

SOME ASPECTS OF THE ECONOMIC PERFORMANCE OF INDIAN RAILWAY

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Abstract:

The infrastructure, particularly transport infrastructure plays a very critical role in development in economy. The transport can be of different modes like roads, railroad, water and air etc.,. Each of the system acts separately using different input produce output. The Indian Railways is among the largest rail networks in the world, which transports more than 23 million passengers daily and 3 million tons of freight daily. It has an enormous economic contribution; however, this contribution is not always recognized.

The government is still working on the modernization, Indian railways electrification status and the expansion of rail freight to transform the efficiency, reduce the emissions and improve the overall contribution to the economy of the sector. As the system is going to make India Railways even more integral to the growth story, with such endeavours as the Gait Shakti Railway project and the growing FDI in Indian Railways, it is becoming an even more solid pillar of the Indian development narrative.

The railway system in India has been called the life line of the country- and justifiably so. Indian Railways is far more than a transport system as it spans over 68,000 kilometres and provides transportation services in the most distant parts of the country. It is a strong economic powerhouse, a uniting force in the nation and one of the major contributors to the Indian growth story. The rail infrastructure and modernization, rail freight, and investment plans are all examples of the railway system that will touch various other industries, creating employment opportunities, increasing GDP, and facilitating the development of the nation.

Through this blog, we shall look at how the Indian Railways budget, the railway network India and the strategic investments are transforming the railways into the most valuable economic asset in India. The modernization programs involve high speed trains, modernized stations and better signalling systems. The Gati Shakti Railway project will be the main component of this vision, which will incorporate railways and roads, ports, and airports to achieve maximum cargo and passenger transportation.

Keywords: Economy, Roads, Railroad, water, air, ports, cargo, India, trains and GDP.

Introduction:

Indian Railway is serving the country for nearly 170 years. It connects the entire country in all the direction. Indian Railway is the major mode of transport of the country. Physical or economic infrastructure acts as the backbone of a country, necessary for its economic development. Transport is a very crucial component

of infrastructure. So, Indian Railway can be thought as an important infrastructure of India. This chapter discusses the functions of infrastructure in general, transport infrastructure in particular and Indian Railway, one of the important modes of transport in India.

Indian Railway:

Indian Railway, the fourth largest rail network in the world is owned and operated by state. Spread over a network of 67000 kilometres the Indian Railways 13000 passenger trains carrying 23 million passengers and 9000 freight trains carrying 3.05 million tonnes of goods every day (Reforms in Passenger Train Operations, Ministry of Railways and Government of India).

Revenue:

The revenue, earned by the IR is mainly of two types- earnings from passengers and earnings from carriage of goods. Almost 70 percent of IR's revenues come from the freight operations as mentioned earlier. Freight traffic can be classified into bulk and other cargo. The bulk commodities bring 94 percent of the freight revenue. Among the bulk commodities, Coal alone accounts for nearly half of the bulk traffic carried. Passenger business, in terms of train kilometres, causes nearly 60 percent of IR's total transport effort, but it constitutes less than 30 percent of the total revenues. Suburban services account for 57 percent of the originating passengers, while contributing to only 8 percent of the passenger revenue. Apart from passenger revenue and goods revenue, railway earns some revenue from collection of fees and fines.

Operational routes:

An indicative list of 100 origin destination pairs for introduction of train services by the private entities have been made by the authority in which total 100 rakes have been divided into a number of clusters such that each cluster would require operation of at least twelve rakes. ω Duration of journey on each Path: A train should complete a path within a time as similar to that taken by the fastest train of IR operating on that path, with a variation of plus or minus ten percent. IR would be non-discriminating for the trains operated by the Concessionaire (shareholders).

Length of Train:

Each train shall have at least 16 coaches and the maximum number of coaches will not be more than the longest passenger train operating on the respective path. ω Configuration of trains: The configuration of each train as well as its coaches shall be determined by the Concessionaire (private owner) based on the demand.

Operation and Maintenance:

The private entity must be responsible for the operation of maintenance. The standards given by The Research Design and Standard Operation (RDSO) must be maintained with respect to operation and maintenance. IR will only provide berth or space to private entity in the existing maintenance depots or washing lines or a space in adjacent area for up-gradation and use of the same by the Concessionaire. The

private entity must arrange its manpower, tools and plants as required for undertaking the maintenance obligations.

Safety Certification:

IR will provide safety certificate to the private entity based on safety parameters indicated by IR and travel worthiness certified by the Concessionaire; however, the same will not relieve or absolve the Concessionaires of the obligation and liabilities as specified in the Agreement. Detailed terms and conditions will be specified in the Concession Agreement.

Maximum Permissible Speed:

The maximum speed for the passenger trains to be operated by the private entity must not exceed 160kmph
Determination of Fare: The private entity will enjoy full freedom to determine the fare, without any intervention from IR.

Design of the Rolling Stock:

Private Entity can procure trains and locomotives from a source of its choice, if such trains and locomotives are compatible with specification and standards specified in the Concession Agreement. The trains could be either loco hauled or distributed power.

Validation of Rolling Stock:

Accredited Independent Safety Assessor (ISA) will be responsible for validation while introduction of new rolling stock.

Role of Private Entity:

Financing, procuring, operation and maintenance of the trains will be the responsibilities of the private entity. They will pay to IR predetermined charges for haulage and any other payments as specified in the Agreement.

Penalties for non-performance:

Pre-specified penalties shall be recovered from the Concessionaire if they fail to meet the prescribed performance standards and outcomes. Similarly, IR will also be penalised in pre specified rate for the failure on the part of the Railways.

Literature Review:

Infrastructure, its components, their importance, contribution to the economy, the development of infrastructure as a whole, the role of infrastructure development in the overall economic development- all these have been the matters of research across the world.

Donaldson and Hornbeck (2016) taking U.S. data from 1870 to 1890 found that as railroads expansion has caused a substantial rise in the agricultural land values during the time period considered. The study

further finds that removal of all railroads in 1890 caused a fall in the total value of U.S. agricultural land by 60 per cent.

Zou et al. (2018) established a general equilibrium trade model and measured the impact of High Speed Rail (HSR) network on the economic growth of 110 main prefecture level cities of People's Republic of China. The results of the paper confirm the evidence of positive impact of introduction of HSR on the economic growth.

Kanmani and Prakash (2019) in their study on Indian railways used application of data Envelopment Analysis for obtaining the efficiency score of 16 zones of IR. The study took data for the year 2016-17. Four input variables Number of employees, number of rolling stock, train kilometres and number of passenger originating and three output variables passenger kilometres, passenger carried and tonne kilometres were considered

Roy and Kulsrestha (2020) used Data Envelopment Analysis (DEA) approach for examining the efficiency, returns to scale of IR for the 15 years between 2003 and 2017. Using variables like Operating expenses, Staff employed, Passenger originating, Freight Carried and Rail Network Length, the study finds existence of efficiencies below 50% with decreasing returns to scale.

Akram et al. (2021), in an empirical study examined the financial performances of IR, identified the causes of lacklustre functioning of IR, and assessed the logistical and safety issues of IR.

Methodology:

This article, being an empirical one, uses secondary data from different sources like Annual Statistical Statements (ASS) of IR, Handbook of Statistics of Indian States published by Reserve Bank of India to study. Different articles use techniques of econometrics and Data Envelopment Analysis (DEA). Line Graphs of time series have been constructed to demonstrate the growth.

Growth of Indian Railways:

Indian Railways, one of the largest transport network as well as one of the largest employers of the country has experienced different ups and downs during its entire period of service. Since independence, the Indian economy has witnessed several changes in the economic policies which definitely affected the performance of the railways. Introduction of other modes of transportation, development of roadways, airways, changes in socio economic scenario, job patterns of the working people have also made impact on the railways.

INDIAN RAILWAYS: ANNUAL REPORT & ACCOUNTS 2024-25:

Freight Operation: The year 2024-25 ended with the Net Revenue Receipts of `2,660.28 crore.

<i>Title</i>	<i>2023-24</i>	<i>2024-25</i>	<i>Absolute Variation</i>	<i>% age Variation</i>
Revenue Originating Tonnes (million)	1,588.06	1,614.91	26.85	1.69
Revenue Net Tonne Kms. (billion)	973.97	971.08	-2.89	-0.30
Goods Earnings @ @Excludes 'other goods earnings' such (in crore)	1,65,880.58	1,68,323.61	2,443.03	1.47
		as wharfage,.	demurrage	
Passenger Business				
	<i>2023-24</i>	<i>2024-25</i>	<i>Absolute Variation</i>	<i>% age Variation</i>
Number of Passengers carried(million)	6,905	7,293	388	5.62
Passenger Kilometers (billion)	1,065	1,133	68	6.38
Passenger Earnings (in crore)	70,693.33	75,367.52	4,674.19	6.61
Engineering Works				

Engineering Works: During the year 2024-25 the following Engineering Works were accomplished:

	<i>2024-25 (in km.)</i>
Construction of New Lines	1,105
Conversion to Broad Gauge	166
Track Renewal	6,851

Electrification 2,701 kms. of IR's route was electrified during 2024-25.

Safety, Signal and Telecom:

Details of consequential train accidents and train accidents per million train kilometres (an important index of Safety) during 2024-25 as compared to 2023-24 are given below:

	<i>2023-24</i>	<i>2024-25</i>
Consequential Train Accidents*	40	31
Train Accidents Per Million Train Kilometres	0.03	0.03
Opera*including Konkan Railway		

Some important efficiency indices for 2024-25 compared to 2023-24 were as follows:

<i>Efficiency Index</i>	<i>Broad Gauge</i>		<i>Metre Gauge</i>	
	<i>2023-24</i>	<i>2024-25</i>	<i>2023-24</i>	<i>2024-25</i>
Net tonne kms. per wagon per day	7,851	7,292	-	-
Speed (kmph) of all goods trains (all traction)	25.0	23.4	-	-
Percentage of loaded to total wagon km	65	68	-	-
Net load per goods train (tonnes)	1,899	1,869	-	-
Net tonne km per engine hour	14,007*	12,779	-	-
Passenger vehicle km per vehicle per day	458*	454	45*	61
*revised				

Materials Management:

Materials Management on IR is being progressively revamped with a view to reduce costs, storage, handling, and insurance and dividend charges. Turnover Ratio in terms of value of inventories to value of materials consumed was 19% (without fuel) and 19% (with fuel) during 2024-25 as compared to 17% (without fuel) and 17% (with fuel) during last year. The disposal of condemned Rolling Stock and scrap arising was monitored closely.

Managing the Environment:

Efforts are steadily being made to make Railway operations environment friendly and to bring down the adverse effects through adaptation of cleaner technologies, energy conservation measures, afforestation on vacant railway land, etc. Railway is utilizing wasteland and rooftops for setting up solar power plants.

Human Resource Development:

A number of initiatives were taken to improve the quality of training programmes for railway employees in order to improve productivity. In this direction, 'National Rail & Transportation Institute' (NRTI) has been set up as India's first University focused on transport related education, multidisciplinary research & training in Vadodara, Gujarat.

Industrial Relations and Personnel:

As on 31st March, 2025, IR had 12, 28,992 regular employees as against 12, 52,180 as on 31st March, 2024 a decrease by 23,188.

Finance:

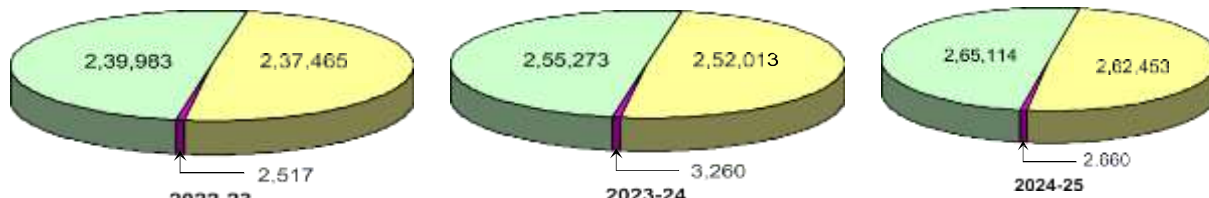
Results for 2024-25

Gross Traffic Receipts of the Railways went up from ₹ 55,272.63 crore in 2023-24 to ₹ 65,113.61 crore in 2024-25. Total Working Expenses increased from ₹ 50,893.61 crore in 2023-24 to ₹ 60,768.89 crore in 2024-25. After taking into account the miscellaneous transactions, the Net Revenue Receipts were ₹ 2,660.28 crore. There was no dividend payment during 2024-25 as per RCC recommendations. The year ended with a net Revenue of ₹ 2,660.28 crore. The Financial Results for 2024-25 compared to 2023-24 are summarized as below:.

	2023-24	2024-25	(` In crore) Variation
Capital Investment (excluding MTPs and Circular Railway, Udhampur-Baramula project and appropriation to SRSF)	6,94,142.62	8,74,743.81	1,80,601.19
Investment from Capital Fund Total	53,449.91	53,449.91	-
Gross Traffic Receipts Total Working Expenses Net Traffic Receipts	7,47,592.53	9,28,193.72	1,80,601.19
Miscellaneous Receipts (Net) Net Revenue Receipts	2,50,893.61	2,60,768.89	9,875.28
Dividend Payable to General Revenues Excess(+)/Shortfall(-)	4,379.02	4,344.72	(-) 34.30
Percentage of	(-) 1,119.34		(-) 565.10
(a) Working Expenses to Gross Earnings	3,259.68	2,660.28	(-) 599.40
(b) Net Revenue to Capital Investment and investment from Capital Fund	704	871	167
Capital Investment*(in paise) per NTKM			

*Includes investment from Capital Fund

Gross revenue and working Experience:



Growth of deployment of Signaling on Indian Railways (As on 31.03.2025)

Item	March, 21	March, 22	March, 23	March, 24	March, 25
Panel Interlocking (Stations)	3,747	3,438	3,134	2,950	2,751
Route Relay Interlocking	247	226	217	201	186
Electronic Interlocking	2206	2572	3045	3424	3691
PI/RRI/EI (Stations)	6,200	6,236	6,396	6,575	6,628
Block Proving by Axle	5,805	6,003	6,364	6,058	6,127
Automatic Signaling	3,447	3,549	3,908	4,431	5,525
Intermediate Block	628	666	727	756	780
Interlocked level Crossing Gates (Nos.)	11,710	10,854	11,079	11,062	11,094

Self-Sufficiency:**Signaling Workshop:**

Railway signalling installations use a number of specialized equipment for smooth & safe running of trains. With upgradation of technology and shift towards electrical/electronic system of Signalling, the demand for these equipment's has gone up. To attain self-sufficiency in meeting this increased demand, IR's Signal Workshops at Polaner on Southern Railway, Mettuguda on South Central Railway, Gorakhpur on North Eastern Railway, Howrah on Eastern Railway, Byculla on Central Railway, Sabarmati on Western Railway, Kharagpur on South Eastern Railway and Ghaziabad on Northern Railway have been manufacturing items like Electric Point Machines, Tokenless Block Instrument, Double Line Block Instruments, Axle Counters, various types of Relays, etc. Year wise out-turn achieved by these S&T workshops is as under.

Year wise Out-Turn of Signal and Telecommunication Workshop

Year	Out Turn (in crore)
2020-21	250.41
2021-22	313.00
2022-23	340.33
2023-24	457.71
2024-25	367.69

Managing the Environment:

Railways are one of the least polluting modes of transport. Efforts are steadily being made to make Railway operation environment-friendly. Some of the important steps taken in this direction are enumerated in the succeeding paras.

Green Energy Initiatives on IR:

Indian Railways is committed for creating a sustainable energy system that minimizes environmental impact, with a strong focus on harnessing renewable energy sources. To make the energy sourcing greener, IR has made notable progress in harnessing solar energy yielding both environmental and economic benefits. In line with this vision, IR has already commissioned 571 MW of solar plants (220 MW on Roof tops + 351 MW on land) and 103.4 MW of Wind plants up to March, 2025. The details of various renewable capacities installed/tied up across IR up to March, 2025 are as under.

Solar Energy:***Non-Traction Application:***

Solar rooftop plants of 220 MW capacity have been provided on 3742 Railway Stations, Service buildings and Residential buildings. MW land based solar plant commissioned at Modern Coach Factory (MCF), Raebareli, (Uttar Pradesh).

Traction Application:

400 MW Solar Power tied up from Budelkhand Saur Urja Limited (BSUL) under Optimal Scheduling (equivalent to typical 800 MW Solar Power Plant) from its solar parks located at Madhogarh & Orai, in Jalun Distt. (U.P.). 500 MW (installed capacity) of solar power has been tied up from IRCON from its Solar Park located at Pavagada (Karnataka). Part power of about 30 MW (150 MW installed capacity) has started flowing. 195 MW Solar Power tied up from Rewa Ultra Mega Solar Ltd. (RUMSL) under Optimal scheduling (equivalent to typical 400 MW Solar Power Plant) from its solar parks located at Agar, Shajapur & Nēembucú (M.P.). Part power of about 144 MW already has started flowing. 50 MW (installed capacity) of solar capacity commissioned at Bhilai, Chhattisgarh 2 MW (installed capacity) of solar capacity commissioned at Diwana, Haryana 1.7 MW (installed capacity) of solar capacity commissioned at Bina, Madhya Pradesh.

Wind Energy:

Indian Railways has commissioned a total capacity of 103.4 MW of wind power plants, which are utilized for meeting both traction and non- traction power requirements, as detailed below:

Traction Application:

50.4 MW (installed capacity) wind power tied up from NTPC Vidyut Vyapar Nigam Ltd from its plant located at Sangli, Maharashtra. 26 MW (installed capacity) wind power tied up from REMCL from its plant located at Jaisalmer, Rajasthan. 10.5 MW (installed capacity) wind power plant commissioned at Madurai, Tamil Nadu 6 MW (installed capacity) wind power tied up from Sri Pawan Energy Pvt. Ltd from its plant located at Sangli, Maharashtra. 50 MW (installed capacity) wind power tied up from Green Infra Power Ltd. from its plant located at Hremanpur and Kushtagi in Koppal District, Karnataka.

Industrial Relations:

Industrial Relations on Indian Railways remained cordial throughout the year 2024-25. Recognized Federation/Unions have participated in all important meetings resulting in effective and meaningful involvement of Railway Servants in achieving the corporate objectives of Indian Railways. Secret Ballot

Elections-2024 were conducted smoothly and peacefully for verification and recognition of Trade Unions in Zonal Railways, Chittaranjan Locomotive Works & Rail Coach Factory Kapurthala.

Number of personnel:

Group-wise and Department-wise break-up of Railway employees (excluding MTP/Railways) as on 31-03-2025 vis-a-vis 31-03-2024 are as follows:

<i>Group-wise break-up</i>	<i>As on 31-3-2024</i>	<i>As on 31-3-2025</i>
Group A	9,983	10,025
Group B	7,048	7,165
Group C		
(i) Workshop & Artisan	1,22,917	1,19,520
(ii) Running	1,53,661	1,52,391
(iii) Others	9,58,571	9,39,891
		Group D
(i) Workshop & Artisan	\$	\$
(ii) Others	\$	\$
Total	12,52,180	12,28,992
\$ Erstwhile Group D is merged in Group C Department-wise break-up		
Administration	14,606	14,375
Personnel	21,298	21,350
Accounts	18,517	17,353
Engineering	3,02,643	2,96,825
Signal and Telecom	63,164	62,328
Transportation	1,64,213	1,62,094
Commercial	74,913	73,822
Mechanical Engineering	2,74,101	2,96,825
Stores	15,922	14,809
Electrical	2,10,247	2,12,769
Medical	27,808	26,194
R.P.F.	63,869	62,272
Construction	-	-
Gati Shakti	879	810
Total	12,52,180	12,28,992

Human Resource Development (HRD) and Manpower Planning:

Human Resource Development (HRD) in Indian Railways focuses on enhancing the skills, knowledge, and capabilities of its vast workforce to ensure efficiency, safety, and service excellence. Through structured training programs, leadership development, and continuous learning initiatives, HRD aims to build a future-ready and motivated workforce aligned with organizational goals.

On Indian Railways, its 08 Centralized Training Institutes (CTIs), located across the country, cater to the training needs of Indian Railway Officers. These CTIs, apart from imparting probationary training also cater to the various specialized training needs of railway Officers. They conduct courses on General Management, Strategic Management as well as functional area for serving Officers. Need-based special courses are also conducted by CTIs for IR, non-railway organisations in India as well as trainees from abroad, which are widely appreciated. The training programmes emphasize on learning with a purpose and professional approach. In addition to in-house faculty, outside experts with diverse experience in business, industry and government are invited to relate academic concepts with practical problems to address the changing needs.

Training needs of non-gazetted staff are being taken care of by Training Centres at Zonal and divisional level. Mandatory training has been prescribed at different stages in an employee's career especially for staff belonging to the safety and technical categories. In fact some categories of staff overdue for refresher training are taken off duty, till completion of the said training. Efforts are constantly made to improve the living conditions in the hostel, provide better messing facilities, strengthen facilities for recreational and cultural activities, making good the deficiencies in respect of training aids and also upgrading the Model Rooms with working models, see through models etc.

Multidisciplinary training centres have also been setup across IR, where cross-functional competencies are imparted to railway employees from different functional areas.

In addition to in-house training facilities, railwaymen are provided specialized training in other institutions in India and abroad. Indian Railway employees are also encouraged to enhance their knowledge and skills by acquiring higher educational qualifications in the specified areas relevant to their work by granting financial incentives. Efforts to improve the basic infrastructure for training are a continuous process. Manpower Planning system has been redesigned to regulate manpower intake with reference to emerging operational and business needs.

Financial Performance:

Despite extremely competitive market scenario, Rail Tel has been growing steadily. In FY 2024-25, Rail Tel recorded its highest-ever operating revenue of `3,478 crore, marking a 35% year-on-year growth. The company's Profit before Tax stood at `402 crore, and Profit After Tax at `300 crore. Rail Tel is amongst the few profit-making and dividend-paying telecom CPSEs. The telecom segment contributed `1,363 crore, while the project segment added `2,115 crore. Rail Tel has paid `99.52 crore to the Department of Telecommunications and will pay `42.35 crore as revenue share to Indian Railways for FY 2024-25. An interim dividend of `2 per share was also paid for FY 2024-25, which amounts to 20% of the paid-up share capital. Earnings per share for the year stood at `9.34.

Conclusions:

Indian Railway fails to generate sufficient growth in terms of revenue and investment during the last 40 years. The fluctuating growth patterns indicate some sort of instability in terms of investment which drives

to a very low growth in terms of revenue. The Indian Railway in its operation is intensive more on labour and fuel than on capital. This on one hand states the importance IR as one of the major employers of the country. This role is also essential for a country like India with a high population and incidence of unemployment. But on the other hand, the inability to reap the benefit of capital investment leaves the industry to fail to generate enough revenue. Indian Railway remains under central Government, it lacks of state centre coordination if the state Governments are not of same political party that is in the central Government. Finally, the railways, to act as a good infrastructure for a state, need some other infrastructural facilities provided for the state like capital formation, supply of institutional credit etc. This seems to be true for the entire economy as well. The railway route has no significant impact on the agricultural production for when all the states and UTs are considered. It has only some effect for the states producing comparatively lower amount of agricultural goods only if they are given with enough credit for agricultural activities.

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