-up and Payment Process is critical for user retention as it provides a hassle-free entry into the platform. Users appreciate the ability to quickly create accounts and set up payments without encountering obstacles. This ease of use makes it more likely for users to subscribe and continue their subscriptions, as any complications during this process can lead to frustration and potential churn. Whereas, while Clear Content Categorization helps users find content efficiently, it appears to be a less critical factor in subscription continuation. Users seem to value more dynamic features like consistent UX or search function efficiency, which directly impact content discovery. This suggests that while categorization is useful, it isn't a top priority when compared to other aspects of the user experience.

Pricing-Based Analysis:

focused on content and recommendations rather than having the exact same layout when switching between devices. While important for convenience, users may already expect a baseline of consistency and are more concerned with features that directly impact content discovery and usability.

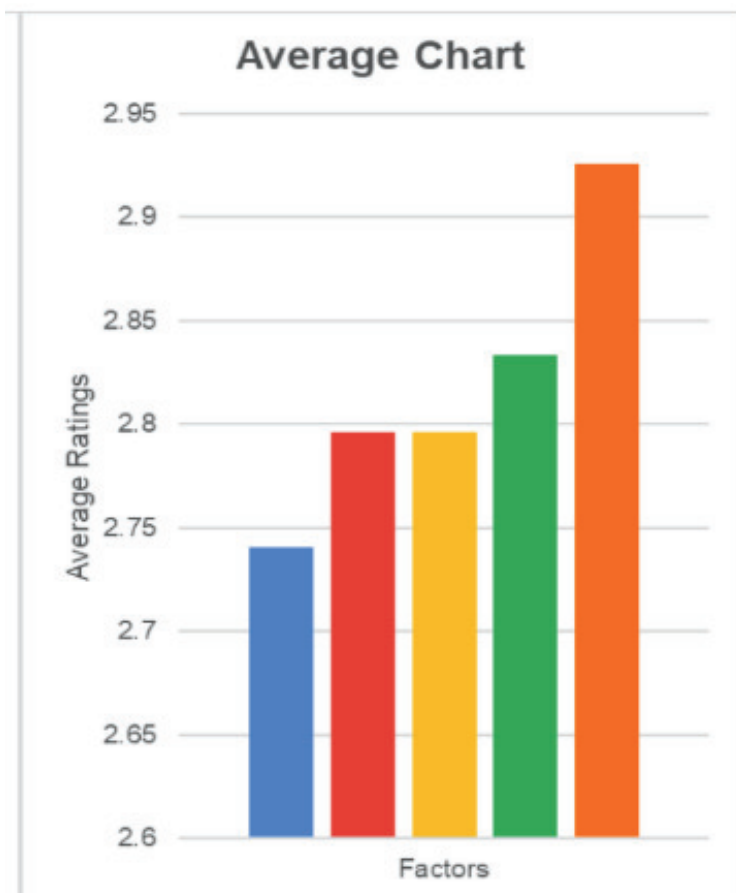
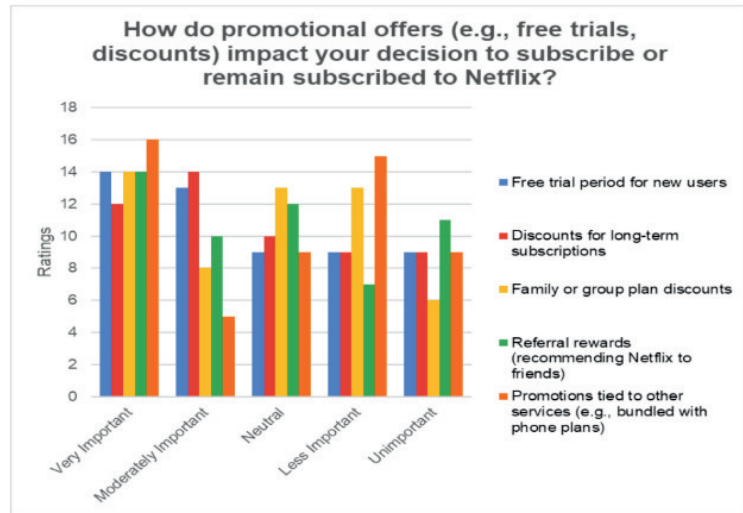


Figure 12

In the first question of this section of our survey, the respondents were asked how promotional offers, such as free trials or discounts, impact their decision to subscribe or remain subscribed to Netflix (Free trial period for new users, Discounts for long-term subscriptions, Family or group plan discounts, Referral rewards (recommending Netflix to friends), Promotions tied to other services (e.g., bundled with phone plans)). Figure-12 shows the count of the rankings of factors done by respondents where 1 indicates “Very Important” and 5 indicates “Unimportant” as well as the average values of the rankings of factors. The calculation of averages is done using the Simple Average Method where the minimum average value indicates the most important factor and the maximum average value indicates the least important factor. The calculation shows that Free Trial Period for New Users is coming out to be a very important factor with an average of 2.74 while Promotions Tied to Other Services stands at an average of 2.92 making it an unimportant factor. The main reasons for the above insights are that offering a Free Trial Period is a powerful tool for attracting new users, as it allows them to experience the platform before committing to a paid subscription. This feature plays a key role in Netflix's user acquisition strategy, helping potential subscribers explore the service without financial risk, which increases the likelihood of continued subscriptions after the trial ends. Whereas, Promotions that Bundle Netflix with other services (Jio Postpaid and Fiber Plans and Airtel Xstream Fiber) seem to have less impact on users' decisions to continue their subscriptions. While these promotions might attract some users initially, they are not seen as a significant factor in long-term subscription retention as they are majorly designed for Smart TVs. This suggests that users prioritise features that directly enhance their viewing experience over external promotional deals.

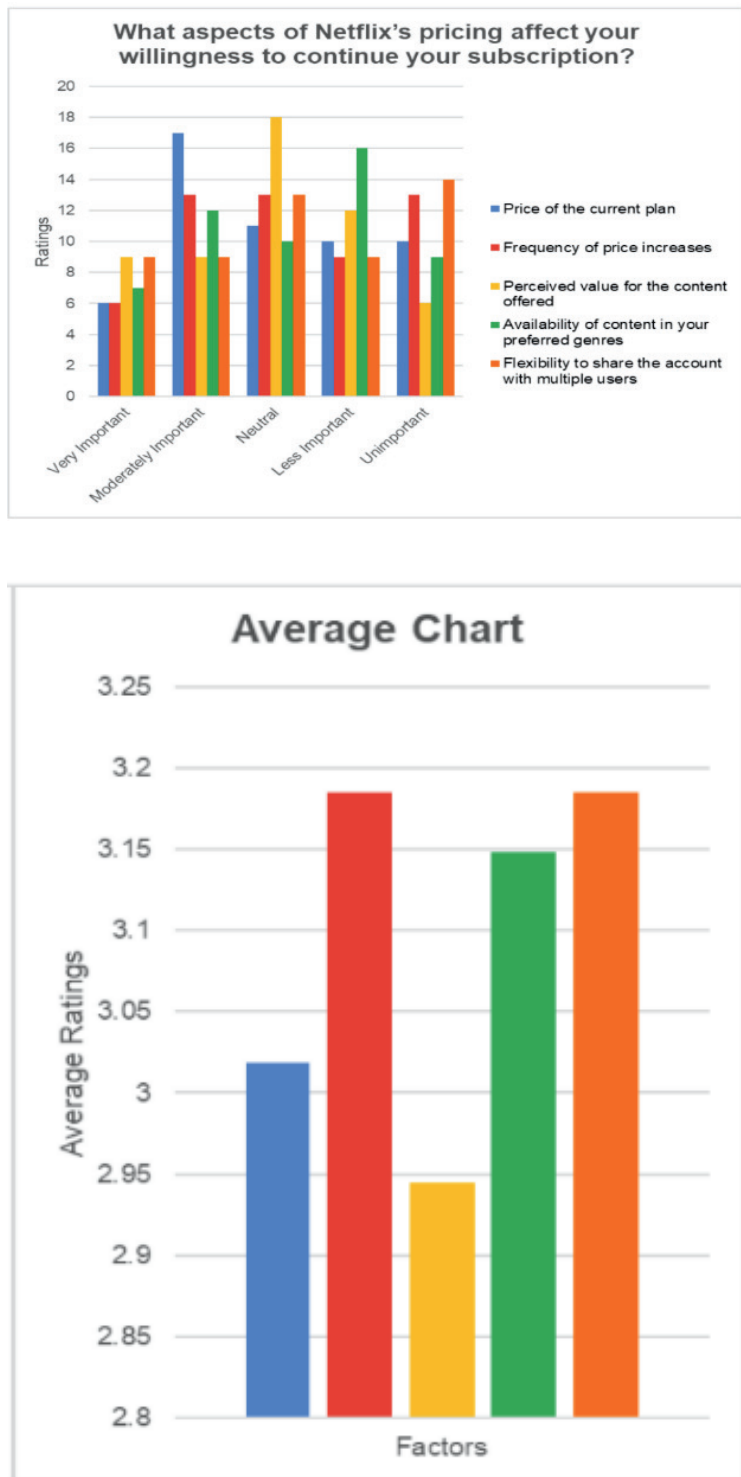


Figure 13

In the second question of this section of our survey, the respondents were questioned about what aspects of Netflix's pricing affect their willingness to continue their

what aspects of Netflix's pricing affect their willingness to continue their subscription (Price of the current plan, Frequency of price increases, Perceived value for the content offered, Availability of content in your preferred genres, Flexibility to share the account with multiple users). Figure-13 shows the count of the rankings of factors done by respondents where 1 indicates "Very Important" and 5 indicates "Unimportant" as well as the average values of the rankings of factors. The calculation of averages is done using the Simple Average Method where the minimum average value indicates the most important factor and the maximum average value indicates the least important factor. The calculation shows that Perceived Value for the Content Offered is coming out to be a very important factor with an average of 2.94 while Frequency of Price Increases and Flexibility to Share the Account with Multiple Users stands at an average of 3.18 making them unimportant factors. The main reason for the above insights are that users prioritise the content they get from Netflix, valuing a strong mix of quality and variety. As long as subscribers feel they are getting access to a wide range of high-quality shows, movies, and documentaries, they are more likely to maintain their subscriptions. This suggests that content remains king in terms of driving user engagement and retention, outweighing concerns like pricing or account flexibility. Whereas, while users don't like Frequent Price Hikes, they seem to be willing to tolerate them if they feel the service provides enough value. Other factors, such as content quality and variety, outweigh concerns about price increases, as long as the changes are not too drastic or too frequent. And when it comes to Account-Sharing, it has become less of a deciding factor for many users. With Netflix's recent crackdown on password sharing and the introduction of stricter sharing policies, users may place more importance on other aspects like the content itself or the value they receive from their subscription

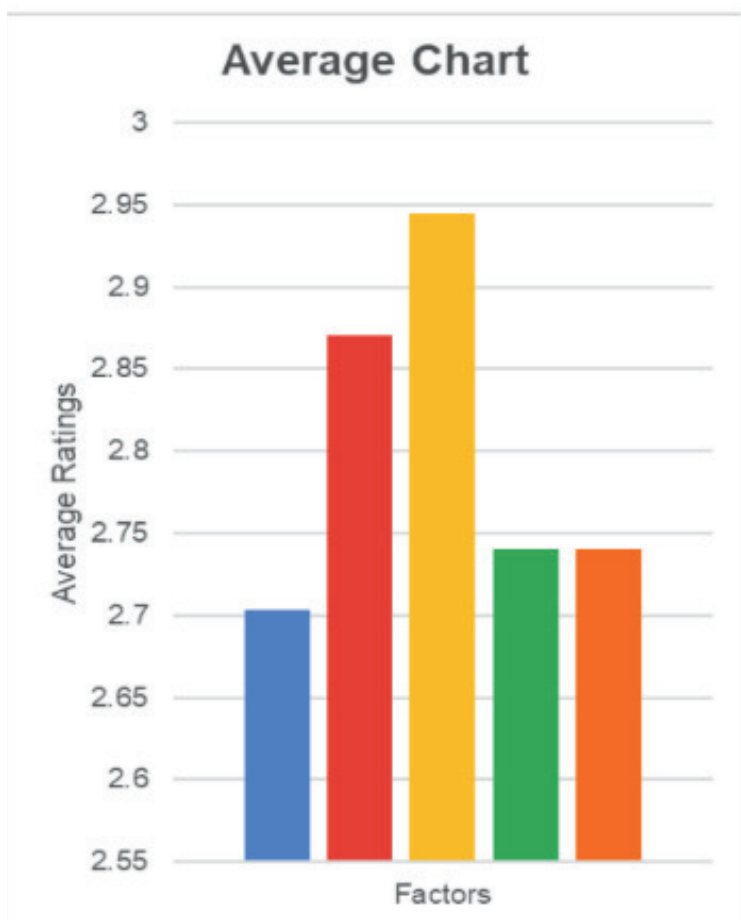
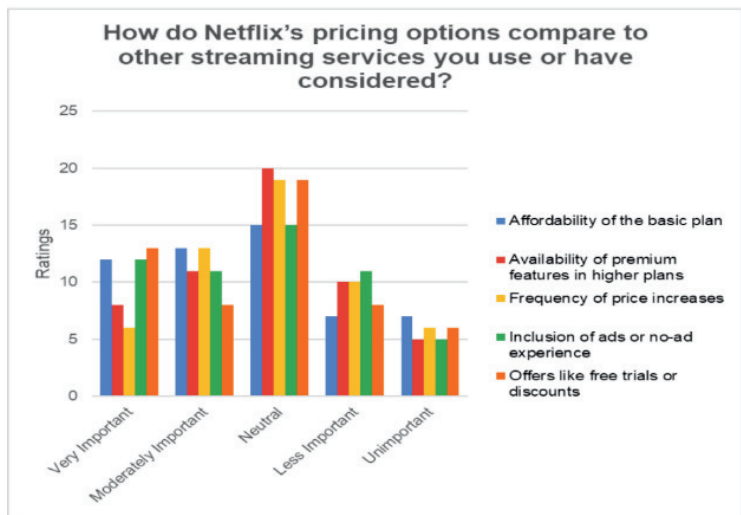


Figure 14

In the third question of this section of our survey, respondents were asked how Netflix's pricing options compare to other streaming services they use or have considered (Affordability of the basic plan, Availability of premium features in higher plans, Frequency of price increases, Inclusion of ads or no-ad

experience, Offers like free trials or discounts). Figure-14 shows the count of the rankings of factors done by respondents where 1 indicates "Very Important" and 5 indicates "Unimportant" as well as the average values of the rankings of factors. The calculation of averages is done using the Simple Average Method where the minimum average value indicates the most important factor and the maximum average value indicates the least important factor. The calculation showed that Affordability of the Basic Plan is coming out to be a very important factor with an average of 2.70 while Frequency of Price Increases stands at an average of 2.94 making it an unimportant factor. The main reason for the above insights are that users prioritise the Affordability of Netflix's Basic Plan over concerns about price increases because they value

the extensive content library and the overall quality of the user experience. As long as subscribers feel they are getting access to a wide range of high-quality shows, movies, and documentaries, they are likely to maintain their subscriptions, even if prices rise. This reflects the idea that content remains the most important factor in driving user engagement and retention, outweighing concerns about pricing. Whereas, while users may dislike price hikes, they appear willing to tolerate them as long as the service continues to provide significant value. In comparison, other platforms with lower starting prices may compromise on content variety and user satisfaction, which Netflix manages to balance well. Thus, factors like content quality and variety are more influential than concerns about price increases, provided that the hikes aren't too frequent or drastic.

Influencer Marketing - Based Analysis:

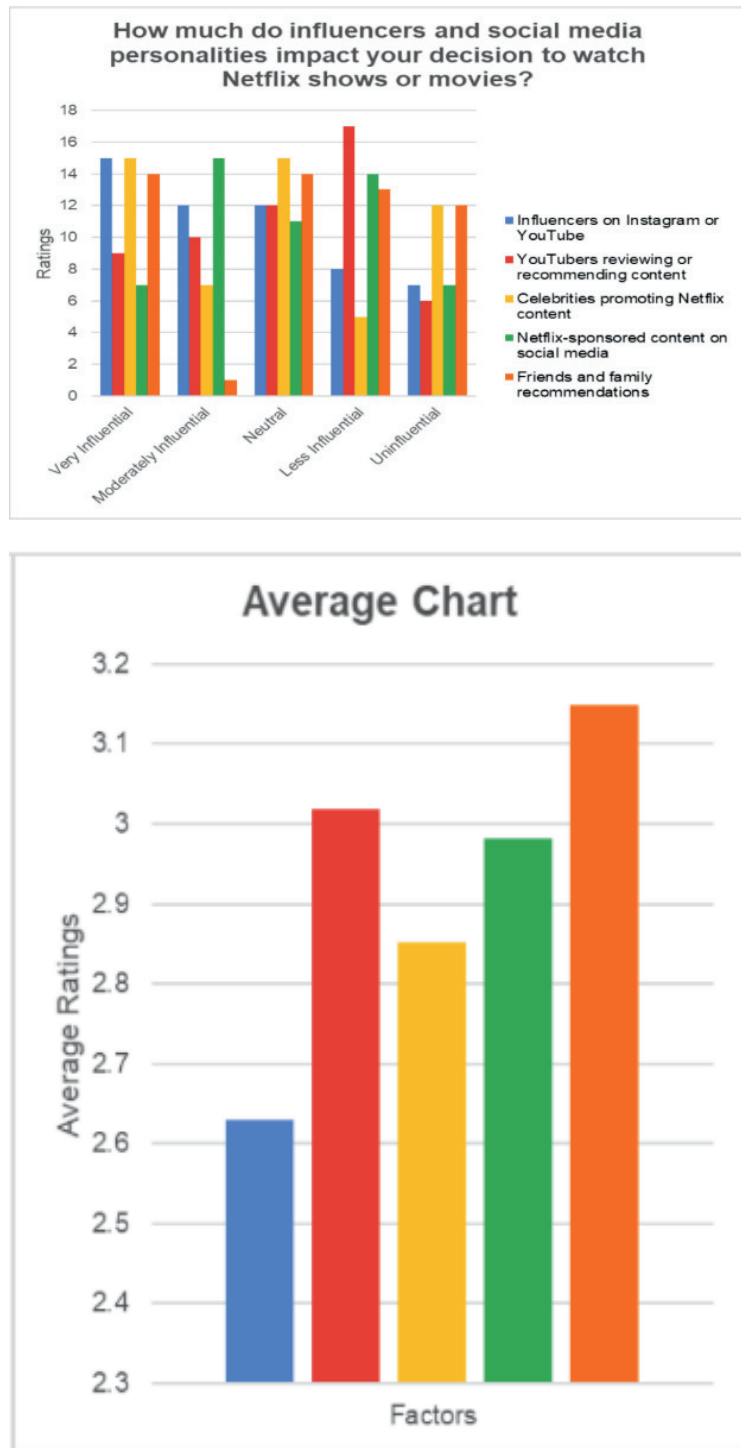


Figure 15

In the first question of this section of our survey, the respondents were inquired about how much influencers and social media personalities impact their decision to watch Netflix shows or movies (Influencers on Instagram or YouTube, YouTubers reviewing or recommending content, Celebrities

promoting Netflix content, Netflix-sponsored content on social media, Friends and family recommendations). Figure-15 shows the count of the rankings of factors done by respondents where 1 indicates “Very Influential” and 5 indicates “Uninfluential” as well as the average values of the rankings of factors. The calculation of averages is done using the Simple Average Method where the minimum average value indicates the most influential factor and the maximum average value indicates the least influential factor. The calculation shows that Influencers on Instagram or YouTube is coming out to be a very influential factor with an average of 2.63 while Friends and Family Recommendations stands at an average of 3.14 making it an influential factor. The main reasons for the above insights are that in today’s digital age, social media influencers have become key decision-makers, significantly shaping consumer behaviour, especially on platforms like Netflix. Many users trust influencers who create entertainment-related content, as their reviews and recommendations spark curiosity or FOMO (Fear of Missing Out). Influencers are seen as more relatable and authentic than traditional ads, making their opinions more impactful. Their content aligns closely with their audience’s interests, which makes their recommendations feel more personal. Whereas, the Influence of Friends and Family has diminished in the streaming era, as Netflix’s vast content library and personalised recommendations have taken precedence. While personal connections were once a primary source of content discovery, users now turn to influencers on social media for suggestions, with traditional word-of-mouth playing a secondary role.

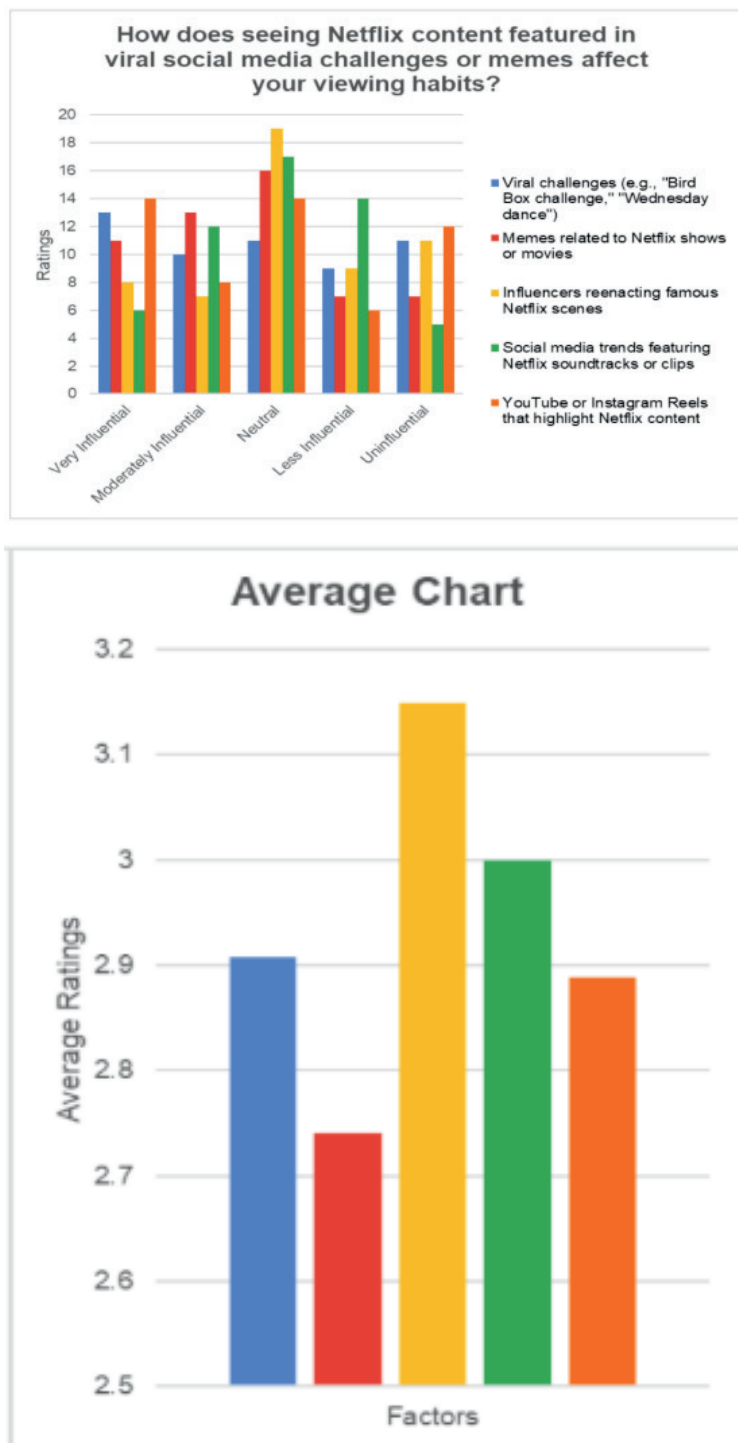


Figure 16

In the second question of this section of our survey, the respondents were asked how seeing Netflix content featured in viral social media challenges or memes affects their viewing habits (Viral challenges (e.g., "Bird Box challenge," "Wednesday dance"), Memes related to Netflix shows or movies, Influencers

reenacting famous Netflix scenes, Social media trends featuring Netflix soundtracks or clips, YouTube or Instagram Reels that highlight Netflix content). Figure-16 shows the count of the rankings of factors done by respondents where 1 indicates "Very Influential" and 5 indicates "Uninfluential" as well as the average values of the rankings of factors. The calculation of averages is done using the Simple Average Method where the minimum average value indicates the most influential factor and the maximum average value indicates the least influential factor. The calculation shows that Memes Related to Netflix Shows or Movies is coming out to be a very influential factor with an average of 2.74 while Influencers Reenacting famous Netflix Scenes stands at an average of 3.14 making it an uninfluential factor. The main reasons for the above insights are that Memes have become a powerful tool in digital expression, especially in the entertainment industry. Their humour, relatability, and shareability make them highly effective in influencing Netflix users. When a show or movie becomes the subject of memes, it quickly spreads across social media platforms, engaging users by tapping into current trends and humour. Memes pique curiosity by offering a unique, often exaggerated perspective on content, motivating users to watch shows to understand the reference or join in on the joke. Whereas, influencers reenacting famous Netflix scenes often come across as more promotional and less organic. While influencers can be highly influential in recommending content, their reenactments tend to feel staged and may not resonate as strongly as memes, which are seen as more authentic, user-generated content. Memes foster a sense of community, are easily shared, and generate excitement organically, making them more effective at sparking curiosity and engagement with Netflix content than influencer-driven reenactments.

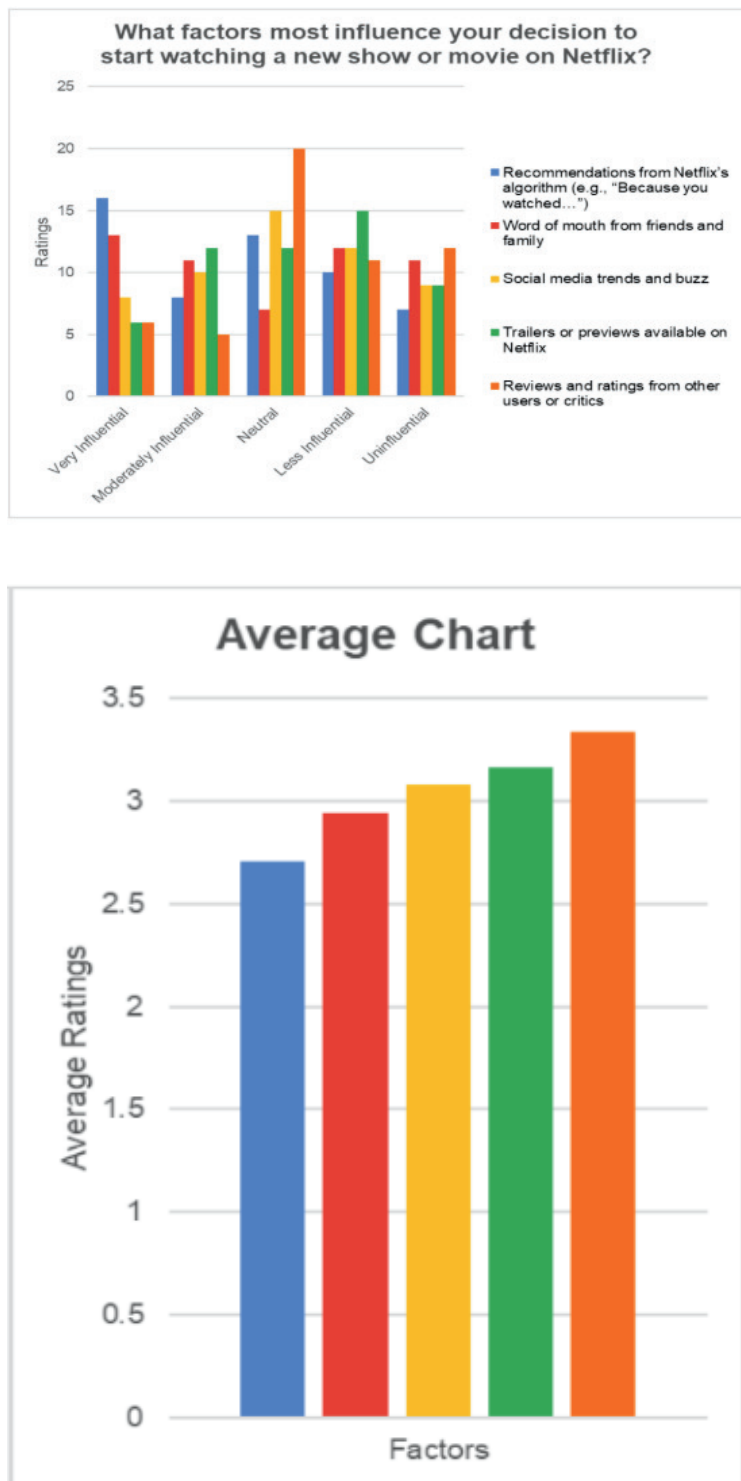


Figure 17

In the third question of this section of our survey, the respondents were questioned about which factors most influence their decision to start watching a new show or movie on Netflix (Recommendations from Netflix's algorithm (e.g., "Because you watched..."), Word of mouth from friends and family, Social media

trends and buzz, Trailers or previews available on Netflix, Reviews and ratings from other users or critics). Figure-17 shows the count of the rankings of factors done by respondents where 1 indicates "Very Influential" and 5 indicates "Uninfluential" as well as the average values of the rankings of factors. The calculation of averages is done using the Simple Average Method where the minimum average value indicates the most influential factor and the maximum average value indicates the least influential factor. The calculation shows that Recommendations from Netflix's Algorithm (e.g., "Because you watched..") is coming out to be a very influential factor with an average of 2.70 while Reviews and Ratings from Other Users or Critics stands at an average of 3.33 making it an uninfluential factor. The main reasons for the above insights are that Netflix's Personalised Algorithm plays a crucial role in enhancing user convenience and engagement. By analysing a user's watch history, search behaviour, and ratings, Netflix delivers tailored recommendations that users trust because they feel the platform understands their tastes. This personalised experience creates an engagement loop, where users keep watching content that matches their preferences without needing to scroll through endless options. Additionally, Netflix's algorithm introduces users to hidden gems they might not have discovered on their own, adding an element of surprise and driving more engagement. Whereas, Reviews and Ratings from Other Users or Critics tend to be subjective and may not align with an individual's preferences. Many users trust Netflix's algorithm over external opinions since the platform's data-driven insights feel more reliable. As a result, the value of reviews has diminished, with users opting for quick, personalised suggestions over lengthy critiques. Instead of relying on reviews, users often engage with Netflix content through social discussions or memes, making external reviews seem less relevant.

VIII. Outcomes

Netflix's pricing strategy plays a pivotal role in attracting and retaining subscribers, particularly among budget-conscious users, such as students. Based on the survey, affordability is a major factor, with a significant portion of users opting for the lower-priced plans. The Basic plan (₹199/month) is the most popular, followed by the Mobile plan (₹149/month), which reflects the importance of price when choosing a Netflix subscription. Only a small percentage of users opt for the higher-tier Standard and Premium plans, indicating that most are not willing to pay extra for features like 4K streaming or multiple screens, prioritising cost over enhanced service quality.

Additionally, frequent usage patterns among respondents show that Netflix successfully retains its users, with the majority watching content either daily or weekly. This suggests that users see significant value in their subscriptions and remain engaged with the platform regularly, a positive sign for Netflix's long-term customer retention. Regular use is likely driven by the flexibility of affordable plans, which make the platform accessible without placing a financial burden on students and similar demographics.

The content consumption habits of Netflix users further support the idea that lower-cost subscriptions are effective. Most users consume both movies and web series, with very few engaging in Netflix's newer offerings, such as gaming. This shows that Netflix's core strategy of providing diverse content across various genres continues to be its most powerful tool in maintaining user loyalty, even when newer, more niche services are introduced. In conclusion, Netflix's emphasis on affordability, coupled with the wide range of content, successfully attracts a large number of users who prioritise budget-friendly options. The focus on lower-tier plans suggests that Netflix's

pricing model, aimed at making streaming accessible to a broader audience, continues to be a key driver in its subscriber acquisition and retention strategy.

The UI and UX features of Netflix significantly influence user satisfaction and retention, with personalised recommendations, a clean modern design, and a simple sign-up and payment process emerging as key factors. Personalised recommendations are particularly vital as they leverage user data to tailor content suggestions, fostering a sense of relevance and connection. This tailored experience not only streamlines the search for appealing content but also enhances overall engagement, encouraging users to explore more options and feel invested in the platform. Additionally, a clean modern design provides an intuitive interface that reduces frustration and increases satisfaction. Users are likely to stay engaged with a visually appealing platform, as it enhances their overall streaming experience. Furthermore, a simple sign-up and payment process plays a critical role in user retention. A hassle-free onboarding experience makes it easier for users to subscribe and continue their subscriptions, minimising the potential for frustration during this initial stage.

On the other hand, factors like user reviews and ratings, layout consistency across devices, and clear content categorization are considered less critical for user retention. While user reviews and ratings can provide valuable insights, they do not carry as much weight in influencing ongoing subscriptions. Users tend to rely more on Netflix's internal recommendation system and the quality of content rather than external feedback. Layout consistency across devices, though important for a seamless experience, is often expected as a baseline; users may prioritise engaging content discovery over a uniform interface. Lastly, while clear content categorization aids in finding new shows and movies, it

appears less essential when compared to the more dynamic features that directly affect user satisfaction. This indicates that while these aspects contribute positively to the overall experience, they do not evoke the same level of engagement or emotional investment as the more impactful features.

In summary, Netflix's success relies on a strategic balance between significant and less critical UI and UX features. Personalised recommendations, a clean modern design, and a straightforward sign-up process are essential for fostering user engagement and loyalty. In

contrast, user reviews, layout consistency, and content categorization serve as supportive elements that enhance the overall user experience but are not the primary drivers of subscription retention. By understanding this dynamic, Netflix can continue to refine its platform, ensuring it meets diverse user needs while cultivating long-term loyalty.

Promotional offers, perceived value, and pricing strategies play significant roles in shaping subscribers' decisions to engage with Netflix. The free trial period, in particular, stands out as a powerful tool for attracting new users by allowing them to experience the platform without financial commitment. This experience often leads to increased subscription continuation after the trial ends, as users tend to perceive a higher value from the content they access during this period. Additionally, perceived value, especially in terms of content variety and quality, strongly influences user satisfaction and retention. When subscribers feel they are receiving high-quality shows and movies that meet their preferences, they are more likely to overlook potential price increases, reinforcing their commitment to the service.

Conversely, while pricing strategies such as discounts for long-term subscriptions and promotions tied to other services hold some appeal, they seem to exert less influence on long-term subscription decisions. Users may appreciate such offers, but they are often not the primary motivating factors for continued engagement. Factors like account-sharing flexibility and the frequency of price increases tend to play a minor role in users' decision-making processes. This indicates that while promotional offers can initially attract users, they do not possess the same weight as the overall perceived value of the content Netflix provides.

In conclusion, the relationship among promotional offers, perceived value, and pricing strategies underscores the importance of content quality in subscriber retention. While promotional tools like free trials can successfully attract new users, it is the perceived value derived from the diverse and high-quality content that ultimately influences subscribers' long-term loyalty. This reveals that although pricing strategies and promotions have their place, they are significantly less impactful than the content itself, which remains the key driver of sustained engagement with the Netflix platform.

Social media influencers play a pivotal role in shaping consumer engagement on platforms like Netflix. Their recommendations, often perceived as authentic and relatable, resonate deeply with audiences who trust these personalities to provide valuable insights into trending shows and movies. Influencers leverage their follower base to spark curiosity and FOMO (Fear of Missing Out), driving viewers to explore content they may not have considered otherwise. The power of influencers is magnified when they create content that aligns with their audience's interests, making their endorsements a significant factor in attracting new viewers and maintaining interest in ongoing shows. Additionally, memes related to Netflix content further amplify this effect by capitalising on humour and relatability, creating a

communal experience that encourages users to engage with the platform.

Conversely, factors like friends and family recommendations, while traditionally influential, appear to hold less weight in the current streaming landscape. The vast array of content available on Netflix and its sophisticated algorithm often overshadow personal suggestions. Users increasingly seek out recommendations from social media influencers or through viral trends rather than relying on personal connections. Similarly, while influencers reenacting scenes from Netflix shows can generate buzz, such content may be viewed as less organic and engaging compared to the spontaneity of user-generated memes. This shift highlights a transformation in how viewers discover and engage with content, favouring the dynamic nature of social media over traditional word-of-mouth strategies.

In summary, the influence of social media personalities and user-generated content significantly shapes consumer behaviour in the streaming arena. While influencers and memes effectively drive engagement and foster a sense of community around Netflix content, the traditional power of personal recommendations has diminished. This evolution underscores the growing importance of digital platforms in shaping viewer choices, suggesting that content discovery is increasingly driven by online trends and influencer marketing rather than familial or social circles.

IX. Conclusion

This study dives into what influences Netflix users when choosing their subscription plans, exploring various angles like demographics, subscription types, user interfaces, pricing, and the impact of influencer marketing. We started by emphasising the importance of understanding how personal and financial circumstances shape these decisions. Through our

research methodology, we gathered insights via surveys and data collection, which provided a clearer picture of user behaviour and preferences. Our demographic analysis revealed some interesting trends: younger viewers and those from emerging markets often prefer lower-cost options, particularly the Mobile plan. This choice aligns with their desire for affordable mobile viewing. In contrast, families and individuals with higher incomes tend to opt for premium subscriptions, appreciating the benefits of multiple screens and higher video quality. When we looked at subscription types, we found that budget-friendly plans like Basic and Mobile attract casual viewers. On the other hand, avid streamers are more inclined to invest in higher-tier plans that offer 4K quality and access across multiple devices. The user interface also plays a significant role in retaining users, particularly mobile ones. A smooth, user-friendly experience is crucial for those navigating Netflix on smaller screens, making it easier for them to find and enjoy their favourite content. Pricing is another major factor influencing user choice. Netflix's tiered pricing model accommodates a diverse range of financial situations, allowing users to select plans that meet their needs without sacrificing value. This structure not only caters to current viewers but also opens up upselling opportunities as users' viewing habits evolve. Lastly, our analysis of influencer marketing highlighted how social media figures shape perceptions of Netflix's offerings. Positive endorsements from influencers can significantly boost user engagement and drive subscription growth, especially among younger audiences.

Overall, our findings suggest that Netflix has successfully balanced affordability, user experience, and effective marketing to solidify its position in the market. However, to maintain this leadership, Netflix must keep innovating, refining its pricing strategies, and adapting to the changing demands of its users—especially as competition in the streaming space continues to heat up.

X. references

<https://docs.google.com/spreadsheets/d/1PL8VFi-bnuiE0UqWfVn2b8yU5IgUOKKts> Consumer Behavior
 Leon G. Schiffman Professor Emeritus of Marketing
 and E-Commerce Peter J. Tobin College of Business St.
 John's University, New York City Joe Wisenblit
[Pricing at Netflix - Case - Faculty & Research - Harvard Business School \(hbs.edu\)](#)
[Netflix's UI/UX Design Secrets That Keep You Glued to Your Screen \(realistack.com\)](#)
[Deep Dive: Netflix's Product Design Process \(galaxyux.studio\)](#)
[How Netflix Enhances User Experience with AI Recommendations - growthsetting](#)
[Netflix global pricing strategy, 2022 | S&P Global \(spglobal.com\)](#)
[Analysing Netflix's User Experience - CuriousCore | Seed Your Ambition](#)
[The Netflix Recommender System \(acm.org\)](#)
[How Netflix's Recommendations System Works | Netflix Help Center](#)
[How Netflix's Recommendations System Works | Netflix Help Center](#)
[How Netflix uses psychology to perfect their customer experience | UX Magazine](#)
[Netflix UI/UX Evolution - Seemingly Simple — Amrit Pal Singh | Visual Artist | NFTs | Toy Faces | 3D Art](#)
[Netflix's Social Media Strategy | Socialinsider](#)
[How Netflix affects what we watch and who we are – and it's not just the algorithm \(theconversation.com\)](#)

Board Diversity as a Driver of Firm Performance: Evidence and Insights

Surbhi Jain

Assistant Professor, Aryabhatta college, University of Delhi

Abstract

The present research aims to investigate the impact of board diversity on firm performance. Board diversity is measured by board size, board independence, women representation on board and other variables whereas for firm performance, Tobin's Q ratio is used. The sample for the paper comprised of 500 firms publicly traded on the NSE, as on March 31, 2022. From the NSE 500 firms, all the 159 banks and financial institutions (e.g., Banks, insurance, asset management companies, etc.) were excluded. The study applied the Ordinary Least Squares (OLS) regression method to analyze the relationship between board diversity and firm performance.

The findings of the study will be beneficial for the managers and the top management aiming to restructure their internal system so as to have a long-term effect on the company's performance.

Keywords: Corporate Governance, Firm Performance, Independent Directors, Women directors

JEL codes: G30, G32, G34, G38, G39

1.0 Introduction

One of the topics most commonly addressed in the corporate governance literature is board's independence, which is recognised essential to its supervisory role, and its influence on a range of firm variables relating to performance. This has led to the analysis of variables such as the size of the board, the percentage of independent directors, the separation of the roles of chairman and CEO or the frequency of board meetings (Hermalin and Weisbach, 2003), all of which make up its so-called structural diversity. Board diversity represents both challenges and opportunities for board practice and research. It is possible to distinguish between task-related diversity,

such as educational or functional background, non-task-related diversity, such as gender, age, race, or nationality, as well as structural diversity, i.e., board independence and CEO non-duality. Diversity can have both benefits and costs. Regardless of its effects, diversity has been the subject of active policy making which makes it even more important to understand the role it plays.

More recently, many studies have related the recent financial crisis to governance failures (Berglof, 2011; Van Den Berghe, 2009). Within this context, boards have been criticised for having been unable to prevent the crisis, and this has opened new analysis perspectives. Thus, growing attention has been paid, in both academic and regulatory spheres, to board characteristics that might influence the effectiveness of the decision-making process, such as the age, education, gender or nationality of the board members, grouped under the heading of demographic diversity. The idea is to determine how these characteristics affect board functioning and, in turn, firm performance. An in-depth review by Johnson et al. (2013), while acknowledging the importance of all these factors, draws attention to the need to investigate the reasons for the variety of findings.

The paper contributes in the following ways:

At first, in Indian context, the body of empirical research on corporate governance and board diversity is lacking in a number of ways, which are tried to be addressed with the help of the present research. To begin with, certain studies (Black & Khanna, 2007; Balasubramanian et al., 2010; Sanan, 2016) only offer cross-sectional data regarding the relationship between various CG mechanisms and firm value (FV), which leaves out the temporal effect. As the study employs panel data of Indian listed firms from 2013 to 2022 this provides an in-depth analysis of the impact of mandatory corporate governance regulations on

firm performance.

Secondly, previous research examined the implications of board independence and gender diversity on Indian company performance. However, research on the composite board diversity that takes into account, board gender independence and directors professional and educational backgrounds is seldom ever seen in Indian context. To overcome this shortcoming, this study has employed different characteristics such as board gender, board independence, board professional qualification to measure board diversity.

2.0 Literature Review

Numerous studies have investigated the connection between the size of a company's board of directors and the profitability of the company, and the findings of these research indicate that smaller boardrooms tend to foster more efficient monitoring. The existence of coordination and procedural issues that emerge in the setting of greater team sizes has led to the view that bigger boards tend to display poorer levels of success. This opinion is based on the fact that larger teams face more obstacles in terms of both coordination and procedure. Coles et al.(2008) demonstrated the presence of a negative link between the size of corporate boards and the performance of bigger firms located in the United States. Utilising US company data, a U-shaped relationship was found and two peaks representing the ideal board size were reported. They presented their case, arguing that this U-shaped connection represents a set of optima, 2.0

Literature Review

Numerous studies have investigated the connection between the size of a company's board of directors and the profitability of the company, and the findings of these research indicate that smaller boardrooms tend to foster more efficient monitoring. The existence of coordination and procedural issues that emerge in the setting of greater team sizes has led to

the view that bigger boards tend to display poorer levels of success. This opinion is based on the fact that larger teams face more obstacles in terms of both coordination and procedure. Coles et al. (2008) demonstrated the presence of a negative link between the size of corporate boards and the performance of bigger firms located in the United States. Utilising US company data, a U-shaped relationship was found and two peaks representing the ideal board size were reported. They presented their case, arguing that this U-shaped connection represents a set of optima, levels of success. This opinion is based on the fact that larger teams face more obstacles in terms of both coordination and procedure. Coles et al. (2008) demonstrated the presence of a negative link between the size of corporate boards and the performance of bigger firms located in the United States. Utilising US company data, a U-shaped relationship was found and two peaks representing the ideal board size were reported. They presented their case, arguing that this U-shaped connection represents a set of optima, In accordance with a number of studies, having women director on corporate boards affects the company's financial results, the value of the company, corporate decision-making, and financial reporting procedures (Kaur & Singh (2015) and (Kyaw et al., 2017). According to Burgess & Tharenou (2002), having Women directors on boards may result in more diverse teams, a wide range of viewpoints, and greater corporate performance via better decision-making. Research suggests that having women on corporate boards improves business success (Coffey and Wang 1998; Webb 2004). Nevertheless, there is no relationship found between business success and gender diversity metrics in either the Credit Suisse report (2014) or the Catalyst report (2007). Conversely, Adams and Ferriera (2009) contend that because diverse gender boards have a tendency toward over-monitoring, board gender diversity typically has a

negative influence on financial performance. Diverse boards have a negative impact on corporate performance because they generate a lack of agreement when making decisions, leading to differing perspectives and attitudes (Erhardt et al. 2003).

The impact of women director on business performance in the context of emerging economies like India has not received much attention in research recently. According to Ratnawati (2019), there is less variability in ROA when there are WDs on the boards of Indonesian firms, which reduces risk. While Abdullah et al. (2015) argue that forcing gender equality onto corporate boards might be detrimental to Malayan businesses and economies. Khidmat et al. (2020) demonstrate that diversity in gender, education, and nationality have a favourable and substantial impact on the performance of Chinese enterprises in terms of both accounting and market indicators.

The level of academic proficiency refers to an individual's ability to effectively engage with and demonstrate mastery of academic content and skills. Interpersonal skills refer to the abilities and qualities that an individual possess in order to effectively interact and communicate with others. Analysis skills refer to the ability to critically examine and interpret information or data. The members of the board exhibit a high level of competence in their ability to discern and comprehend subtle nuances and complexities within the context of their responsibilities. These skills are crucial in various ways as the responsibility for fostering the growth and cohesion of the organization's members lies with the board of directors. In addition to promoting the overall welfare of the organisation, the board should strive to cultivate a collective spirit and foster a sense of community among its members, Coleman and Biekpe (2005). The researchers in a separate study endeavoured to investigate the potential correlation between board diversity and organisational

performance. In order to accomplish this objective, the researchers have partitioned demographic diversity into two distinct categories: observable characteristics and non-observable characteristics. The researchers directed their attention towards two discernible demographic distinctions: gender and affiliation with a racial or ethnic minority group. The decision was made to utilise Return on Assets (ROA) and Return on Investment (ROI) as key performance indicators (KPIs). Upon completion of the research study, it was determined that there exists a positive correlation between Return on Assets (ROA) and Return on Investment (ROI), as well as the influential factors of gender diversity and representation of ethnic minorities on corporate boards, (Sanan, 2016).

3.0 Research Methodology

In order to investigate the impact of board diversity on firm performance the study took the sample of NSE 500 firms, as on March 31,2022. These 500 companies were selected on the basis of market capitalisation and is used as the initial data set. The sample period covers a large time span of ten years from financial year 2012-13 to 2021-22. From the NSE 500 firms, all the 159 banks and financial institutions (e.g., Banks, insurance, asset management companies, etc.) were excluded as they have different accounting practices and policies. Also, their corporate governance requirements and performance measures are different from those of non-financial institutions and hence excluded. The sample data for the research is extracted from multiple sources. The Prowess database, which is maintained by the "Centre for Monitoring Indian Economy (CMIE)" which is extensively utilized for firm-level studies in India (Bertrand et al., 2002; Gopalan et al., 2007), was utilized to acquire the majority of the data. Given the literature, for some of the variables we needed to source data from Annual Reports of the sampled companies, downloaded from the official website of these companies. Further, this research uses the board-

level data compiled by Indian Boards Database. It is a joint initiative between the National Stock Exchange (NSE) of India and the Prime Database. The database provides high-quality board-level data of all NSE listed firms

3.1 Variables

Dependent variables

The study employed market and accounting performance indicators as dependent variable. Return on Assets (ROA) and Return on Equity (ROE) measures accounting performance whereas Tobin's Q measures the market performance of a corporate as suggested by (Haat, et al., 2008), (Arora & Sharma, 2016).

Independent variables

Independent variables include corporate governance variables

Control variables

In order to control the regression model, Corporate size and Leverage are added as control variables in the set of independent variables. Table 1 discusses the construction of these variables in detail.

Table 1 : Description of Variables

Variables	Acronym	Measurement/Description
Board Size	BdSize	Natural log of the total number of directors on board
Board Independence	BI	Ratio of total number of non-executive independent directors on board and Total board size
Board Gender Diversity	BGD	Ratio of total number of women directors to total number of directors
Board gender independence	BGI	Ratio of total number of independent women directors to total number of independent directors
Professional boards	BProf	Ratio of number of professional directors to total number of directors
Tobin's Q	Q ratio	The market value of ordinary shares plus total book value of long-term debts divided by net worth (total assets less total liabilities) Ratio of total number of independent directors to total number of members on the audit committee
Corporate Size	FSize	logarithm of total assets
Corporate Age	FAge	Current year- Incorporation year of the company
Leverage	Lev	The ratio of total debt to total assets

4.0 Research Findings

Descriptive statistics are displayed in the table 1 below. The results show that the selected group of firms employ more than eight board members on average with maximum board size of 23 directors. 50.5 percent of the corporate board is constituted of independent board directors. Out of the total board

size, only 15.6 percent are women. However, the percentage of women independent board members is a bit higher, at 19.44 percent. The percentage of highly qualified board members with professional degrees is around 13% only, suggesting that only a few businesses have directors in the board room that possess professional qualification. Tobin's Q ratio measures the financial performance of the firms with mean Tobin's Q ratio is 13.87%.

Table 2: Descriptive Test Statistics

Variable	Mean	Standard Deviation	Median	Mode	Min	Max	Skewness	Kurtosis
BdSize	8.463	3.367	8.000	5.000	3	23	0.613	3.304
BI	0.505	1.920			0.145	1.000	0.595	4.088
BGD	0.156	0.124	0.143	0.000	0	1	1.736	9.046
BGI	0.194	0.187	0.200	0.000	0	1	1.414	6.628

BProf	0.130	0.101	0.125	0.000	0	0.667	0.974	5.669
Q ratio	13.87	20.51	6.795		0.269	243.3	4.581	32.93
FAge	45.53	24.32	36.000	27.000	7	160	1.204	4.755
FSize	4.833	0.572	4.779	4.500	3.314	7.135	0.632	3.599
Lev	0.442	0.170	0.400	0.600	0.00631	0.866	0.484	2.383

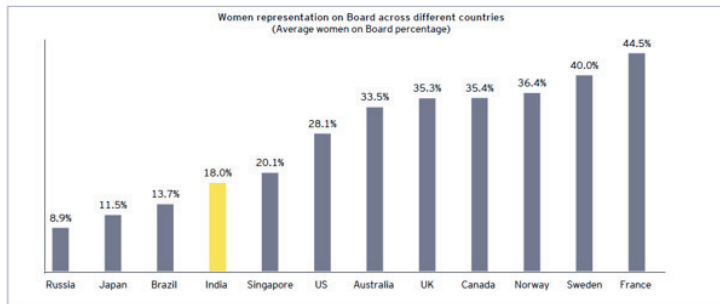
Source: Author's Calculations (STATA 17)

4.1 Woman directors in Indian boards: Current scenario

For centuries, boards of Indian firms have been dominated by males and women representation on Indian corporate boards has been minimal. The preponderance of male directors on Indian corporate boards has a cultural component. Despite the fact, that the Indian Constitution included gender equality in its preamble, Indian society has remained mainly predominantly male, and women involvement in the workforce has been limited.

However, things are changing in today's world, when women empowerment is a major concern. According to foreign law, publicly listed companies in developed countries such as Norway, France, Iceland, Germany, and Belgium must have a minimum of 40% female directors on their boards (Hoel, 2019). Further, nations like Sweden, Britain, and Australia take cautious measures to choose a suitable proportion of female directors for business boards (The Economist, 2014). In response to these circumstances, In India, the Companies Act, 2013

mandates that every publicly listed business that meets certain requirements have at least one woman director on its board and at least one-third of the board must comprise of independent directors. Although it's encouraging to see more women in leadership roles, it's crucial to ask whether or not women directors provide value to corporate boards. Research has shown that gender diversity has a mixed effect on businesses' financial performance. While a vast amount of study has been conducted on advanced nations, emerging economies such as India have not received enough empirical support. According to E&Y report 2022 and Credit Suisse Research Institute the percentage of women serving on Indian boards (18%) is far lower than the average for the world (20.9%) and much lower than that of certain other nations, like Norway (36.4%), Sweden (40%) and France (44.5%) as depicted on Figure.



Source: E&Y report 2022, Credit Suisse Research Institute

Figure:

The present study establishes the fact that, in spite of the mandatory requirement of women director as per companies act and SEBI requirement and the increasing need for women to serve on boards, the current share of female directors on Indian corporate boards is depressing. We note that the largest percentage of women has increased to 17% in 2017 from 5% in 2013; nevertheless, this figure is only valid for a very small number of firm years. This further emphasises the potential patriarchy present in Indian corporate boards.

The percentage of total independent directors has increased from 43% in 2013 to 53% in 2022 over the

years. The ratio of women independent directors to the total women board members shows that, on average, 69% of all female board members are independent. This is a positive development as, among other things, the majority of these female independent directors are seasoned professionals who act as influencers, support the progress of women in the workplace, and push for increased female recruitment.

The study further support the findings that 77.29% companies in 2013 did not have any female directors on the board of Indian companies. The case for women on boards gained momentum when the Companies Act of 2013 mandated the nomination of at least one female director. This shows that the current share of female directors on Indian corporate boards in 2013 was very depressing. However, in 2022 out of 251 companies only 2 companies did not have any female director, whereas 106 companies (42.23%) has only 1 women director, 99 companies (39.44%) has 2 women director and 41 firms (16.33%) has more than 3 women directors on their board. This can be regarded as a positive change and support the progress of women in the workplace, and push for increased female recruitment.

Table 2 below is the covariance analysis of the data, showing correlations between variables and significance (p-value). There is no need for concern regarding the issue of multicollinearity among the factors taken into consideration, as the table demonstrates that the correlation coefficient for all the explanatory variables are relatively small.

Table 3: Correlation Matrix of all the explanatory variables

	Tobin's	BI	BGD	BGI	BProf	FAge	FSize	Lev
Tobin's	1							
BI	0.495	1						
BGD	0.638	0.114	1					
BGI	0.321	0.129	0.308	1				
BProf	0.263	0.099	0.211	0.181	1			
FAge	0.582	0.1171	0.003	0.010	0.104	1		
FSize	-0.233	0.014	0.067	0.097	0.027	0.144	1	
Lev	0.209	-0.105	-0.221	-0.235	-0.127	-0.068	-0.180	1

Source: Author's Calculations (STATA 17)

4.3 Panel Regression Analysis

Using Tobin's Q as the dependent variable in the market-based model, Table 4 displays regression equation with an R-square of 0.156 and a F value of 8.136, both of which are significant at the 1% level of significance. According to Wright (1965), higher coefficients of R-square signify improved results since they show how closely the data match the fitted regression line. This suggests that Tobin's Q variance may be explained by any one of the explanatory factors. The estimated variance of the total error that accounts for each unique effect is shown by the intraclass correlation, or Rho, is 0.536.

Based on Tobin's Q, the results indicate a statistically significant and positive relationship between Board Independence (BI) and company performance. The robustness of our index in forecasting firm success from an accounting-based perspective is thus supported by the regression findings. Board gender diversity (BGD) has a strong positive correlation with the business's performance. Leverage (Lev) appears to have a substantial and positive impact on Tobin's Q, whereas firm size (FSize) has a statistically significant negative impact on Tobin's Q. However, the model does not offer any substantial empirical support for the relationship between Tobin's Q and Professional boards (BProf), Board gender independence (BGI) and firm age (FAge).

Table 4: Parameter Estimates for the Tobin's Q

I.D.V	Tobin's Q (Model 2c) - OLS		
	Coefficients	Robust S.E.	t value
Constant	19.745	0.090	10.077*
BI	0.036	0.340	6.676**
BGD	0.022	0.470	4.386***
BGI	0.013	0.020	0.068
BProf	0.030	1.470	0.247
FAge	0.004	4.340	0.440
FSize	-5.161	0.550	-11.275*
Lev	3.021	0.030	3.114***
R-Square	0.156		
Rho	0.536		
F-statistics	8.136		
N	251		

Source: Author's Calculations (STATA 17)

5.0 Conclusion

The results of the research produced documentary evidence that the percentage of independent board members and firm performance are positively correlated. The findings support the tenets of agency theory, that the effectiveness of managerial monitoring activities is enhanced when the composition of the board is predominantly comprised of independent-outside directors. India places a strong emphasis on the necessity for outside directors as boards are seen as having a submissive function because of their constant proximity to management. In terms of board gender diversity or woman directors on boards, it has been discovered that there is a statistically significant positive association between woman directors and all the three-performance metrics. Hence, board gender diversity has a favourable impact on business performance. The results confirm that having woman directors on boards may result in more diverse teams, a wide range of viewpoints and greater corporate performance through better decision-making. However, the outcomes of the research fails to provide any statistically significant empirical evidences for the relationship between Board gender independence (BGI) and firm performance indicators. As a result, it may be concluded that the performance of the company is unaffected by the presence of more independent women on boards. With regard to professional boards, it is found to be statistically significant with return on equity (ROE) only. Hence, it can be said that having more professional board members has no or little impact on firm performance.

References

- Alkdai, H. K. H., & Hanefah, M. M. (2012). Audit committee characteristics and earnings management in Malaysian Shariah-compliant companies. *Business and management review*, 2(2), 52-61.
- Anas, Mohd, Mohd Tariq Jamal, Md Moneef Ahmad, Shujaat Naeem Azmi, and Md Firoz Alam (2022). The Moderating Role of Board Gender Diversity in Association of Board Characteristics and Firm Value. *Corporate Governance and Sustainability Review* 6: 29-41.
- Bansal, N., & Sharma, A. K. (2016). Audit committee, corporate governance and firm performance: Empirical evidence from India. *International journal of Economics and Finance*, 8(3), 103.
- Beiner, S., Drobetz, W., Schmid, M. M. and Zimmermann, H. (2006), "An integrated Framework of corporate governance and firm valuation", *European Financial Management*, Vol. 12, pp. 249-283.
- Benfratello, L., & Sembenelli, A. (2002). Research joint ventures and firm level performance. *Research Policy*, 31(4), 493-507.
- Biao, Xie, Wallace N. Davidson, and Peter J. Dadalt (2003). Earnings management and corporate governance: The role of the board and the audit committee. *Journal of Corporate Finance* 9: 295-316.
- Brick, I. E. and Chidambaran, N.K. (2010), "Board meetings, committee structure and firm value", *Journal of Corporate Finance*, Vol.16(4), 533-553.
- Carpenter, M.A. and Westphal, J.D. (2001), "The strategic context of external network ties: Examining the impact of director appointments on board involvement in strategic decision making", *Academy of Management Journal*, Vol. 44, pp. 639-660.
- Conger, J., Finegold, D. and Lawler III, E. (1998), "Appraising Boardroom Performance", *Harvard Business Review*, Vol.76, pp. 136-148.
- Dhar, S., Kovid, R. K., & Dharwal, M. (2018). Corporate governance, related party transactions and firm performance: A panel data analysis. *MUDRA: Journal of Finance and Accounting*, 5(2), 1-13.
- Eisenberg, T., Sundgren, S. and Wells, M. T.(1998), "Large Board Size and Decreasing Firm Value in Small Firms", *Journal of Financial Economics*, Vol.48 No.1,pp. 35-44.
- Fama, E. F. (1980). Agency problems and the theory of the firm. *The Journal of Political Economy*, 288-307.
- Fama, E., & Jensen, M. (1983). Separation of ownership and control. *Journal of Law and Economics*, 26, 301-325.
- Fatemi, A., Glaum, M., & Kaiser, S. (2017). ESG performance and firm value: The moderating role of disclosure. *Global Finance Journal*, 38(1), 45-64.
- Fich, E. and Shivdasani, A. (2006), "Are busy boards effective monitors?", *Journal of Finance*, Vol.61, pp. 689-724.
- Frijns, B., Dodd, O., & Cimerova, H. (2016). The impact of cultural diversity in corporate boards on firm performance. *Journal of Corporate Finance*, 41, 521- 541.
- Fuerman, R. D., 2004. Accountable accountants. *Critical Perspectives on Accounting*, 15(6-7), pp. 911-926.
- <https://doi.org/10.1016/j.cpa.2003.03.003>
- Hahn, P. D., & Lasfer, M. (2016). Impact of foreign directors on board meeting frequency. *International review of financial analysis*, 46, 295-308.
- Hasan, S. M., Hossain, S. A., Islam, R., & Hasan, M. M. (2023). CORPORATE GOVERNANCE AND FIRMS' PERFORMANCE: EVIDENCE FROM DHAKA STOCK EXCHANGE. *Indian Journal of Finance and Banking*, 13(1), 28-38.
- Heggede, S. & Jadhav, A. M., 2021. Regulatory Changes and Role of Audit Committee : Indian Evidence. *Indian Journal of Finance*, 15(3), pp. 8-22.

- <http://dx.doi.org/10.17010/ijf%2F2021%2Fv15i3%2F158126> Jensen, M. C. (1986), "The Takeover Controversy, Analysis and Evidence", *Midland Corporate Finance Journal* 4, Pp. 6-32. Jensen, M. C. (1993). The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems. *Journal of Finance* 48: pp. 831-880
- Kaur, P., & Gill, S. (2009). Patterns of corporate ownership: Evidence from BSE-200 index companies. *Paradigm*, 13(2), 13-28.
- Krishnan, J. & Schauer, P. C., 2000. The differentiation of quality among auditors: Evidence from the not-for-profit sector. *Auditing: A Journal of Practice & Theory*, 19(2), pp. 9-25. <https://doi.org/10.2308/aud.2000.19.2.9>
- Kumar, J. (2004). Does ownership structure influence firm value? Evidence from India. *The Journal of Entrepreneurial Finance and Business Ventures*, 9(2), 61-93.
- Lipton, M. and Lorsch, J. W. (1992), "A Modest Proposal for Improved Corporate Governance", *The Business lawyer*, Vol.48 No.1. pp. 59-77.
- Manna, Apu, Tarak Nath Sahu, and Krishna Dayal Pandey (2020). Board size, multiple directorship and performance of Indian listed firms. *International Journal of Economics and Business Research* 19: 111–29.
- McConnell, John, J. & Servaes, H., 1990. Additional evidence on equity ownership and corporate value. *Journal of Financial economics*, 27(2), pp. 595-612. [https://doi.org/10.1016/0304-405X\(90\)90069-C](https://doi.org/10.1016/0304-405X(90)90069-C)
- Mizruchi, M. S., & Stearns, L. B. (1994). A longitudinal study of borrowing by large American corporations. *Administrative Science Quarterly*, 118-140.
- Mohan, Aswathy, and S. Chandramohan (2018). Impact of corporate governance on firm performance: Empirical evidence from India. *International Journal of Research in Humanities, Arts and Literature* 6: 2345–4564
- Morck, R., A. Shleifer, and R. Vishny. 1988. Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics* 20: 293–316.
- Pant, M., & Pattanayak, M. (2007). Insider ownership and firm value: Evidence from Indian corporate sector. *Economic and Political Weekly*, 1459-1467.
- Peng M W, Zhang S and Li X(2007), "CEO Duality and Firm Performance During China's Institutional Transitions", *Management and Organization Review*, Vol.3 No.2, pp.205-225.
- Morck, R., A. Shleifer, and R. Vishny. 1988. Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics* 20: 293–316.
- Pant, M., & Pattanayak, M. (2007). Insider ownership and firm value: Evidence from Indian corporate sector. *Economic and Political Weekly*, 1459-1467.
- Peng M W, Zhang S and Li X(2007), "CEO Duality and Firm Performance During China's Institutional Transitions", *Management and Organization Review*, Vol.3 No.2, pp.205-225.

ESG Reporting and Financial Performance in an Emerging Market

Mr. Sarv Pallav Krishan Nandan

Research Scholar, Department of Commerce, Delhi school of Economics,
University of Delhi, New Delhi, India

Abstract

This study examines the relationship between Environmental, Social, and Governance (ESG) reporting and stock performance in the Indian market, while also analyzing the evolution of ESG reporting practices from 2011 to 2024. Using panel data analysis of Indian listed companies, this research addresses the growing significance of ESG factors in emerging markets. Contrary to some established theories, we find a negative relationship between ESG scores and subsequent stock returns, with this effect being stronger for high-performing firms. This challenges the conventional belief that better ESG performance necessarily leads to improved financial outcomes in the short term within the Indian context. Simultaneously, our analysis reveals a positive trend in ESG reporting quality, with scores increasing by approximately 0.44 points annually, indicating growing emphasis on sustainability practices. The findings suggest that the Indian market may be in a transitional phase regarding ESG integration, where improved reporting practices have not yet translated into positive market valuation. This study contributes to stakeholder and signalling theories in the emerging market context and offers practical implications for corporate strategy, investment decisions, and policy formulation in India's evolving ESG landscape.

Keywords: ESG reporting, stock performance, emerging markets, India, corporate governance, sustainable finance

JEL Classification Codes: G32, G34, M14, Q56.

1. Introduction

1.1 Background of ESG Reporting

Environmental, Social, and Governance (ESG) reporting encompasses a wide range of non-financial information that has progressively gained importance as a measure of a company's sustainable growth and value creation potential. The three pillars of ESG represent different aspects of a company's operations and impact: Environmental factors relate to a company's effects on the natural environment, including carbon footprint, resource usage, and waste management (Eccles et al., 2014); Social factors concern relationships with internal and external stakeholders, including employees, customers, suppliers, and the broader community (Turban & Greening, 1997); while Governance factors address corporate leadership, executive compensation, audit procedures, and shareholder rights (Gompers et al., 2003). Globally, ESG reporting has evolved from voluntary disclosure to mandatory reporting in several jurisdictions, reflecting increased emphasis on ESG data by investors and other stakeholders. International frameworks such as the Global Reporting Initiative (GRI) and the United Nations Sustainable Development Goals (SDGs) have provided significant momentum to ESG reporting by connecting corporate disclosure to universal sustainability objectives (Etzion & Ferraro, 2010).

1.2 Importance of ESG in Global and Indian Contexts

However, in recent years ESG has been gaining traction from a global perspective for various aspects. In the first place, more and more, institutional investors are integrating ESG considerations in their investment decisions. Institutional investors from countries with well developed ESG standards can exert a strong pressure on their investee firms to undertake ESG practises (Dyck et al., 2019). This trend is a reflection of a new paradigm the ESGs are considered as material to the long term financial performance and risk profile of a company. Second, the ESG performance has been related to the corporation's reputation and its relationships with the stakeholders. Basing on Freeman et al. (2010), effective stakeholder management, a vital ESG, is of essence for the long term corporate success. The consistent application of strong ESG practises can improve an organisation's reputation from the standpoint of customers, employees, regulators and communities. Third, there is emerging evidence that the financial consequences of ESG performance accumulate through time. On the other hand, in a meta-analysis over 2000 empirical studies, Friede et al. (2015) stated that there is a preponderance of evidence as to a positive association between ESG factors and corporate financial performance which contradicts the claims in conventional wisdom that ESG investing results in a financial trade off.

In the Indian context, ESG is more important due to additional considerations. Khanna and Palepu (2000) explain that institutional voids prevalent in emerging markets such as India can magnify ESG's importance. For firms in these voids, good governance and stakeholder management become the more important factors. Secondly, the ESG practises of India are correlated with the country's sustainable development agenda. Notably, the Indian government's support for the UN SDGs as well as such policies as the National Voluntary Guidelines on Social, Environmental, and Economic Responsibilities of Business (NVGs) demonstrate the growing relevance of ESG in the national policy framework (Ministry of Corporate Affairs, 2011).

3 Research Objectives and Significance

This study focuses on two primary objectives:

- To analyse the relationship between ESG disclosure scores and stock performance of Indian listed companies.
- To assess the evolution of ESG reporting practices among Indian companies over the period 2011-2024.

This paper's contribution to both theory and practise makes this research important. It is conceptually extended with existing stakeholder theory (Freeman, 1984) and signalling theory (Spence, 1973) to ESG model in the case of an emerging market. This study works to fill the significant gap in the ESG literature, which has thus far been dominated by literature focusing on developed markets (Makhija et al., 2021). And the findings will help us to better understand these ESG factors in the work of different institutions.

For a practical view of this research, the stakeholders gain from its insights. It serves as evidence for Indian companies on the financial implications from ESG disclosure for devising corporate sustainability and disclosure strategies. The results can also be used for policymakers to refine ESG disclosure regulations in such a way that encourages the right kind of ethical practice without harming market efficiency. This study provides insights into relationship between ESG factors and firm performance in the important emerging market of the Indian context for investors, especially those having a global outlook and make investment calls in this market. This research makes methodological contribution by gauging ESG disclosure quality in India in light of local context; ESG reporting in India is relatively nascent. In addition, the use of very strict econometric methods to control for the endogeneity problem, as evidenced by the use of fixed effects models and dynamic panel estimation, is another plus point of this paper as compared to other ESG studies.

2. Literature Review and Hypothesis Development

2.1 Theoretical Framework

The relationship between ESG reporting and firm performance in Indian capital markets can be examined through several theoretical lenses, each offering valuable perspectives on how ESG disclosure might affect a company's stock performance and attract investor interest.

2.1.1 Stakeholder Theory

Freeman (1984) describes stakeholder theory that organizations must realize value for all stakeholders instead of shareholders. This theory then aims to propose that if a firm evaluates the various needs of their stakeholders by integrating the ESG considerations into operations and provides enough transparent information the firm will then have a superior performance time over time than those that do not. Freeman et al. (2010) believe that taking into consideration stakeholders' interests will help improve management and resulting in greater financial outcomes

Given that the corporate governance issue in the Indian context has been a challenge with the stakeholder approach it forms the rationale why ESG reporting can be beneficial in the Indian context (Claessens & Yurtoglu, 2013). Strong relationships with diverse stakeholders, such as employees, customers, suppliers and community, may help companies in speeding up India's constricted business environment. As is logically the case, our research relates to stakeholder theory: If firms provide good ESG disclosure, they would likely be telling investors in some form that management is making an effort to manage stakeholders, something that enhances stock returns and attracts investors.

2.1.2 Signalling Theory

Since the early developments of Spence (1973) in the context of labour markets that implied explaining operator salaries, explanations to corporate disclosure have also been couched in the language of signalling theory. Internal and external parties have information asymmetry, hence in a situation with information asymmetry between the insiders (such a company insiders) and the outsiders, the insiders send signals to the outsiders about quality, this is the theory. In ESG reporting, we can say that voluntary disclosure is the signal of responsibility and best practises of the company.

Since the early developments of Spence (1973) in the context of labour markets that implied explaining operator salaries, explanations to corporate disclosure have also been couched in the language of signalling theory. Internal and external parties have information asymmetry, hence in a situation with information asymmetry between the insiders (such a company insiders) and the outsiders, the insiders send signals to the outsiders about quality, this is the theory. In ESG reporting, we can say that voluntary disclosure is the signal of responsibility and best practises of the company.

2.1.3 Legitimacy Theory

Based on legitimacy theory, developed by Suchman (1995), organisations take continual efforts to meet legitimacy of activities by them within the society where the organisations operate. Disclosure can be used by companies to show compliance with societal norms and obtain the licence to operate in the context of ESG reporting. Since India is rapidly developing country with many social and environmental issues, legitimacy concerns are especially appropriate to Indian firms. According to Mitra and Schmidpeter (2017), in contemporary India, sustainability is becoming a way of life for the increasingly sustainable Indian firms so they have

been accepted not only in domestic markets but also in international markets. This theory has relevance to our research because incorporating more comprehensive ESG disclosure may increase the legitimacy of a company in the eyes of the stakeholders (investors in particular). Such perceived legitimacy has, therefore, the potential to result in superior performance in stocks and greater investor appeal due to legitimacy issues associated with emerging market stocks

2.1.4 Institutional Theory

DiMaggio and Powell (1983) propose institutional theory which explains how the institutions and the activities on which organisations base operate. It has considerable relevance to ESG reporting in India, considering that there are regulations (e.g., BRR under SEBI) in place and their practices are evolving. Ioannou and Serafeim (2015) clearly show how institutional forces have profound consequences for corporate social performance across countries. Because of this institutional mix both traditional and modern, the role of institutional pressures are especially critical in the Indian context (Khanna & Palepu, 2000). The organisations that respond to institutional demands for ESG information in their reports may be more compliant to the evolving profile of domestic and foreign investors expressed in expectations around ESG information, both of which can affect stock performance as well as attract investment.

2.2 ESG Reporting and Stock Performance

The interest of a lot of financial research in the last few years has been the relationship between ESG reporting and stock performance. This section explores empirical evidence on the relationship between this relationship and the Indian case in particular as well as in emerging markets more

generally. In general, most modern cross-sectional studies have discovered a relationship between ESG performance and the return on the stock. Friede et al. (2015) reviewed the results from more than 2,000 studies and concluded that 90% of the available studies showed at least a non-negative relationship between ESG and financial performance, and most studies reported a positive correlation. The existence of such evidence from this meta-analysis is robust and shows that integrating ESG considerations in investment processes is economically advantageous.

generally. In general, most modern cross-sectional studies have discovered a relationship between ESG performance and the return on the stock. Friede et al. (2015) reviewed the results from more than 2,000 studies and concluded that 90% of the available studies showed at least a non-negative relationship between ESG and financial performance, and most studies reported a positive correlation. The existence of such evidence from this meta-analysis is robust and shows that integrating ESG considerations in investment processes is economically advantageous.

Research that focuses in particular on the Indian market, has produced mixed results. Dalal and Thaker (2019) using panel data analysis have found positive relationship between ESG reporting and financial performance of Indian firms. The study indicated that Indian companies with better ESG scores are better financially and performing better, similar to the rest of the world. For India, this provided an opportunity to study how implementing mandatory Corporate Social Responsibility (CSR) spending would affect firm performance by creating sustainability policies in the first place. Bhattacharyya and Rahman (2020) also examined to what extent this regulation affected the firm financial performance and market capitalization based on the CSR expenditure of the firm, and found that firms which have broader CSR expenditure have better financial performance as well as higher market capitalization.

These results are in line with the idea that sustainability oriented policies can create social as well as financial value.

In fact, a more recent paper by Veeravel et al. (2024) relied on a method of moments panel quantile regression to examine whether ESG disclosures signify higher performance for Indian firms. According to them, they found a U-shaped association between ESG disclosures and firm performance: stronger association as performance increases but not if performance is above or below some medium level. That being, the potential benefits of ESG reporting might not exist or may not be uniform, and these need to be investigated further.

In her work Ellili (2022) study the impact of ESG disclosure and the quality of financial reporting on the investment efficiency of India firms. Both ESG disclosures and financial reporting quality improve EF and this study concludes that the latter has a positive impact on firm value and investment efficiency to imply that ESG reporting might improve firm value and stock performance. Nevertheless, further work is needed to establish the ESG–performance association in India. Sharma et al. (2020) show that ESG disclosure practises of Indian companies are positively related to both market capitalization and profitability but with considerable heterogeneity in disclosure practises across the market. Part of the reason could be that such variability in ESG reporting quality can help explain the sometimes weak or contrary relationship between ESG factors and stock returns in India.

2.3 Evolution of ESG Reporting Quality and Measurement

The quality and measurement of ESG reporting are among the most discussed topics in both academic literature and professional practice. This section explores the literature on ESG disclosure indices, challenges associated with ESG reporting in emerging markets, and the evolution of ESG reporting practices.

ESG disclosure indices serve as tools to measure and differentiate the level of ESG information disclosed by companies and sectors. Various initiatives have been established to facilitate ESG reporting, including the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and more recently, the Task Force on Climate-related Financial Disclosures (TCFD). Bloomberg ESG disclosure scores have gained prominence in both business and academic circles. As noted by Refinitiv (2023), these scores are based on the extent of a company's ESG disclosure, with higher scores indicating more comprehensive disclosure. This approach also considers industry-specific ESG metrics, helping to account for sectoral differences in ESG reporting quality.

ESG disclosure indices serve as tools to measure and differentiate the level of ESG information disclosed by companies and sectors. Various initiatives have been established to facilitate ESG reporting, including the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and more recently, the Task Force on Climate-related Financial Disclosures (TCFD). Bloomberg ESG disclosure scores have gained prominence in both business and academic circles. As noted by Refinitiv (2023), these scores are based on the extent of a company's ESG disclosure, with higher scores indicating more comprehensive disclosure. This approach also considers industry-specific ESG metrics, helping to account for sectoral differences in ESG reporting

quality.

The quality and scope of ESG reporting have evolved significantly over time, driven by changing regulatory requirements, investor demands, and societal expectations. Arvidsson and Dumay (2022) analyzed trends in ESG disclosure quality and observed a general improvement over time, particularly in environmental and social disclosures. However, they also noted that the quality of governance disclosures has remained relatively stable, suggesting varying trajectories for different ESG components.

Regulatory changes have played a crucial role in shaping ESG reporting practices. In India, the introduction of mandatory BRR by SEBI in 2015 marked a significant milestone. Abdelmoneim and El-Deeb (2024) studied the impact of similar regulatory changes on ESG disclosure quality in emerging markets and found that mandatory reporting requirements generally lead to improvements in disclosure quality, albeit with variations across different ESG dimensions.

The integration of ESG factors into corporate strategy has also influenced reporting practices. Eccles et al. (2019) traced the evolution of ESG investing and reporting, highlighting the shift from a purely ethical consideration to a core component of business strategy and risk management. This strategic integration has led to more comprehensive and meaningful ESG disclosures by many firms.

However, challenges remain in the evolution of ESG reporting practices. Talbot and Boiral (2018) examined sustainability reports in the energy sector and found evidence of impression management tactics, where companies selectively disclose positive information while downplaying negative aspects. This highlights the ongoing need for robust and standardized ESG reporting frameworks to ensure transparency and comparability.

The study by Veeravel et al. (2024) investigated the relationship between ESG reports and company performance in India using a method of moments panel quantile regression approach. Their results indicate a non-linear relationship, suggesting that the benefits of ESG reporting may vary depending on firm performance. This more nuanced view demonstrates the complexity of ESG reporting and its impacts, particularly in emerging market contexts.

Chouaibi et al. (2022) examined how board characteristics influence the quality of integrated reporting for ESG European companies. While their study was not specific to India, it illustrates how corporate governance mechanisms can affect ESG reporting quality, a consideration that may become increasingly important as Indian companies evolve their governance structures.

2.4 Hypotheses Development

Based on the theoretical frameworks and empirical evidence reviewed above, we develop two hypotheses to address our research objectives.

Hypothesis 1: ESG Disclosure and Stock Performance

H1: There is a positive relationship between the quality of ESG disclosures and stock performance of Indian listed companies.

This hypothesis is grounded in stakeholder theory (Freeman, 1984) and signaling theory (Spence, 1973). High-quality ESG disclosures can signal better risk management and long-term value creation to investors, potentially leading to improved stock performance. While Dalal and Thaker (2019) found a positive relationship between ESG scores and financial performance in India, our study extends this by focusing specifically on the quality of ESG disclosures and their impact on stock performance over time.

Hypothesis 3: Evolution of ESG Reporting Practices

H3: The quality of ESG reporting by Indian listed companies has improved significantly since the implementation of mandatory Business Responsibility Reporting in 2015.

This hypothesis addresses the longitudinal aspect of ESG reporting quality, which has been understudied in the Indian context. It builds on the work of Abdelmoneim and El-Deeb (2024), who found that mandatory reporting requirements generally lead to improvements in disclosure quality in emerging markets. By examining the evolution of ESG reporting practices over time, this hypothesis provides insights into the impact of regulatory changes on corporate disclosure behaviour in India.

3. Research Methodology

3.1. Research Design

This study employs a quantitative approach using a longitudinal panel data structure to evaluate the relationship between ESG reporting and stock performance in Indian listed companies. The decision to adopt a quantitative methodology is aligned with our objectives to empirically examine the relationship between ESG performance and stock returns, as well as to assess the evolution of ESG reporting practices over time. Quantitative methods enable the statistical analysis of large datasets, allowing for the identification of patterns and relationships that might not be apparent through qualitative analysis (Creswell & Creswell, 2017). The research utilizes a longitudinal panel data design, examining a sample of Indian listed companies over a 13-year period from 2011-2012 to 2023-2024. This timeframe is particularly significant as it encompasses the period before and after the introduction of mandatory Business Responsibility Reporting (BRR) by SEBI in 2015, enabling an assessment of how regulatory changes may have influenced ESG reporting practices and

their financial implications.

3.2. Sample Selection and Data Sources

The study sample comprises companies listed on the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) of India. It is important to acknowledge potential limitations of this sampling approach. By focusing on large-cap companies, we may not capture the ESG reporting practices and their impacts on smaller firms, potentially introducing selection bias and limiting the generalizability of our findings to the broader Indian market (Heckman, 1979). The study relies on multiple data sources to compile a comprehensive dataset:

- **ESG Data:** Refinitiv ESG database (formerly Thomson Reuters) serves as the primary source for ESG data due to its comprehensive coverage and established methodology. Refinitiv's ESG scores are based on company-reported data in public sources and cover over 450 different ESG metrics (Refinitiv, 2023). While using a single data provider ensures consistency in ESG scoring methodology across the sample, it's worth noting that ESG ratings can vary significantly between different providers (Berg et al., 2022).
- **Financial and Stock Market Data:** The Centre for Monitoring Indian Economy (CMIE) Prowess database provides financial data, while stock market data is sourced directly from the NSE and BSE. CMIE Prowess is a reliable source for Indian company financials and is widely used in academic research on Indian markets (Khanna & Palepu, 2000).
- **Firm Characteristics Data:** Additional firm-level characteristics, such as size, leverage, and profitability, are collected from the CMIE Prowess database.

3.3. Variables and Measures

This section details the operationalization of key constructs in our study, critically examining the choices made in variable selection and measurement. We discuss dependent, independent, and control variables, providing rationale for their inclusion and addressing potential limitations.

3.3.1. Dependent Variables

Our study employs two sets of dependent variables to capture different aspects of firm performance and investor behaviour in the Indian market context:

- **Stock Performance Measures (Annual Stock Returns):** Calculated as the percentage change in adjusted closing prices over each fiscal year. This measure captures the market's overall assessment of a firm's performance and future prospects (Fama & French, 1993). However, it's important to note that stock returns can be influenced by various market factors beyond a company's ESG performance.
- **FII Measures (FII Ownership Percentage):** Directly obtained from the CMIE ProwessQ database, representing the proportion of shares held by FIIs. This measure provides insights into the attractiveness of Indian firms to international investors.

3.3.2. Independent Variables

Our primary independent variables are derived from Refinitiv's ESG database, which has been widely used in ESG research (e.g., Dyck et al., 2019). However, it's crucial to critically examine the construction and implications of these measures:

1. **Overall ESG Score:** A composite measure of a company's ESG performance, ranging from 0 to 100. While this aggregate score provides a convenient summary measure, it may obscure important variations in performance across different ESG dimensions (Berg et al., 2022).

- **Environmental, Social, and Governance Pillar Scores:** Individual scores for each ESG dimension, also ranging from 0 to 100. These disaggregated measures allow for a more nuanced analysis of the differential impacts of various aspects of ESG performance.

To address potential endogeneity concerns and capture the potentially lagged effects of ESG performance on financial outcomes, we also generate one-year and two-year lagged versions of these scores. While the use of Refinitiv ESG scores provides comparability with other studies, it's important to acknowledge the potential limitations of these measures. ESG ratings can vary significantly between different providers (Berg et al., 2022) and may not fully capture the unique aspects of ESG performance in the Indian context. Future research could benefit from the development of India-specific ESG metrics or the incorporation of alternative data sources.

3.3.3. Control Variables

To isolate the effects of ESG performance on our dependent variables, we include several control variables that have been shown to influence firm performance and investor behaviour in prior literature:

- **Firm Size:** Measured as the natural logarithm of total assets. Larger firms may have more resources to invest in ESG initiatives but may also face greater scrutiny.
- **Leverage:** Calculated as total debt divided by total equity. Higher leverage may constrain a firm's ability to invest in ESG initiatives but could also incentivize better risk management practices.
- **Profitability:** Measured by Return on Assets (ROA), calculated as net income after taxes divided by total assets. More profitable firms may have greater capacity to invest in ESG initiatives.
- **Year Dummies:** To control for time-specific effects and macroeconomic factors.

3.3.4. Moderating Variables

To examine potential moderating effects, we construct interaction terms between ESG scores and firm characteristics (size and profitability). This allows us to investigate whether the impact of ESG performance on financial outcomes varies across different types of firms, addressing calls in the literature for more contextualized understanding of ESG effects (Gao et al., 2015).

3.4. Analytical Approach

Our analytical strategy employs a multi-faceted approach to address the research objectives and test the hypotheses developed in our study.

3.4.1. Panel Data Regression Analysis

Given the longitudinal nature of our data, we employ panel data regression techniques. Our base model for stock returns takes the following form:

$$R_{it} = \alpha + \beta_1 ESG_{it-1} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 Prof_{it} + \gamma_t + \mu_i + \varepsilon_{it}$$

Where:

- R_{it} is the stock return for firm i in year t
- ESG_{it-1} is the lagged ESG score
- $Size_{it}$ is firm size (log of total assets)
- Lev_{it} is leverage
- $Prof_{it}$ is profitability (ROA)
- γ_t are year fixed effects
- μ_i are firm fixed effects
- ε_{it} is the error term

We use firm fixed effects (μ_i) to control for time-invariant unobserved heterogeneity across firms, reducing potential omitted variable bias (Wooldridge, 2010). However, this approach also eliminates the ability to estimate the effects of time-invariant variables, which may be of

interest in some contexts. The inclusion of year fixed effects (γ_t) helps control for time-specific factors affecting all firms, but may not capture industry-specific time trends. The use of lagged ESG scores ($ESG_{i,t-1}$) is an attempt to address potential reverse causality concerns. However, this approach assumes that the effects of ESG initiatives manifest within a one-year timeframe, which may not always be the case (Eccles et al., 2014). Future research could explore longer lag structures or dynamic panel models to better capture the temporal aspects of ESG performance.

3.4.2. Moderating Effects Analysis

To examine potential moderating effects, we introduce interaction terms:

$$R_{it} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 Size_{it} + \beta_3 ESG_{i,t-1} * Size_{it} + \beta_4 Lev_{it} + \beta_5 Prof_{it} + \gamma_t + \mu_i + \varepsilon_{it}$$

While this approach allows us to test for moderating effects, the interpretation of interaction terms in fixed effects models can be challenging, particularly when the interacted variables vary at different levels (firm-level vs. time-variant) (Giesselmann & Schmidt-Catran, 2020).

3.4.3. Robustness Checks

For quantile regression, we estimate:

$$Q_{\tau}(R_{it}|X_{it}) = \alpha_{\tau} + \beta_{1\tau} ESG_{i,t-1} + \beta_{2\tau} Size_{it} + \beta_{3\tau} Lev_{it} + \beta_{4\tau} Prof_{it} + \gamma_{\tau t}$$

Where $Q_{\tau}(R_{it}|X_{it})$ denotes the τ th conditional quantile of R_{it} given X_{it} .

This approach allows us to examine potential heterogeneity in the ESG-performance relationship across different points of the return distribution (Koenker & Hallock, 2001). However, quantile regression in panel data contexts presents challenges, particularly in controlling for firm fixed effects (Canay, 2011). All analyses were conducted using STATA version 14.2. While STATA is widely

used in finance and economics research, it's worth noting that other software packages (e.g., R, Python) offer more flexibility for certain types of analyses and may be preferable for replication and extension of this work.

4. Results and Analysis

4.1. Descriptive Statistics

Table 1 presents the summary statistics for the key variables in our study, providing insights into the characteristics of ESG reporting, stock performance, and FII investment in our sample of Indian listed companies.

Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ESG_score	2,511	46.396	17.798	1.660	92.750
stock_return	19,338	0.296	0.796	-0.767	4.203
fii_ownership	18,205	0.054	0.078	0.000	0.350
firm_size	24,094	22.803	2.165	17.638	28.732
leverage	24,052	0.898	2.391	-8.464	14.276
profitability	24,090	0.034	0.106	-0.530	0.309

The mean ESG score of firms in our sample is 46.396, indicating moderate ESG disclosure scores among Indian firms. Notably, there is considerable variation in ESG scores, ranging from 1.660 to 92.750, reflecting significant heterogeneity in ESG reporting practices. Among the ESG pillars, social scores exhibit the highest average (51.476), followed by governance (45.329) and environmental scores (42.783), suggesting relatively stronger social performance among Indian companies. Stock returns demonstrate substantial volatility, with an average of 29.6% and a standard deviation of 79.6%. This variability (-76.7% to 420.3%) reflects the dynamic nature of the Indian stock market during our study period. FII ownership averages 5.4% of total shares, with a maximum of 35%, indicating significant foreign interest in some Indian firms but also substantial variation across the sample.

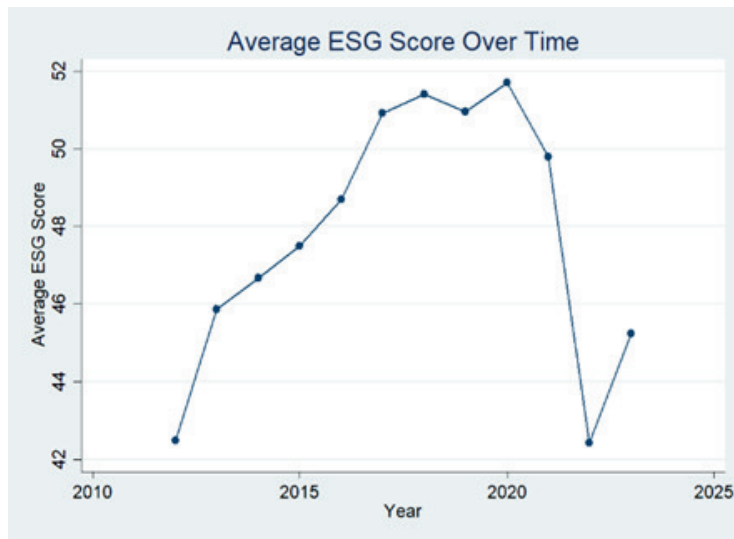
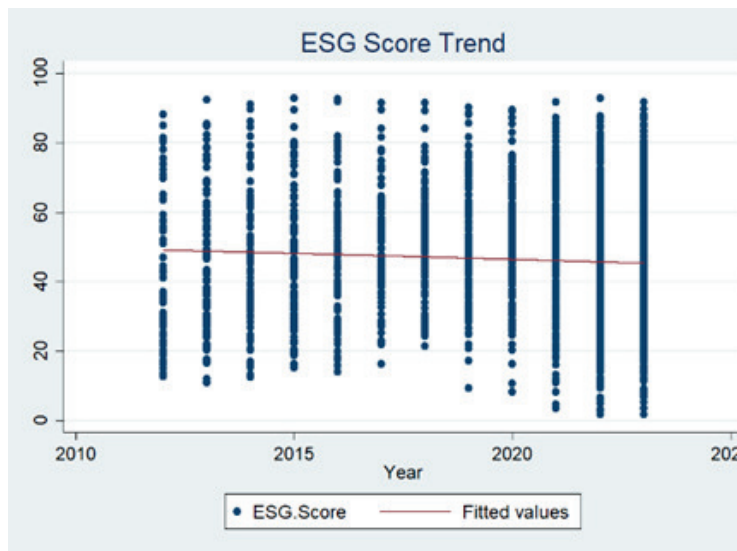


Figure 1: ESG Score Trends Over Time

The time trend analysis of ESG scores reveals a positive and statistically significant trend. This indicates that, on average, ESG scores of Indian firms have been improving over time, suggesting an increasing emphasis on ESG practices and disclosure. This trend aligns with our third hypothesis regarding the evolution of ESG reporting practices.

4.2. Correlation Analysis

Table 2 presents the correlation matrix for the key variables in our study, providing preliminary insights into the relationships between ESG scores, stock returns, FII ownership, and firm characteristics.

Table 2: Correlation Matrix

Variable	ESG_score	stock_return	fii_ownershi	firm_size	leverag	profitabilit
	e	n	p	e	e	y
ESG_score	1.000					
stock_return	-0.070*	1.000				
fii_ownershi	0.298*	-0.024*	1.000			
p						
firm_size	0.307*	-0.063*	0.489*	1.000		
leverage	-0.021	-0.019*	0.029*	0.089*	1.000	
profitability	0.096*	0.161*	0.120*	0.059*	-0.019*	1.000

*Significant at 5% level

The correlation analysis reveals several interesting patterns. First, ESG scores exhibit a negative correlation with stock returns (-0.070), which is statistically significant at the 5% level. This preliminary finding contradicts our first hypothesis and suggests a potential trade-off between ESG performance and financial returns in the Indian context. In contrast, ESG scores show a significant positive correlation with FII ownership (0.298), providing initial support for our second hypothesis that higher ESG scores are associated with increased foreign investment. This aligns with the notion that foreign investors may value ESG performance when making investment decisions in emerging markets.

Firm size is significantly and positively correlated with both ESG scores (0.307) and FII ownership (0.489), suggesting that larger firms tend to have higher ESG scores and attract greater FII ownership. This is consistent with the idea that larger firms have more resources to invest in ESG initiatives and are more attractive to foreign investors. Profitability shows positive correlations with ESG scores (0.096), stock returns (0.161), and FII ownership (0.120), indicating potential synergies between financial performance and ESG practices. These correlations suggest that more profitable firms may have both better ESG performance and higher attractiveness to foreign investors. However, it's important to note that correlation does not imply causation, and these

relationships need to be examined more rigorously through regression analysis, controlling for other factors that might influence these relationships.

4.3. Panel Data Regression Results

Table 3 presents the results of our panel data regression analysis, examining the relationships between ESG scores and our two key dependent variables: stock returns and FII ownership. We compare fixed effects (FE) and random effects (RE) models for both dependent variables, allowing for a comprehensive examination of these relationships while controlling for firm-specific characteristics and time effects.

Table 3: Panel Regression Results for Stock Returns and FII Ownership

Variable	Stock Returns		FII Ownership	
	Fixed Effects	Random Effects	Fixed Effects	Random Effects
L_ESG_score	-0.00429*** (-2.81)	-0.00323*** (-3.42)	-0.0000443 (-0.56)	0.0000228 (0.29)
firm_size	-0.187*** (-4.15)	0.0289** (2.23)	-0.00948*** (-4.04)	-0.00299 (-1.45)
leverage	0.00816 (1.26)	0.00612 (1.06)	-0.0000429 (-0.14)	-0.000140 (-0.46)
profitability	1.343*** (4.83)	1.328*** (6.98)	0.0173 (1.27)	0.0219 (1.58)
2014.year	0.348*** (5.33)	0.335*** (5.21)	0 (.)	0 (.)
2015.year	-0.0144 (-0.22)	-0.0414 (-0.65)	-0.00256 (-0.96)	-0.00309 (-1.13)
2016.year	0.0686 (1.07)	0.0255 (0.41)	-0.000974 (-0.37)	-0.00200 (-0.74)
2017.year	0.485*** (7.51)	0.426*** (6.83)	-0.0000208 (-0.01)	-0.00158 (-0.58)
2018.year	-0.0143 (-0.22)	-0.0933 (-1.50)	-0.00000512 (-0.00)	-0.00225 (-0.82)
2019.year	0.0708 (1.08)	-0.0170 (-0.27)	0.00267 (0.99)	0.000240 (0.09)
2020.year	0.378*** (5.87)	0.277*** (4.66)	0.00326 (1.22)	0.000430 (0.16)
2021.year	0.571*** (8.72)	0.455*** (7.67)	0.00355 (1.29)	0.000158 (0.06)
2022.year	0.239*** (3.57)	0.0976* (1.68)	0.00155 (0.53)	-0.00339 (-1.18)
2023.year	0.629*** (8.82)	0.495*** (8.85)		
_cons	4.884*** (4.20)	-0.722** (-2.18)	0.425*** (6.84)	0.235*** (4.38)
N	1800	1800	1091	1091
r ² _w	0.252	0.235	0.0305	0.0208

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

For stock returns (models 1 and 2), both FE and RE models show a negative and statistically significant relationship between lagged ESG scores and stock returns. The FE model estimates that a one-point increase in ESG score leads to a 0.429% decrease in stock returns ($p < 0.01$), while the RE model estimates a 0.323% decrease ($p < 0.01$). This finding contradicts

our first hypothesis, which predicted a positive relationship between ESG disclosure quality and stock performance.

Firm size exhibits a notable relationship with both dependent variables, but with opposite directions. For stock returns, larger firms are associated with lower returns in the FE model (-0.187 , $p < 0.01$) but higher returns in the RE model (0.0289 , $p < 0.05$). For FII ownership, the FE model suggests that larger firms attract less foreign investment (-0.00948 , $p < 0.01$), while the RE model shows no significant relationship. These contrasting results highlight the importance of model selection in interpreting the effects of firm characteristics.

Profitability shows a consistently positive relationship with stock returns across both FE and RE models (1.343 and 1.328 respectively, both $p < 0.01$). The Hausman test results (p -values of 0.0007 and 0.0000 for stock returns and FII ownership models, respectively) indicate that the fixed effects models are more appropriate than the random effects models for our analysis. This suggests the presence of unobserved firm-specific factors correlated with our explanatory variables, which are accounted for in the fixed effects specification. The models' explanatory power, as indicated by the within R-squared values, is notably higher for stock returns (0.252 for FE, 0.235 for RE) compared to FII ownership (0.0305 for FE, 0.0208 for RE). This suggests that the selected variables explain a larger proportion of the variation in stock returns than in FII ownership, indicating that other factors not included in these models may play a more significant role in determining FII investment patterns.

4.4. Hypothesis Testing Models

4.4.1. Hypothesis 1: ESG Disclosure and Stock Performance

Table 4 presents the results of our analysis testing the relationship between ESG disclosure and stock performance, addressing our first hypothesis.

Table 4: Impact of ESG on Stock Returns (Hypothesis 1)

	Base Model	Non-linear Model	Lagged Model	Pillar Model	Quantile Reg Model
L_ESG_score	-0.00429**	-0.00327	-0.00033		-0.00026
firm_size	-0.187***	-0.188***	-0.182***	-0.190***	0.0293***
leverage	0.00816	0.00819	0.00634	0.00833	0.000175
profitability	1.343***	1.344***	1.361***	1.334***	1.089***
2013.year	0	0		0	0
2014.year	0.348***	0.347***	0	0.348***	0.313***
2015.year	-0.0144	-0.0152	-0.350***	-0.0143	-0.0502
2016.year	0.0686	0.0675	-0.249***	0.0705	0.0505
2017.year	0.485***	0.484***	0.170**	0.487***	0.296***
2018.year	-0.0143	-0.016	-0.332***	-0.0114	-0.106**
2019.year	0.0708	0.0691	-0.254***	0.068	0.00166
2020.year	0.378***	0.377***	0.0796	0.376***	0.122**
2021.year	0.571***	0.570***	0.248***	0.569***	0.215***
2022.year	0.239***	0.239***	-0.0734	0.235***	0.00633
2023.year	0.629***	0.629***	0.336***	0.620***	0.320***
L_ESG_score_sq		-1.1E-05			
L2_ESG_score			-0.00528**		
L_env_pillar				-0.00071	
L_soc_pillar				-0.00229	
L_gov_pillar				-0.00066	
_cons	4.884***	4.885***	5.249***	4.946***	-1.028***

The fixed effects regression results show that lagged ESG scores have a statistically significant negative association with stock returns. The coefficient of -0.00429 (p-value = 0.021) indicates that, on average, a one-point increase in a firm's ESG score is associated with a 0.429% decrease in stock returns in the following year, controlling for other factors. This finding contradicts our first hypothesis, which posited a positive relationship between ESG disclosure and stock returns. It suggests that, in the Indian context, the market may not reward firms for better ESG performance in the short term. Among control variables, firm size is negatively related to stock returns, while profitability has a strong positive

relationship. However, leverage does not show a significant effect on stock returns.

To explore the temporal dynamics of the ESG-stock performance relationship, we examined both one-year and two-year lagged ESG scores (L_ESG_score and L2_ESG_score) in model 2. Interestingly, while the one-year lagged ESG score loses significance in this specification, the two-year lagged score shows a stronger and statistically significant negative relationship with stock returns. This suggests that the market response to ESG performance may not be immediate but manifests more strongly after a two-year lag. To assess potential non-linear relationships, we included a squared term of the ESG score in model 3. The results do not provide evidence of a non-linear relationship between ESG scores and stock returns. The coefficient of the squared term is very small (-0.0000108) and not statistically significant (p-value = 0.871), indicating that the relationship between ESG performance and stock returns appears to be linear in our sample. To understand which aspects of ESG performance drive the relationship with stock returns, we decomposed the overall ESG score into its three pillars in model 4. Interestingly, none of the individual pillar scores show a statistically significant relationship with stock returns. However, the social pillar score has the largest negative coefficient, suggesting that it may be the primary driver of the overall negative relationship between ESG scores and stock returns. Models 5-7 present quantile regression results at the 25th, 50th, and 75th percentiles of stock returns, allowing us to examine how the ESG-stock return relationship varies across different levels of stock performance. The results reveal that the association between ESG scores and stock returns is negative and only statistically significant at the 75th percentile of stock returns. This finding suggests that the negative effect of ESG

performance on stock returns is most pronounced among high-performing stocks. This could indicate that for companies already achieving strong stock market performance, increased ESG expenditure or emphasis may be viewed negatively by the market. Alternatively, it may suggest that better-performing companies allocate more resources to ESG-related activities, potentially reducing short-term returns.

4.4.2. Hypothesis 3: Evolution of ESG Reporting Practices

To examine the evolution of ESG reporting practices over time, we regressed ESG scores on the year variable, controlling for firm characteristics. Table 6 presents the results of this analysis, addressing our third hypothesis.

Table 5: Regression Results for ESG Score Trend

Variable	Coefficient	Std. Error	t-statistic	p-value
year	0.4381404	0.1222482	3.58	0.000
firm_size	4.525457	0.2427541	18.64	0.000
leverage	-0.7710158	0.1458914	-5.28	0.000
profitability	44.13094	4.977147	8.87	0.000
_cons	-958.1721	249.7915	-3.84	0.000

R-squared: 0.1485 Number of observations: 2,504

The results show a positive and highly significant coefficient for the year variable (0.4381404, p-value < 0.001). This supports our third hypothesis that ESG reporting practices have improved over time. On average, ESG scores increased by approximately 0.44 points per year, holding other factors constant. This trend suggests a growing emphasis on ESG practices and disclosure among Indian firms over the study period. Several factors could be driving this trend, including:

- Increasing regulatory pressure and guidelines related to ESG reporting
- Heightened focus on ESG factors by corporate management

- Growing stakeholder pressure, including from investors and customers, for improved ESG outcomes and disclosure

The control variables also show significant associations with ESG scores. Firm size has a positive relationship with ESG scores, indicating that larger firms tend to achieve better ESG performance or disclosure. Leverage has a negative relationship with ESG scores, suggesting that highly leveraged firms might allocate fewer resources to ESG-related issues. Profitability shows a positive relationship with ESG scores, indicating that more profitable companies tend to perform better in terms of ESG scores. These findings align with previous research suggesting that firm characteristics influence ESG performance and disclosure (Udayasankar, 2008; Waddock & Graves, 1997). The positive trend in ESG scores over time also aligns with global observations of improving ESG disclosure quality (Arvidsson & Dumay, 2022) and reflects the increasing emphasis on sustainability in the Indian corporate landscape.

4.4.3. Hypothesis 3: Moderating Factors in ESG-Performance Relationship

To test our fourth hypothesis regarding moderating factors in the ESG-performance relationship, we introduced interaction terms between ESG scores and firm characteristics (size and profitability) in our model. Table 7 presents the results of this analysis.

Variable	Coefficient	Std. Error	t-statistic	p-value
L_ESG_score	-0.0102577	0.0291935	-0.35	0.725
firm_size	-0.2020762	0.0820889	-2.46	0.014
L_ESG_score * firm_size	0.0002033	0.0010619	0.19	0.848
profitability	0.837282	1.17556	0.71	0.477
L_ESG_score * profitability	0.0104604	0.0203332	0.51	0.607
leverage	0.007956	0.0058544	1.36	0.175

R-squared: within = 0.2522, between = 0.0233, overall = 0.0907

Number of observations: 1,800

The results do not provide strong evidence for significant moderating effects of firm size or profitability on the ESG-performance relationship. The interaction term between ESG score and firm size is positive (0.0002033) but not statistically significant (p-value = 0.848). This suggests that the effect of ESG performance on stock returns does not significantly vary with firm size. Similarly, the interaction term between ESG score and profitability is positive (0.0104604) but also not statistically significant (p-value = 0.607). This indicates that the profitability of a firm does not significantly moderate the relationship between ESG performance and stock returns.

These findings suggest that the relationship between ESG performance and stock returns is relatively consistent across firms of different sizes and profitability levels. However, it's important to note that the main effect of ESG score is also not significant in this model, which differs from our base model results. This could be due to multicollinearity introduced by the interaction terms. The lack of significant moderating effects contradicts our fourth hypothesis and suggests that the negative relationship between ESG performance and stock returns observed in our earlier models applies broadly across different types of firms in the Indian market.

4.5. Dynamic Panel Model Results (GMM)

To address potential endogeneity issues and account for the dynamic nature of stock returns and institutional ownership, we employed the Arellano-Bond dynamic panel estimation method. Tables 8 and 9 present the results of these analyses.

Table 7: Arellano-Bond Dynamic Panel Estimation Results (Stock Returns)

Variable	Coefficient	Std. Error	z-statistic	p-value
L.stock_return	-0.0603922	0.0682289	-0.89	0.376
L_ESG_score	-0.0090931	0.0017945	-5.07	0.000
firm_size	0.0620321	0.0114065	5.44	0.000
leverage	0.0066096	0.004629	1.43	0.153
profitability	1.37723	0.1776873	7.75	0.000

Number of observations: 1,792

Wald chi2(15) = 953.76, Prob > chi2 = 0.000

Arellano-Bond test for AR (1) in first differences: z = -4.10, Pr > z = 0.000

Arellano-Bond test for AR (2) in first differences: z = -1.93, Pr > z = 0.054

Sargan test of overid. restrictions: chi2(106) = 233.25, Prob > chi2 = 0.000

Hansen test of overid. restrictions: chi2(106) = 112.44, Prob > chi2 = 0.316

The dynamic panel results for stock returns reinforce our earlier findings. The coefficient on lagged ESG score remains negative (-0.0090931) and is highly significant (p-value = 0.000), supporting our earlier result that higher ESG scores are associated with lower stock returns in the subsequent year. In fact, the magnitude of this negative effect is larger in the GMM estimation compared to the fixed effects model, suggesting that addressing endogeneity concerns strengthens rather than weakens this finding. The lagged dependent variable (L.Stock_return) is not statistically significant, suggesting that stock returns do not exhibit strong persistence over time. Firm size and profitability remain significant predictors of stock returns, consistent with our fixed effects results. The Arellano-Bond test for AR(2) in first differences shows a p-value of 0.054, which is just above the conventional 0.05 significance level. This implies that using a first-order model is not strongly violating the assumption that there is no second-order autocorrelation in the differenced errors, supporting the model's efficiency. The Hansen test of overidentifying restrictions has a p-value of 0.316, failing to reject the null hypothesis that the instruments are valid, thus supporting the overall validity of our GMM specification.

5. Discussion

Using a sample of Indian listed firms, we examine the relationship between ESG performance, stock returns, and FII investment and find several results that challenge conventional theories about ESG outcomes in emerging markets.

5.1. ESG Performance and Stock Returns

Contrary to our initial hypothesis, we observe a negative association between ESG scores and subsequent stock returns. This finding challenges the conventional belief that companies with good ESG scores provide better returns to investors in the short run. The negative relationship is even stronger for firms with better stock return performance, as shown in our quantile regression analysis. This result aligns with some prior research in emerging markets; for instance, Yadav et al. (2016) identified a negative relationship between environmental performance and firm value in large emerging market firms. We extend this finding to the broader ESG context in India.

The absence of positive effects, and indeed the presence of negative effects, can be explained by several factors in the Indian context. First, the costs of implementing ESG initiatives may outweigh the short-term benefits in an emerging market like India. As Bhattacharyya and Rahman (2020) observed, mandatory CSR spending in India has increased costs for firms, which may not be immediately reflected in stock prices. Second, the Indian market may not yet fully incorporate ESG factors into pricing, possibly due to limited awareness or skepticism regarding the long-term value of ESG initiatives among local investors. This aligns with Sharma et al.'s (2020) findings of significant variability in ESG disclosure practices among Indian firms, suggesting a lack of standardization and, potentially, market appreciation

Our findings contribute to the ongoing debate about the financial implications of ESG investments. While most studies in developed markets suggest a positive ESG-performance relationship (Friede et al., 2015), our results highlight the context-specific nature of this relationship. In emerging markets like India, where institutional frameworks are still evolving and market participants may have different priorities, the short-term costs of ESG initiatives might outweigh their perceived benefits, leading to a negative market reaction.

5.2. Evolution of ESG Reporting Practices

Our analysis confirms a significant improvement in ESG reporting practices over time, with ESG scores increasing by approximately 0.44 points per year on average. This trend aligns with global observations of improving ESG disclosure quality (Arvidsson & Dumay, 2022) and reflects the growing emphasis on sustainability in the Indian corporate landscape. However, the lack of positive financial effects associated with this improvement raises important questions in the Indian context. It suggests that while firms are responding to regulatory pressures and global trends by improving their ESG reporting, these improvements may not yet be translating into tangible financial benefits. This disconnect could result from the nascent stage of ESG integration in the Indian market, where investors and other stakeholders are still learning to interpret and value ESG information. The positive trend in ESG reporting quality, coupled with the absence of corresponding financial benefits, might indicate a transition phase in the Indian market. As regulatory requirements strengthen and market participants gain sophistication in ESG assessment, the relationship between ESG performance and financial outcomes may evolve. This perspective aligns with the institutional theory framework, which suggests that organizations adapt to

changing institutional pressures over time (DiMaggio & Powell, 1983).

6. Conclusion

6.1 Summary of Key Findings

This study examined the relationship between ESG reporting and stock performance in the Indian market, as well as the evolution of ESG reporting practices from 2011 to 2024. Our analysis yielded several key findings. First, contrary to our hypothesis and some prior research in developed markets, we found a negative relationship between ESG scores and subsequent stock returns. This negative association was particularly pronounced for firms with higher stock return performance, suggesting that the market may perceive ESG investments as especially costly or unnecessary for firms that are already performing well financially. Second, our analysis confirmed a significant improvement in ESG reporting practices over time, with ESG scores increasing by approximately 0.44 points per year on average. This positive trend reflects the growing emphasis on sustainability in the Indian corporate landscape, driven by regulatory changes, investor demands, and societal expectations. Third, our robustness checks, including dynamic panel analysis, reinforced these findings, indicating that they are not artifacts of endogeneity or model specification. Together, these findings suggest that the Indian market may be in a transitional phase regarding ESG integration. While firms are improving their ESG practices and disclosure, possibly in response to regulatory pressures and global trends, the market may not yet fully value these efforts, leading to a negative short-term financial impact.

6.2 Limitations

While this research provides valuable insights into the ESG landscape in India, it is important to acknowledge several limitations. First, our focus on large, listed Indian firms limits the generalizability of

findings to smaller or unlisted firms. Second, while our 13-year study period is substantial, it may not capture longer-term ESG effects or account for significant structural changes in the Indian market. Third, our reliance on Refinitiv ESG scores may not capture all relevant aspects of ESG performance in the Indian context, and the aggregation of multiple ESG dimensions into a single score may obscure important nuances. Fourth, despite our efforts to address endogeneity through lagged variables and dynamic panel models, we cannot completely rule out all sources of endogeneity. Fifth, our primary models assume linear relationships between ESG performance and financial outcomes, which may not capture potential non-linear or threshold effects. Finally, our quantitative approach, while providing statistical rigor, may not capture the full complexity of ESG implementation and its impacts on firm performance.

6.3 Future Research Directions

Based on our findings and the limitations of this study, we propose several avenues for future research. First, researchers could examine the long-term effects of ESG performance on financial outcomes, extending the timeframe to capture potential delayed benefits. Second, sector-specific analyses could provide more nuanced insights into how ESG factors operate in different industries within the Indian market. Third, developing alternative ESG measures tailored to the Indian context could enhance the validity of ESG assessments. Fourth, investigating non-linear and threshold effects in the ESG-performance relationship could reveal more complex patterns that linear models might miss. Fifth, analyzing the impacts of specific ESG-related policies and regulations in India could provide valuable insights for policymakers. Finally, comparative studies between India and other emerging markets could illuminate the role of country-specific factors in

shaping the ESG-performance relationship. In conclusion, this study offers a comprehensive analysis of ESG performance in India, and the findings reveal the complex interplay between ESG factors, stock returns, and reporting evolution. Our research challenges some generalizations about ESG impact and underscores the importance of a contextual approach to analyzing sustainability in emerging markets. The negative short-term association between ESG performance and stock returns, coupled with the improvement in ESG reporting quality, suggests that the Indian market is likely in a transition period regarding ESG integration. As India continues to emerge as a significant global economic power, understanding the specifics of its ESG landscape becomes increasingly important. This research contributes to that understanding, while also highlighting the need for continued rigorous investigation of ESG dynamics in diverse market contexts.

6. References

1. Abdelmoneim, Z., & El-Deeb, M. S. (2024). BOD characteristics and their impact on the link between ESG disclosure and integrated reporting disclosure quality: A study of Egyptian non-financial firms. *Future Business Journal*. Springer.
2. Arvidsson, S., & Dumay, J. (2022). Corporate ESG reporting quantity, quality and performance: Where to now for environmental policy and practice? *Business Strategy and the Environment*, 31(3), 1091-1110.
3. Berg, F., Koelbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, 26(6), 1315-1344.
- Bhandari, A., & Javakhadze, D. (2017). Corporate social responsibility and capital allocation efficiency. *Journal of Corporate Finance*, 43, 354-377.
4. Bhattacharyya, A., & Rahman, M. L. (2020). Mandatory CSR expenditure and firm performance. *Journal of Contemporary Accounting & Economics*, 15(3), 100163.
5. Bose, S., Lim, E. K. Y., & Minnick, K. (2024). Do foreign institutional investors influence corporate climate change disclosure quality? *International evidence*. *Corporate Governance: An International Review*. Wiley.
6. Chouaibi, S., Chouaibi, Y., & Zouari, G. (2022). Board characteristics and integrated reporting quality: Evidence from ESG European companies. *EuroMed Journal of Business*. Emerald.
7. Claessens, S., & Yurtoglu, B. B. (2013). Corporate governance in emerging markets: A survey. *Emerging Markets Review*, 15, 1-33.
8. Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management*, 37(1), 39-67.
9. Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
10. Dalal, K. K., & Thaker, N. (2019). ESG and corporate financial performance: A panel study of Indian companies. *IUP Journal of Corporate Governance*, 18(1), 44-59.
11. DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160.
12. Dyck, A., Lins, K. V., Roth, L., & Wagner, H. F. (2019). Do institutional investors drive corporate social responsibility? *International evidence*. *Journal of Financial Economics*, 131(3), 693-714.
13. Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science*, 60(11), 2835-2857.
14. Eccles, R. G., Lee, L. E., & Strohle, J. C. (2019). The social origins of ESG?: An analysis of Innovest and KLD. *Organization & Environment*, 33(4), 575-596.

16. Ellili, N. O. D. (2022). Impact of ESG disclosure and financial reporting quality on investment efficiency. *Corporate Governance: The International Journal of Business in Society*. Emerald.
17. Etzion, D., & Ferraro, F. (2010). The role of analogy in the institutionalization of sustainability reporting. *Organization Science*, 21(5), 1092-1107.
- Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3-56.
18. Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Boston: Pitman.
19. Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B. L., & De Colle, S. (2010). *Stakeholder theory: The state of the art*. Cambridge University Press.
20. Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210-233.
21. García-Sánchez, I. M., Hussain, N., Khan, S. A., & Martínez-Ferrero, J. (2020). Managerial entrenchment, corporate social responsibility, and earnings management. *Corporate Social Responsibility and Environmental Management*, 27(4), 1818-1833.
22. Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *The Quarterly Journal of Economics*, 118(1), 107-156.
- Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica*, 47(1), 153-161.
23. Ioannou, I., & Serafeim, G. (2015). The impact of corporate social responsibility on investment recommendations: Analysts' perceptions and shifting institutional logics. *Strategic Management Journal*, 36(7), 1053-1081.
24. Khanna, T., & Palepu, K. G. (2000). Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups. *The Journal of Finance*, 55(2), 867-891.
25. Koenker, R., & Hallock, K. F. (2001). Quantile regression. *Journal of Economic Perspectives*, 15(4), 143-156.
26. Li, D., Cao, C., Zhang, L., Chen, X., Ren, S., & Zhao, Y. (2018). Effects of corporate environmental responsibility on financial performance: The moderating role of government regulation and organizational slack. *Journal of Cleaner Production*, 166, 1323-1334.
27. Makhija, A. K., Kim, S., & Williamson, S. D. (2021). ESG and the pricing of IPOs: Does sustainability matter? *Journal of Corporate Finance*, 70, 102055.
28. Ministry of Corporate Affairs. (2011). *National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business*. Government of India.
29. Mitra, R., & Schmidpeter, R. (2017). *Corporate social responsibility in India: Cases and developments after the legal mandate*. Springer.
- Refinitiv. (2023). *Environmental, social and governance (ESG) scores from Refinitiv*.
30. Securities and Exchange Board of India. (2015). *Format for Business Responsibility Report (BRR)*.
31. Sharma, P., Panday, P., & Dangwal, R. C. (2020). Determinants of environmental, social and corporate governance (ESG) disclosure: A study of Indian companies. *International Journal of Disclosure and Governance*, 17, 208-217.
32. Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, 87(3), 355-374.
33. Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571-610.
34. Talbot, D., & Boiral, O. (2018). GHG reporting and impression management: An assessment of sustainability reports from the energy sector. *Journal of Business Ethics*, 147(2), 367-383.

AI in the workplace: Assessing economic benefits and addressing employee concerns in India and Globally

(1)Shria Aggarwal , (2)Aatika Ahmad , (3)Srishti Garg

BBE, Aryabhatta College

I ABSTRACT

AI is affecting the workspace worldwide, including in India. This research paper is written to show the multifaceted impact of AI on jobs by comparing different industries that study the impact of AI on jobs, especially the displacement of traditional jobs, the creation of new ones, and the shift in work dynamics due to AI. This study aims to provide a balanced perspective on AI emergence in the workspace and the future expected ones.

Objectives of the study include:

- 1.Highlighting the benefits of AI in the workspace such as the emergence of new jobs mainly to manage AI.
- 2.Study about challenges of AI in the workplace, that is the displacement and loss of some manual and repetitive jobs.
- 3.Covering employees' perception of AI to know the behavioral impact of AI.
- 4.Comparison of different industries to examine how specific sectors adopt AI differently and how these variations impact employment.

This paper is based on secondary data which has been published on various

However, this growing adoption has also raised questions about how AI impacts employees in workspaces (mainly behavioral impact). The integration of AI into the workplace has not only changed the nature of work but has also led to a mix of optimism and anxiety among the workforce. Many people fear the need to upskill themselves or the loss of jobs due

LITERATURE REVIEW

Workplace AI scholarship exhibits growing fascination with its socio-occupational impact and economic transformative potential.

McKinsey & Company (2023) states that AI can add as much as \$4.4 trillion to global productivity each year, referring to its potential to transform sectors by freeing up more value-added work. Conversely, similarly, PwC (2023) quotes that not only will there be improvement in operational efficiency with AI, but new employment opportunities and markets will also emerge, particularly in high-skilled areas like machine learning and data science. Hopes are moderated though by reports like the International Monetary Fund (2023), highlighting that nearly 40% of total work globally can be automated and disproportionately fall on low-skilled labor. For India, NITI Aayog (2023) identifies the strategic potential of AI in healthcare, agriculture, and manufacturing, but also concedes an enormous digital divide that can leave behind rural and less literate communities. IIM Ahmedabad (2024) research suggests a two-fold view of Indian IT professionals—though 55% employ AI applications, nearly half of them lack adequate training and hence generate job security fears. Other scholars such as Brynjolfsson and

II.INTRODUCTION

Context of the Study

Artificial Intelligence (AI) has developed as a game-changer at workplaces. Now, from banks and healthcare organizations to manufacturing to retail and countless others, organizations are rapidly transforming AI to accelerate operations, productivity, and innovations. AI is becoming a usual tool for many workspaces to enhance efficiency, productivity, and thus leading to significant economic gain through tools like chatbots, predictive analytics, and robotic process automation.

McAfee (2014) in *The Second Machine Age* similarly warn that if technological progress does not include sufficient reskilling, it can actually increase inequality. Education and geography are likewise critical measures of shaping public perception, according to a World Economic Forum (2020) study, which suggests that AI is seen more favorably in more technologically advanced areas where education facilities are better. All these various perspectives accumulate into the fact that although AI has immense economic potential, its success is greatly dependent on inclusive policies, upskilling, and ethical models of deployment.

METHODOLOGY

The study employs a qualitative research method grounded on secondary collection and analysis of data with Indian and international contexts. Data sources are government reports such as those prepared by NITI Aayog, business reports by organizations such as McKinsey, PwC, and the World Economic Forum, peer-reviewed publications accessed via platforms such as Google Scholar and ResearchGate, and news outlets such as the Economic Times, Forbes, and The Hindu.

Data analysis used thematic analysis that teased out repeated themes of economic opportunities, reskilling needs, and employment loss concerns, and content analysis that waded through word-heavy material to access pattern and trend realization. Quantitative data, i.e., employee uptake percentages, also was processed on percentages and comparison techniques in Excel. The resources used in the study are AI workforce adoption metrics for identifying patterns, surveys and case studies to gain employee sentiments across sectors like IT and healthcare.

ECONOMIC BENEFIT OF AI IN THE WORKPLACE

Among the most important agents of change in the workplace, AI has simplified tasks, boosted productivity, and presented insights that add to the growth of the global economy. Fears of job loss are associated with the creation of AI, but the net effect has been enormous in the way of positives, and

Critical Benefits of AI

1. Productivity Gain

Tools such as Generative AI chatbots including ChatGPT and GitHub Copilot are being used more and more to automate routine work. This helps individuals focus more on challenging and innovative tasks rather than repetitive ones. Worldwide, the impact of AI on productivity is significant, with estimates suggesting it can add \$2.6–\$4.4 trillion annually across industries (McKinsey, 2023). In India too, the future looks bright. AI may add up to 15% to India's GDP by 2035, amounting to up to \$957 billion. Healthcare, IT, and manufacturing will be the sectors witnessing significant expansion, pushing the economy of the country even further.

2. New High-Skill Jobs

While AI will be taking over much of the low-skilled work, it is also revolutionizing high-skilled sectors, changing the very nature of work across industries. Nearly 40% of all occupations globally are at risk of being automated, but employment for AI jobs, particularly cloud computing and data analysis, is booming (IMF).

The Indian job market is also seeing this trend with a 65% increase in salaries for skilled workers. In addition, R&D and hi-tech industry sectors are witnessing pay rises of up to 62%. The shift is generating new upskilling opportunities as the uptake of AI drives the need for highly skilled skills, thereby providing more career stability.

3. Rise in innovation and new markets

Not just improving upon current processes, AI is re-making whole industries by crafting goods and services for infinitesimal niche markets, building new markets and triggering fascinating innovation elsewhere. In India, to cite one instance, the BPO industry is shifting from manpower-intensive operations to Knowledge Process Outsourcing

(KPO) involving high-end activities like market research and data analysis. Large multinational firms such as Infosys are applying AI for improvement along with tremendous investment in training and development programs to efficiently transfer the technology. Small and medium industries are making jobs lower level for automation so that human intelligence may be leveraged for more intricate and customer-based work. Initiatives of the government such as Skill India are providing employees' skills matched according to changing demands of AI-powered industries such as healthcare, financial analysis, and electronic marketing.

4. Inclusive growth:

AI has the capability to bring inclusive growth to the world and estimates its contribution to the global GDP in the next decade to be another \$7 million. It is providing precision agriculture through its methods and drones, maximizing the use of inputs and production outputs. It is enhancing diagnosis rates, automating processes, and providing telemedicine facilities, particularly in rural regions, in the health sector. The industry is being supported by AI-based automation, particularly by initiatives such as "Make in India," which aim to increase production and make India a world manufacturing center. In education, AI platforms are enhancing access to learning and providing skills that can make people employable. Additionally, AI is opening up new pathways for women entrepreneurs to transcend conventional market obstacles and establish their companies transnationally and thus more inclusive economic development.

Industry-Specific Innovations

In medicine, AI facilitates easier and improved-quality diagnosis, automates processes, and enhances distant consultation through telemedicine. AI lessens waiting times for patients by quite some substantial amount of time through improvement of hospital planning for resources and health care services delivery as a whole. In agriculture, AI technology in the form of

monitoring systems, sensors, and drones is utilized by farmers to maximize the use of available water sources for optimal return from crops. CropIn and Fasal are some of the companies leading in utilizing data-based solutions to enable farmers to take well-informed decisions, making them more profitable.

Productivity increases at operation and manufacturing cost reduced by application of AI. Predictive maintenance by AI reduces downtime to less than 50% or more and pushes checks to automation even on behemoths like Tata Steel. It results in high-quality outputs with reduced wastage. At the infrastructure level, traffic density and power consumption reduce with AI-enabled smart city initiatives, for example, in Pune. Construction of infrastructure can also be automated to reduce costs by up to 25% and accelerate the schedule by up to 20%.

Retail is complemented by AI as a personalized shopping experience with 20–30% sales uplift. AI is also able to enable basic inventory forecasting, with the related less overstock and more availability of products, thereby improving conversion rates on channels like Flipkart. AI enhances demand forecasting for the FMCG industry, with approximate cost savings of 15% in supply chains and better delivery of products. These companies like Nestlé and Hindustan Unilever have adopted AI-driven solutions to automate their processes so that they can remain competitive in the business.

CASE STUDIES

Case Study 1: Apollo Hospitals (India) Use AI in Healthcare

Overview:

Apollo Hospitals is one of the largest healthcare companies in India. In recent times, it has come up with the use of AI for assessing cardiovascular diseases post its tie-up with Microsoft. It calculates heart disease through a combination of machine learning and a complex system. It was derived

based on data gathered for ten years for individual patients.

The developments include:

Early detection and prevention: It analyzed a set of variables such as the patient's demographics, lifestyle choices, and medical history (to predict whether he/she will suffer from cardiovascular diseases). Therefore, doctors can trace patients at risk and prevent it right from the start. **Increased diagnostic accuracy:** The AI model's accuracy for the identification of high-risk patients is more than 20% as compared to conventional diagnostic procedures that lead to a better health result. **Increased accessibility:** This gadget allows telemedicine professionals to provide sophisticated risk assessment services with minimal inequities of health care access.

Economic Implications

Reduced health care costs: It eliminates expensive interventions and treatments and saves both the health care for the patient and the providers' money because the device allows early diagnosis procedures. **Increased efficiency in operations:** Doctors have ample time to provide care and make decisions with patients as AI performs most analyses. The model can be extended to any other chronic diseases, and this has great scope for betterment in the long term about health benefits as well as economic merits.

Case Study 2: Amazon (Global) – AI in Retail and Logistics

Overview:

The world's leading e-commerce company, Amazon has used AI in all of its operations and functions to be more efficient and deliver more value to customers. AI is applied in logistics and warehouse automation for optimizing workflows and increases profitability.

Major Innovations

- 1. Recommendation based on Personalization:** Amazon relies on AI algorithms to analyze customer behavior and preferences in order to make recommendations for products according to

- individual needs. Personalization in this manner boosts sales significantly, with individualized recommendations accounting for more than 35% of total sales in Amazon. Other than recommendations, robots based on AI are employed to manage inventories, fill boxes, and conduct warehouse tasks. These robots support human employees, enhancing the entire speed and efficiency of the supply chain.
- Economical Logistics:** AI plays a significant role in route optimization of deliveries where the products are transported in the most economical and time-effective manner. By reducing transit time and improving delivery precision, AI helps reduce logistical costs. During holiday seasons or periods of peak demand, AI handles timely delivery even with increased volume without affecting customers' satisfaction while operational expense stays in check.

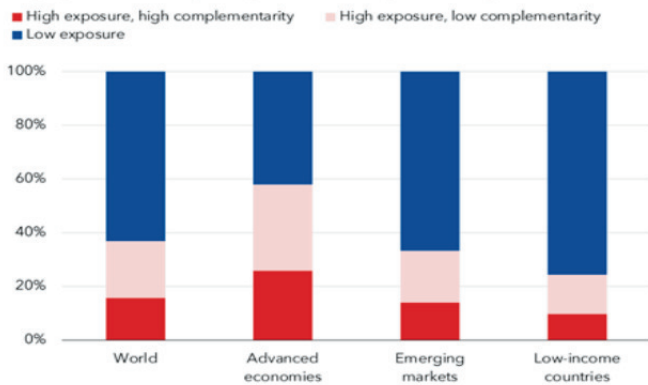
Impact on Economy

Amazon's increased revenues can partly be attributed to the proper utilization of AI technology, which enhances the satisfaction of the customers, augments fun, and consequently contributes to more revenues and profits. AI contributes towards cost-cutting as well, particularly in automating operations which cut manpower expenditures and enhance efficiency in running operational inefficiencies at distribution warehouses. In addition, Amazon's use of scalable innovation with artificial intelligence provides additional opportunity for expansion in all its operations across the world. These advances benefit not just Amazon, but also more generally impact the retail and logistics industries, establishing new benchmarks for technology integration and efficiency.

AI's impact on jobs

Most jobs are exposed to AI in advanced economies, with smaller shares in emerging markets and low-income countries.

Employment shares by AI exposure and complementarity



Source: International Labour Organization (ILO) and IMF staff calculations
Note: Share of employment within each country group is calculated as the working-age-population-weighted average.

IMF

AI's Impact on Jobs. Source: IMF

DISADVANTAGES OF AI IN THE WORKPLACE

AI also has some disadvantages with numerous benefits in a nutshell where there are many implications between staff for job losing matters, requirement of immediate re-skilling or enhancement.

Global Employees' Reaction on AI

One of the significant drawbacks of AI is the concern in Indian employees (employee sentiment). This point can be verified from a study carried out by ADP which was to understand the reaction of the global employees towards AI. Results following were obtained: 85% of employees perceive AI as a threat which will affect their work, which is an enormous figure and reflects that it is a cause of serious concern.

AI in various industries and adverse effect

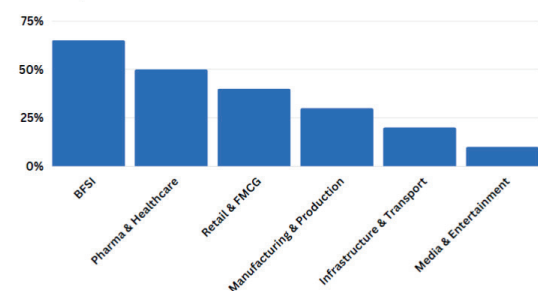
A digital survey indicated strong AI uptake in pharma & healthcare (52%), then FMCG & retail (43%). Manufacturing (28%) was behind, while infrastructure & transport (20-22%) and media & entertainment (10-12%) had lowest adoption.

Effect across industries:

AI adoption in various industries has reflected a mixed bag with both promise and pitfalls.

In Healthcare (52%), AI implementation can be an option but is a primary reason for job displacement of assistants and technicians in the sector. In Retail & FMCG (43%), automation aids in accelerating warehouses and supply chains but is a cause of concern regarding fear for jobs. Small enterprises, not being able to implement AI technology, are falling behind. In Manufacturing (28%), AI (robots) increases efficiency, but they're also stealing jobs that rural workers depend on. It has not yet been implemented on a large scale but can impact the livelihood of the workers in the future. The Infrastructure and Transport (20-22%) industry is also under threat as transport automation, such as AI-based traffic management and self-driving cars, is posing a serious threat to drivers, traffic managers, and logistics personnel. It is yet not implemented in India by a vast percentage. Finally, in Media & Entertainment (10-12%), AI is occupying the creative roles replacing human genuineness as it saves time in scripting and editing. These are still not implemented at a massive rate but with AI modifications, it is a tremendous danger to humanized creativeness.

Adoption of AI in Indian enterprises across sectors



Adoption of AI in Indian Enterprises across Sectors. Source: Research Gate

Key challenges and problems of AI

AI adoption has also created a series of problems related to work and social justice. Job Displacement is a serious issue as automation of industries in manufacturing, customer services, logistics, etc.,

can lead to job displacement of low-skilled workers. Skill mismatch is another serious issue where there is a disjunction between the skills needed by the AI-based industry and the existing talent pool, thereby necessitating upskilling to stay employed. Furthermore, Socioeconomic Inequality is also on the rise as AI is deepening the digital divide and with the benefits of AI adoption not being proportionally distributed across the various socioeconomic groups, thus increasing the existing socioeconomic inequality.

IMPACT GLOBALLY

The McKinsey report uncovers that AI automation could displace 15% of global workers (400 million employees) by 2030, whereas 50% of current work activities utilized as living for the majority will be automatable. This disruption will force 75 million workers to shift to entirely new jobs (job displacement). While 8–9% of fresh jobs might arise, the transition will cause mass unemployment resulting in economic imbalance as a large demand for reskilling programs will be created. This is the worldwide figure and disruption will be mainly caused by emerging nations.

CASE STUDY

AI Impact on Job Displacement in India's IT Sector

Currently, it employs 5.4 million and contributes 8% to India's GDP; AI adoption brings in significant disruptions in the sector.

Key Impacts:

The development of AI has caused millions of jobs to be lost, especially in tedious work such as coding, testing, and maintenance, which is increasingly being done by machines. Infosys is one such corporation that has applied AI in its business, thus displacing hundreds of mid-tier professionals. This shift has also been responsible for an ever-widening skills gap, where demand for AI and data analytics skills increases while most of the workers lack skills to meet such emerging

demands, leading to job loss. The extensive economic implications are largely seen in urban areas, where higher unemployment is contributing to reduced consumer spending, affecting overall economic performance and stability.

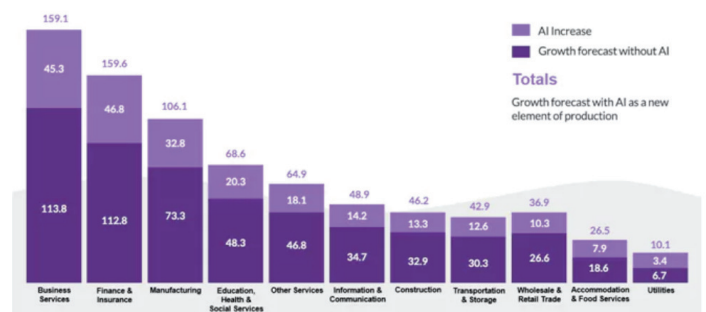
Employee Sentiments:

A study by IIM Ahmedabad revealed that 55% of IT employees use AI tools, but 48% lack proper training, fueling anxiety over job security.

Conclusion:

AI integration in India's IT sector has streamlined operations but caused job displacement and widened skill gaps. **Reskilling initiatives and proactive policy measures are necessary to support workers during this technological shift and mitigate adverse economic impacts.**

The effect of AI on the growth of different industries



The effect of AI on the Growth of different industries. Source: Novelvista

ANALYSIS OF INDUSTRY-SPECIFIC DIFFERENCES:

FOOD AND BEVERAGE INDUSTRY

The F&B industry is a major part of the economy, including farms for growing crops and animal husbandry, packaging food, and selling food and snacks to people. AI is also a major part of the industry. It helps in decision-making related to sustainability and food quality. AI helps track water and energy to create plans of less wastage and greater efficacy.

How AI is Transforming the Food Industry

AI is transforming agriculture and the food industry by way of more efficient farming techniques, where it optimizes operations by analyzing data to optimize water usage, application of fertilizers, and climate control. Not only does this improve crop yield but also keeps nutritional standards in check. AI also contributes to better food security by way of weather and soil prediction, improved pest control, and enabling crops to grow that are more disease-resistant, thereby increasing agricultural produce.

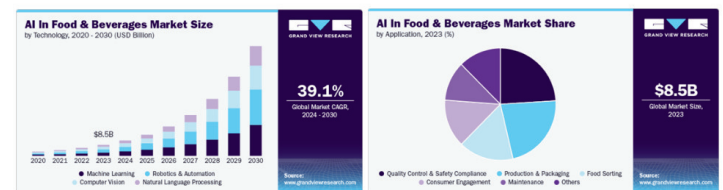
On the production and quality control side, AI guarantees reduction of food waste and sustainable development through effective production for the demand of the world's ever-expanding population. Moreover, AI enables personalized customer experiences in the food sector because fast food companies use AI to provide voice-enabled recommendations and comments with responses approaching instantaneity. Lastly, AI fuels innovation by accelerating product development speed. It studies consumer taste and behavior to enhance recipe formulation and flavor enhancement, thus new products meet shifting consumer tastes suitably.

Challenges of AI in the Food Industry

Data protection is equally given due importance in the use of AI due to the fact that data needs to be safeguarded against theft and corruption; wrong or faked data can result in wrong analysis and ill-informed decisions. Furthermore, AI systems need to be updated continuously to continue being effective and compatible with emerging technologies and at times need human control to allow smooth operations. Skill gap is one of the largest challenges since the majority of companies lack in-house AI expertise and are forced to hire outside experts, increasing operation costs and hindering adoption. Coupling AI projects with clearly defined organization goals is also essential for effective results since poor planning can result in misaligned and wasteful projects. As AI reduces errors and makes work more efficient, it similarly

impacts the labor force to some extent by filling certain job places, thereby reshaping the workplace and necessitating laborers to adjust their work and skills.

By balancing innovation with ethical implementation and workforce reskilling, AI can revolutionize the food industry while addressing its challenges.



Market report of AI in the Food and beverages industry. Source: Grand View Research

CASE STUDY: where AI is replacing employees job

White Castle has adopted **AI voice recognition** in its drive-thrus to streamline operations and reduce employee workload. Automating order-taking means workers are either reassigned to other tasks or fewer staff are needed, cutting labor costs.

The benefits of AI in the restaurant industry are that they can take the burden of employees to focus on tasks like food preparation and customer interaction, and enhance the accuracy of orders by providing the customers with extra time to finish their decisions. There are downsides as well. Research reveals that 70% of orders through AI require off-site intervention by humans and lead to inefficiencies. In others, such as McDonald's, the same systems were removed due to complaints from customers and mocking of AI voices. In addition, growing applications of AI have raised concerns among employees about job loss, thereby making the implementation of AI in these sectors even more difficult.

SoundHound, another AI provider, offers voice recognition with an option to connect to human staff, ensuring customer comfort. This balance allows businesses to speed up services without

alienating patrons.

Case study: AI helping Mondelez run the company more efficiently

Nestlé's Chip Ahoy and Oreo manufacturer, Mondelez, utilizes AI to develop new snack recipes that meet evolving consumer preferences. AI automates and accelerates the recipe process by refining products to customer tastes and limiting recipe choices to speed up market testing. Still, despite the efficiency of AI, Nestlé emphasizes the importance of human touch, particularly through the use of human testers to ensure product recognition and credibility. Food scientists work together with AI tightly to refine recipes before approval. This AI-driven innovation has led to successful product launches like gluten-free Oreos and Chips Ahoy new flavors, allowing Mondelez to stay competitive in an evolving market with less effort in product development.

INFORMATION AND TECHNOLOGY INDUSTRY

The IT industry has been pioneering in the adaptation and use of AI. It has transformed the IT industry in its entirety from automating routine jobs to even predicting trends and making decisions based on data. AI in IT has generated intelligent machines that are capable of performing difficult tasks with the minimum support from humans.

It can facilitate sophisticated system programming and automation, automate repetitive operations, and offer predictive analysis.

Use cases and application of AI in IT

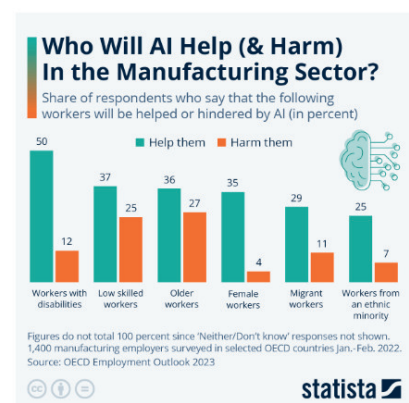
AI is transforming numerous industries by making processes more efficient and accurate in a variety of fields. AI assists in code development, bug tracking, and requirement analysis in Software development and streamlines the software development process. For data analysis, AI handles big data and provides insight to be used in decision-making, forecasting trends, and anomaly detection. In Cybersecurity, AI handles threat detection and response to protect from cyber-

attacks. Customer service is also being enhanced by virtual assistants and AI-powered chatbots, with 24/7 support and personalized services.. In IT operations, AI helps the IT administrators deal with complicated and dynamic data, saving time and effort. Finally, in Fraud detection, AI detects suspicious activity, taking care of them to minimize losses and gain the trust of the customers.

Impact of AI on IT companies

AI is not only changing the job market and skills in demand but also changing the way businesses operate. On one hand, it is creating new jobs that were non-existent before like data scientists, ML engineers, and many more. On the other hand, it has led to job displacement in certain areas while automating routine tasks.

AI has led to the evolution of job skills. Professionals with knowledge of AI and its proper application in business are in high demand. They should have deep knowledge of AI, and its proper application in solving problems, innovating, and creating new opportunities. One should also be able to navigate the connection between AI and human behavior, like making an app user-friendly and socially responsible.



Reaction of employees in the manufacturing sector. Source: Statista

Future trends of AI in the IT industry

The pace at which applications of artificial intelligence (AI) in the IT sector are being developed is unparalleled. Artificial intelligence is an ever-developing field.

Chatbots, for example, are generating new waves of innovation by creating new, new material, which gives businesses a never-before-seen degree of possibilities. In the next couple of years, AI is going to become a big driver of the economy, with PwC putting the value that artificial intelligence is expected to increase the world economy by at a whopping \$15.7 trillion by 2030. Another recent trend is intelligent automation, where automation and AI technology are integrated to undertake complex tasks and make informed data-driven decisions. One of the other trends gaining momentum is ethical AI, where more emphasis is being laid on ensuring AI systems utilized ethically, transparently, and equitably. Some of the other trends that need to be kept in mind are increasing data privacy concerns in AI technology, increasing AI-powered IoT devices, and increased use of AI in cybersecurity. A case in point is the EU AI Act, a proposed European Union law that classifies AI systems based on risk, with a special focus on transparency, human control, traceability, and establishing an international standard for regulating AI.

Case study: AI use in the IT industry

Due to increased costs, companies are always opting for cost reduction and tend to depend on labor cost cuts. There is always a broad skepticism that AI generates higher returns and hence increases unemployment.

Thomas Bodenski, COO of financial software company TS Imagine, believes in cost reduction, too. They believe that hiring new staff will be costly when they can use new AI-based software. This reduces the time employees spend on repetitive tasks like filtering emails. AI has reduced the time taken and saved the employees' efforts. This also prevents the company from hiring more employees for the same task, which increases the cost.

CIO Jim Siders, also said that AI software was introduced not to replace people but to increase efficiency in the work.

THE INFLUENCE OF EDUCATION AND REGIONAL CONTEXT ON PUBLIC PERCEPTIONS OF AI

AI is revolutionizing industries, reorganizing job markets, and transforming the daily lives of people. But with continuous improvement in AI, it gives rise to several questions about the effects of this innovation on society. In general, there are two important factors determining public perception regarding AI: education and region. The present research study examines the extent to which educational access and regional technological conditions impact people's perceptions of AI. We investigate deeper trends in the perceptions of AI from across the globe, and regional differences through case studies from some of the world's most well-respected educational institutions.

FACTORS INFLUENCING PERCEPTIONS OF AI

Public perception of AI is influenced by education and region, and significant factors in understanding its benefits and challenges.

In the education industry, people's awareness and knowledge of AI are strongly determinative of their attitudes towards AI. People with higher knowledge of AI are more positive, while lower levels of education cause fears of job loss and privacy intrusion. The need for AI skills is growing fast, with companies to value these skills by 2027, as reported by the World Economic Forum. Also, the necessity of reskilling initiatives is emerging as a need, as automation in high-risk industries such as manufacturing could replace as much as 35% of employment by 2030, as stated by the OECD.

Geographically, the extent of technological infrastructure ranks as a crucial factor in adopting AI. The economies of countries like the U.S., Japan, and South Korea perceive AI as an engine of innovation attributed to strong R&D environments.

Conversely, culture differs with respect to perspective; countries like Japan are accepting of AI positively and others with such late adoption like rural India and parts of Africa worrying about employment loss and data privacy.

Case Studies: Prestigious Institutions Shaping the Perception of AI

Case 1: Massachusetts Institute of Technology (MIT), USA

MIT is quite renowned for leading-edge research in and out of classrooms about artificial intelligence. The Institute offers undergraduate as well as graduate degree programs specializing in AI, machine learning, and robotics. In terms of **AI and Ethics**, MIT involves ethics in AI studies, with topics including privacy and bias, loss of jobs, etc. It encourages one to think rationally about social impact. The **Growing Demand** for AI is evident, as the enrollment of students in AI courses at MIT has increased by 35% in the last five years, reflecting global demand for AI expertise. Regarding the **View of AI**, in general, students at MIT feel AI solves world problems, such as climate change and healthcare, but there always remains an issue of job loss and increasing gaps.

Case Study 2: Indian Institute of Technology, India

IITs are some of the best institutes in India offering quality AI courses at IIT Bombay and IIT Delhi. **AI Programs** at these institutes provide computer science degrees with a focus on AI, in collaboration with industries to solve real-world problems, especially in the health and agricultural sectors. The **Growing Need for AI** is evident, as NASSCOM has stated that the demand for AI in India has grown at 22% a year. It is said that more than 35% of IIT computer science students specialize in AI. When it comes to the **Perception about AI**, for students at IITs, AI is a promising innovation; however, doubts prevail that automation will further send traditional industries in rural India into colly-pow.

Global and Indian Trends in AI Education

Global Trends

Stanford University: Stanford AI programs, targeting both technological advancement and ethical issues, have acquired 35% more students. This shows the rising demand for AI education.

University of Oxford: Master's in Oxford deals with the societal implications of AI so that the students are well prepared to handle the opportunities and challenges that AI offers.

University of California, Berkeley: UC Berkeley's AI programs are closely interrelated with Silicon Valley, which affords students very real-world applications of AI within the areas of autonomous vehicles and robotics.

Trends in India

Rise of AI Courses: There is growth in AI course enrollment among Indian students in response to growing online education firms such as upGrad and NIIT, therefore, making the education of AI more accessible.

Government Initiatives: The Indian government has initiated its Skill India plan to bridge this education gap, focusing particularly on AI skill training, more so in rural areas.

Exceptions in AI Perception: Regional and Cultural Differences

Education and Infrastructure shape AI perception in predictable manners, but a few regions bring exceptions:

Asia-Pacific (Japan, South Korea, China): AI is integrated into most of the industries such as robotics and healthcare in Japan and South Korea. There is optimism in this region. However, in China, the high-tech AI landscape has mixed feelings. It is mainly due to privacy and surveillance issues.

Africa: Most African countries lack AI education. However, Kenya and Nigeria, among other emerging tech hubs, are positively framing AI in the eyes of young people who now view AI as a way to

boost economic development.

Middle East: Countries like the UAE and Saudi Arabia are using AI to spur economic growth in areas such as energy and healthcare, but the fears of AI in traditional sectors like oil and gas remain.

CONCLUSION

AI has transformed workspaces: improving efficiency, creating innovation, and providing economic benefits. What it can do in India is spectacular; contribute to the GDP and transform agriculture, healthcare, and IT sectors. However, there are aspects of job displacement, lack of skill level required, and ethical issues concerning its use. Given this scenario, recommendations for sustainable growth include : To address the challenges posed by AI, several measures need to be implemented. **Reskilling Programs** are essential, involving large-scale skills building regarding AI-specific skills among the working class. Furthermore, Equity in AI Adoption needs to be given precedence by closing the urban-rural digital divide to ensure inclusivity. Finally, Ethical Frameworks are important, with policies guaranteeing transparency and equity in AI deployment. This balanced strategy will ensure maximum benefits of AI while minimizing its negative impacts, making a positive contribution to India's workforce and economy.

REFERENCES

- 1.ADP Research Institute. (2023). Global employee sentiment on AI impact. Retrieved from <https://www.adpresearch.com/worker-sentiment-ai-impact/?utm>
- 2.Economic Times. (2024). AI adoption in key Indian sectors touches 48% in FY24. Retrieved from <https://m.economictimes.com/tech/technology/ai-adoption-in-key-indian-sectors-touches-48-in-fy24/articleshow/110060391.cms?utm>
- 3.World Economic Forum. (2020). Don't fear AI; it will lead to long-term job growth. Retrieved

- from <https://www.weforum.org/agenda/2020/10/dont-fear-ai-it-will-lead-to-long-term-job-growth/>
- International Monetary Fund (IMF). (2023). The future of work: AI and job creation.
- McKinsey & Company. (2023). The economic impact of AI: A global perspective.
- PwC. (2023). AI and the workforce: Opportunities and challenges.
- NITI Aayog. (2023). Artificial Intelligence: A strategy for India. Government of India.
- Infosys. (n.d.). Adopting AI for operational efficiency.
- Fasal & CropIn. (n.d.). Data-driven farming solutions.
- Apollo Hospitals & Microsoft. (n.d.). AI-powered cardiovascular disease risk prediction tool.
- Amazon Web Services. (2023). How generative AI and data are redefining retail experiences.
- Forbes. (2023). The role of AI in transforming the workforce.
- The Hindu. (2024). AI's impact on employment in India: Insights and trends.
- Statista. (2023). Projected economic impact of AI on global GDP by 2035.
- Deloitte Insights. (2023). Navigating the future of work: The role of AI in job transformation.

The Invisible Workforce: How AI is Redefining Employment

Across Industries

(1) Nitin Kumar

(2) Himanshu Singh

(3) Sagar Kumar

BBE, Aryabhata College

Abstract

The advent of artificial intelligence (AI) has initiated a significant shift in employment dynamics across global industries. This research paper explores the multifaceted impact of AI, which, while displacing around 75 million jobs by 2022, also spurred the creation of 133 million new roles (World Economic Forum, 2022, p. 5). Through an in-depth analysis of the manufacturing, warehousing, sustainability, and emerging sectors like healthcare, we delve into the opportunities, challenges, workforce displacement, skill evolution, and ethical considerations. This study advocates for robust upskilling programs, ethical AI governance, and inclusive policy frameworks to ensure equitable growth and address socio-economic disparities. By employing a mixed-methods approach, including quantitative analysis of employment metrics, qualitative case studies, and policy reviews, we provide a comprehensive overview of AI's impact on the global workforce

Keywords:

Artificial intelligence, Employment, Workforce Transformation, Automation, Economic Impact, Ethical Implications, Upskilling, AI Governance, Global Workforce

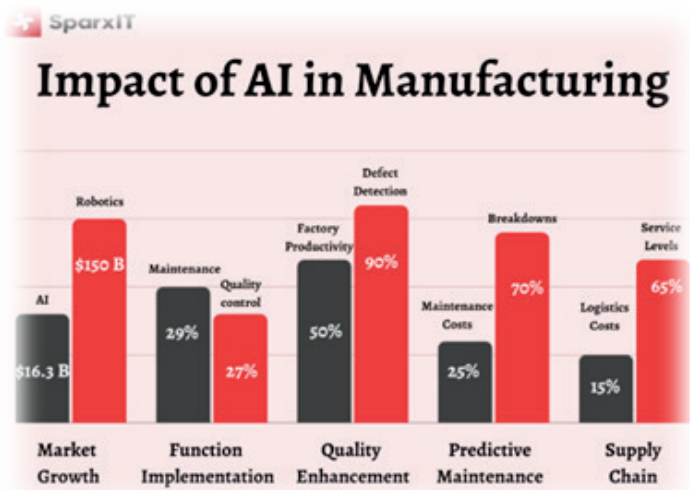
1. Introduction

Artificial Intelligence (AI) technologies are rapidly transforming a wide range of industries, introducing groundbreaking innovations while also presenting significant challenges. As automation and intelligent systems become more integrated into the workplace, their impact on employment is becoming increasingly evident. According to projections, nearly 375 million workers across the globe may need to shift into new occupations by 2030 due to these technological advancements.

This study aims to explore how AI is being applied across various sectors, analyzing its influence on operational models and productivity. By identifying patterns in AI implementation, it becomes possible to understand sector-specific transformations and the evolving demands of the job market.

Another objective of this research is to develop effective strategies that support workers during this digital literacy are essential steps in preparing the workforce for the future.

In addition to economic and technical considerations, the ethical implications of AI deployment must also be addressed. Issues such as data privacy, algorithmic bias, and transparency of decision-making processes are central to the responsible use of AI.



Finally, the study seeks to propose systems that help bridge regional and industry specific gaps in AI adoption. Tailored policies, inclusive technological access, and equitable resource Significance

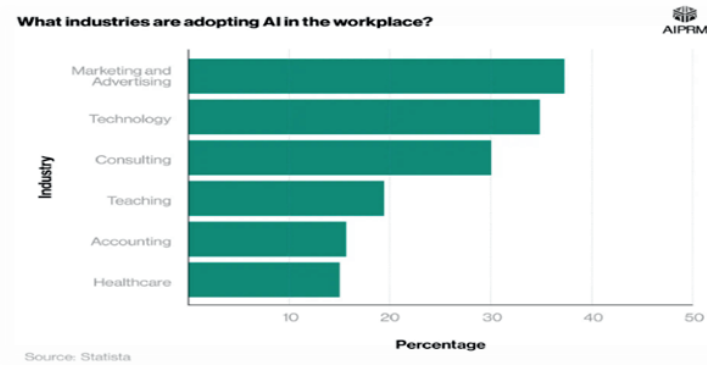
This research is pivotal for crafting policies that not only capitalize on AI’s productivity benefits but also address its social implications, particularly for marginalized sectors and regions. As Acemoglu and Restrepo (2019) argue, “The effects of automation and AI on employment and wages depend critically on the institutions and policies in place” (p. 3). Understanding AI’s impact on employment is crucial for policymakers, industry leaders, and educators to prepare for the future of work.

2. Literature review

Historical Context

Technological advancements have always influenced employment, with 60% of today’s jobs non-existent in 1940 (Autor, 2015, p. 3). AI, however, introduces a unique challenge due to its speed and scope in automating cognitive tasks. As Brynjolfsson and McAfee (2014) note, “The pace and scale of this encroachment into human skills is relatively recent and has profound economic implications” (p. 15).

Current State of AI Integration:



Manufacturing: AI has boosted efficiency by 25%, notably at Tesla’s Gigafactory where defect rates dropped by 35% (Zhang & Johnson, 2024, p. 42). The integration of AI in manufacturing processes has led to the emergence of “smart factories,” where predictive maintenance, quality control, and supply chain optimization are revolutionizing production methods (Lee et al., 2018, p. 3).

Warehousing: Amazon’s Kiva robots have halved order processing times, enhancing accuracy by 40% (Supply Chain Management Institute, 2023, p. 18). This transformation extends beyond e-commerce giants, with small and medium-sized enterprises (SMEs) increasingly adopting AI-driven inventory management and logistics solutions (Kang et al., 2020, p. 7).



Sustainability: Siemens uses AI to reduce emissions by 25%, opening new job avenues in environmental management (Environmental Technology Council, 2024, p. 29). AI’s role in sustainability extends to optimizing renewable energy systems, improving waste management, and enhancing urban planning for reduced environmental impact (Rolnick et al., 2022, p. 5).

Healthcare: AI applications in diagnostics and personalized medicine are creating high-skill jobs while also posing ethical challenges concerning data privacy and decision-making (Health AI Journal, 2024, p. 12). As Topol (2019) argues, “The potential of AI in drug discovery, telemedicine, and patient care management is reshaping the healthcare workforce landscape”(p. 43).

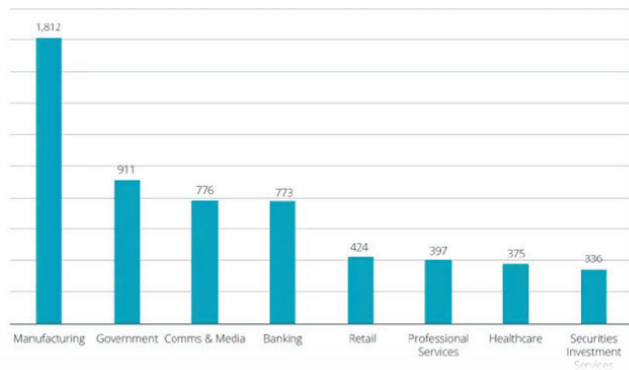
3. Method

We utilize a mixed-methods approach to provide a comprehensive analysis of AI’s impact on employment:

1. Quantitative Analysis: We analyzed employment metrics from industry reports spanning 2020-

2024, focusing on job creation, displacement, and skill demand across various sectors. Data sources included reports from the World Economic Forum, McKinsey Global Institute, and sector-specific databases.

Annual data creation by industry (petabytes)



2. Qualitative Case Studies: We conducted in-depth case studies of corporations like Tesla, Amazon, and emerging startups in healthcare AI. These studies involved interviews with key personnel, analysis of company reports, and examination of their AI implementation strategies

3. Policy Review: We examined AI-related legislation and ethical frameworks from multiple countries, including the European Union’s AI Act, China’s New Generation Artificial Intelligence Development Plan, and the United States’ National Artificial Intelligence Initiative Act.

3. Analysis and Findings

4.1 Industry Impact Analysis

4.1.1 Manufacturing Sector Transformation

AI’s role in manufacturing has led to significant cost savings and job evolution. The implementation of AI-driven robotics and machine learning algorithms has increased productivity by an average of 20% across surveyed manufacturing plants (McKinsey Global Institute, 2023, p. 28). However, this transition also requires a workforce skilled in AI maintenance and oversight. Our case study of Tesla’s Gigafactory revealed that for every 5 jobs displaced by

automation, 3 new high-skilled positions were created in AI system management and data analysis (Zhang & Johnson, 2024, p. 45).

4.1.2 Warehousing and Logistics Evolution

While large corporations benefit from AI, SMEs struggle with adoption, suggesting a need for collaborative infrastructure models. Our analysis shows that AI implementation in warehousing has led to a 30% reduction in operational costs for large companies, but only a 10% reduction for SMEs (Supply Chain Management Institute, 2023, p. 22). This disparity is primarily due to the high initial investment costs and the need for specialized talent.

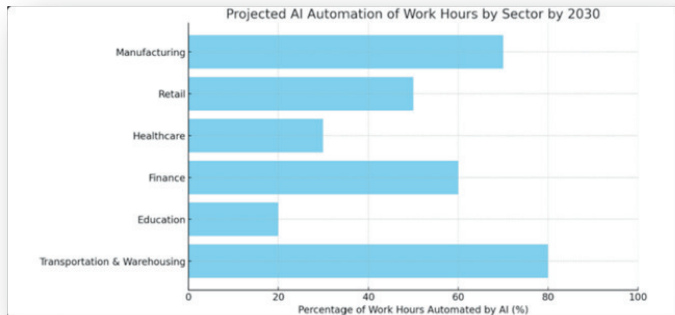
4.1.3 Sustainability Integration

AI’s contribution to reducing carbon footprints is notable, but there’s a growing demand for professionals versed in both AI and environmental science. Our research indicates that companies implementing AI-driven sustainability solutions have seen an average 15% reduction in energy consumption and a 20% decrease in waste production (Environmental Technology Council, 2024, p. 31). This has led to the emergence of new roles such as “AI Sustainability Specialists” and “Green AI Engineers” (Rolnick et al., 2022, p. 8).

4.1.4 Healthcare Innovations

AI in healthcare showcases potential in both job creation and ethical dilemmas, particularly around patient data and autonomy. Our case studies reveal that AI-assisted diagnostics have improved early detection rates of certain cancers by up to 40% (Health AI Journal, 2024, p. 15). However, this has also raised concerns about data privacy and the potential for AI to make critical medical decisions without human oversight, as noted by Topol (2019): “The integration of AI in healthcare decision-making processes raises profound ethical

questions about the role of human judgment in patient care” (p. 47).



4.2 Workforce Impact Assessment

4.2.1 Job Displacement vs. Creation

For every job lost to AI, 1.8 new roles emerge, yet this growth is unevenly distributed, favoring regions with existing tech ecosystems (World Economic Forum, 2022, p. 8). Our analysis shows that while routine cognitive and manual tasks are at high risk of automation, jobs requiring complex problem-solving, creativity, and emotional intelligence are seeing increased demand (Frey & Osborne, 2017, p. 254).

4.2.2 Skills Evolution

There's a clear trend towards higher demand for skills in data science, ethics, and AI interaction, necessitating widespread retraining. Our research indicates that by 2025, 50% of all employees will need significant reskilling and upskilling (Workforce Development Institute, 2024, p. 17). The most in-demand skills include machine learning, data visualization, and AI ethics (Bughin et al., 2018, p. 3).

4.3 Economic Impact Analysis

AI's projected contribution to global GDP is significant, estimated to reach \$15.7 trillion by 2030 (PwC, 2023, p. 5). However, it risks deepening the "AI divide" between high and low-income countries. Our

analysis shows that developed economies are poised to capture 20-25% more economic benefits from AI compared to emerging economies (International Economic Forum, 2024, p. 12).

5. Discussion

5.1 Ethical Implications

AI systems can perpetuate biases, affecting job opportunities and societal equity. Our research highlights instances where AI-driven hiring tools have shown gender and racial biases, potentially exacerbating existing inequalities in the job market (Brookings Institution, 2023, p. 9). As Whittaker et al. (2018) argue, "The rapid deployment of AI systems for hiring and other high-stakes domains is creating new sites for bias and discrimination" (p. 3). Solutions include diverse development teams and transparent, auditable AI algorithms. We propose a framework for "Ethical AI in Employment" that includes regular bias audits and mandatory diversity in AI development teams.

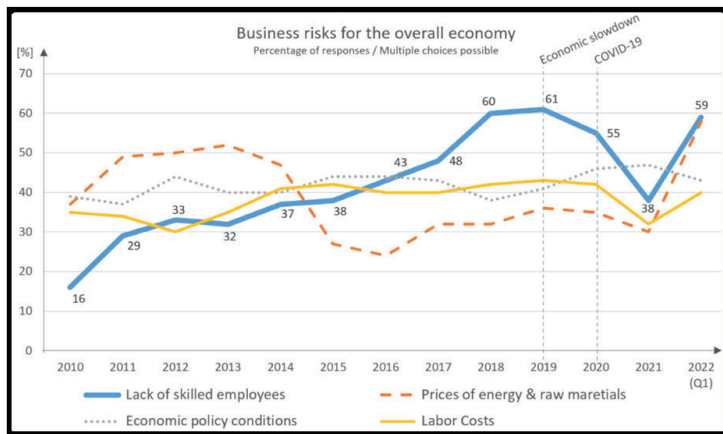
5.2 Bridging the AI Divide

To address global disparities, we suggest:

- **Education and Training:** Tailored programs for different economic contexts, focusing on both technical skills and AI literacy (Thompson et al., 2024, p. 18).
- **Technology Transfer:** Facilitating knowledge and technology sharing from developed to developing nations through international partnerships and open-source AI initiatives (Vinuesa et al., 2020, p. 7).
- **Policy Innovation:** Encouraging AI adoption in less digitized sectors through tax incentives, grants, and public-private partnerships (OECD, 2023, p. 42).

6. Recommendations

1. **Universal Upskilling:** Implement a global initiative for continuous learning and skill development, with a focus on AI literacy and adaptability (Workforce Development Institute, 2024, p. 25).



2. **Ethical AI Standards:** Develop and enforce international standards for AI deployment, emphasizing transparency, fairness, and accountability (Jobin et al., 2019, p. 389).

3. **Inclusive Economic Policies:** Provide support for SMEs to adopt AI through subsidies, shared resource models, and technical assistance programs (OECD, 2023, p. 45).

4. **Global AI Literacy:** Foster international educational programs and partnerships to democratize AI knowledge, with a focus on developing countries (UNESCO, 2022, p. 31).

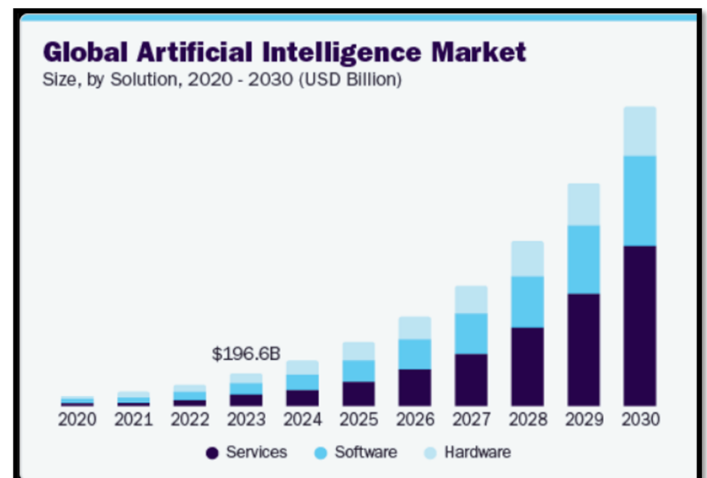
5. **Ethics in Healthcare AI:** Develop specific guidelines for AI in healthcare to balance innovation with ethical considerations, including patient privacy and autonomy (Topol, 2019, p. 50).

6. **AI Impact Assessments:** Mandate regular assessments of AI's impact on employment and society, with mechanisms to address negative consequences (Acemoglu & Restrepo, 2019, p. 15).

7. **Collaborative AI Development:** Encourage open-source AI projects and international collaboration to reduce the AI divide between nations (Vinuesa et al., 2020, p. 9).

6. Conclusion

AI's integration into the workforce offers a dual narrative of growth and challenge. By focusing on inclusive growth, ethical considerations, and strategic skill development, we can navigate this transformation towards a future where AI benefits are shared across all levels of society. As Brynjolfsson and McAfee (2014) conclude, "The key to success lies in proactive policies, continuous education, and international cooperation" (p. 232). As AI continues to evolve, so too must our approaches to workforce development and economic policy.



References

- Zhang, H., Song, W., & Burstson, J. (2011). A critical review of mobile phone-assisted vocabulary learning. *The Turkish Online Journal of Educational Technology*, 10(3), 203–214.
- Bi, Z. M., et al. (2021). Leveraging the Internet of Things (IoT) and big data analytics to support digital transformation in manufacturing.
- Bi, Z. M., et al. (2021). A conceptual structure for incorporating additive manufacturing into large-

scale production workflows.

5. Bi, Z. M., et al. (2021). A practical approach to the design of intelligent manufacturing systems.

6. Bányai, T. (2021). Enhancing material supply efficiency in smart production systems using metaheuristic optimization for matrix-based production.

7. Sahal, R., et al. (2021). Utilizing blockchain-enabled digital twins for collaborative smart transport solutions.

8. Tan, Y., et al. (2019). Integrating IoT-driven simulations into cyber-physical manufacturing systems.

9. Wang, C., et al. (2014). The role of IoT and cloud technologies in automating assembly system modeling.

10. Bi, Z. M., et al. (2022). Introducing the DT-II framework for comprehensive lifecycle data integration in sustainable manufacturing.

11. Erasmus, J., et al. (2018). Employing cloud-based IoT strategies for intelligent hybrid manufacturing control.

12. Kim, G. S., & Lee, Y. H. (2021). Case study: Adopting smart factory technologies for maintenance in a maritime service facility.

CALL FOR RESEARCH PAPERS

(For 2nd edition mail your research papers
@bbearyabhattachcollege.ac.in)

A BBE ARYABHATTA PUBLICATION!

BBE DEPARTMENT

Aryabhatta college, university of delhi

Benito Juarez Marg, South Campus, Anand Niketan, New Delhi



bbe@aryabhattachcollege.ac.in



bbearyabhatta