IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

# INTER TEMPORAL GROWTH AND PERFORMANCE OF INDIAN RAILWAYS: AN ANALYTICAL STUDY

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***Abstract***

*Indian railway is a popular mode of transport in India. It provides comfortable journey to every class of people. It is very helpful in transferring heavy & large materials like jute, cement, petroleum etc. from one part of the country to another part. This research paper measures inter temporal growth and performance of Indian railways for the period of five years from 2013-14 to 2017-18 through exponential growth rate mechanism. The study is entirely based on secondary data that is collected from annual reports of Indian railway. In this paper it was found that growth of Indian railways is satisfactory for total investment, total capital, number of passengers originating, number of stations etc. but net revenue receipts and number of employees employed are showing negative growth. Findings of this study will help Indian railways in the process of decision making.*

***Keywords-*** *Indian railways, growth, exponential growth rate etc.*

## Introduction

An Indian Railway is the state owned enterprise that was introduced in 16 April 1853.It was operated by Ministry of Railways. The first train journey in India is from Bombay to Thane. The idea of the railways is given by Mr. George Clark who was chief engineer in government of Bombay. All the major cities of India and neighbour countries like Pakistan and Nepal are connected with Indian Railways. It is divided into 18 zones and 68 divisions. It is the biggest rail network in Asia & fourth largest rail in the world after U.S, Russia and China. According to IBEF

(India Brand Equity Foundation) revenue of Indian Railways increased at a CAGR of 5.48 percent and earning from business of passenger increased at CAGR of 5.58 percent during 2007-19. Exports of Indian Railways have also grown at a CAGR of 27.05 percent during 2010-17. To improve the infrastructure of railways foreign direct investment inflows stood at US$ 969.28 million from FY 2000-19. In 2017-18 freight traffic in railways was more than 1.2 billion tonnes. It is targeting to increase freight traffic to 3.3 billion tonnes by 2030. As per Indian Railways Annual Report of 2017-18 total length of the rail tracks in India is about 68442 route km. out of which 29376 km. route is electrified covering 7318 railway stations in India. It carried an average of 26 million passenger traffic in a day. It is one of the popular modes of transport that is of low cost and provides comfortable journey to every class of people. It is not only providing transport services to people but also providing freight services. It is very helpful in transferring heavy & large materials like jute, cement, petroleum etc. from one part of the country to another part. Now a day's various superfast trains and container services are introduced for the fast movement of human & material.

## REVIEW OF LITERATURE

**Bharill & Rangaraj (2008)** studied revenue management of Indian railway operation through study of Rajdhani express train. After analysis it was found that leisure and short notice customers were using Rajdhani train as a medium of transport. It was facing competition from airlines. It was also found that 36% of booked tickets were cancelled suddenly. On the basis of results this study offered various suggestions that include reduction in fare for some seats, introduction of cancellation charges & non refundable tickets, offer huge discounts on fare for early booking and introduction of tatkal scheme for first class of air conditioned coach (AC1) during peak time etc. All these suggestions will lead to higher revenue for railways.

**Gupta and Sathye (2008)** studied financial turnaround of Indian railways. It was found that macro economic factors had contributed to turnaround of Indian railways. It was also found that retrenchment, repositioning, Reorganisation and environmental conditions were important factors that contributed financial turnaround.

**Bogart and Chaudhary (2012)** studied historical perspective of Indian railways in terms of its regulation, cost and ownership. It was observed that due to state ownership of Indian railways working expenses were reduced by 13 percent and it does not resulted into reduction in its quality. It was suggested that minimum wages should be guaranteed and capital from foreign countries should be raised to build better infrastructure.

**Bhushan (2013)** studied trends of south central railway zone of Indian railways. For this purpose secondary data was collected and processed through excel and SPSS software. In this study averages, percentage, graphs and regression were used as statistical tools. It was found that total investment and earning from passengers has increased during the study period. It was also revealed that growth rate of distance covered by running vehicles was also increased.

**Sharma and Kumar (2014)** in their study compare the Indian railways with worldwide railways. It was revealed that among the various countries Indian railways ranked first in terms of passengers travelled per kms. Although it was ranked last in adopting latest technology. It was expected that in the year 2020 Indian railways will improve its research and development and will expand its railway network.

## NEED OF THE STUDY

India is the second highly populated country of the world after China and its rapid growth in population increases the travelling demands of the people. In India there are various modes of transport like airways, land ways and water ways. But among the various modes, Railway is the most preferable mode because of safety, affordability by every class of people, comfort ability of seats and convenient for long distance travel etc. It have wide network all over India in terms of technical, operational and commercial aspects. This wide network attracted the eyes of researchers and motivated to do research on its different aspects. The present study measures growth and performance of Indian railways in terms of expenditure, revenue, investment, passengers, stations etc. since last five years 2013-14 to 2017-18. It is estimating existing position of Indian railways and is helpful in making prediction of Indian railways growth in the coming years. This study is new in itself as earlier studies have not covered these aspects related to selected period.

## OBJECTIVES OF THE STUDY

- To analyze the growth and performance of Indian railways during the study period.
- To study the punitive vigilance report of Indian railways.

## RESEARCH METHODOLOGY

Research design of the study is exploratory. This study is entirely based on secondary data that is published by Indian railways in the form of year books and annual reports. Various journals and thesis are also studied. In this study EGR (exponential growth rate) and mean are used as statistical tools.

## DATA ANALYSIS AND INTERPRETATION

It is one of the significant step of research that includes analysis and interpretation of collected data. This step helps in arriving at conclusion of the study. In this collected data of Indian railways related to period of 2013-14 to 2017-18 is analyzed with the help of tables and graphs. Further data interpretation is done that includes explanation of tabular and graphical presentation.

**Table 1**

**Financial aspects of Indian Railways During 2013-14 to 2017-18**

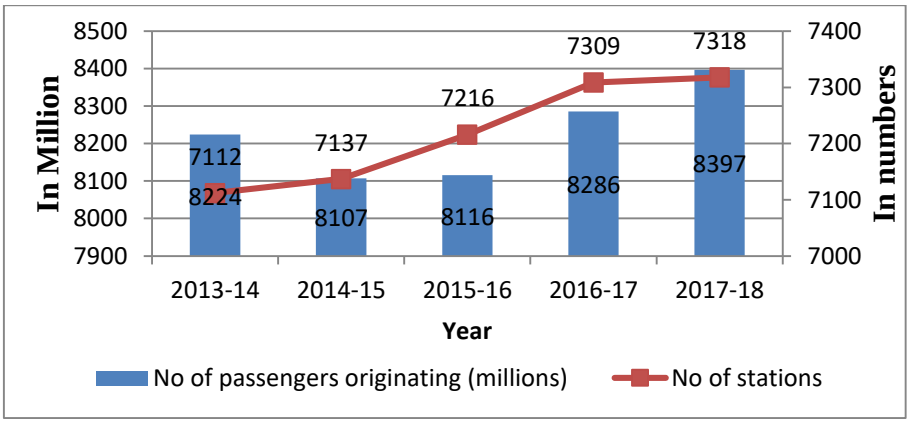
| Year | Total investment (crores) | Total capital (crores) | Net revenue receipts (crores) | No of passengers originating (millions) | No of stations |
|---|---|---|---|---|---|
| 2013-14 | 324662.40 | 208844.28 | 16838.49 | 8224 | 7112 |
| 2014-15 | 368758.21 | 242116.97 | 19228.48 | 8107 | 7137 |
| 2015-16 | 419123.61 | 275135.23 | 4913.00 | 8116 | 7216 |
| 2016-17 | 471776.39 | 302457.78 | 1665.61 | 8286 | 7309 |
| 2017-18 | 517324.19 | 324725.64 | 11749.07 | 8397 | 7318 |
| **Mean** | **420329** | **270656** | **10879** | **8226** | **7218** |
| **EGR** | **12.5%** | **11.69%** | **-27.14%** | **0.64%** | **0.81%** |

**Source: Indian Railways Year Book**

This table shows total capital, total investment, net revenue receipts, number of passengers originating and total number of stations during the study period from 2014-15 to 2017-18. It reveals that on average basis investment, capital and net revenue receipts made in Indian railways during the study period is 420329 crores, 270656 crores and 10879 crores respectively. During this period exponential growth rate of total investment and and total capital is positive while it is negative in case of net revenue receipts. Average no of stations and passengers originating is 7218 and 8226 (millions). Overall this table reveals that Indian railways is progressing in terms of all aspects studied but net revenue receipts are decreasing by 27.14%.

**Graph 1**

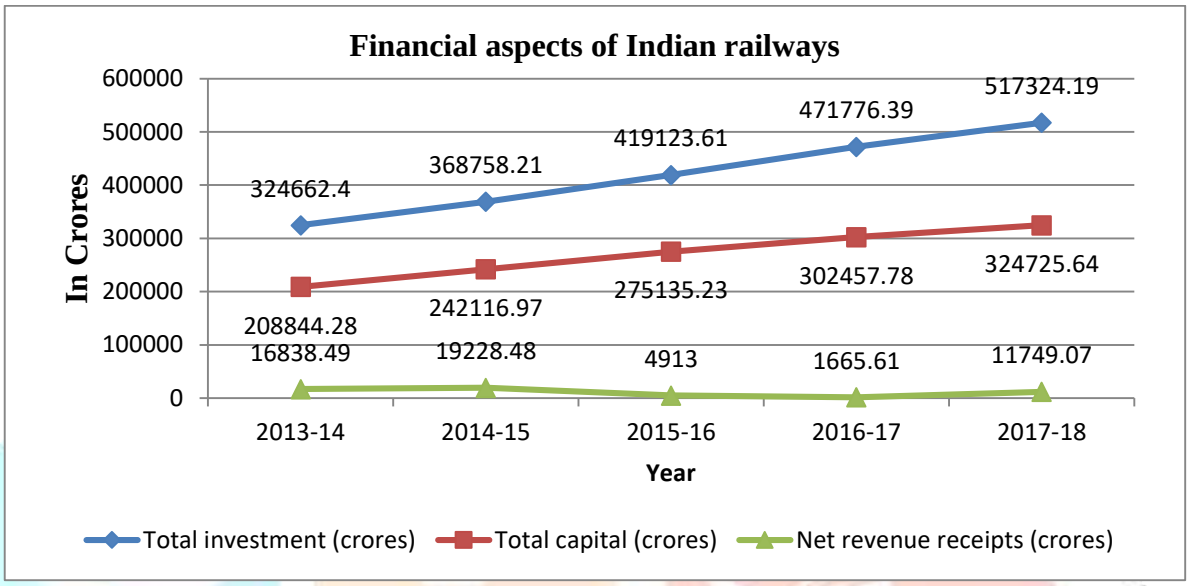
**No of passengers and stations of Indian Railways During 2013-14 to 2017-18**



This graph reveals that increase in the number of stations leads to increase in the number of passengers. Number of stations in the initial year of the study was 7112 and it was maximum 7318 during the final year 2017-18 of the study. It increased 0.81% during the study period. The reason behind is increase in the investment and capital of the Indian railways.

**Graph 2**

**Financial aspects of Indian Railways During 2013-14 to 2017-18**




Line of total investment and total capital are showing upward toward during the selected period. The reason behind the increase of investment and capital is increase in the number of stations, introduction of new trains and new coaches in the train. But line of net revenue receipts is showing negative growth. The reason behind negative growth is increase in working expenses of Indian Railways. Here working expenses includes depreciation and all miscellaneous expenses.

**Table 2**

**Punitive vigilance report during 2013-14 to 2017-18**

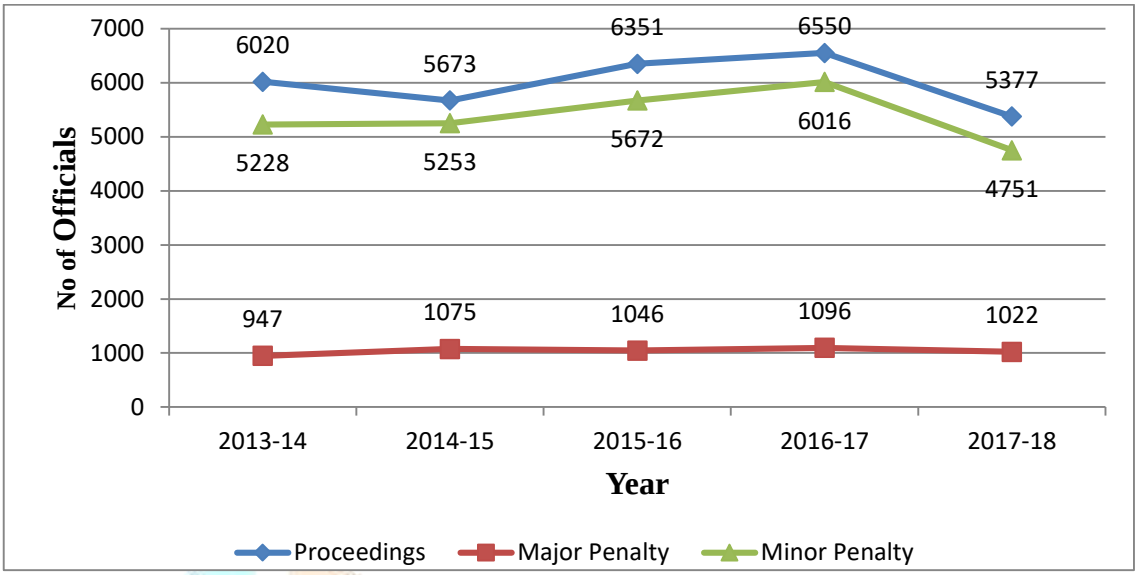
| Year / punitive cases | Number of officials against whom disciplinary proceedings were initiated | Number of officials against whom disciplinary proceedings resulted in imposition of major penalty | Number of officials against whom disciplinary proceedings resulted in imposition of minor penalty |
|---|---|---|---|
| 2013-14 | 6020 | 947 | 5228 |
| 2014-15 | 5673 | 1075 | 5253 |
| 2015-16 | 6351 | 1046 | 5672 |
| 2016-17 | 6550 | 1096 | 6016 |
| 2017-18 | 5377 | 1022 | 4751 |
| **Mean** | **5994** | **1037** | **5384** |
| **EGR** | **-0.82%** | **1.73%** | **-0.56%** |

**Source: Indian Railways Year Book**

This table reveals punitive vigilance report of Indian railways during the selected period of study. Data of the study shows that during the study period 2013-14 to 2017-18 on an average basis against 5994 officials punitive cases are filed but major penalty is filed against only 1037 officials an average basis and remaining officials pays only minor penalty. Number of employees against whom proceedings are made and against whom major penalty is imposed showed positive growth that implies negative sign for Indian railways. The reason behind the increase is major offences including bribe, corruption, long period absence committed by employees. No of employees against whom minor penalty is imposed is 5384 on average basis. It was showing negative EGR value that means over the study period this number has been decreased.

**Graph 3**

**Punitive vigilance report**




It is the graphical presentation of punitive vigilance table. It is showing the performance of Indian railways in terms of punitive vigilance report. Line showing number of officials against whom proceedings are made and against whom minor penalty is imposed is showing downward slope upto year 2014-15 and then upward slope up to year 2016-17 and then in the year 2017-18 it is again showing downward slope. Horizontal red Line is showing officials against whom major penalty is imposed. There are no major changes happened in this line. It is interpreted from the graph that railway employees are facing punishment because of their own wrong behavior. No of officials against whom proceedings are made is highest 6550 in the year 2016-17 and no of officials against whom major penalty is imposed is also highest 6016 in the year 2016-17. Correlation is establishing between no of employees against whom proceedings are made and against whom major penalty is imposed.

**Table 3**

**Length of the Railway Track (kms) during 2013-14 to 2017-18**

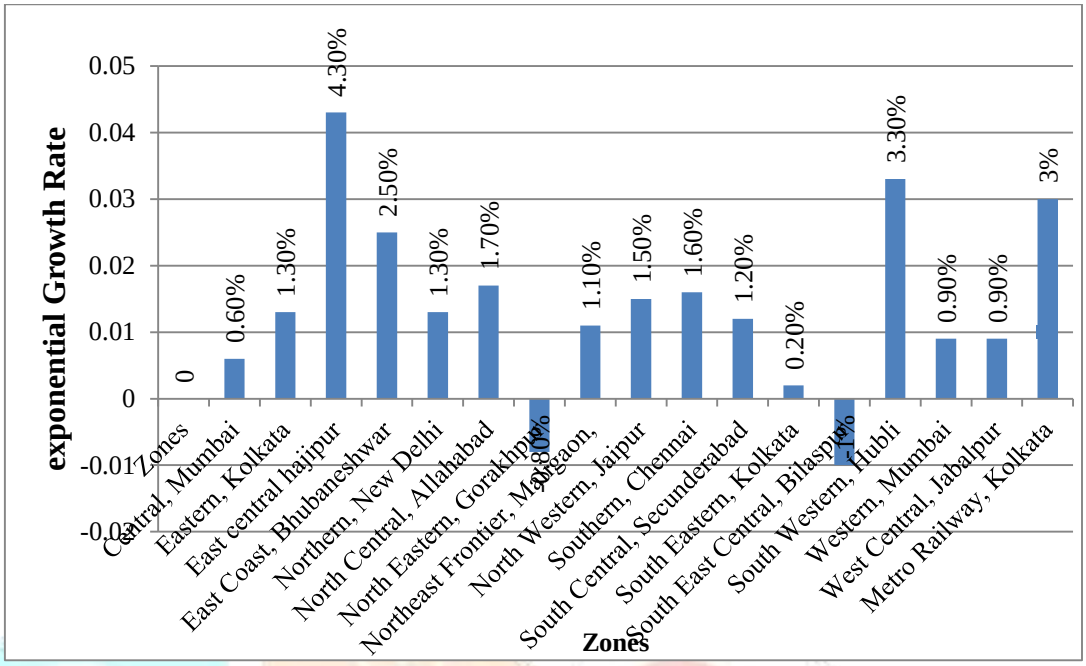
| Zone/year | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Mean | EGR |
|---|---|---|---|---|---|---|---|
| Central, Mumbai | 8404 | 8444 | 8491 | 8565 | 8598 | 8500.4 | **0.6%** |
| Eastern, Kolkata | 7058 | 7376 | 7461 | 7526 | 7454 | 7375 | **1.3%** |
| East central hajipur | 7996 | 8048 | 8199 | 8297 | 9723 | 8452.6 | **4.3%** |
| East Coast, Bhubaneshwar | 5262 | 5294 | 5440 | 5562 | 5802 | 5472 | **2.5%** |
| Northern, New Delhi | 12663 | 12771 | 12966 | 13141 | 13302 | 12968.6 | **1.3%** |
| North Central, Allahabad | 5928 | 5935 | 6101 | 6279 | 6285 | 6105.6 | **1.7%** |
| North Eastern, Gorakhpur | 5196 | 5169 | 5321 | 5269 | 4953 | 5181.6 | **-.8%** |
| Northeast Frontier, Maligaon, | 5951 | 5972 | 6025 | 6099 | 6227 | 6054.8 | **1.1%** |
| North Western, Jaipur | 7251 | 7354 | 7430 | 7547 | 7680 | 7452.4 | **1.5%** |
| Southern, Chennai | 8426 | 8533 | 8647 | 8842 | 8972 | 8684 | **1.6%** |
| South Central, Secunderabad | 9939 | 9971 | 10107 | 10280 | 10384 | 10136.2 | **1.2%** |
| South Eastern, Kolkata | 6748 | 6789 | 6834 | 6796 | 6816 | 6796.6 | **0.2%** |
| South East Central, Bilaspur | 4962 | 4999 | 5048 | 5159 | 4859 | 5005.4 | **-1%** |
| South Western, Hubli | 4738 | 4816 | 4931 | 5283 | 5332 | 5020 | **3.3%** |
| Western, Mumbai | 9984 | 10225 | 10239 | 10337 | 10373 | 10231.6 | **0.9%** |
| West Central, Jabalpur | 6178 | 6205 | 6295 | 6333 | 6381 | 6278.4 | **0.9%** |
| Metro Railway, Kolkata | 81 | 95 | 95 | 93 | 95 | 91.8 | **3%** |

**Source: Indian Railways Year Book**

This table reveals exponential growth rate of total track of Indian railways among all zones during the selected period of study. Data of the table 3 shows that exponential growth rate is positive of all zones except two zones named North Eastern, Gorakhpur zone and South East Central, Bilaspur zone. Among the all zones exponential growth rate of East Central, Hajipur zone is highest (4.3%) and growth of Central, Mumbai zone, South Eastern, Kolkata zone, Western, Mumbai zone and West Central, Jabalpur zone is less than 1%.

**Graph 4**

**Length of the Railway Track (kms) during 2013-14 to 2017-18**




It reveals that among the 17 zones only 2 zones are showing negative bars which means their exponential growth rate is negative during 2013-14 to 2017-18. East central Hajipur zone is showing higher bar that means exponential growth of this zone is highest in terms of total track. The reason behind the increase of length of total track is increase of capital and investment by Indian railways.

**Table 4**

**Average wage per employee of Indian railways during 2013-14 to 2017-18**

| Year | No of Employees (thousands) | Wage Bill (crores) | Average Wage per Employee |
|---|---|---|---|
| 2013-14 | 1334 | 75893.05 | 585620 |
| 2014-15 | 1326 | 84759.69 | 651376 |
| 2015-16 | 1330 | 93001.24 | 715726 |
| 2016-17 | 1309 | 118501.74 | 908263 |
| 2017-18 | 1271 | 129336.48 | 1030961 |
| **Mean** | **1314** | **100298.4** | **778389.2** |
| **EGR** | **-1.1%** | **15%** | **9.1%** |

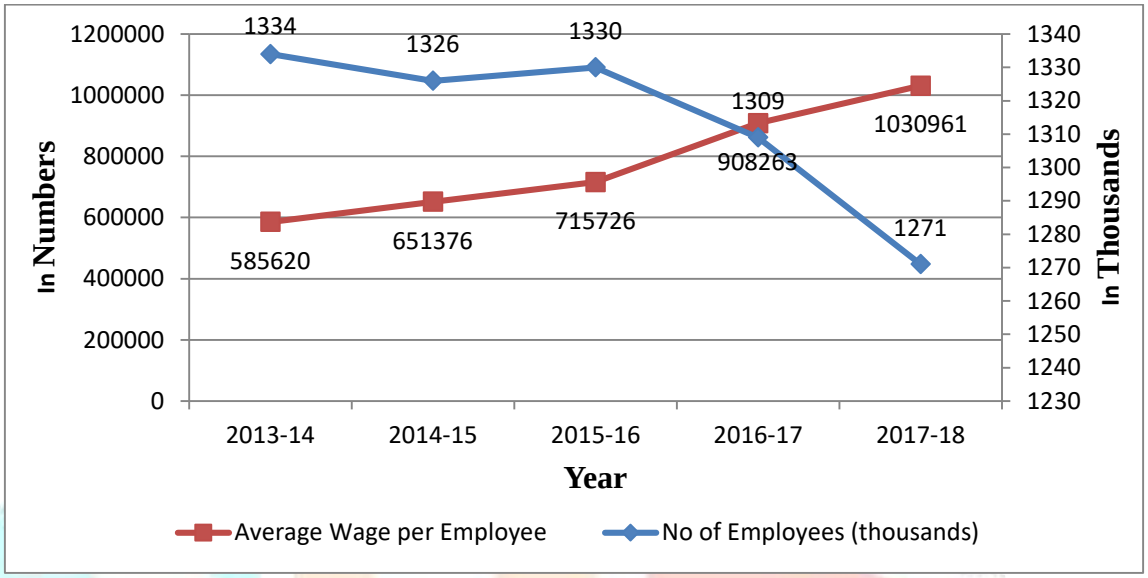
**Source: Indian Railways Year Book**

This table reveals that during the selected five years average number of employees employed in Indian railways are 1314000 with the average expenditure in terms of wage bills is 100298.4 crores. Value of EGR shows that wage bills has increased and these are highest 129336.48 crores in the final year of the study 2017-18. It is because of hike in salary of railway employees. Salary scale of employees was reviewed by government in the study period. The Exponential growth rate (EGR) of

wage bills is recorded as 15%. Due to rise in the wages of employees average wage rate also recorded growth rate 9.1%.

**Graph 5**

**Average wage per employee of Indian railways during 2013-14 to 2017-18**




This graph reveals that line showing number of employees employed shows that whether no of employees are less or more but average wage of employee increased 9.1%. The reason behind the increase in average wage per employee is hike in salary of employees of railways.

## Conclusion

The analysis of the study reveals that capital at charge, investment, average wage per employee, number of stations and passengers originating shows positive growth during 2013-14 to 2017-18. But net revenue receipts and number of employees employed shows negative growth over the studied five years. In case of punitive vigilance report number of officials against whom proceedings were initiated and against whom minor penalty was imposed are decreased over the five years but number of officials against whom major penalty was imposed is increased with 1.73%. It was not a good symbol for Indian railways that their officials were not disciplined and paying major penalty. It was suggested that railways should focus on their net revenue receipts and employees discipline for the high level of its growth and performance.

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