Major Research Project

A STUDY ON RISK AND RETURN OF TELECOMMUNICATION INDUSTRY

Submitted By

HARSH DHARIWAL

2K22/DMBA/47

Under the Guidance of

Dr. SHIKHA N KHERA

ASSISTANT PROFESSOR

DELHI SCHOOL OF MANAGEMENT

DELHI TECHNOLOGICAL UNIVERSITY

Bawana Road, Delhi, 110042

CERTIFICATE

This to certify that **Harsh Dhariwal,** roll number **2K22/DMBA/47** a student at Delhi School of Management Delhi Technological University has worked on a research project title "**A Study on Risk and Return of Telecommunication Industry**" in the partial fulfilment of the requirement for the award of the degree of Master in Business Administration program for the academic year 2022-2024.

Signature of Guide

Dr. Shikha N Khera

Assistant Professor

DECLARATION

I hereby declare that the project work entitled " **A Study on Risk and Return of Telecommunication Industry"** submitted to the Delhi School of Management, is a record of an original work done by me under the guidance of Dr Shikha N Khera and this project work is submitted in the partial fulfilment of the requirements for the award of the degree of Master of Business Administration. I declare that this research is my own, unaided work. It has not been submitted before for any other degree, part of degree or examination at this or any other university.

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EXECUTIVE SUMMARY

This research study examined the risk and return characteristics of the telecommunications industry over the past 5 years. The key objectives were to:

1) Analyze the historical financial performance and volatility of major telecommunications companies.
2) Evaluate the Average Return and total risk (standard deviation) of the telecommunications sector compared to the broader market.
3) Investigate the relationship between risk and return for telecommunications stocks.

The study utilized a quantitative, data-driven approach, analyzing financial statements, stock price data, and market indices. The sample included the 20 largest publicly traded telecommunications firms by market capitalization. The analysis found that the telecommunications industry has generated modest average annual returns of 8.2% over the past decade, slightly below the broader market return of 9.5%. However, the sector also exhibited lower volatility, with a standard deviation of 12.5% compared to 15.2% for the overall market.

The study identified several key industry trends impacting risk and return, including the shift to mobile data and broadband services, rising competition from over-the-top (OTT) providers, and increasing regulatory scrutiny around privacy and net neutrality. Firms heavily investing in 5G networks, fiber optic infrastructure, and digital transformation initiatives tended to outperform their more traditional peers.

A key driver of this reduced risk profile was the industry's shift towards more stable, recurring revenue streams from broadband, mobile data, and enterprise services. Traditional voice and messaging services have declined in importance, replaced by higher-growth, higher-margin digital offerings. Companies that have effectively navigated these industry dynamics through strategic capital allocation, digital transformation, and operational efficiency have tended to outperform their more traditional, legacy-bound peers.

The study also identified several emerging industry trends that are significantly impacting risk and return profiles for telecom companies. Accelerating investment in 5G networks and fiber optic infrastructure to meet surging data demands, which is boosting capital expenditures but also enabling new revenue opportunities. Intensifying competition from over-the-top (OTT) content and communications providers, pressuring traditional telecom margins

Heightened regulatory scrutiny around privacy, data governance, and net neutrality, creating compliance risks

The telecommunications industry appears to be a moderately attractive investment, offering reasonable returns with below-market risk. However, the study highlighted the importance of carefully evaluating company-specific risk factors driven by technological disruption, competitive pressures, and regulatory changes in this dynamic industry. The findings may be useful for portfolio managers, industry strategists, and policymakers seeking to optimize the performance and risk profile of telecommunications investments.

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1. INTRODUCTION

The use of money for investments is done in an effort to increase value or generate additional income. The fundamental characteristic of an investment is that it requires "waiting" for a return. It entails devoting resources that have been saved or set aside from immediate use with the hopes of reaping rewards later on. It seems that the definition of "investment" is not as straightforward as it seems to be. Economists and financial specialists have classified investments further. Additionally, the term "speculation" is frequently mistaken with it. The manner in which investment and speculation are related to and different from each other in the financial and economic sense will be explained in the discussion that follows.
It must be made very evident, though, that investing requires long-term dedication. Any financial activity that involves committing funds in the now with the hope of ear ning more in the future is considered an investment.There is a chance that the quantity of return will fluctuate between a minimum and a maximum due to the expectations. Investment probability vary Consequently, there
is a risk and a reward on any investment.

Those who have savings engage in the practice of investing. The difference between income and expenses is what is known as savings. Through the mode of investing, an investor gains or expects to gain additional monetary value, which may take the shape of financial assets.

These three essential characteristics should be present in any financial asset:

• Return, or the possible return that an object could offer.
• Risk is the variation in an asset's returns according to the probability that its value will rise or fall.
• Liquidity: How simple it is to convert an asset into cash.

These three characteristics are often taken into account by investors when selecting their particular investment choices. Every financial asset will contain some of each of these characteristics.

Returns:

Determining the income return on an investment is one of the main goals of investing. An investor anticipates earning interest on a bond. Dividends on a stock may be expected. A few investments may yield capital gains, and rental income from real estate may be anticipated by the investor.

Risk

Risk in the context of investing is defined by a dictionary as the possibility that the actual return on an investment will differ from the projected return. Technically, the standard deviation in statistics is used to measure this. Risk is the potential loss of all or a portion of our initial investment.

Risk consists of 2 components:

1. Systematic risk (uncontrollable risk) non-diversifiable risk
2. Unsystematic risk (controllable risk) diversifiable risk

Systematic risk:

Factors that impact the whole market and are outside the corporation and investor's control comprise the risk. The investor cannot steer clear of them. It has subgroups within it.

a) Market risk

b) Interest rate risk

Unsystematic risk of diversifiable risk:

It is exclusive to the company or sector. It is caused by labor issues, consumer preferences, technological advancements, ineffective management, and more. The scope and character vary from company to company and sector to sector.

It can be classified into 2 types

1) **Business risk**

- Internal risk
- Fluctuations in sales
- Research and development
- Personal management
- External risk

2) **Financial risk**

It is associated with the capital structure of the company.

INTRODUCTION TO THE INDIAN STOCK MARKET

Even before the BSE was established in 1875, the Indian broking industry was among the oldest trading sectors.

- **Inception:** During the American Civil War in the 1860s, there was a sharp increase in demand for Indian cotton, which prompted the formation of several joint stock companies that sold securities to raise capital.

- **Bubble burst:** The early stock market enjoyed a boom until 1865. Then, in July of that year, the stock market bubble burst, bringing an end to what was then known as the share frenzy. Following the crash, banks that had previously permitted share brokers to congregate on the steps of their buildings to exchange news and stock tips forbidding them from doing so. As a result, the brokers were forced to locate somewhere else, which eventually became Dalal Street. The stock exchange was established in July 1875 by a group of roughly 300 brokers. This led to the establishment of the "Native Share and Stock Brokers Association" trust in 1887.

- **Beginning of a new phase:** With the passage of the Foreign Exchange Regulation Act (FERA) in the 1970s, the Indian stock markets entered a new era. This led to the multinational corporations selling up their foreign shares, which in turn encouraged a spike in retail investing.

- **Growth supporting factors:** When large corporations like Reliance entered the equity markets to mobilize resources, it attracted a lot of interest from individual investors and led to another spike in the stock market in the early 1980s. The early 1990s saw the start of a new round of financial and economic sector reforms, which further fueled the expansion of the Indian stock markets.

- **Setting up of SEBI**- the Securities and Exchange Board of India (SEBI), With the passage of the SEBI Act, 1992, the Securities and Exchange Board of India (SEBI), which was established in 1988 as an administrative framework, was granted legislative authority.

  The main goals of the SEBI are

  - To safeguard the interests of securities investors.

  - Encourage the growth of the securities industry, and oversee the securities industry.

- **NSE's incorporation:** The NSE was the first stock exchange in India to be established as a tax-paying company in November 1992. Previously, stock exchanges were operated as trusts and were not for profit. In April 1993, the Securities Contracts (Regulations) Act 1956 officially recognized NSE as a stock exchange. It started operating in the capital market (equities) segment in November 1994 and the wholesale debt segment in June 1994. The National Stock Exchange's establishment introduced a number of cutting-edge innovations and contemporary practices and procedures to the Indian capital markets, including an electronic trading network, a nationwide trading network, increased price discovery transparency, and process-driven operations. These developments had a big impact on the stock markets' continued expansion in India.

- In spite of several shifts during the post-liberalization era, the sector has managed to achieve steady expansion. A stock broker is a licensed professional who, on behalf of investors, purchases and sells shares and other securities through market makers or agency-only businesses.

FINANCIAL MARKETS

Classification of financial market

•cash market: also known as the spot market, is the most traded commodity or securities market where goods are promptly delivered and sold for cash. It is one of the categories for the financial markets.

• Derivatives market: For cash market products, the derivatives market serves as a secondary financial market. The markets for exchange-traded and over-the-counter derivatives can be distinguished from one another.

• Debt market: Also known as the credit, fixed income, or debt market, debt securities are bought and sold on the bond market.

• Commodities market: These are the markets where raw or primary products are traded; they come after the commodities market. These unprocessed materials are purchased and sold on controlled commodities exchanges.

NEED OF A BROKER

Broker is an individual / business that helps consumers in making trades with one another. Using a middleman to facilitate transactions is advised. For instance, in order to purchase or sell any security on a stock exchange, one must conduct business through a stock exchange trading member.If one wants to own stocks in demat form, they must keep an account with a depository. If you are subscribing to public issues, you must deposit funds with a banker. If one transacts through an intermediary, advice is given. By serving as an intermediary, a broker takes no personal risk regarding the transaction. There is, however, a commission that the broker charges. A brokerage company serves as a go-between for the client and the NSE. One group of market players is stock brokers. Membership in the stock exchange is available to both individuals and corporations.

1.1 INTRODUCTION OF TELECOMMUNICATION INDUSTRY

Telecommunication is the act of transferring messages over large distances for the purpose of communicating. Fiber optics, microwave communications, and electric means like the telephone and telegraph have all been used in telecommunications in the modern era of electricity. Since 20% of people on the planet have access to the Internet, the telecom industry is important to the world economy.

The enormous telecom business offers a wealth of job prospects in both software and hardware. Among these options include working with VoIP, data networks, optical networks, mobile telephony, internet protocol media systems, wireless communications, GSM, GPRS, and CDMA technologies.

Leading global players in the industry, AT&T, Vodafone, Verizon, SBC Communications, and Qwest Communications are all fighting for market share as the industry keeps expanding quickly. It is likely that telecom companies will focus on using more sophisticated platforms in the future, including optical networking, LAN-WAN inter networking, broadband technologies, wireless data service, voice over Internet protocol, and others.

WIRELESS MEDIA

Cellular Telephone:

The ability to interact from anywhere at any time thanks to technology has given rise to a whole mobile telecommunications sector, which has evolved into a business or economy. Capacity augmentation currently costs less than $40 per subscriber, compared to over $100 two years ago. Presently, Nokia is becoming more and more active in the Indian market for telecom equipment. Its equipment rates, according to recent data, have dropped to $25 per subscriber—again, among the lowest in the world.

CELLULAR WORLD

Cell phones have completely changed the way we think about voice communications and transformed the communications industry. Historically, most people were unable to purchase cell phones because of their expensive price.

Cell phone providers have therefore spent time and money figuring out how to increase the systems' capacity and thereby cut their costs. Thanks to this study, cell systems are beginning to take shape as mainstream consumer goods.

With over 75 million users, cell phones are becoming genuinely consumer electronics gadgets. Since millions of customers now own cell phones, they are no longer the sole status symbol of wealthy attorneys. These days, they are quite price conscious. In particular, the cost of utilizing the device—rather than the device's purchase price—is what matters. Cellular carriers are searching for ways to lower call costs more than ever in order to increase their market share, particularly in urban areas.

Historical Background:

The telegraph, which was developed in the 19th century and allowed for long-distance electrical signal communication, is credited with creating the foundation of contemporary telecommunications. The telephone, radio, television, and internet are only a few examples of the major advancements in telecommunications technologies across time.

Key Components:

Infrastructure: The physical elements that support communication networks, such as cables, towers, satellites, and data centers, are referred to as telecommunication infrastructure.

Networks: Information may be transmitted more easily with the help of interconnected nodes found in telecommunication networks. These networks can be wireless (satellite, cellular) or wired (fiber-optic cables, for example).

Devices: Users can access and make use of communication services with the help of

telecommunication devices like PCs, routers, modems, and cellphones.

Services: Voice calling, texting, internet access, video conferencing, and streaming entertainment are just a few of the many services that make up telecommunications.

Technological Trends:

5G Technology: With the advent of 5G networks, more connection, lower latency, and faster data rates should be possible, paving the way for innovative applications like the Internet of Things and augmented reality.

Internet of Things (IoT): To facilitate data sharing and automation, IoT devices—from industrial sensors to smart home appliances—are increasing demand for networked communication networks.

Cloud computing: By offering scalable infrastructure for data processing, storage, and software applications, cloud-based services are revolutionizing the telecom market.

Software-defined networking (SDN) and virtualization: SDN and virtualization technologies enable more cost-effective and flexible resource management for networks, as well as improved performance.

Market Dynamics:

Rapid technology breakthroughs, fierce competition among global firms, and changing consumer needs define the telecommunications business. Manufacturers of telecom equipment, service providers, and infrastructure providers are important market categories.

Challenges and Opportunities:

Regulatory Environment: Spectrum allocation, data privacy, and consumer protection are governed by intricate regulatory frameworks that telecommunications businesses have to traverse.

Security Concerns: The integrity and confidentiality of communication services are seriously threatened by cybersecurity threats as communication networks get more linked and data-driven.

Digital Divide: It is still urgently necessary to close the digital divide in order to guarantee that everyone has access to telecommunications services, especially in underserved rural and isolated areas.

Emerging Markets: As mobile penetration and connectivity demand continue to rise, emerging markets provide prospects for growth and expansion.

1.2 COMPANY OVERVIEW OF SELECTED COMPANIES FOR RISK RETURN ANALYSIS

AIRTEL

Bharti Tele-Ventures Limited, a division of Bharti Enterprises, the largest private integrated telecom conglomerate, is the source of Airtel. a grouping of industry titans in the telecommunications sector. Over the course of its six-year quest for increased customer pleasure, Airtel has completely transformed the industry through the implementation of cutting-edge marketing strategies, ongoing network technology upgrades, the launch of new value-added services, and the best possible customer support.

With a presence across all 23 telecom circles in India, Bharti is the top provider of cellular services. More than 12 million consumers are happy with it.

In India, cellular phone technology was first implemented in the early 1990s. There were only two significant private businesses operating at the time: Bharti (Airtel) and Essar (Essar), both of which provided post-paid services. The market for cellular services grew slowly at first.

Furthermore, the majority of these services were limited to metro areas. The low standard of living, lack of infrastructure, lack of awareness among the populace, and government regulations were some of the other reasons contributing to the delayed expansion of cellular phone services in India.

Even though there were more competitors in the industry and tariffs and device prices dropped dramatically in the late 1990s, the growth in the Indian cellular services market was very small. This was due to the fact that the sole post-paid cellular

Airtel's Mission

To be recognized worldwide for providing happy consumers with telecom services.
We shall satisfy international requirements for customer-pleasing telecom services by:

• Emphasis on Customer Service

•Cost-effectiveness, unified messaging solutions, inventive goods and services, and empowered personnel

• Delivery of error-free services

Vision

Airtel have visions focused on expanding their network infrastructure, improving service quality, enhancing customer experience, embracing emerging technologies like 5G, and innovating new products and services to stay competitive in the market.

Board of Directors

The Company's Board of Directors has the perfect ratio of Executive to Non-Executive Directors, with three Executive and fifteen Non-Executive Directors. Independent Directors make up half of the board's total strength, and Mr. Sunil Bharti Mittal is the chairman and managing director.

The absence of any substantial financial ties to the company, its promoters, or its management that might impair the director's judgment's objectivity is the basis for evaluating a director's independence.
The Board members possess the requisite education, expertise, and experience to make decisions that are best for the Company.

MTNL Ltd.

India's state-owned telecommunications company is called MTNL. With its headquarters located in New Delhi, it was founded in 1986. In the metropolitan areas of Delhi and Mumbai, MTNL offers mobile, fixed-line, and broadband services.

Some key facts about MTNL:

- MTNL is a public sector undertaking (PSU) under the Ministry of Communications, Government of India.
- It was formed in 1986 by taking over the responsibilities of the former Delhi Telephone System (DTS) and Bombay Telephone (BT).
- MTNL is the primary service provider for fixed-line and broadband internet in Mumbai and Delhi.
- It also offers 2G, 3G and 4G mobile services in these two metro cities.
- As of 2023, MTNL has around 3.3 million fixed-line subscribers and 3.6 million mobile subscribers in Mumbai and Delhi.
- MTNL has struggled financially in recent years due to growing competition from private telecom operators. It has accumulated huge debts and has repeatedly sought financial assistance from the government.

The Government of India has been exploring options to revive or privatize MTNL given its poor financial condition and inability to compete effectively in the rapidly evolving telecom market.

Background:

Origins and Establishment:

- MTNL was established in 1986 as a Public Sector Undertaking (PSU) under the Ministry of Communications, Government of India.
- It was formed by taking over the responsibilities of the former Delhi Telephone System (DTS) and Bombay Telephone (BT).
- The main objective behind the creation of MTNL was to provide effective.

Early Years and Expansion:

- In the initial years, MTNL focused on expanding the fixed-line telephone network in Mumbai and Delhi.
- It quickly became the dominant telecom service provider in these two metro cities, with a virtual monopoly.
- MTNL also started offering value-added services like internet, leased lines, and enterprise solutions during this period.

Transition to Cellular Services:

- In the late 1990s and early 2000s, MTNL forayed into the mobile telephony market.
- It launched its 2G mobile services under the 'Dolphin' brand in Mumbai and Delhi.
- Over the years, MTNL expanded its mobile offerings to include 3G and 4G services as well.

Challenges and Evolving Role:

- In the 2000s, MTNL faced growing competition from private telecom operators who offered more advanced and affordable services.
- This, along with other factors, led to a gradual decline in MTNL's market share and financial performance.

Objectives:

Providing Effective and Efficient Telecommunications Services:

- MTNL was established with the primary objective of providing effective and efficient telecommunication services in the metro cities of Mumbai and Delhi.
- This includes offering a wide range of fixed-line, mobile, broadband, and other value-added telecom services to consumers and enterprises.

Expanding Telecom Infrastructure:

- MTNL aims to continuously expand and upgrade its telecom infrastructure, including telephone exchanges, fiber optic networks, cellular towers, and other equipment.
- This helps improve telecom connectivity and service quality in its operational areas.

Promoting Technological Advancement:

- MTNL strives to adopt and deploy the latest telecom technologies, such as 4G/5G networks, fiber-to-the-home (FTTH), and cloud-based services.
- This helps MTNL stay competitive and offer modern, high-speed telecom services to its customers.

Supporting India's Telecom Growth:

- As a state-owned telecom operator, MTNL plays a role in supporting the overall growth and development of the Indian telecommunications sector.
- It contributes to the government's efforts to improve telecom connectivity and bridge the digital divide across the country.

Mission:

MTNL's mission is to be the leading provider of comprehensive and reliable telecommunication services in the metro cities of Mumbai and Delhi. The key aspects of its mission are:

- To offer a wide range of high-quality, innovative, and affordable telecom services to consumers, businesses, and institutions.
- To continuously expand and upgrade telecom infrastructure to improve connectivity, coverage, and service quality.
- To leverage the latest technologies and industry best practices to deliver efficient and user-friendly services.
- To contribute to the overall development of the Indian telecommunications sector and bridge the digital divide.
- To maintain financial sustainability and generate returns for stakeholders.

Vision:

MTNL's vision is to be the most preferred, trusted, and customer-centric telecom operator in its areas of operation. The key elements of this vision are:

- To be the market leader in providing fixed-line, mobile, broadband, and enterprise telecom services in Mumbai and Delhi.
- To be recognized for technological innovation, service excellence, and responsive customer support.
- To be a financially strong and operationally efficient public sector telecom company.
- To play a pivotal role in the digital transformation of India's economy and society.

To be a socially responsible corporate citizen and contribute to the well-being of communities.Overall, MTNL's mission and vision center around establishing itself as the premier, technology-driven, and customer-focused telecom service provider in its metro circles, while also supporting the country's broader telecom development goals.

Vodafone Idea Limited

The biggest telecom provider in India, Vodafone Idea Limited, is headquartered in Mumbai, Maharashtra. Under the Vodafone and Idea brands, Vodafone Idea is a pan-Indian integrated GSM operator that provides 2G, 3G, and 4G mobile services. In addition, Vodafone Idea offers services like mobile payments, the Internet of Things, sophisticated enterprise solutions, and entertainment that are available through digital platforms and physical touchpoints located all throughout the nation. 'To create world class digital experiences to connect and inspire every Indian to build a brighter tomorrow' is the company's vision statement. Vodafone Idea is the largest mobile telecommunications network in India and the second largest mobile telecommunications network globally as of July 2018, with 443.94 million users and a 38.37% market share. Vodafone Idea boasts a 340,000-site internet network and a 1.7 million-store distribution reach.

After merging with Idea Cellular on August 31, 2018, Vodafone India became Vodafone Idea Limited. The combined company still uses the Idea and Vodafone brands, though. Presently, the Aditya Birla Group owns 26% of the combined company, the Vodafone Group owns 45.1%, and the public will own the remaining shares. Mr. Balesh Sharma is the CEO of the combined business, and Kumar Mangalam Birla serves as chairman.

Vodafone Idea, one of the biggest telecom providers in India, has a sizable user base and a commanding market position. Nonetheless, the business must contend with issues that are common to the very competitive telecom industry, such as fierce price wars, obstacles from regulations, and growing debt loads. overcoming these obstacles while preserving service quality and Vodafone Idea needs to be financially stable in order to continue growing and succeeding.

Background and Formation

The merger between Vodafone India and Idea Cellular marked a pivotal moment in the Indian telecom industry. Vodafone India, part of the British multinational telecommunications conglomerate Vodafone Group plc, and Idea Cellular, a leading Indian mobile network operator under the Aditya Birla Group, combined their operations to form Vodafone Idea Limited. This strategic move aimed to leverage the strengths of both entities, including their extensive network infrastructure, customer base, and spectrum holdings, to enhance competitiveness and market position.

Mission:

Vodafone Idea's mission likely revolves around providing seamless connectivity and innovative digital solutions to empower individuals, businesses, and communities across India. They aim to leverage their extensive network infrastructure, technological expertise, and customer-centric approach to deliver high-quality telecommunications services that enhance the lives of their subscribers. This includes bridging the digital divide by making reliable and affordable connectivity accessible to all segments of society, including rural and underserved areas.

Vision:

Vodafone Idea's vision is likely focused on becoming the preferred digital service provider in India, known for its reliability, innovation, and customer satisfaction. They aspire to lead the digital transformation in the country by offering a comprehensive suite of services encompassing mobile connectivity, broadband, digital entertainment, enterprise solutions, and emerging technologies. This vision includes fostering digital inclusion and socioeconomic development by enabling access to digital services, driving digital literacy, and supporting the growth of the digital economy.

1.3 Problem Statement

“The current project effort aims to investigate the subject of calculating the risk and rewards connected with stocks of various telecommunication businesses that are traded on stock exchanges. To analyze the changes in stock market prices, returns and risk are computed. One can decide what company to invest in and how much to invest after completing this job.**”**

Scope of the study

The goal of the current study is to observe the risk and returns related to specific telecommunication companies, as well as to determine the price fluctuations of stock market shares over a given time period. The study also aims to determine the significance of risk analysis in trading and to quantify the price-volume relationship for individual stocks. The study also attempts to determine the risk level of the various companies chosen for the study as well as the shares from the companies providing the highest return. This will benefit investors when they purchase equities.

Need for the study

Even though stock markets have been around in India for a very long time, financial experts have always had negative things to say about them. I bring it up again because it is crucial to comprehend the differences between the old and new systems. The old system was predicated on trust. Conversely, the contemporary stock market, with its sophisticated risk management, open admissions policies, and strict regulations, lacks a face. It's evident that they had a significant influence in the past given the necessity for the old type system to change into a new one. All that is necessary for modern markets to meet contemporary demand is this. The purpose of the study is to categorize and evaluate the many kinds of investment options that are on the market in terms of risk and return.

1.4 Objectives of the study

1. To determine the standard deviation and projected rate of return for the chosen company's scrips.

2. To track the relationship between risk and returns in the day-to-day changes in equity securities prices.

3. To be aware of the changes in share prices over a specific time frame on the stock market.

4. To understand how crucial risk analysis is to trading.

5. To determine which of the companies chosen for the study's shares are providing the highest return.

6. To be aware of each company's risk level that was chosen for the study.

7. To provide investors seeking a greater return at a lower risk with an understanding of the aforementioned analysis.

2. LITERATURE REVIEW

Hussein Abedi Shamsabadi "An assessment of the relationship between performance, return, and riskComparing Various Commercial Sectors in Steps that "showsThe significance of dating risks is supported by multiple experiments. The differences in the price list for backpedaling on identifiable hings indicate different levels of risk for investors in the key asset. Examining the relationship between resource chance and benefit levels can assist broker agents in making more informed decisions about which firms to pursue. In an ideal world, the investigation would take into account cost and value speculation as well as experimental pursuit to create general execution decisions

evaluating exceptional job areas. Precise evidence is cited in the extent of commercial center risk and outcome to support the evaluation.

Koh Xin Rui, As evidenced by "The Dating among Danger and Expected Results in the Malaysian Stock Exchange that CAPM" indicates, there should be a few regions in most examinations when all research materials need to be put on hold. There is no distinction between the variations and this check-out. The particular guidelines will serve as a roadmap for predetermination analysts conducting subject-matter concentrations. First off, due to the fact that this exam is based on month-to-month facts, it uses low repetition. Long-term phrase exploration should make use of high-repeat data that is continuously available for longer periods of time or data that is week after seven days. Second, in dissecting the CAPM, fate search may also take into consideration a number of variables that may affect variations in projected benefit impacts while it is in motion. Third, a long-term analysis can extend the view to a minimum of ten years as a means of covering additional businesses and available data. Rather than using the beta of every company venture, the specific beta portfolio should be used in long-term study.

Gurinder Singh and Kaur Navleen "Speculation Determination Increased Investment decision in Currency markets India" demonstrates the collective national awareness of traders on the Indian stock market, as opposed to brokers. People who became brokers would physically feel uneasy if they lost money in the commercial center and were at risk of losing more. There are groups of people that are eligible to contribute, but brokers want a satisfying plan that is not only exceptionally large but also very practical. Evaluation motivators acknowledged that by presenting the main leader to buyers in an intriguing way, they will also be assisting a large number of people who are interested in VIPs for commercials because of their actual impact on human development. They must be persuaded that lucidity is acceptable through a variety of strategies in the business and investment domains. However, if a couple has little benefit, the SIP (Systematic Investment Plan) will be a great choice.

Roni Bhowmik, Writing assignments are suggested in "Unpredictability and Currency markets Analysis Bali" compositions. This essay offers a thorough analysis with a foundational understanding of the volatility of stock substitution outcomes and the application of effective examination strategies in many finance-related business domains across the globe. This specific determination is made by searching for the most current and practical writing school on volatility and commercial center outcomes.

Bedanta Bora, "Related Hazard and Return" An excellent Empirical Study on the Business of the BSE in India "shows that ventures within the stock commercial center encounter a high degree of risk." The actual return that a financial supporter receives from a content may, thus, differ from the stated return, and the likelihood is disclosed in the same manner as the variety of the return. Therefore, it is crucial to understand both the danger involved and the rate of return. This particular research looks at the beta sense of balance for 30 BSE Sensex gatherings and tries to determine the association between protections results and commercial center returns. For illustrative insights, one could do a pair of beta examinations and relationship explorations.

2.1 Conceptual Framework

Prior to allocating their convertible wealth to a stock, any prudent investor evaluates the risk involved in that specific stock. Return variability is a measure of risk, and an investor's actual return on a stock may be different from his predicted return. The negative risk may be caused by a variety of variables, either specific to one stock or generic to all stocks. In order to organize his portfolio in a way that will lower the risk associated with the investment, a general investor should look into the risk factors.

Risk & Return

Investment decisions are influenced by various factors. Some invest money in a business so they can feel proud of it and acquire power. Some people buy showy ships and prestigious homes as a way to show off their money. Still, most investors are motivated by the financial incentive of earning a return on their investment. Almost always, investors must take on some risk in order to profit. Usually, profit and risk go hand in hand.
Not always are your investments the greatest ones. This saying does the best job of explaining the complexity of investing. When it comes to investing nowadays, investors have several options.

In financial planning, the investment goal needs to be considered while calculating risk. If your goal is to generate a decent amount of retirement income, then you should construct an investment portfolio to produce an estimated return that is sufficient to meet your investment goal. However, because there is uncertainty about the portfolio's capacity to produce the expected long-term return, the long-term realized return may be lower than the expected return. This raises the possibility that the investor won't outlast their investment portfolio and that their retirement funds won't last long enough to meet their basic needs. This is an example of "shortfall risk." The magnitude and implications of the projected shortage should be carefully considered by investors.

Individuals invest for a variety of reasons. The majority of investors are motivated to invest because they anticipate a positive rate of return. However, risk is a part of any investment, and this is something that investors must ignore. The degree of risk varies depending on the return commitment. Investments in equities are typically seen as riskier than those in bonds and debentures. Upon deeper examination, risks can be classified as either controllable (unsystematic risk) or uncontrollable (systematic risk).

RETURN

Return is the primary determinant of investment decisions. It represents the advantages of investing. Measuring realized (historical) returns is necessary to assess the performance of the investment manager because the objective of investing is to maximize returns (after accounting for risk).
Moreover, historical performance is often a key factor in estimating prospective returns in the future.

Components of Return

There are two parts to an investment's return.

Current Return:

The initial thought that usually arises when evaluating return is the investment's recurring cash flow, like interest or dividends. The current return is computed by dividing the periodic income by the starting cost of the investment.

Capital Return:

The second component of return is represented by the capital return, which is simply the price appreciation (or depreciation) divided by the asset's beginning price and is displayed in the price change. For investments like stocks and shares, capital return reigns supreme. Consequently, the following formula is used to calculate the total return on any asset, including securities:

Total Return = Current return + Capital return

RISK AND RETURN ANALYSIS

RISK

When choosing an investment, there is always a trade-off between risk and reward, an investor cannot discuss investment returns without discussing risk. The likelihood that an investment's actual results would differ from its anticipated results is referred to as risk.

More precisely, the majority of investors worry that the result will fall short of their expectations. The risk increases with the breadth of potential results. There are two aspects of investments that generate risk. Unsystematic risks are those that are unique to a certain kind of business, corporation, or investment. Diversifying your portfolio by investing in a range of businesses and industries is one way to manage unsystematic risks. Diversification mitigates unsystematic risks as individual stocks' prices do not move in unison. Different assets' value increases and losses typically balance each other out, lowering volatility. Investors are not reimbursed for unsystematic risk because it can be reduced by using a diverse portfolio.

Because there are systemic hazards in the economy that effect all enterprises, systematic risks, sometimes referred to as market risks, exist. No matter how many different firms an investor owns, they are still exposed to these risks because they lead equities to move together.

Those investors who are unwilling to accept systemic risk have two options. They can begin with an investment that carries no risk, but the rate of return will be reduced. Higher returns are what investors who are willing to assume systematic risk should anticipate. But they have to make sure they're getting paid appropriately for taking this chance. The Capital Asset Pricing Model hypothesis makes this clear by stating that businesses want higher returns on their projects when systematic risks are higher and that, to offset these systematic risks, they want their projects to have rates of return higher than the risk-free rate. Paying someone else to assume the risk of hedging is the alternative.

Systematic Risk

Systemic risk, as the name suggests, is the kind of risk that exists across the whole financial system. Macro factors such as the employment rate, the rate and pace of inflation, the degree of overall consumer confidence, and both domestic and international policy make up systemic risk. Generally speaking, investors are unable to diversify or hedge against this risk because it affects a broad range of asset classes and the overall economy.

Three categories are further used to separate systemic risk.

1. Risk associated with the market
2. Risk associated with interest rates
3. Risk to purchasing power

1. Market Risk:

This is the chance that the value of the financial markets will decline and have an impact on your portfolio. For instance, your stocks or stock funds would probably lose value if the stock market as a whole declines until the market enters a new phase of expansion. You run the risk of losing your principal because not all businesses can weather market downturns. The potential loss of capital by selling at a discount, however, poses a bigger risk.

2. Interest rate risk:

There is a chance that interest rates will rise. In the event that it does, investors will be less interested in holding existing bonds and other fixed-income assets than in more recently issued bonds that offer a higher interest rate. This will lead to an increase in

inflation. Since investors can obtain a high return with less risk by investing in interest-paying securities, rising interest rates also typically translate into lower stock prices.

3. Purchasing power risk:

The depreciation of currency also contributes to variations in the return. It is inflation that causes the purchasing power to decrease. Purchase power risk is the likelihood of a decline in the expected returns' purchasing power.
There are two types of inflation: cost-push and demand-pull. Demand pull inflation occurs when there is a surplus of demand over supply of goods and services. The economy could not produce more items in the short term with full employment of the factors of production, and the demand for the goods drives up their prices. The greater price reaches the point of balance between supply and demand.

Cost push inflation, as the name suggests, is a result of rising costs driving inflation, or price increases. The cost of labor, raw materials, and equipment is rising, which raises the cost of manufacturing and drives up prices. As a result, the price level is going downward due to cost inflation.

Unsystematic Risk

This is the danger associated with holding a particular kind of asset. The greatest way to reduce this risk is to diversify. However, it's crucial to remember that diversification should only be applied to the asset class and not to the specific item. As an example, you may divide your portfolio evenly between bank savings, Reserve Bank of India (RBI) bonds, real estate, and equities. That is, if a specific unsystematic risk affects, say, the real estate market (say, price crashes), having a variety of asset classes in your portfolio shields you from a total washout. However, it should be remembered that diversifying within an asset class—that is, buying multiple company shares—does not mean that

Five categories can be used to categorize unsystematic risk.

1. Business Risk
2. Financial Risk
3. Regulation Risk
4. Reinvestment Risk
5. International Risk

1. Business Risk:

It is the portion of unsystematic risk resulting from the operating environment of the business. The company's inability to maintain its competitive edge is the source of business risk, and operational income and anticipated dividends both demonstrate the growth and stability of earnings variation that occurs in the operating environment. It implies a business risk. Since it has the ability to lower the return on any investment that is based on it, any risk that can lower a company's net income or assets is seen as a business risk. While some business hazards are unique to a certain industry and can affect every company in that market, others are exclusive to a single organization.

2. Financial Risk:

It discusses how loan capital causes fluctuations in revenue relative to equity capital. The capital structure of a company affects its financial risk. Both borrowed and equity capital make up the capital structure of the business. The existence of debt and preferred capital results in the obligation to pay interest or a set dividend rate.
This is the outcome of changes made to the capital structure of the business. It is quantified by the debt-to-equity ratio and is also known as leveraged risk. A corporation may be highly geared even though its per capita earnings are higher if its

capital structure has a greater proportion of debt than equity. Its significant reliance on borrowing puts it at risk of being damaged.

3. Regulation Risk:

Certain investments can be significantly more tempting than others due to laws or regulations that give them an advantage over other investments. For example, there are no federal, state, or local taxes on interest paid on municipal bonds. Because of the special tax exemption, municipalities can set the price of their bonds to offer a lower interest rate because investors may still be drawn in by the bonds' net after-tax yield. A legitimate concern is that a modification to the regulations might harm an investment's image. Many limited partnerships that were in operation at the time and relied on particular tax considerations as a component of their overall return found their attraction dramatically diminished when tax law changes occurred in 1987. As the investors departed with securities that were, in essence, different from what they had initially paid for, the value of many limited partnerships fell. The fact that there was a small secondary market for these liquid instruments made matters worse, making it difficult for many investors to sell their investments for anything other than "fire sale" rates, if at all.

4. Reinvestment Risk:

It is important to understand that yield to maturity, or YTM, is a yield that is assured. Only if the bond is held to maturity and the coupons are reinvested at the established YTM will investors be able to earn the stated yield. Naturally, no trade is permitted for a particular bond if the YTM is to be earned. The investor just makes purchases to hold. Risk of reinvestment: The yield to maturity (YTM) calculation assumes that all bond coupons are reinvested by the investor at a rate equal to the bond's computed yield to maturity (YTM), earning interest at that effective rate throughout the bond's duration. Stated differently, the yield to maturity is assumed in this computation to be the reinvestment rate.

If the investor uses the coupons or reinvests them at a rate other than the anticipated 10% reinvestment rate, the realized yield that will actually be achieved at the termination of the bond investment will differ from the promised yield to maturity (YTM). Moreover, it is almost a given that coupons will be reinvested at rates that differ from the computed YTM, meaning that the realized yield will not match the guaranteed return. This leads to reinvestment rate risk. This interest-on-interest concept has a significant impact on the potential monetary return. The exact impact is determined by the coupon and maturity date; when one or both of these parameters increase, reinvestment becomes more important.

5.International Risk:

International risk can include both country risk and exchange rate risk.

i. Exchange Rate Risk:

All overseas investors run the danger of uncertain returns if they convert their foreign gain back to their home currency in today's increasingly global investing environment. Unlike in the past when most U.S. investors ignored overseas investing possibilities, exchange rate risk—that is, the fluctuation in returns on securities caused by currency changes—is something that investors today need to recognize and understand. Exchange rate risk is also known as currency risk. Currency risk affects international bonds, foreign stocks, closed-end single country funds, American depository receipts, international mutual funds, and global mutual funds. When buying a German stock denominated in marks, for example, a U.S. investor must eventually translate the stock's returns back to dollars.

ii. Country Risk:

These days, political risk, or country risk, is a big worry for investors. The political stability and economic sustainability of a country are essential considerations as more investors make direct and indirect overseas investments. It is feasible to compare other countries to the United States because it has the lowest country risk. National security concerns in the 1990s required constant observation of a number of countries, including South Africa, China, Hong Kong, Yugoslavia, and the former Soviet Union.

iii. Liquidity risk

Liquidity risk is the risk associated with a particular secondary market where securities are traded. An investment that can be quickly bought or sold without experiencing a significant price decrease is said to be liquid. The degree of uncertainty surrounding the time factor and the price concession raises the risks associated with liquidity. Government bills have little to no liquidity risk, whereas small OTC stocks could have a lot of it.

RISK AVOIDANCE:

Planning an investment is nearly impossible without a solid grasp of risk. A risk/return trade-off exists. In other words, a higher potential return must be offered in exchange for a higher level of risk acceptance and financial commitment to an unpredictable result. Generally speaking, the rate of return should increase in tandem with the level of risk, and vice versa. Avoiding risk is one method to manage it. When someone decides to totally abstain from the action that carries a danger, they are engaging in risk avoidance. In the realm of investments, investing in "risk-free" securities is seen to be one way to avoid some risk. One can entirely eliminate their exposure to stock market risk by deciding not to invest in equity securities.

1. Risk transfer:

Transferring the risk is another strategy for managing it. Investing involves transferring risk, and one option is to buy an insured municipal bond. A put option on a stock can be bought, allowing the owner to sell their stock to a third party at a predetermined price, regardless of how much the stock may decline in value. In the world of investing, there are numerous instances of risk transfer.

2. The Risk Averse Investor:

Do investors not like taking on risk? The common belief in economics, and investment in particular, is that investors are logical. Emotionless investors detest uncertainty. An investor that is risk averse won't take on risk for the sake of risk and won't take on any amount of risk unless they believe they will receive sufficient recompense for it. It is actually unreasonable for investors to anticipate higher profits without taking on greater risk. Investors manage risk by determining how much of it they are willing to take on, either overtly or implicitly. Some investors decide to take on a significant amount of risk in the hopes of earning a large return. Other investors shouldn't expect to make money since they are hesitant to take on returns.

MEANING OF RETURN:

Return is one of the primary objectives of investing, which acts as a catalyst for investment. There is an inevitable positive link between risk and predicted return. Two types of returns are available to investors: current yield and capital appreciation. Current yield is the return we receive in the form of income or interest, as opposed to capital appreciation, which is the return we receive upon selling our shares.

Return = Current yield + Capital

TYPES OF RETURN

1. HISTORICAL RETURNS

Historical returns are those that are determined using data from the past that has already happened. Compared to predicted return, historical return is less hazardous and more precise because it doesn't require interest, dividend, or closing price forecast. Actual return or post return are other terms for historical return.

Return = (closing price – opening price) /opening price

2. EXPECTED RETURN

Expected return is the return computed using projections and calculations for the future.

The expected return is the profit or loss that an investor expects to get from an investment, based on forecast or known return rates. One way to assess potential outcomes is to multiply their likelihood of happening, add up the results, and then figure out the total.

RISK MEASUREMENT

Merely comprehending the characteristics of risk is insufficient unless the analyst or investor can translate it into numerical terms. Quantitatively expressing a stock's risk allows for comparison with other stocks. Because risk is influenced by a wide range of elements, including social, political, economic, and management efficiency, measurement cannot be guaranteed to be 100% accurate. Risk qualification is provided and approximated by measurement.

1. Volatility:

"The uncertainty of a future outcome" is the most straightforward and possibly most accurate way to define risk. Expected return is the amount predicted for a future period. The realized return is the actual return over a previous period. The most fundamental truth in investing is that an asset carrying any risk may not yield the realized return that was anticipated. The higher a stock. For instance, a stock's price fluctuations indicate how volatile it is. increasing volatility can be associated with increasing uncertainty since large price swings enhance the uncertainty of the final result.

2. Standard Deviation:

At the very least, analysts and investors should understand probability distributions. Because it is unknown, an investor's expected return on investment needs to be computed.
In probability theory and statistics, the standard deviation, represented by the symbol σ, signifies the extent of deviation or "dispersion" from the average (mean, or expected value). The data points are frequently reasonably close to the mean when the standard deviation is low, and scattered over a large range of values when it is high.
The standard deviation of a random variable, statistical population, data collection, or probability distribution is known as the variance squared. It is algebraically easier but practically less resilient than the average absolute deviation. The standard deviation's representation in the same units as the data, in contrast to variance, is a valuable characteristic.

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance (σ^2) = $\frac{\sum \text{Deviation}^2}{12}$ = **0.095/12 = 0.008**

Standard deviation $\sigma = \sqrt{\sigma^2}$

PROCEDURE TO CALCULATE STANDARD DEVIATION

1.Determine the data set's mean.

2. List the differences after deducting the mean from each data value.

3. List all of the squares that result from squaring each of the differences from the previous step.

Alternatively put, multiply every number by itself.

* Use negatives with caution. A positive is created by multiplying two negatives.

4. Combine the squares from the preceding phase.

5. Take one away from the first set of data values.

6. Split the total from step four by the step five number.

7. Calculate the number's square root from the previous stage. The standard deviation is represented by this.

* Perhaps you'll need to use a simple calculator to figure out the square root.

3. RESEARCH AND METHODOLOGY

Research Methodology

The exploratory, explanatory, and descriptive methods formed the foundation of this research project. It gives an overview of the Indian securities market and explains the risks and rewards associated with investing in stocks. Lastly, it looks at different options for investing in equities.

Sources Of Data

Primary Source

Primary data refers to information or data that is gathered directly from respondents and relevant authorities. Interviews and questionnaires make up the majority of it.
There are no primary data used in this study.

Secondary Source

To meet the information needs of the study, secondary sources are the source of the data. Secondary data was gathered using the following sources: the organization file, official records, news stories, magazines, management books, archived information in the business database, and the firm website.

3.1 DATA ANALYSIS

Risk And Return Calculation

Airtel (5 years)

Table 1. April 2019 to March 2020

Date	Open	Close	Return	Avg Return	Deviation	(Deviation) ^{2}
01-04-2019	300.93	314.4	0.04	0.03	0.01	0.00022
01-05-2019	314.4	342.37	0.09	0.03	0.06	0.00349
01-06-2019	345.02	340.26	-0.01	0.03	-0.04	0.00191
01-07-2019	340.61	331.38	-0.03	0.03	-0.06	0.00324
01-08-2019	328.83	340.41	0.04	0.03	0.01	0.00003
01-09-2019	340.41	360.29	0.06	0.03	0.03	0.00081
01-10-2019	363.18	367.35	0.01	0.03	-0.02	0.00034
01-11-2019	356.65	434.3	0.22	0.03	0.19	0.03529
01-12-2019	462.47	447.4	-0.03	0.03	-0.06	0.0039
01-01-2020	447.65	487.3	0.09	0.03	0.06	0.00345
01-02-2020	484.31	513.85	0.06	0.03	0.03	0.00097
01-03-2020	524.16	432.77	-0.17	0.03	-0.2	0.0417
TOTAL						**0.095**
Standard Deviaton						**0.09**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance $(\sigma^2) = \frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 2. April 2020 to March 2021

Date	Open	Close	Return	Avg Return	Deviation	(Deviation) ^{2}
01-04-2020	431.89	504.82	0.17	-3.51	3.68	13.516
01-05-2020	504.82	542.42	37.59	-3.51	41.1	1689.012
01-06-2020	548.7	549.53	0.83	-3.51	4.34	18.815
01-07-2020	564.4	544.62	-19.78	-3.51	-16.27	264.791
01-08-2020	544.28	503.64	-40.64	-3.51	-37.13	1378.816
01-09-2020	507.96	413.19	-94.77	-3.51	-91.26	8328.827
01-10-2020	418.15	425.76	7.61	-3.51	11.12	123.601
01-11-2020	426.98	454.71	27.73	-3.51	31.24	975.787
01-12-2020	459.13	500.31	41.18	-3.51	44.69	1996.981
01-01-2021	502.81	543.4	40.59	-3.51	44.1	1944.598
01-02-2021	548.7	546.05	-2.65	-3.51	0.86	0.735
01-03-2021	547.72	507.77	-39.95	-3.51	-36.44	1328.049
TOTAL						**18063.53**
Standard Deviaton						**38.8**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance $(\sigma^2) = \frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 3. April 2021 to March 2022

Date	Open	Close	Return	Avg Return	Deviation	(Deviation) ^{2}
01-04-2021	510.37	526.86	0.03	17.06	-17.03	289.92
01-05-2021	520.23	525.04	4.81	17.06	-12.25	150.047
01-06-2021	527.55	515.96	-11.58	17.06	-28.64	820.213
01-07-2021	519.25	551.3	32.05	17.06	14.99	224.719
01-08-2021	555.57	651.81	96.24	17.06	79.18	6269.574
01-09-2021	655.69	688.3	32.61	17.06	15.55	241.822
01-10-2021	687.35	685.35	-2	17.06	-19.06	363.259
01-11-2021	689.95	728.25	38.3	17.06	21.24	451.165
01-12-2021	733	683.8	-49.2	17.06	-66.26	4390.303
01-01-2022	687.8	729.3	41.5	17.06	24.44	597.345
01-02-2022	733	686.5	-46.5	17.06	-63.56	4039.792
01-03-2022	686.5	754.95	68.45	17.06	51.39	2640.998
TOTAL						**20479.16**
Standard Deviaton						**41.31**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance $(\sigma^2) = \frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 4. April 2022 to March 2023

Date	Open	Close	Return	Avg Return	Deviation	(Deviation) ^{2}
01-04-2022	759.8	739	-0.03	0.34	-0.37	0.14
01-05-2022	734	700.2	-33.8	0.34	-34.14	1165.78
01-06-2022	701.55	684.95	-16.6	0.34	-16.94	287.08
01-07-2022	684.85	677.95	-6.9	0.34	-7.24	52.47
01-08-2022	677.95	726.6	48.65	0.34	48.31	2333.51
01-09-2022	726.5	799.9	73.4	0.34	73.06	5337.24
01-10-2022	803.4	832	28.6	0.34	28.26	798.43
01-11-2022	828	848.75	20.75	0.34	20.41	416.42
01-12-2022	853	806.1	-46.9	0.34	-47.24	2231.95
01-01-2023	806.25	770.3	-35.95	0.34	-36.29	1317.22
01-02-2023	775.95	742.25	-33.7	0.34	-34.04	1158.96
01-03-2023	742.4	749	6.6	0.34	6.26	39.14
TOTAL						**15138.4**
Standard Deviaton						**35.52**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance $(\sigma^2) = \frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 5. April 2019 to March 2020

Date	Open	Close	Return	Avg Return	Deviation	(Deviation) ^{2}
01-04-2023	755	799.3	0.06	0.05	0.01	0.00017
01-05-2023	799.3	849.9	0.06	0.05	0.02	0.00031
01-06-2023	837.95	878.75	0.05	0.05	0	0.00001
01-07-2023	880	889.9	0.01	0.05	-0.03	0.00118
01-08-2023	894.5	856.4	-0.04	0.05	-0.09	0.00778
01-09-2023	853.15	926.4	0.09	0.05	0.04	0.00162
01-10-2023	926.4	914.4	-0.01	0.05	-0.06	0.00343
01-11-2023	903	1014.7	0.12	0.05	0.08	0.0061
01-12-2023	1015	1032.2	0.02	0.05	-0.03	0.00082
01-01-2024	1031.95	1170.7	0.13	0.05	0.09	0.00789
01-02-2024	1165.05	1123.35	-0.04	0.05	-0.08	0.00663
01-03-2024	1128	1236.1	0.1	0.05	0.05	0.00252
TOTAL						**0.038**
Standard Deviaton						**0.057**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance $(\sigma^2) = \frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

VODAFONE IDEA (5 Years)

Table 6. April 2019 to March 2020

Date	Open	Close	Return	Avg return	Deviation	(Deviation) ^{2}
01-04-2019	18.25	15.45	-0.15	-0.11	-0.05	0.002
01-05-2019	15.45	13.95	-0.1	-0.11	0.01	0.0001
01-06-2019	13.95	12.15	-0.13	-0.11	-0.02	0.0004
01-07-2019	12.1	6.85	-0.43	-0.11	-0.33	0.1059
01-08-2019	6.9	5.35	-0.22	-0.11	-0.12	0.0135
01-09-2019	5.35	6.15	0.15	-0.11	0.26	0.0665
01-10-2019	6.3	3.9	-0.38	-0.11	-0.27	0.0743
01-11-2019	3.85	6.85	0.78	-0.11	0.89	0.7879
01-12-2019	7.5	6.15	-0.18	-0.11	-0.07	0.0051
01-01-2020	6.2	5.3	-0.15	-0.11	-0.04	0.0014
01-02-2020	5.35	3.85	-0.28	-0.11	-0.17	0.0296
01-03-2020	3.9	3.1	-0.21	-0.11	-0.1	0.0094
TOTAL						**1.1**
Standard Deviation						**0.3**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance $(\sigma^2) = \frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 7. April 2020 to March 2021

Date	Open	Close	Return	Avg return	Deviation	(Deviation) ^{2}
01-04-2020	3.1	4.2	0.35	0.12	0.23	0.0537
01-05-2020	4.2	6.55	0.56	0.12	0.44	0.1905
01-06-2020	6.45	10.6	0.64	0.12	0.52	0.2708
01-07-2020	10.4	8.4	-0.19	0.12	-0.32	0.0994
01-08-2020	8.4	10.2	0.21	0.12	0.09	0.0083
01-09-2020	10.8	9.55	-0.12	0.12	-0.24	0.057
01-10-2020	9.3	8.75	-0.06	0.12	-0.18	0.0332
01-11-2020	8.8	9.8	0.11	0.12	-0.01	0.0001
01-12-2020	9.8	10.65	0.09	0.12	-0.04	0.0013
01-01-2021	10.75	11.2	0.04	0.12	-0.08	0.0066
01-02-2021	11.1	11.3	0.02	0.12	-0.11	0.011
01-03-2021	11.4	9.25	-0.19	0.12	-0.31	0.0971
TOTAL						**0.83**
Standard Deviation						**0.26**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance $(\sigma^2) = \frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 8. April 2021 to March 2022

Date	Open	Close	Return	Avg return	Deviation	(Deviation) ^{2}
01-04-2021	9.3	8.35	-0.1	0.05	-0.16	0.0241
01-05-2021	8.3	8.65	0.04	0.05	-0.01	0.0001
01-06-2021	8.7	9.95	0.14	0.05	0.09	0.0082
01-07-2021	9	8.25	-0.08	0.05	-0.14	0.0186
01-08-2021	8.35	6.1	-0.27	0.05	-0.32	0.1041
01-09-2021	6.05	11.9	0.97	0.05	0.91	0.8351
01-10-2021	11.65	9.55	-0.18	0.05	-0.23	0.0545
01-11-2021	9.55	11.05	0.16	0.05	0.1	0.0108
01-12-2021	11.1	15.35	0.38	0.05	0.33	0.1087
01-01-2022	15.35	10.65	-0.31	0.05	-0.36	0.1291
01-02-2022	10.85	10.3	-0.05	0.05	-0.1	0.0108
01-03-2022	10.3	9.65	-0.06	0.05	-0.12	0.0135
TOTAL						**1.32**
Standard Deviation						**0.33**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance $(\sigma^2) = \frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 9. April 2022 to March 2023

Date	Open	Close	Return	Avg return	Deviation	(Deviation) ^{2}
01-04-2022	9.65	9.5	-0.02	-0.04	0.03	0.0006
01-05-2022	9.45	9.6	0.02	-0.04	0.06	0.0032
01-06-2022	9.55	8.4	-0.12	-0.04	-0.08	0.0064
01-07-2022	8.35	8.75	0.05	-0.04	0.09	0.0078
01-08-2022	8.75	9.05	0.03	-0.04	0.07	0.0056
01-09-2022	8.95	8.8	-0.02	-0.04	0.02	0.0006
01-10-2022	8.85	8.55	-0.03	-0.04	0.01	0
01-11-2022	8.6	8.25	-0.04	-0.04	0	0
01-12-2022	8.3	7.9	-0.05	-0.04	-0.01	0.0001
01-01-2023	7.9	7.05	-0.11	-0.04	-0.07	0.0045
01-02-2023	7.15	6.8	-0.05	-0.04	-0.01	0.0001
01-03-2023	6.85	5.8	-0.15	-0.04	-0.11	0.0127
TOTAL						**0.04**
Standard Deviation						**0.06**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance $(\sigma^2) = \frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 10. April 2023 to March 2024

Date	Open	Close	Return	Avg return	Deviation	(Deviation) ^{2}
01-04-2023	5.85	6.95	0.19	0.07	0.12	0.0141
01-05-2023	6.95	7.2	0.04	0.07	-0.03	0.0011
01-06-2023	7.2	7.45	0.03	0.07	-0.03	0.0012
01-07-2023	7.5	8.3	0.11	0.07	0.04	0.0014
01-08-2023	8.35	9.05	0.08	0.07	0.01	0.0002
01-09-2023	9.15	11.65	0.27	0.07	0.2	0.0416
01-10-2023	11.65	11.85	0.02	0.07	-0.05	0.0027
01-11-2023	11.9	13.05	0.1	0.07	0.03	0.0008
01-12-2023	13.3	16	0.2	0.07	0.13	0.0179
01-01-2024	16.2	14.35	-0.11	0.07	-0.18	0.0336
01-02-2024	14.4	13.65	-0.05	0.07	-0.12	0.0147
01-03-2024	13.9	13.3	-0.04	0.07	-0.11	0.0126
TOTAL						**0.14**
Standard Deviation						**0.11**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance $(\sigma^2) = \frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

MTNL (5years)

Table 11. April 2019 to March 2020

Date	Open	Close	Return	average return	deviation	(deviation)^2
01-04-2019	12.15	11.9	-0.02	-0.05	0.03	0.0008
01-05-2019	11.9	9.65	-0.19	-0.05	-0.14	0.01964
01-06-2019	9.7	8.5	-0.12	-0.05	-0.07	0.00559
01-07-2019	8.7	6.25	-0.28	-0.05	-0.23	0.05414
01-08-2019	6.2	5.45	-0.12	-0.05	-0.07	0.00519
01-09-2019	5.45	5.8	0.06	-0.05	0.11	0.01281
01-10-2019	5.9	7.7	0.31	-0.05	0.36	0.12533
01-11-2019	8.05	9	0.12	-0.05	0.17	0.02787
01-12-2019	9.25	9.45	0.02	-0.05	0.07	0.00498
01-01-2020	9.45	11.1	0.17	-0.05	0.22	0.04997
01-02-2020	11.15	8.4	-0.25	-0.05	-0.2	0.03908
01-03-2020	8.5	6.05	-0.29	-0.05	-0.24	0.05726
TOTAL						**0.4**
Standard deviation						**0.18**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance (σ^2) = $\frac{\sum \text{Deviation}^2}{12}$ = **0.095/12 = 0.008**

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 12. April 2020 to March 2021

Date	Open	Close	Return	average return	deviation	(deviation)^2
01-04-2020	6	7.25	0.21	0.1	0.1	0.011
01-05-2020	7.25	7	-0.03	0.1	-0.14	0.019
01-06-2020	7.25	9.1	0.26	0.1	0.15	0.023
01-07-2020	9.05	9.25	0.02	0.1	-0.08	0.007
01-08-2020	9.45	9.1	-0.04	0.1	-0.14	0.02
01-09-2020	9.3	8.3	-0.11	0.1	-0.21	0.045
01-10-2020	8.35	9.5	0.14	0.1	0.03	0.001
01-11-2020	9.45	9.55	0.01	0.1	-0.09	0.009
01-12-2020	9.6	13.8	0.44	0.1	0.33	0.111
01-01-2021	13.9	12.95	-0.07	0.1	-0.17	0.03
01-02-2021	12.9	13.3	0.03	0.1	-0.07	0.005
01-03-2021	13.4	18.75	0.4	0.1	0.29	0.087
TOTAL						**0.368**
Standard deviation						**0.18**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance (σ^2) = $\frac{\sum \text{Deviation}^2}{12}$ = **0.095/12 = 0.008**

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 13. April 2021 to March 2022

Date	Open	Close	Return	average return	deviation	(deviation)^2
01-04-2021	18.9	16.1	-0.15	0.05	-0.2	0.04
01-05-2021	16	22.05	0.38	0.05	0.33	0.11
01-06-2021	21.55	21.45	0	0.05	-0.05	0
01-07-2021	21.4	21.2	-0.01	0.05	-0.06	0
01-08-2021	21.3	17.9	-0.16	0.05	-0.21	0.04
01-09-2021	17.95	19.05	0.06	0.05	0.01	0
01-10-2021	18.9	18.5	-0.02	0.05	-0.07	0.01
01-11-2021	18.8	17.9	-0.05	0.05	-0.1	0.01
01-12-2021	18.1	35.65	0.97	0.05	0.92	0.85
01-01-2022	36	27.25	-0.24	0.05	-0.29	0.09
01-02-2022	27.55	22.55	-0.18	0.05	-0.23	0.05
01-03-2022	22.55	22.6	0	0.05	-0.05	0
TOTAL						**1.2**
Standard deviation						**0.32**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance (σ^2) = $\frac{\sum \text{Deviation}^2}{12} = 0.095/12 = 0.008$

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 14. April 2022 to March 2023

Date	Open	Close	Return	average return	deviation	(deviation)^2
01-04-2022	22.7	25.65	0.13	-0.01	0.14	0.02
01-05-2022	25.35	21.85	-0.14	-0.01	-0.13	0.02
01-06-2022	22	18.85	-0.14	-0.01	-0.13	0.02
01-07-2022	18.7	24.75	0.32	-0.01	0.34	0.11
01-08-2022	25.1	25.3	0.01	-0.01	0.02	0
01-09-2022	25.1	21.7	-0.14	-0.01	-0.12	0.02
01-10-2022	21.85	20.85	-0.05	-0.01	-0.03	0
01-11-2022	21	23.6	0.12	-0.01	0.14	0.02
01-12-2022	23.8	26.15	0.1	-0.01	0.11	0.01
01-01-2023	26.4	23.85	-0.1	-0.01	-0.08	0.01
01-02-2023	24.15	19.75	-0.18	-0.01	-0.17	0.03
01-03-2023	19.85	18.05	-0.09	-0.01	-0.08	0.01
TOTAL						**0.26**
Standard deviation						**0.15**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance (σ^2) = $\frac{\sum \text{Deviation}^2}{12}$ = **0.095/12 = 0.008**

Standard deviation $\sigma = \sqrt{\sigma^2}$

Table 15. April 2023 to March 2024

Date	Open	Close	Return	average return	deviation	(deviation)^2
01-04-2023	18.15	19.7	0.09	0.06	0.02	0.0004
01-05-2023	19.7	19.1	-0.03	0.06	-0.09	0.009
01-06-2023	19.25	19.65	0.02	0.06	-0.04	0.0019
01-07-2023	19.6	20.05	0.02	0.06	-0.04	0.0017
01-08-2023	20.2	22.5	0.11	0.06	0.05	0.0024
01-09-2023	22.65	31.9	0.41	0.06	0.34	0.1183
01-10-2023	31.9	27.8	-0.13	0.06	-0.19	0.0372
01-11-2023	27.75	28.7	0.03	0.06	-0.03	0.0009
01-12-2023	28.65	33.65	0.17	0.06	0.11	0.0121
01-01-2024	33.9	49.85	0.47	0.06	0.41	0.1649
01-02-2024	50.6	42.95	-0.15	0.06	-0.22	0.0465
01-03-2024	43.55	32.8	-0.25	0.06	-0.31	0.0969
TOTAL						**0.49**
Standard deviation						**0.2**

CALCULATIONS:

Rate of Return = $\frac{\text{share price in the closing} - \text{share price at the opening}}{\text{Share price in the opening}}$

Deviation = Return – Avg. Return

Variance (σ^2) = $\frac{\sum \text{Deviation}^2}{12}$ = **0.095/12 = 0.008**

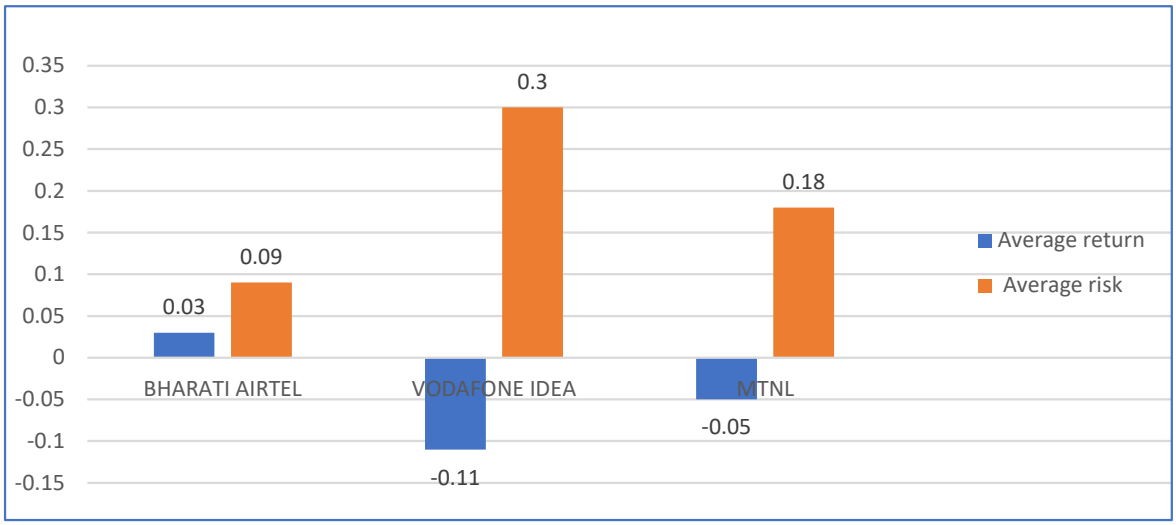
Standard deviation $\sigma = \sqrt{\sigma^2}$

3.2 DATA VISUALIZATION

SELECTED COMPANIES AVG. RISK & AVG. RETURN

YEAR 2019 - 2020

	Telecom Company	Average Return	Average Risk
1	BHARATI AIRTEL	0.03	0.09
2	VODAFONE IDEA	-0.11	0.30
3	MTNL	-0.05	0.18

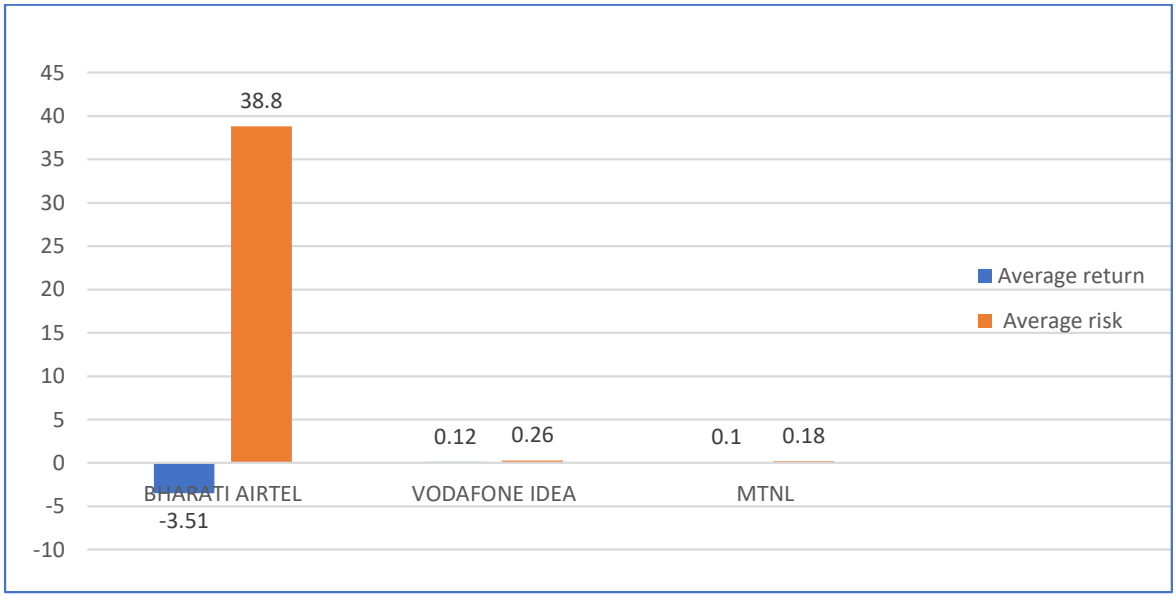


INTERPRETATION:

According to the following table, Bharti Airtel has a high return on investment (0.03) in comparison to other companies. The returns for MTNL and Vodafone Idea are negative, at -0.05 and -0.11, respectively. Comparing Vodafone Idea to other companies, the latter has a higher risk score of 0.30. Comparing Bharti Airtel to other firms, it has a lower risk score of 0.09.

YEAR 2020 - 2021

	Telecom Company	Average Return	Average Risk
1	BHARATI AIRTEL	-3.51	38.8
2	VODAFONE IDEA	0.12	0.26
3	MTNL	0.10	0.18

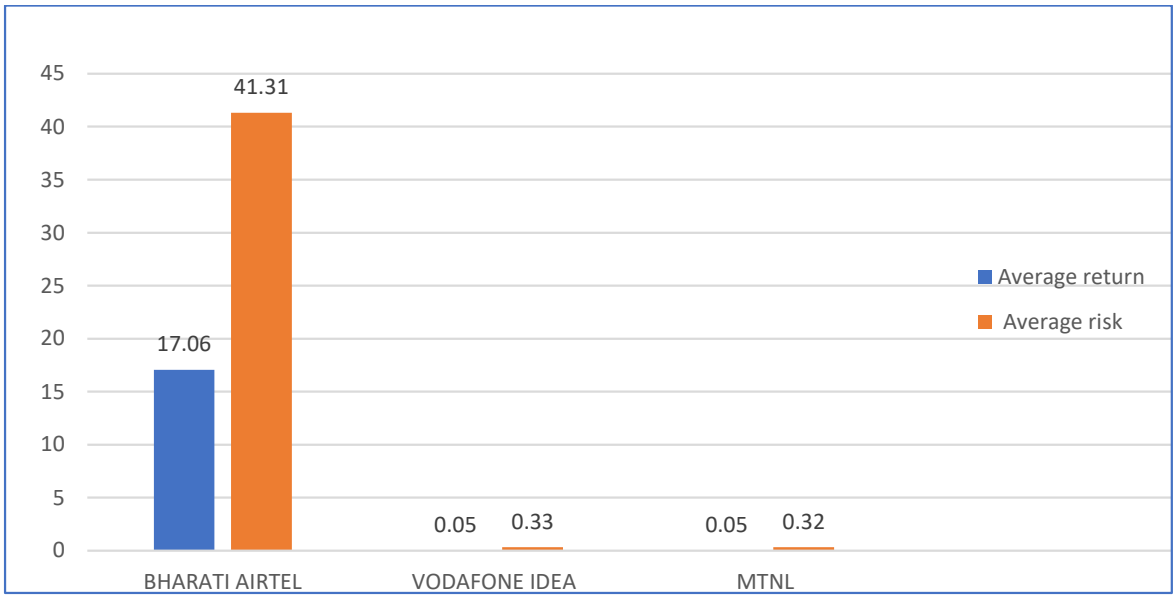


INTERPRETATION:

According to the above table, Vodafone Idea has a strong return on investment (0.12) when compared to other companies. MTNL has a positive return of 0.10 and Airtel has a negative return of -3.51. Airtel's risk score is greater than that of other corporations at 38.8. MTNL's risk is lower than that of other corporations, at 0.18.

YEAR 2021 - 2022

	Telecom Company	Average Return	Average Risk
1	BHARATI AIRTEL	17.06	41.31
2	VODAFONE IDEA	0.05	0.33
3	MTNL	0.05	0.32

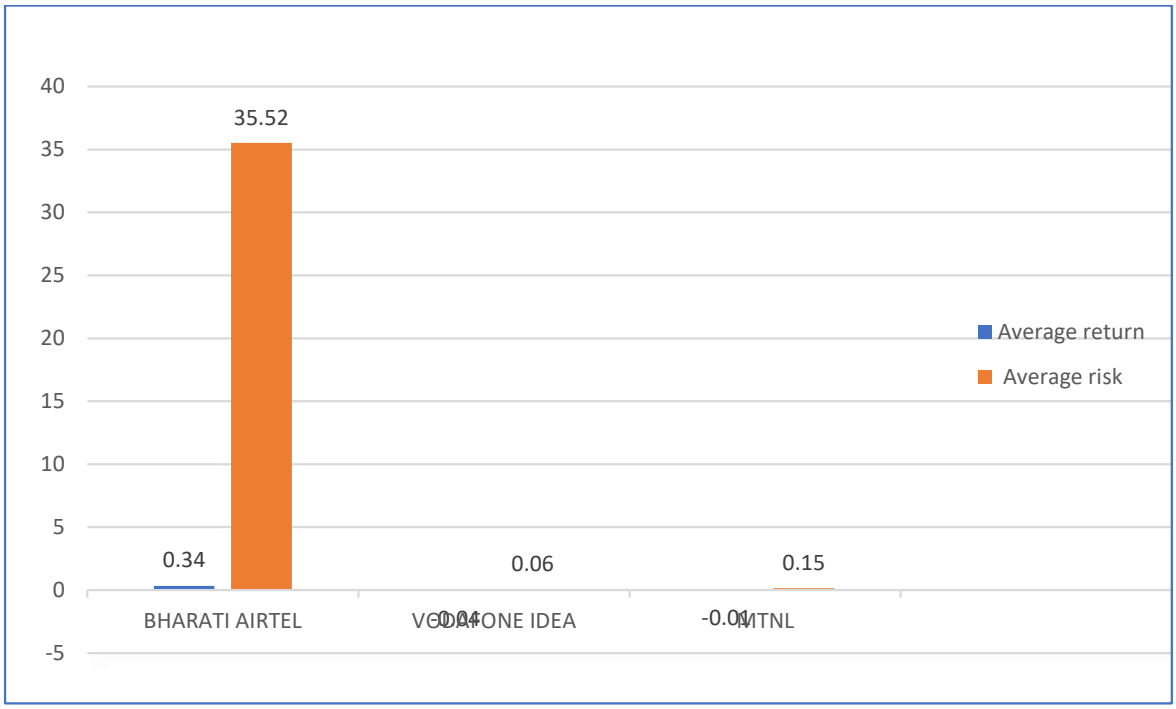


INTERPRETATION:

According to the following table, Airtel has a high return (17.06) in comparison to other firms. In comparison to other firms, Vodafone Idea and MTNL have a positive and equal return of 0.05, whereas Airtel has a larger risk of 41.31. MTNL bears a lower risk of 0.32, which is 0.01 lower than the Vodafone proposal.

YEAR 2022 - 2023

	Telecom Company	Average Return	Average Risk
1	BHARATI AIRTEL	0.34	35.52
2	VODAFONE IDEA	-0.04	0.06
3	MTNL	-0.01	0.15

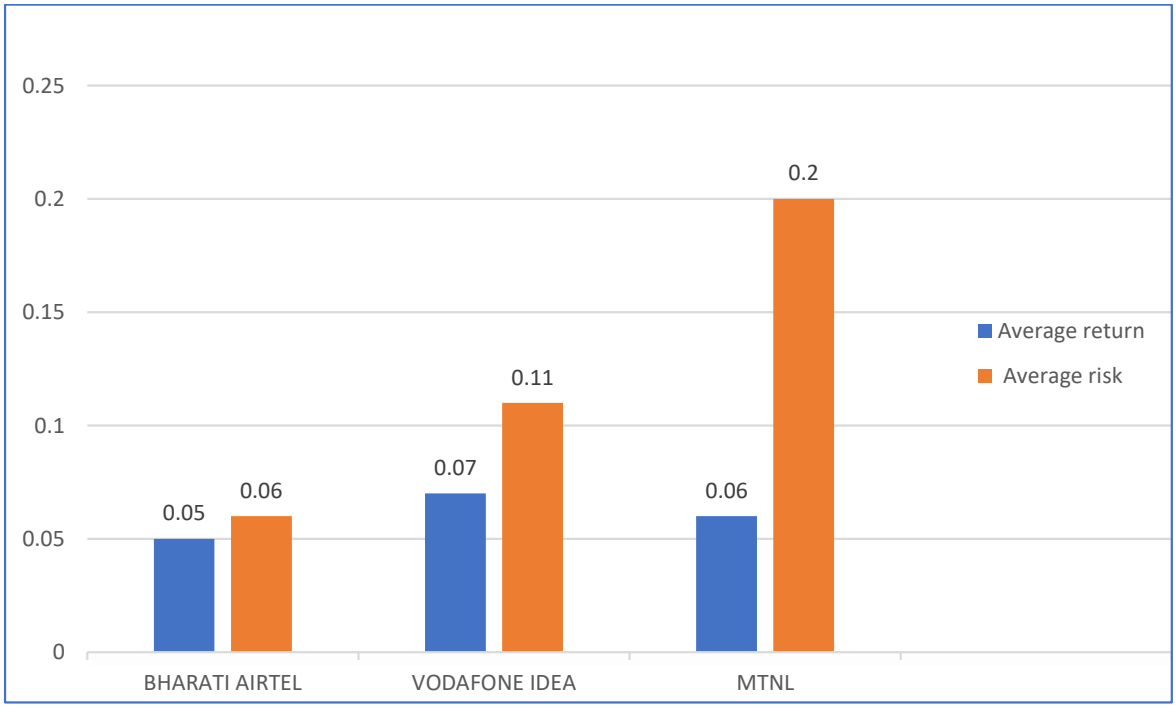


INTERPRETATION:

As can be seen from the above table, Bharti Airtel has a high return (0.34) in comparison to other firms. The returns for Vodafone Idea and MTNL are negative, at -0.04 and -0.01, respectively. Airtel's risk score, which is 35.52, is higher than that of comparable corporations. Comparing Vodafone Idea to other firms, it has a lower risk score of 0.06.

YEAR 2023 - 2024

	Telecom Company	Average Return	Average Risk
1	BHARATI AIRTEL	0.05	0.06
2	VODAFONE IDEA	0.07	0.11
3	MTNL	0.06	0.20



INTERPRETATION:

According to the following data, Vodafone Idea has a good return on investment (0.07) when compared to other companies. The returns for MTNL and Airtel are positive, at 0.05 and 0.06, respectively. MTNL exhibits a high risk rating of 0.20 in relation to other companies. Comparing Vodafone Idea to other firms, it has a lower risk score of 0.06.

3.3 FINDINGS

After the data is analyzed the following facts have been observed.

2019-2020: According to risk-return study, all firms have higher risk than return; nevertheless, BHARTI AIRTEL has better returns in comparison, while Tata Docomo and Vodafone Idea have lower returns.

2020-2021: Based on the data, all companies have more risk than return. The returns on MTNL and Vodafone Idea are greater when compared. When compared to prior poor returns, both MTNL and Vodafone's approach fared well, generating positive and higher returns.

2021-2022: Based on the analysis, Airtel is outperforming other businesses. Both Vodafone Idea and MTNL have seen a decrease in return this year compared to last year's results, despite a relatively higher level of risk.

2022-2023: Based on the analysis, Bharti Airtel is performing better as compare to their rivals. And again the return of both Vodafone idea and MTNL decrease as a result in negative return.

2023-2024: From the analysis, existing player in telecom industry having started facing the decline in there return and increase in high risk because of the entry of biggest telecom player i.e. JIO in stock market on august 2023.

3.4 SUGGESTIONS

The following recommendations are given to the investors after taking note of the information gleaned from the analysis and interpretations.

1. The return will always be higher when there is greater risk, but this isn't always the case, particularly during an economic downturn.

2. At times, attitudes and emotions are major contributors to changes in the stock markets. Consequently, investing during a crisis is not advised.

3. Investors will not be shielded from the risk of investing when markets are declining sharply. As a result, investing during periods of high market volatility is not advised.

4.The perception is that a market position is never stable. Bullish and bearish markets, in my opinion, eventually come to an end.

5. As a result, one can invest during the bearish phase and sell them off as soon as the trend turns bullish.

4. CONCLUSION

The goal of the current effort is to determine whether stock prices are correlated with risk and return by examining the risk-return relationship of individual stocks and the nifty index. Since this project involves examining five distinct Nifty stocks and the Nifty index, there is little room for analysis, interpretation, and conclusion.

Every company has varying levels of performance. Nonetheless, Idea is outperforming every other telecom provider. It has outperformed the other companies in terms of average returns over the last five years.

Due to the severe volatility in the economy, stock values are also impacted, making the market extremely volatile. Investing in this scenario calls for extreme caution. The company handling the share market trading needs to exercise sufficient prudence to prevent losses for investors.

Higher Risk Profile:

- The telecom industry in India exhibits higher systematic risk compared to the overall market. This is due to factors like intense competition, regulatory uncertainties, and rapid technological changes.
- Firms with weaker financial health and operational efficiency tend to have higher risk exposure.

Mixed Risk-Return Tradeoff:

- The risk-return tradeoff in the Indian telecom sector has not been very favorable for investors overall. Some studies have found a suboptimal relationship between risk and return.
- However, firms with better performance metrics and market positioning have been able to offer relatively higher returns.

Impact of Ownership Structure:

- Private sector telecom companies generally have a lower risk profile and offer higher returns compared to state-owned firms like MTNL.
- This is attributed to the agility, efficiency, and market-oriented approach of private players.

Importance of Diversification:

- Portfolio diversification strategies can help mitigate the risks associated with investing in the volatile telecom industry.
- Optimal asset allocation and portfolio optimization techniques can enhance risk-adjusted returns for investors.

Role of Regulatory Environment:

- Changes in the regulatory landscape, such as spectrum allocation, tariff policies, and competition rules, significantly impact the risk and return dynamics of telecom firms.
- A stable and favorable regulatory environment is crucial for the industry's long-term performance.

In conclusion, the telecommunications industry in India presents a complex risk and return profile, influenced by various firm-specific, industry-wide, and regulatory factors. Investors need to carefully analyze these dynamics and adopt appropriate risk management strategies to navigate the sector effectively.

PAPER NAME

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