

STRATEGIES TO INCREASE RAILWAY'S SHARE IN FREIGHT TRANSPORT IN INDIA

Rail Freight Tariff Policies

Volume 3



THE ENERGY AND
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Creating Innovative Solutions for a Sustainable Future

STRATEGIES TO INCREASE RAILWAY'S SHARE IN FREIGHT TRANSPORT IN INDIA

Volume III: Rail Freight Tariff Policies

Prepared by:

Transport and Urban Governance Division,
The Energy and Resources Institute (TERI)

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Abbreviations

AFTO	Automobile Freight Train Operator Scheme
AOLS	Asset Operation Liability System
CCM	Chief Commercial Manager
CCR	Container Class Rate
CAGR	Compound Annual Growth Rate
CERC	Central Electricity Regulatory Commission
CMI	Commercial Inspector
COM	Chief Operating Manager
CONCOR	Container Corporation of India Limited
CRC	China Rail Corporation
CRT	Container Rake Terminal
CTO	Container Train Operator
DCM	Divisional Commercial Manager
DEC	Divisional Empowered Committee
DFCCIL	Dedicated Freight Corridor Corporation India Limited
DRM	Divisional Railway Manager
FA&CAO	Financial Advisor and Chief Accounts Officer
FAK	Freight of All Kinds
FEU	Long-term Equivalent Unit
FFC	First Freight Company
FRTA	Federal Railway Transport Agency
FST	Federal Service for Tariffs
GAAP	Generally Acceptable Accounting Principles
GM	General Manager
Gol	Government of India
ICWAI	Institute of Cost and Work Accounts of India
INR	Indian Rupee
IR	Indian Railways
JPP	Joint Parcel Product
KPI	Key Performance Indicator
LTTC	Long Term Tariff Contract
MT	Million Tonnes
NDRC	National Development and Reform Commission
NTKM	Net Tonne-kilometre
NTPC	National Transport Policy Committee
NTR	Normal Tariff Rate

Abbreviation

OD	Origin–Destination
OPRAF	Office for Passenger Rail Franchising
ORR	Office of the Rail Regulator (now Office of Rail and Road)
PFT	Private Freight Terminal
PHOD	Principal Head of Department
PLF	Plant Load Factor
POL	Petroleum, Oil, and Lubricants
PSU	Public Sector Undertaking
RCT	Railway Claims Tribunal
RDA	Rail Development Authority
RMC	Railway Material Consignment
RR	Railway Receipt
RRA	Regional Rail Authority
RRAI	Railway Regulatory Authority of India
RSR	Rail–Ship–Rail
RTA	Rail Tariff Authority
RTRA	Railway Tariff Regulatory Authority
RZD	Russian Railways
SERC	State Electricity Regulatory Commission
SFC	Second Freight Company
SFTO	Special Freight Train Operator Scheme
SPTO	Special Parcel Train Operator Scheme
SRA	State Railway Administration
STS	Station to Station
TEU	Twenty-foot Equivalent Unit
TIA	Travelling Inspector of Accounts
TRAI	Telecom Regulatory Authority of India

Glossary

Class 100	The class of commodities for which the operation of Indian Railways (IR) breaks-even (no profit-no loss). The tariff charged for Class 100 exactly accounts for the cost of transportation.
Economies of Density	It refers to the efficiency gain in terms of declining cost of transportation from increasing utilization of the capacity.
Economies of Scale	It is the cost advantage a firm enjoys when its production is efficient, and the cost advantage increases (per unit cost decreases) with increasing output (scale).
Externality	Any positive (benefit) or negative (cost) impact of an individual's activity on others.
Fully Distributed Cost	This is a top-down approach to distribute the total cost (direct and indirect) of a service to all the users, so that no cost remains unallocated.
Marginal Cost	It is the additional cost associated with any incremental change in demand for a commodity/service.
Natural Monopoly	A natural monopoly in an industry is the monopoly position a first mover firm enjoys due to high fixed cost, economies of scale, and associated entry barriers in an industry for other competitive firms. Under a natural monopoly only the single monopolist firm can provide service at the least cost.
Price Elasticity of Demand	Price elasticity of demand for a commodity is the percentage change in its demand for a percentage change in its price.
Public Good	A public good is one for which no one can be excluded from its usage/ consumption, and the usage/consumption of which by any individual has no impact on the availability of it for others.
Social Service Obligation	This denotes the losses IR incurs for providing uneconomic transportation services to poorer section of society and for movement of essential commodities for mass consumption.

17 Introduction

17.1 Background

Over the time with administrative restructuring of Indian Railways (IR) and changes in operational characteristics, the process of tariff settings has gone through several changes. It is useful to analyze the comprehensive history of these changes in order to better understand the motivation behind the present tariff system of IR.

Railways started operation in India in 1953, and in its early phase, the powers to set freight rates and passenger fares were completely in the hands of two government rail companies, private rail companies, and princely state railways, with little government oversight. The companies were free to set their rates to maximize their profits without any limits. In 1868, the government (the newly formed British India Government, through the enactment of Government of India Act, 1858) started setting maximum limits for different commodities and the companies could decide their rates within these limits. A major change occurred in 1883, when the government established a general principle for setting rates, i.e., rates would vary between: (a) the maximum of what the traffic could bear; and (b) the minimum determined by the 'cost of carriage'. It was motivated by the need to rationalise rates and reduce the competition between different rail companies that was leading to suboptimal rates. The Indian Railway Board Act, 1905 established the Railway Board. Subsequently, Government of India (GoI) delegated certain powers of the Central Government under the Indian Railways Act, 1890 to Railway Board. In 1905, a uniform classification of goods across all railways was put into place; based on the recommendations of the Traffic Simplification Committee. Individual railways were still free to set their own rates within the range laid down for each class of commodities. However, sanctions from Railway Board were made mandatory for any change in the classification of goods or adding additional commodities.

Major changes in the rate structure occurred after the integration of the railways mostly in the late 1940s (around 1948), and with full integration by 1952. The major changes that took place were the adoption of 'telescopic rates' and 'wagon-load scales'; in place of the different scheduled rates existing across the 31 railways at the time. Telescopic rates provided benefits for several industries which had longer leads, that is the distance from origin to destination. This was also the first time the principle of a 'uniform rate' was introduced in railways. These changes were seen as a major move towards rationalising rail rates to serve the interests of the nation rather than private interests. These concepts still govern the freight structure of the railways and are analyzed in the chapters to follow.

In 1955, the Railway Freight Structure Enquiry Committee (also known as the Shahnawaz Committee) was set up to relook at the freight operations for the railways (GoI, 1957). The Committee made several recommendations related to refining telescopic rates, removal of terminal charges, and classification of commodities. One of the major recommendations was the evolution of the percentage system of rates, consisting of different classes to form an integrated scale of rates. The standard rate was to be called the 'Class 100 rate', and rates for classes above and below this rate were expressed as a percentage of this rate. This system is still followed today, even though the classifications of goods and rates have seen overhaul since then. The 1955 Committee also highlighted for the first time the need for more rigorous methods for assessing the cost of service and aligning

rates with these costs. There was recognition that the cost of rail transport was different from most other services due to the nature of the costs involved. The setting up of traffic costing cells in the early 1960s was a first step towards understanding costs better, later in 1972–73 similar cells in the zonal railways were also set up. The specific tariff-setting powers vested on the Central Government (Railway Board) and the zonal railways by the Indian Railways Act, 1890 and the Railway Act, 1989 are listed in Table 1. All relevant sections of the two Acts relating to goods tariff setting are given in Annexure I.

Table 1: Tariff-setting provisions in the Railway Acts of 1890 and 1989

Acts	Powers	Railway Board	Zonal Railway Administration
Indian Railways Act, 1890	Classification and reclassification of commodities	√	
	Maximum-minimum rates*	√	
	Change the class rates	√	
	Any other charges	√	
	Directing the zonal railways to carry specific goods at specific rates, notified in public interest	√	
	Station to station (STS) rates- quoting		√
	STS rates- alteration of rates		√
	STS rates- alteration of conditions		√
Railways Act, 1989	Classification and reclassification of commodities	√	
	Fixation of rates	√	
	Change the class rates	√	
	Any other charges- demurrage, wharfage	√	
	Directing the zonal railways to carry specific goods at specific rates, notified in public interest	√	
	STS rates- quoting		√
	STS rates- alteration of rates		√
	STS rates- alteration of conditions		√
	Fixation of lump sum rate		√

*An amendment in 1950s replaced the section 29, hence abolishing the 'maxima-minima' principle

Source: The Indian Railways Act, 1890; the Railways Act, 1989

Due to operational reasons of IR, there has been a shift in priorities from moving all commodities, bulk as well as non-bulk, earlier to currently carrying nearly the bulk commodities only. IR is involved in moving bulk commodities in all distance segments (short, medium, and long); however, IR has its presence mostly in long distance haul of non-bulk commodities which can be aggregated into train loads and is almost non-existent in short and medium hauls for these. Adopted in early 1980s, this operational policy helped railways to overcome enormous transit delays on account of detention of wagons in marshalling yards but reduced its commodity basket of only bulk commodities that could be offered in train loads for through carriage from origin to destination. The commodities that were carried in small volumes, that is less than a train load, were no longer suitable for carriage by rail.

Fixation of Rates

The Indian Railways Act, 1890 initially vested the powers to set a maximum-minimum rate and rates for any other charges on the Central Government (Section 29 of the Act), however a latter amendment in 1950s abolished the principle of maximum-minimum. The Act also vested exclusive powers to the Central Government to classify or reclassify commodities and alter the rates (Section 42 of the Act). The zonal railways were empowered to quote a new STS rate, alter (or withdraw) the STS rates in compliance with the orders given by the Railway Rates Tribunal (RRT), and alter (or cancel) the conditions attached to STS rates (except for those in compliance with orders given by the RRT) (Section 46 of the Act).

The Act of 1890 was replaced with the Railways Act, 1989. The concept of maxima-minima rates was abolished in 1955. Under the new act, instead of setting maxima-minima rates, the Central Government is vested with power to set rates, and also rates for any other charges (Section 30 of the Act). Like the Act of 1890, the Central Government is given the powers to classify commodities or alter their rates (Section 31). Similarly, the zonal railways were given the power to set STS rates, alter (or withdraw) the STS rates in compliance with the Railway Claims Tribunal (RCT) order, and alter (or cancel) the conditions (except for those in compliance with RCT orders) attached to STS rates (Section 32). Under the new act, the zonal railways were also empowered to charge any lump sum rate (Section 32).

17.2 Need for the Study

Railway transportation in India is an integral part of the development and diversification of the economy. However, over years IR has been losing its share in freight transport. It has declined steadily from 85% in 1951, to 60% in 1991, and in 2022 it accounted for around 27–28% of the total freight movement (p. 1, Gol, 2022). After India's independence, massive investments were made in railways during First to Third Five-year Plans for augmenting its capacity, particularly in the Eastern region, but policy of 'maximum tariff restraint' was adopted, even at the height of IR's monopoly power when there was little competition from the other modes of transport. On the other hand, railways encouraged carriage of low volume goods in short distance segment by road as it was considered operationally cheaper usually.

In view of better fuel efficiency of railways over road transport, the National Transport Policy Committee (NTPC), 1980 (Gol, 1980a) recommended for railway's market share to be over 70%. Therefore, railway's policy of giving preference to carry mostly commodities that can be offered in train loads due to operational convenience was not in line with the NTPC recommendation. The policy excluded many commodities which could be offered only in less than train loads; the commodities which hitherto were carried by rail had to be diverted to road even at higher transportation cost. The policy is still in force and cannot be reversed as the infrastructure facilities like marshalling and sorting yards, repacking sheds, etc. have been largely dismantled. Railways' efforts for attracting non-bulk commodities moving in less than train loads are through aggregation by freight forwarders and offering a train load to railways for haulage or by moving such commodities in domestic containers have been not very successful for variety of reasons discussed in volume II of the report.

With opening up of the market in 1991 (with the adoption of New Economic Policy, 1991) market signal also became an important factor in determining the transport pricing in the freight sector. As the efficiency

and assured service of other modes of transport improved, especially the roadways, diversion (or greater dependence on road for freight transport) of traffic became an unavoidable consequence.

In addition, continuation of the 'social service obligation' in the overall pricing policy led to further inefficiency in freight operation and a substantial loss of market. Under the social service obligation principle, IR has been undertaking uneconomic operation of certain services that mainly cater to the movement of mass consumption items and poorer section of the society. These are: (i) essential commodities carried at subsidized rate; (ii) passenger and other coaching service; (iii) operation of uneconomic branch and new lines (opened in last 15 years); (iv) operation of strategic lines; and (v) losses on EMU suburban services (Indian Railways Yearbook 2021–22). Over time expenditure on account of social service obligation has increased as shown in Table 2. The largest expenditure is on account of loss-making passenger and other coaching services.

Table 2: Net social service obligation of IR

Years	% of revenue earnings	% of revenue expenditure
2001–02	9.00	9.30
2006–07	7.60	5.98
2011–12	16.95	17.89
2016–17	17.90	18.60
2021–22	26.06	22.94

Source: IR Yearbook (various issues), Gol (2003)

Yet, as historical experience exhibits, public obligations are difficult to be fulfilled unless the functioning of an enterprise is successful and generates adequate financial returns for sustenance and leaves enough investable surplus for future expansion. One major way of financing its social service obligations has been the traditional practice of cross-subsidizing the losses through freight operations. This has resulted in India's rail freight rates being among the highest in the world.¹

Further, the thin cost advantage (INR 1.36/tonne-kilometres (TKM) for railways vs. INR 2.5/TKM by road)² rail transport enjoys over road, disappears when additional costs associated with mostly inefficient and overpriced last-mile connectivity, and longer transit times (including unpredictable stabling of trains) are considered. Also, the freight rates structure of IR lacks the dynamism offered by road transport. This deficient cost-parity between road and rail has been highlighted as one of the major reasons for a decline in the share of rail for most commodities (Gol, 2018), and necessitates a reassessment of the freight pricing of IR.

17.3 Recommendations of Major Committees

Since independence numerous committees have been constituted to analyze the tariff setting procedures of IR, especially regarding freight transportation. The major recommendations made by some of the important committees on reforming IR with focus on tariff fixation policy are highlighted in Table 3. These mainly involve recommendations on direct tariff reform, as well as on organizational and administrative reforms for bringing efficiency of operation.

¹ Details available at: <<https://www.itln.in/budget-2022-indian-railways-freight-prices-highest-in-the-world?infinitescroll=1>>

² Details available at: <<https://www.livemint.com/Money/fzAZ8hyYWaiQkVWVOrMesl/When-it-comes-to-moving-things-Indians-just-hit-the-road.html>>

Table 3: Major committees and their recommendations

Committees	Major recommendations	Implementation
The Freight Structure Enquiry Committee, 1955–57	<p>Tariff reforms</p> <ul style="list-style-type: none"> » Revision of the telescopic scale to discourage short distance traffic by rail » A percentage system of classification rates instead of the earlier class rates and wagon scales having no relation with each other » A basic rate as Class 100 rate was suggested and all other classes to be expressed as a percentage of Class 100 rate. » New scales for Class 100 recommending upward revision of rates » Two sets of rates for commodity classification – ‘smalls’ and ‘wagon loads’ » Abolishing maxima and minima rates for rate classes » Minimum distance charge to be applied only once on each booking and not separately reckoned on each railway » Introduction of rates on a block mileage basis » Recommendations for all 31 classes excluding coal and livestock 	<ul style="list-style-type: none"> » A new freight structure was introduced on October 01, 1958 » The percentage system of classification rates with Class 100 as the base rate was adopted » All commodities classified in the Goods Tariff were given a corresponding scale separately for ‘smalls’ and for ‘wagon loads’ – two sets of scale were introduced – A Scale and B Scale » Minimum charge per wagon was abolished » Minimum distance for charge of 25 miles was applied on the through distance irrespective of the number of railways involved » Rates were notified in block mileage basis based on the recommendation » The coal rate was revised and a special scale for coal was introduced » Owner’s risks were provided for a few commodities, railway risk being 20% higher than the owner’s risk » Levy of supplementary charges and reclassification of commodities occurred from time to time
The Rail Tariff Enquiry Committee, 1977–80	<p>Tariff reforms</p> <ul style="list-style-type: none"> » Uniformity of tariffs for the whole of IR for the same type of goods » Railways should not bear the social burden, passenger services should be self-supporting » The tariffs should not be kept artificially low » An integrated fare and freight structure based on cost and financial data » A suitable taper in the freight rate considering the basic cost data available as well as the ability of traffic to bear cost of haulage for long distances » Commodity Grouping under different classes ranging from Class 65 to Class 260 	<ul style="list-style-type: none"> » A new freight structure was introduced with effect from April 01, 1983 » There were 32 classes ranging from Class 65 to Class 300 » The rates for various classes were determined by taking the class number as a percentage of base rate (Class 100) for each distance and adding a fixed charge of 75 paise per quintal » The fixed charge of 75 paise per quintal was equivalent to the terminal charge recommended » For smalls, the charges to be levied were much less than the recommendation by the committee

Contd...

Committees	Major recommendations	Implementation
<p>The Rail Tariff Enquiry Committee, 1977–80</p>	<ul style="list-style-type: none"> » Basic scale rate <ul style="list-style-type: none"> • The rate levels should be relatively higher compared to costs for short distance traffic as a deliberate policy • The rate was to be kept sufficiently high for medium-lead to generate adequate surplus from the bulk traffic moving • Over long distances, freight burden was to be reduced but rates should be higher than costs • The fully distributed costs were covered from 100 to 3000 km » Differential pricing for movement of traffic in train load in terms of freight rebates » No stream of coaching traffic to be carried at a rate lower than the direct costs– including depreciation and dividend » Minor commodity classification recommendations based on representations from various stakeholders <p>Organizational reforms</p> <ul style="list-style-type: none"> » A regulatory body for expert examination of tariff revision matters 	<ul style="list-style-type: none"> » The taper introduced was different from the recommendations and the classification for major bulk commodities was higher than what was recommended » The existing ‘Small’, ‘Wagon load’ and ‘Train load’ classification was replaced by classes which was twice the current number of existing classes » The exemptions granted for certain commodities from the levy of supplementary charges was withdrawn and were now charged at normal tariff rates » No supplementary charges to be levied apart from the rates in the rationalised freight structure » All STS rates were continued until further notice
<p>Railway Fare and Freight Committee, 1993</p>	<p>Accounting reforms</p> <ul style="list-style-type: none"> » Traffic costing to facilitate identifying ‘profit centres’ for commercial activities and ‘cost centres’ for government-supported activities » Undertaking special surveys and studies to determine parameters and ratios for joint costs (every 5 years) » Setting up a committee for in-depth review of the accounting system » Adoption of recommendations of the Institute of Cost and Work Accounts of India (ICWAI) to assess incremental costs and methodology in cost accounting » Computerized data bank of costing data for future use 	<ul style="list-style-type: none"> » The 8th and 9th Five-year Plans focused on modernization and technological upgradation of IR. Development of terminals and upgrading inter-modal operations was undertaken during the plans’ period » A study was commissioned by the ICWAI in 1992 on traffic costing based on the Committee recommendation

Contd...

Committees	Major recommendations	Implementation
Railway Fare and Freight Committee, 1993	<p>Tariff reforms</p> <ul style="list-style-type: none"> » IR should have maximum freedom in quoting special rates in terms of competitive pricing » A general approach of emphasizing both marginal cost and full cost pricing in the rating process » 'Time saving' to be an important component along with cost of service and value of service » Focus on non-rate factors affecting modal choice of transport demand » Reduction of classification of commodities from then 60 to about 20 by rationalisation and simplification » Railway Board should try not to use classification as a means of raising revenues as it seriously affects the relativities of freight structure » Offering of reduced rates in the direction of empty haulage » Two separate scales – 'wagon load' and 'train load'. The present practice of quoting lower rates for train loads should be discontinued » The zonal railways can selectively offer rebates between 2% and 4% on the wagon load scale (with distance greater than 250 km) for 2 or 3 destination rates » The number of classes to be reduced from 60 to 14, followed by abolishing the sub-categories within classes and all exceptional classes » For train load, minimum distance of charge to be reduced from 100 to 60 km » Congestion charges to be levied on certain congested routes » For fixing lump sum rates (contract rates), specific costing of the stream of traffic to be undertaken to determine incremental cost, making minimum use of average unit cost » 'Smalls' to be integrated with parcels in terms of tariff and service <p>Organizational reforms</p> <ul style="list-style-type: none"> » Sufficient flexibility to the zonal railways for fixing special rates 	<ul style="list-style-type: none"> » Financial implication of social service obligations of passenger and other coaching services is carried out as per the Committee recommendation with suitable updation

Contd...

Committees	Major recommendations	Implementation
<p>Report of the Expert Group on Railways, 2002 (also known as Rakesh Mohan Committee)</p>	<p>Tariff reforms</p> <ul style="list-style-type: none"> » Lowering of freight tariff rate » Developing the potential for transportation of small loads » Focus on increasing the share of other commodities » Rebalancing of passenger tariff to do away with cross subsidy <p>Accounting reforms</p> <ul style="list-style-type: none"> » Proper accounting procedure and sufficient transparency in the existing financial structure and accounts » Recasting of accounts under Indian Generally Acceptable Accounting Principles (GAAP) to reflect the commercial nature of Indian Railways and its viability <p>Organizational reforms</p> <ul style="list-style-type: none"> » Institutional separation of roles into policy, regulatory, and management » Formation of an independent Railway Regulatory Authority » Corporatization of railways and division of responsibility into three institutions— Indian Railway Corporation, Indian Railway Regulatory Authority, Ministry of Railways <p>Additional reforms</p> <ul style="list-style-type: none"> » Clear distinction between social obligations and performance imperatives » Adopting measures to increase freight growth by 7% 	<ul style="list-style-type: none"> » Future freight tariffs were accepted to be market driven, in principle » Rationalisation of freight tariff is being undertaken through reduction of number of classes as well as reduction in the highest class rate since 2002–03 » Door-to-door service is being offered for certain commodities like coal, power houses, steel » A Government Accounting Standards Advisory Board is entrusted for developing accounting standards for government entities in India » While the role of Rail Tariff Regulatory Authority was not accepted, a note was sent for consideration of the Cabinet
<p>Expert Group for Modernisation of Indian Railways, 2012 (also known as Sam Pitroda Committee)</p>	<p>Accounting and tariff reforms</p> <ul style="list-style-type: none"> » Revamping the accounting framework to accommodate separation of cost of infrastructure service from operational activities » Analysis of profitability of trains and routes and a rational pricing policy <p>Organizational reforms</p> <ul style="list-style-type: none"> » Empowerment of the zonal railways with accountability for a more decentralized decision-making » Constitution of a Railway Tariff Regulatory Authority (RTRA) to provide a level playing field to all its stakeholders » Reducing the unskilled workforce 	

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Committees	Major recommendations	Implementation
Expert Group for Modernisation of Indian Railways, 2012 (also known as Sam Pitroda Committee)	<p>Other reforms</p> <ul style="list-style-type: none"> » Development of PPP model of financing for stations, terminals, high-speed and elevated rail corridors, leasing of wagons, etc. » Disinvestment in railway PSUs 	Setting up of a Rail Tariff Authority (RTA) was initiated by the government
Report of the Committee for Mobilization of Resources for Major Railway Projects and Restructuring of Railway Ministry and Railway Board, 2015 (also known as Bibek Debroy Committee)	<p>Accounting reforms</p> <ul style="list-style-type: none"> » Adoption of commercial accrual-based double-entry accounting system of costs » Revising/updating norms for apportionment of joint and common costs » Tracking of assets and liabilities » A monitoring agency, supported by domain experts from outside railways should be constituted <p>Tariff reforms</p> <ul style="list-style-type: none"> » Freight rates to be determined by market principles » Post-liberalization efforts, no freight related social cost to be imposed on Indian Railways <p>Organizational reforms</p> <ul style="list-style-type: none"> » Rationalisation of excess number of Zones and Divisions in railways, and decentralization of IR down to the division level » The zonal railways should have full powers relating to expenditure, re-appropriation and sanctions but also meet its earning target » Making each of the zonal railways accountable for its transport output and profitability » Establishment of an independent regulator, a Railway Regulatory Authority of India (RRAI) statutorily with: <ul style="list-style-type: none"> • Powers and objectives of economic regulation, tariff regulation, enhancing competition, setting technical standards • Quasi-judicial power • Independent budget 	Government has notified a resolution to set up the Rail Development Authority (RDA) with the following attributes: <ol style="list-style-type: none"> a. As an advisory/recommendatory body b. The objective is to provide expert advice to government on the following: <ul style="list-style-type: none"> • Pricing of railway services commensurate with costs • Enhancement of non-fare revenue • Quality of services and cost optimization • Promotion of competition, efficiency, and economy • Promoting efficient allocation of resources

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Committees	Major recommendations	Implementation
Report of the Committee for Mobilization of Resources for Major Railway Projects and Restructuring of Railway Ministry and Railway Board, 2015 (also known as Bibek Debroy Committee)	<ul style="list-style-type: none"> » With a timeline of 5 years, the first 2 years was recommended for transition to the commercial accounting system and greater decentralization to the zones. » The next 3 years were recommended for setting up of the RRAI and other changes in human resource management » Rationalisation of manpower to limit the growing overhead costs on account of wage and pension <p>Budgetary reforms</p> <ul style="list-style-type: none"> » Gross budgetary support of the Central Government to the Railways should be net of dividend obligations » Social service obligation needs to be delinked from the commercial operation 	

Source: Gol, 1957; 1980b; 1993; 2002; 2015

The need for a regulatory authority has been highlighted by most of these committees along with the recommendations of greater devolution of power to the zonal railways and their financial autonomy. Another important issue most of these committees highlighted is the problem of cross-subsidization of passenger segment from the excess tariff charged to the freight operation, and the need for rationalising the tariff structure to attract freight traffic. The three committees of 2001, 2012 and 2015 also put stress on reducing overhead expenses through rationalisation of manpower and mobilizing revenue through PPP and disinvestment channels.

17.4 Freight Demand Projection on Indian Railways

Total freight traffic in India is expected to grow at 7% per annum to reach over 15.6 trillion net tonne-kilometres (NTKM) by 2050 from about 3 trillion NTKM in 2020 (Gol, 2022). In the National Rail Plan (Gol, 2020) IR has set a target of achieving 45% of total freight transport market in India by 2030–31. This requires augmenting capacity to be able to handle annual freight loading of 3600 million tonnes (MT) by 2030–31 and an intermediate target of achieving 3000 MT annual freight loading by 2027 (Gol, 2020).³ This section provides projected annual freight loading and transport output (NTKM) for IR till 2030–31 to validate the feasibility of achieving the said targets in business-as-usual (BAU) scenario.

Figure 1 depicts the estimates of annual freight loading till 2030–31 along with the observed freight loading during 1990–91 to 2020–21. The projections are based on three different models from 2021–22 to 2030–31. Model 1 estimates the freight loading based on a linear relationship between freight loading and GDP, both measured in logarithmic scale. Model 2 estimates the freight loading based on a linear relationship between freight loading and sectoral GDP (of agriculture, industry, and construction), both measured in logarithmic scale. In each case, first, a linear model is fit using Prais-Winsten transformation of log-log models in the generic form: $\log(\text{freight loading}) = a + b \times \log(\text{economic activity})$. As a second step, based on estimates of economic

³ Gol, 2022, pp. 1–2

activities till 2030–31 (by TERI) freight loading is projected. Since 1970–71, IR achieved the highest compound annual average growth rate (CAGR) of freight loading during 2000–01 and 2009–10, at 7%. As an optimistic scenario, Model 3 uses 7% CAGR in its prediction. As depicted by Figure 1, the estimated annual freight loading fails to meet the set target.

Predictions based on the relationship between annual freight loading and economic activity (during 1990–91 and 2020–21) indicate (Figure 1) that the annual freight loading in IR's network is likely to range between

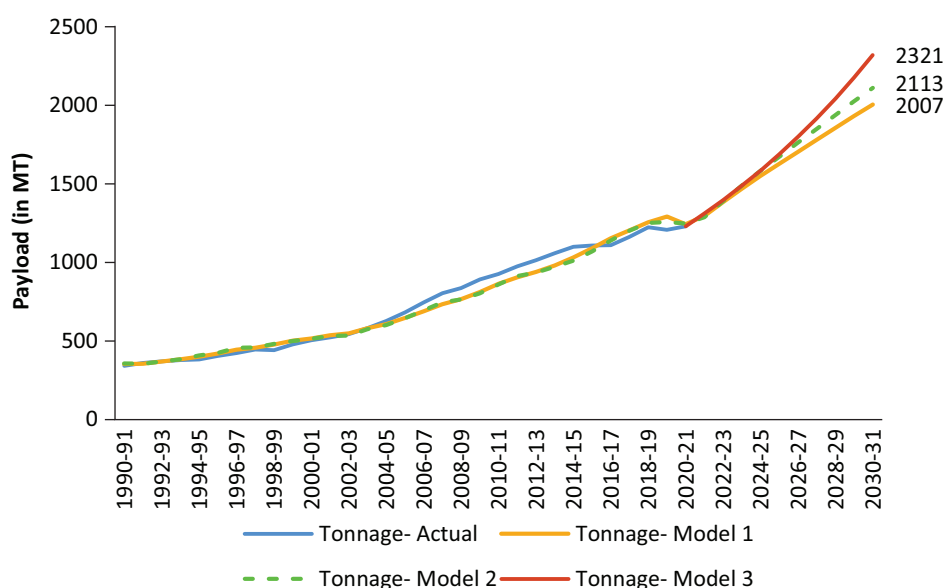


Figure 1: Freight loading projections– Indian Railways

Source: TERI estimate

2007 MT and 2113 MT, which is significantly less than the annual loading target of 3600 MT. Even in the scenario of 7% CAGR (the maximum CAGR experienced by IR in last 5 decades) during 2020–21 and 2030–31, annual freight loading is projected to reach 2321 MT by 2030–31. IR has achieved freight loading of 1416 MT in the year 2021–22 (IR Yearbook 2021–22). To reach the target of 3600 MT by 2030–31, freight loading by IR needs to grow annually (CAGR) by 11%, which is considerably higher than its past achievements.

Similarly, the freight movement (NTKM) on IR network can also be predicted and these are depicted in Figure 2. Model 1 is based on the relationship between NTKM and GDP (both in logarithmic scale) whereas, Model 2 is based on the relationship between NTKM and sectoral GDP (of agriculture, industry, and construction), both in logarithmic scale. IR also achieved a 7% CAGR of NTKM during 2000–01 and 2009–10, highest in last five decades. As an optimistic scenario, Model 3 uses 7% CAGR in its prediction for 2020–21 till 2030–31. IR can almost double the freight movement by 2030–31 from 2020–21 level (Model 3) if it achieves a CAGR of 7% during 2020–21 and 2030–31. Assuming a CAGR of 11% during 2021–22 and 2030–31, IR can reach freight movement of 1998 billion NTKM in 2030–31 from its present freight demand of 871 billion NTKM in 2021–22 (IR Yearbook 2021–22).

The above analysis indicates very clearly that current business strategies may not be able to help IR to achieve an annual freight loading target of 3600 MT by 2030–31. IR needs to transform its business strategies that

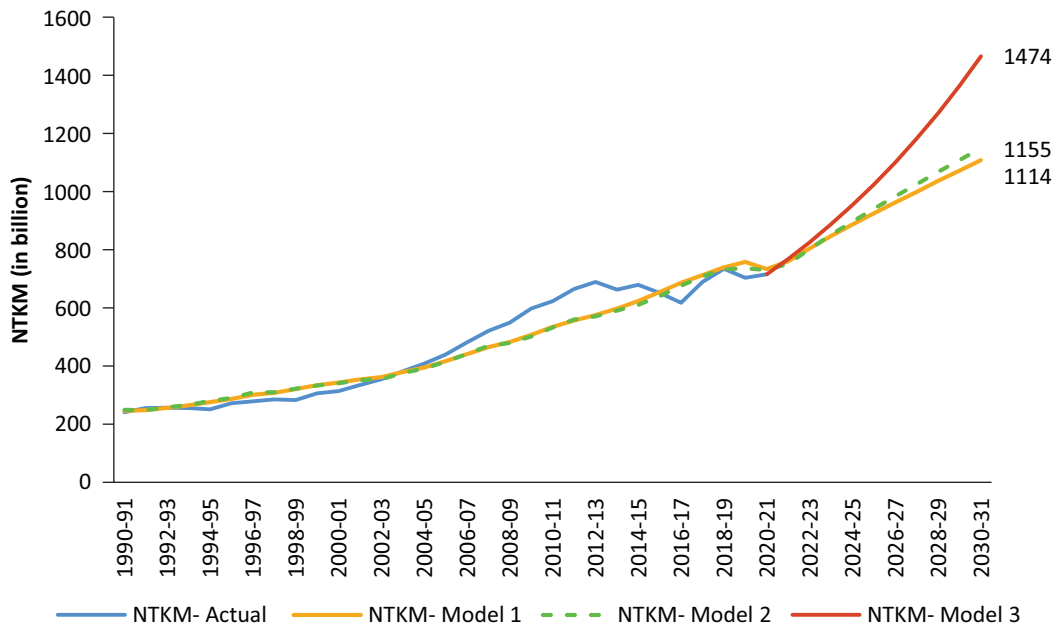


Figure 2: Freight movement (NTKM) projections– Indian Railways

Source: TERI estimate

include a host of things like: proactive marketing strategies; aggressive penetration in non-traditional transport market of non-bulk commodities, by suitably designing new service methods; looking in to its rating policy afresh to make it market-driven; and prioritising its investments in low-cost operational improvements like terminals that give immediate benefits etc. In other words, for achieving the 3600 MT annual freight loading target, IR requires an overhaul of the existing system to meet the future demand projections in view of stiff competition from other modes of transport. This also necessitates sustained efforts for rationalisation and liberalisation of the freight market of IR in tandem with modernisation of the framework governing it.

17.5 Objectives and Methodologies

There are four objectives of this report. First, it investigates the present freight tariff policies of IR and identifies problems within the policies. Second, this report estimates the price responsiveness of the bulk commodities to infer about the impact of freight rate changes on demand. Third, as a case study this report analyzes the issues with the STS rate policy which is under the domain of the zonal railways, as entrusted by the Railways Act, 1989. Finally, based on past recommendations of different committees this report suggests changes in the existing regulatory approach for increasing private participation and better assessment of tariff structure of IR. The first two objectives are related to the functioning of the Railway Board (Central Government), whereas, the third objective relates to the functioning of the zonal railways. These three together raise concerns about the ‘fixation of rates’ (Sections 30, 31, 32 of the Railways Act, 1989) by IR system. This report utilizes secondary data available in public domain and accessed from Railway Board for trend analysis of freight operation of IR and estimates the price elasticities of the bulk commodities.

“Aims to relook at existing tariff policies and suggest areas where improvements can be made to make rail tariffs more competitive compared to other modes”

The next Chapter 18 analyzes the costs of operation of IR and links the pricing based on costs. Chapter 19 discusses the tariff setting principles followed by railways, key issues, and some of the recent rationalisation efforts. Chapter 20 discusses about the bulk commodities and their price sensitivities. Chapter 21 analyzes STS rate policy, which is the major policy handle of the zonal railways. Chapter 22 discusses the best practices and draws important lessons from international experiences of railway reforms. Chapter 23 discusses the regulatory framework, suggesting gradual delinking of the regulatory role from government. The last Chapter 24 provides the policy recommendations.

Cost Structure: Indian

18 Railways

Although railway is a mode of public transport, it is not a pure 'public good' in economic sense as its services are both excludable and rival.⁴ However, it generates positive externalities through high social benefits (employment generation, infrastructure development, better connectivity, economic progress of adjoining areas, connecting hinterland with important hubs, etc.). Also, IR is a classic example of natural monopoly, with high infrastructure and entry costs acting as entry barriers for any non-governmental entity in the operation.

18.1 Classification of Costs

As a monopoly operator, for expanding and maintaining a large network efficiently, costs of service need to be ascertained accurately (for budgeting). Broadly, costs associated with railways can be classified into three major components:

- » **Network infrastructure costs:** These include the costs for expanding and maintaining the rail infrastructure, i.e., capital and maintenance costs for track; engineering structures such as: bridges and tunnels, train signalling, communications systems, power supply in electrified sections, and terminal infrastructure (Transport and ICT, 2017). The infrastructure costs contain a fixed component which does not vary with the amount of traffic, and a variable component that changes with traffic volume. Infrastructure costs for railways usually exhibit 'economies of density', (i.e., the average cost curve slopes downward in the long run) as traffic rises on a railway line the fixed cost of providing track is spread over more and more traffic units (Harris, 1977).
- » **Train operating costs:** These include fuel costs; depreciation and maintenance of locomotive and rolling stock; salaries of train crew; terminal operations and commercial costs, etc.
- » **Overhead costs:** These include pensionary expenses as well as the cost of maintaining the administrative services and headquarters, such as: board and executive management finance; legal; security; and personnel functions.

Three types of costs mentioned above can also be classified under two broad types: 'variable costs' (also known as direct costs or, dependent costs or, marginal costs) and 'fixed costs' (also known as indirect costs or, constant costs or, overheads) (p. 62, Sthanunathan, 1986). For the pricing policy to completely account for cost of transportation and ensure no loss from operations, it is necessary to estimate the cost of transportation for each service (e.g., passenger, freight).⁵ Estimating accurate costs for a particular service on railways is complicated due to the existence of common costs associated with use of assets for multiple services. Common and joint costs are associated with infrastructure and operation that support all users and services, and arise due to non-homogeneity of product mix. Railway tracks and signalling infrastructure are used by both passenger and freight trains; it is not easy to exactly attribute the associated costs to a particular service in such a mixed-use system. Fixed costs are allocated based on several methods: (i) engineering analysis (of gross tonne-kilometre

⁴ A 'public good' is one for which no one can be excluded from its usage ('non-excludable') and the consumption of which by one person does not have an impact on the consumption for others ('non-rival'). Defense services can be considered as a classic example of 'public good'. Railway has limited capacity in terms of its ability to move passenger and cargo, making it 'rival' in nature. It is also 'excludable' as the access to it is linked with paying defined cost (passenger or freight rates).

⁵ There can be several other classifications of service: suburban vs. long-haul, etc.

(GTKM), vehicle tonne-kilometre (VKM), etc.); and (ii) statistical analysis (survey method; regression method; 'per cent variable' method- where the ratio of variable costs to total costs is used; using the ratio of direct expenses for different services).

Presently, unit costs for different services are estimated using a 'fully distributed cost' approach. This is a top-down approach which aims to assign the total costs (direct and indirect) to the services which incur the costs. Presently, the apportioning of costs is done based on guidelines laid down in the Railways Financial Code and according to methods identified in the manual on statistical instructions.

18.2 Challenges in Traffic Costing

The major challenge in railway traffic costing has been the allotment of joint and common costs. 'Joint costs' are maintained jointly by accounts for two or more products or services whose production cannot (for physical reasons) be separated, so that providing one service (in a given quantity) automatically makes the facility available for another service. The consequence is that costs incurred in the corporate production of the joint activities cannot be accurately mapped on to each of the products or services. Though the apportionment may follow different principles, a common method is to use traffic output of each product or service to distribute the cost. For some joint activities, however, segregation of expenditure is possible, such as: loco maintenance cost. Locomotives are dedicated to specific services and expenditure incurred for repair services can be available separately. If it is done, in fact, joint cost can be maintained for such services. Though different types of locomotives are generally used for passenger and freight trains by IR, on many occasions a goods locomotive is utilized for working a slow passenger train.

'Common costs' cater to all services, which cannot be separately identified, and a scientific basis is required for apportionment to services (e.g., cost of track maintenance, signalling, etc.). Joint use of facilities and resources is a common phenomenon in all multi-service industries, but is of a much higher dominance in railway systems.

This complex structure of joint and common cost systems under the operations of IR is rarely found elsewhere. While the direct costs can be allocated to the appropriate units of performance with reasonable accuracy, joint and common costs on track, signalling, constructing stations, etc., are necessarily to be allocated based on ratios and formulae devised for the purpose. For a monopolistic system like IR, the ideal tariff should be based on the cost of each service rendered plus a reasonable profit margin over the amount. However, determining the true unit cost incurred is a complicated task; posing difficulties for a pricing system based on it.

Almost the entire fixed cost and most of the variable costs are incurred on account of the overall operation of railways, and one-to-one mapping on-to different types of services rendered is not possible. Different principles are then used to apportion the costs and assign to a particular service. Moreover, such costs are usually fluctuating and uncertain, and cannot be determined *ex ante* (and can only be determined after the service is rendered). Since the prices need to be fixed *a priori*, it makes an objective implementation of such a costing-based price policy redundant in the present scenario.

There is lack of integration of IT services in railways, further posing challenges for traffic costing. The process of existing costing system is done after the closure of financial accounts and cost statement generation takes another 9–10 months. There is a substantial time gap between occurrence of activities; incidence of costs and capturing of its operational data; its authentication and validation. This time lag renders the present costing system for managerial and cost control only marginally useful. There is a need to evolve better methodology of capturing cost data and performance data from activity centres. IT integration is important as it will enable real-time data sharing across applications, increase cohesion and reliability.

Cost Accounting in Indian Railways

Costs are determined in various steps; the first step involves aggregating gauge-wise total expenditure at the zonal railways level. From the gauge-wise expenditure the expenditure of suburban activities is excluded, since the costing for these services is done separately. The data from the zonal railways is then compiled by Railway Board and unit costs are estimated by the dedicated costing cell. The total expenditure is then attributed to coaching and goods services based on infrastructure usage. The division between coaching and freight is done on predetermined parameters, majorly traffic output. Common and joint costs are apportioned on predetermined ratios between coaching and goods, and traffic output. Overhead costs are also apportioned to different services based on the ratio between the direct costs. Further, expenses relating to goods are divided into commodity wise, terminal operations, documentation, etc.

18.3 Cost-based Pricing Policy

The fully distributed cost approach for tariff setting, followed by IR was developed at Railway Board level. This system has continued to exist with relevant modifications as and when required. However, such a tariff setting principle leads to an inefficient resource allocation. Uncongested lines are charged at a higher rate, resulting in further underutilization of installed capacity whereas; heavy density lines are under-charged, causing further congestion on such routes.

However, a marginal cost pricing ensures that the prices are based on additional costs associated with the consumption of one more unit of the railway service. In theory, this will ensure an optimum outcome with the incremental costs equal to the price the users are willing to pay for it. IR requires huge *ex ante* lumpy investments and has a mix of idle and congested capacity. Short-run marginal cost pricing will, therefore, result in the capital costs being uncovered, causing huge losses to the sector. But, long-run marginal cost pricing can cover both current and capital costs for an efficient production.⁶ However, this requires the costs to be estimated based on prospective future expenditures, instead of the practice of using past expenditures (pp. 80-81, Rónai, 2003).

It is generally argued that marginal cost pricing is feasible if the fixed costs are covered by the public exchequer, given the public utility nature of railways (p. 66, Sthanunathan, 1986). However, such cross-subsidization of railways is subjected to justifications of burden sharing by the tax-payers. Even a price set at the long-run marginal cost alone cannot ensure future expansion of service unless an investible surplus is ensured. Cross-subsidization across different streams of service (e.g., freight to passenger, high value to bulk commodities, better utilized routes to underutilized routes, across different commodity groups) is feasible only if: (i) the system (as a whole) generates investible surplus; and (ii) cross-subsidization (by high rates on some streams of services) does not crowd-out traffic to other competing modes of transport (e.g., roadways) (p. 66, Sthanunathan, 1986).

Thus, ideally optimal freight tariff is that which equals the long-run marginal cost. However, this principle of tariff setting is not followed by IR for multiple reasons:

⁶ In the short-run, many of the cost items are fixed (lumpy) and beyond any adaptation (e.g., factory size). In the long-run, all the cost components (including lumpy) are variable and the producer can change the quantities based on the demand. A critical mass of railway network is necessary below which railways cannot function. Any investment on such critical mass is fixed cost. But, any investment in railway network beyond the critical mass is purely in the control of railways (hence can be treated as variable).

- » Marginal costs are computed for an incremental increase in outputs, such as the single passenger seat or wagon-km. As mentioned earlier, for a large enterprise like IR the costs are not calculated at such a micro level, but estimates are only available for a particular type of passenger service or for a particular commodity across the railway system;
- » Since railways show economies of density, the average cost curve is downward sloping in both the short and long run. As a result, the marginal cost curve will always lie below the average cost curve, i.e., pricing based on marginal cost would lead to sustained financial losses for the railways unless compensated by tax-subsidy schemes (p. 81, Rónai, 2003);
- » No other operators in the transport sector include additional external social costs in their pricing policy, for railways to do this exclusively would place it at an unfair disadvantage in the market.

Moreover, with taxes-subsidies; externalities; and the monopoly nature of IR, a theoretical approach towards marginal cost-based pricing is not practically feasible. It may result in overutilization of resources and undervaluation of the factors engaged in providing the service. Taking these factors into consideration, the 'cost-of-service' principle on railways is not strictly based on the long-run marginal cost principle.

The Tariff Enquiry Committee (1977) stated that the tariffs should be based on marginal cost principle when "... either the incidence of its costs already incurred and their servicing is to be borne by some other authority such as the public exchequer, or that other streams of traffic are able to bear these costs." However, the committee noted that it would be unfair to pass on the large part of the cost of expanding railways onto the public exchequer, when IR should compete with other sectors for investment for capital resources whose scarcity is especially felt in a developing country like India. Thus, the committee noted that the pricing for railways should be designed in a way that each stream of traffic should be able to meet its direct cost. At the same time, there must be certain streams of traffic which can bear the incidence of a charge which would provide adequate surpluses so that the undertaking as whole can generate investable surplus.⁷ However, it is important to assess the extent of burden those streams of traffic may be able to bear without feeling compelled to move to alternative modes of transport.

⁷ It needs to be highlighted that, on one hand through positive externalities railways provides 'social benefits', on the other hand it also accounts for few 'social costs' (deforestation, accident costs, noise, sunk costs). The pricing mechanism should account for these two, apart from the private costs and benefits.

Freight Tariff Policy in Indian 19 Railways

19.1 Price Setting Principles

The pricing of railway service needs to be set in such a way that it covers “...the day to day working expenses including maintenance of assets, provide for replacements and renewals and leave a reasonable surplus” (p. 64, Sthanunathan, 1986). Freight rate setting in IR is guided by two principles.⁸ These are:

a. Cost of service: The lowest rate that can be charged for a commodity should be equal to the cost to railways for transporting that commodity. Any rate lower than this would mean that railways would incur a loss while transporting the good, and represents the lower limit for deciding freight rates. Some of the factors that influence cost of service are:

- » Bulk in proportion to weight
- » Risk of damage, wastage, or deterioration in transit
- » Speed of transit
- » Volume of traffic

b. Value of service: Alternatively known as the ‘what traffic will bear’ principle, this states that, the charge for each variety of good is to be fixed according to the ability to pay for transportation. Thus, goods of high value are made to pay more and commodities of lower value, such as food grains, can be carried at a lower rate. Thus, the value of service represents the upper limit for setting freight rate. Several factors influence the value of service, such as:

- » Value in relation to weight
- » Uses
- » Stage of manufacturing
- » Volume of traffic
- » Competition from other modes
- » Risk of damage

Thus, the freight rate chargeable by railways lies between the lower bound set by the ‘cost of service’ and the upper bound set by the ‘value of service’. Any rate outside this feasible zone will render the service too costly to operate or, too costly to use for transporting goods. Generally, high value commodities have greater ability to pay for a higher rate than low value commodities (while for the former, freight rates form a small proportion of their price at the destination; for the latter it forms a significant part) (p. 84, Sthanunathan, 1986).

⁸ See for example https://indianrailways.gov.in/railwayboard/uploads/codesmanual/ADMIN_FINANCE/AdminFinanceCh9_Data.htm (accessed on November 21, 2022).

There are several other characteristics of the freight tariff system under IR worth mentioning. These are:

- a. **Uniform tariffs:** During the initial years of operation, different railway systems (which were autonomous) in India competed with each other, tariff war and disputes were common. Since the revision of freight rate structure in 1948, IR follows a countrywide uniformity in tariffs (p. 101, Sthanunathan, 1986); there is no accounting for regional or directional sensitivity of tariffs. This means that the cost of service and value of service principles are incorporated only at a national level, even though these values could differ significantly based on local conditions. The motivation between this was to create a unified system throughout the country and deter rate competition between different zonal railways in attracting traffic. However, this is unlike the regional variation observed in road transport rates.
- b. **Slab-based system:** IR follows a 'class system' to categorize different groups of commodities. Different commodities are divided into few groups and each group is charged at a different rate class. In its earliest phase of operation, railways had maximum 5 rate classes (along with fixed maximum rates applicable to each class, and for coal and food grains). Subsequently, in 1936 there were 16 classes with defined maximum and minimum rates, and in 1948, these were rationalised to 15 classes. This type of commodity classification (15 classes) suffered from lack of inter-linkages with the then existing 13 wagon-load scales. The present class structure (starting October 01, 1958) follows the recommendation of the Freight Structure Enquiry Committee (Gol, 1957) to anchor the basis rate to the Class 100 rate, which is the break-even base class, and commodities listed under any higher/lower class are levied proportionately higher/lower freight rates (p. 109, Sthanunathan, 1986). It rechristened the then existing Class 9 as Class 100, and reclassified the 13 wagon-load scales and first 8 commodity classes to be placed lower than the base Class 100, whereas, the remaining 6 commodity classes were above Class 100. In the new classification, the lower percentage classes ranged from 25% to 95% (containing 21 classes), and higher percentage classes ranged between 110% and 230% (containing 6 classes) w.r.t. the Class 100.

The rates within each class are based on a slab-based system, i.e., rates within a certain distance interval are charged the same rate. The distances covered under each slab differ for different rate classes but usually range from 1–100 km to 3376–3500 km. This is different from road pricing which is based on the exact kilometres being travelled. This puts users who are at the extreme ends of the scale at a disadvantage and can lead to discriminatory practices which seek to bring the chargeable rates under lower slabs.

Factors that influence the rate class assigned to particular good include:

- i. Perceived value of the good
- ii. Relation between volume and weight
- iii. Liability to damage
- iv. Packing
- v. Size of the consignment (wagonload/trainload)

Presently there are 16 rate classes for 25 groups of commodities.⁹ The Class 100 rate notionally represents the rate at which the tariff exactly accounts for the cost of transportation, thus IR earns no surplus on these rates. As in November 2022, there were four items listed under Class 100, namely– fish and poultry meal (10); leather, rubber and plastic (13a); machinery and machine tools (15); and salt (19).¹⁰ However, it is important to note that with inflation, and moreover with increased transportation cost during the COVID-19 pandemic (mainly in entire 2020–21 and parts of 2021–22, as there was negligible passenger

⁹ Accessed from https://indianrailways.gov.in/railwayboard/uploads/directorate/traffic_comm/GOODS%20TARIFF%20NO_49%20%20PART%20I%20VOL_PART%20-%20II_Rev_120219.pdf (accessed on November 22, 2022).

¹⁰ Goods Tariff No. 49, and subsequent revisions in 2020 (RC 18) and 2021 (RC 24). Serial numbers of commodities are indicated in the parentheses.

operation), the notional break-even class rate has likely moved upward.¹¹ So, periodic re-assessment of the break-even class is a sine qua non for financial viability of operation. LR3 is the lowest rate class and class 200 denotes the highest rate class, for Class 200 the rate is exactly double of the Class 100 rate. There are few commodities for which the rates are comparatively higher than the rates applicable to other commodities placed at higher freight classes. For example, coal & coke are placed in Class 145A/B whereas most of the petroleum, oil & lubricant (POL) products are placed higher in Class 180A/B. But the rates applicable to coal & coke are higher than the rates on POL.

In last two decades, IR has attempted to fit all commodities into one of these existing classes only. Along with reducing the number of classes, the total number of commodities which have been so classified have been reduced. An over-riding clause issued by Railway Board stipulates that if any commodity does not figure in the list of commodities which have been classified, then it should be charged at the composite class rate, which in turn is based according to the type of the wagon used for transporting the said commodity and which is quite high.

As a result of reduction in number of classified commodities, there are a large number of commodities which do not have any class at all. As the present rule stipulates that all of them are to be charged at the highest class rate, some of these commodities have moved to road. Secondly, by reducing the number of classes, the gap between freight rates of adjoining classes has substantially increased. Any change of class even by one step increases the freight rate substantially.

- c. **Telescopic rates:** Starting October 01, 1948, the class rates and wagon-load scales were made telescopic (p. 101, Sthanunathan, 1986). As an example Figure 3 displays the variation in rates per tonne under three different rate classes (classes 100, 150, and 200). The rates per tonne are much higher in higher distance slabs but when considered as per TKM basis, the rating system follows telescopic nature.

Telescopic rates refer to charging lower rates with longer distances; thus, the average rate per TKM reduces with greater utilization (distance of freight movement) of the network (Figure 4). This principle aims to attract commodities with longer leads. Multiple studies suggest that transport for short distances (except

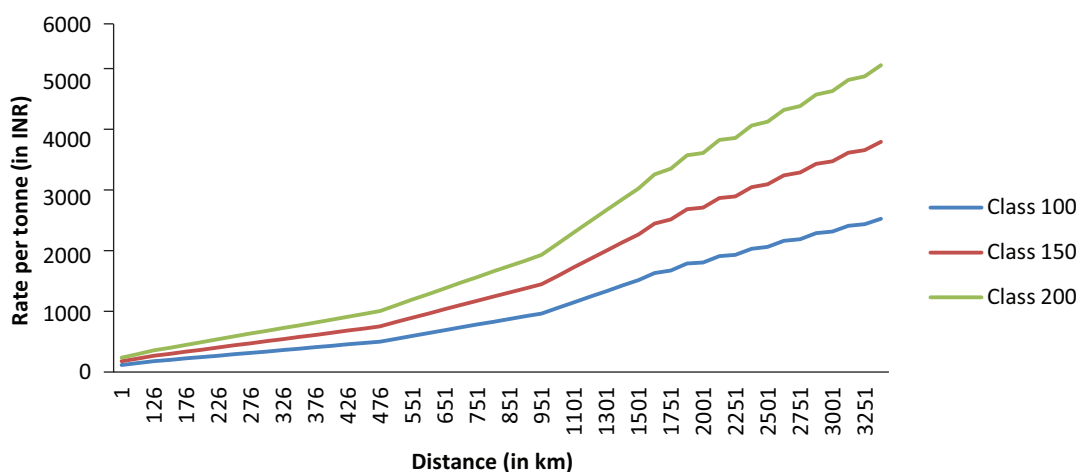


Figure 3: Class rates over distance slabs
 Source: Goods Tariff No. 49, Part II, 2019, Indian Railways

¹¹ Short-lead concessions were provided to all commodities except for coal and coke, and iron ore traffic. Long-lead concessions were provided to: (i) coal and coke; (ii) iron and steel; and (iii) iron ore traffic (p. 16, Indian Railways Annual Reports and Accounts 2020-21). There were several other fiscal incentives taken during 2020-21, to ease out the effects of COVID -19 pandemic on economy.

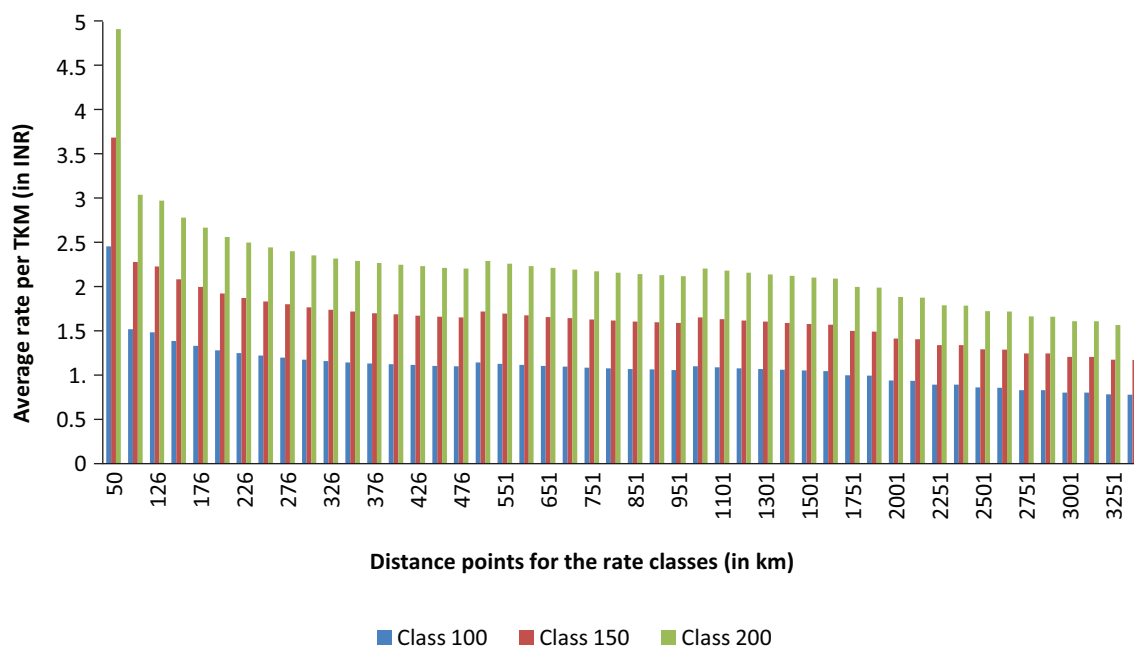


Figure 4: Telescopic rates– Tapering effect

Note: Average rates are calculated only for the mentioned km points in the figure. For example, the average rates charged on commodities under classes 100, 150 and 200 for a distance of 101 km are respectively INR 1.5, 2.3, and 3.1. The same figures for a distance of 3001 km are INR 0.8, 1.2, and 1.6, respectively.

Source: Goods Tariff No. 49, Part II, 2019, Indian Railways

bulk commodities) is best carried by road, while transport for medium and long distances are best provided by railways (NTDPC, 2014). Cost to railways is also lower for longer distance traffic as this system does not translate into losses for IR. The average rates are very high at the initial distance slab of 1–100 km (particularly till 80 km).

- d. Haulage charges:** IR levies a ‘haulage charge’ on privately owned container (both loaded and empty) wagon and flat wagon traffic for the use of its infrastructure (track, signalling system, etc.) on per-km basis. There are two types of commodity classes to set the haulage charges: (i) a set of ‘notified commodities’ that are charged ‘container class rates’ (CCR); and (ii) a set of ‘freight of all kinds’ (FAK) that are levied the FAK rates. Presently, there are 645 commodities of which 551 are permitted to be moved via containers. 510 of the permissible commodities are levied FAK rates whereas the remaining 41 notified commodities are levied CCR. IR has been involved with FAK operation in container traffic for over two decades to facilitate inter-modal freight shipment via containers. The share of commodities under CCR in both loading and earning from container traffic is less than 1%.

Presently, there are five slabs of haulage charges levied on the loaded FAK container traffic (twenty feet equivalent units, TEUs): (i) ≤ 10 tonnes (T); (ii) $> 10T$ but $\leq 20T$; (iii) $> 20T$ but $\leq 26T$; (iv) $> 26T$ but $\leq 31T$; and (v) $> 31T$. In case of double stack container traffic, the upper stack is charged at 50% rate applicable in each slab. For 40 feet container (FEUs) traffic, the rates are 1.8 times of that chargeable to the TEUs. Presently, the haulage charges levied per tonne of weight declines regressively with higher weight slabs (a decline in rate by 37% for second slab over the rate charged to base slab of $\leq 10T$ ’, followed by successive decline in rates at 7%, 3%, and 2%.¹²

¹² Ministry of Railways, Gol

The determinants of the haulage charges are understood to constitute: (i) data on loading, empty return ratio, tare load, payload, types of wagons, number of wagons, capital cost of rake, number of TEUs, etc.); (ii) terminal and marshalling costs; (iii) line haul cost; (iv) provision and maintenance costs; (v) direct costs; and (vi) mark-up of approximately 20%. Unlike the bulk commodities, value of service is not considered in determination of haulage charges. Whenever the operators use terminals owned by IR for loading or unloading, they need to pay terminal access charges also.

Over the years IR has adopted several measures to promote containerization of freight traffic. These include:

- » Allowing loading of several 'restricted' commodities (ores, minerals, coal and coke in imported containers; calcined petroleum coke; zinc concentrate, soap stone powder, lead concentrate; chemical gypsum; talc powder; dolomite powder; quick lime; hydrated lime; felspar) in containers in last 10 years (by issuing different container traffic letters)
- » Introduction of cube containers for two-wheeler traffic
- » Round trip charging as economical and reliable alternative to ultra-short lead (up to 50 km) container traffic
- » Approving additional route under the 'hub-spoke' system of operation.

Despite these efforts, there are several issues plaguing the container operation of IR highlighted during stakeholder discussion (Puri, 2021) such as:

- » Multiplicities of rates (FAK and CCR, as well as slabs) deter container operators to ship via railways. Also, restricting certain commodities (mainly bulk) to move via container (wherever possible) incentivizes the shippers to look for alternative modes of transport.
- » The present rating system is highly skewed in favour of heavy cargos deterring container movement of light and manufacturing goods.
- » The railway tariff is less competitive vis-à-vis road, which drives the traffic away from railways.
- » High rate charged to the empty movement of containers (cost of repositioning of empty containers and wagons) reduce profitability of the container business.

Empty containers account for 7–8% of container traffic and contribute 3–4% of the total haulage charges received by IR. To address the issue of declining profitability of container business due to the significantly high rates levied on empty haulage, the container train operators (CTOs) are of the view that a reduction in haulage of empty rakes and empty containers could help them attract more traffic, thus increasing the revenue. Railway Fare and Freight Committee, 1993 also recommended reduced haulage charges for empty direction traffic flow. In circuits elimination of empty haul for short-leads (≤ 300 km) can be considered.

19.2 Key Issues Identified

19.2.1 Lack of Accurate Micro-level Cost Data

The unit costs estimated from the fully distributed cost approach are used in deciding pricing policy of IR. However, since the unit costs are derived from total expenditure based on primarily static accounting principles (especially for common costs), the actual resource use for a particular service at a micro-level is not completely accounted for. Based on total expenditure, IR calculates the costs of different commodities (in INR/NTKM) and compares to revenue (in INR/NTKM), to identify any under-recovery. The need for changing tariff rates for a particular commodity is assessed based on the change required to break-even (ICWAI-MARF, 2019). Thus, fares based on the fully distributed cost approach may not properly account for the actual cost of that particular service. This approach is different from the commonly used (particularly in road transport) marginal cost approach and makes the rates policy of IR less attractive. A marginal cost approach for IR would aim to estimate the cost it incurs for

providing a particular unit of service using a more bottom-up approach. However, the data requirements for such an exercise would be much more extensive and would require an overhaul of the cost reporting system of IR.

IR has undertaken accounting reform starting 2013-14, which includes migration to accrual accounting and a performance costing system. A move to accrual accounting system (with detailed listing of assets and liabilities in balance sheet) will bring robustness and transparency in accounting. The accrual accounting system being developed (with possible rollout in 2023-24) is a pan-India, and IT-based system. Once the accrual accounting system is in place, IR would switch to a more performance-based approach to costing. The new approach would aim to estimate the cost of a service based on an activity-based system. Within this system, different costing centres would be identified at the zonal, divisional, and workshop levels which would record all relevant costs for the particular service being catered to. The updated costing database would accumulate the cost from each centre with a unique code identifying the nature of the service and the location of the cost. This bottom-up approach is likely to account better for the actual performance and efficiency of different services and help to identify services more accurately with under-recoveries. Resulting route-wise and service-wise costing will help IR in better formulation of tariff and will help in marginal-cost pricing.

19.2.2 Uniform Rates and Lack of Flexibility in Price Setting

Despite the use of rate classes and distance slab-based freight pricing, IR charge uniform rates across the country (no regional variation). In 2020–21, the average rate per NTKM was INR 1.61 per NTKM (p. 171, Annual Statistical Statements 2020–21, IR). However, the rates charged by trucking industry differ significantly based on the region, as per the National Freight Index (Rivigo) the average rates per tonne-km was significantly higher for all truck types in Eastern and Western India (Table 4).

Table 4: Region-wise road freight rates

Region	Rate per tonne-km in INR (for distance classes)	
	250–750 km	>750 km
North	2.29	2.13
South	2.74	2.15
East	4.35	2.62
West	4.07	3.03

Note: Estimates are as of March, 2020

Source: National Freight Index (Rivigo)

The practice of charging uniform rates places IR at a distinct disadvantage compared to road freight transport. By not allowing flexible rates based on different regions (and routes), IR loses out traffic in areas where truck rates are low and loses out revenue where truck rates are higher.

Additionally, as the marginal cost of operation differs for railways based on the used capacity; lines with higher capacity usage can be charged higher rates. This kind of price discrimination, as practised in other industries, would allow IR to increase revenues from overused tracks by charging higher rates. Tracks with low-capacity usage (underutilized), have a very low (close to zero) marginal cost of operation. In this situation, by charging lower rates on these underutilized sections IR can attract traffic allowing better utilization of installed capacity.

Further, there is uniformity in terms of rates charged to a particular commodity (within a commodity class) based on the distance slabs. However, this does not differentiate between shippers by their efficiency of

operation (in terms of freight loading through use of wagons with better payload capacity), and disincentivizes efficient loading. For incentivizing efficient loading on existing infrastructure, discounted pricing based on loading can be considered.

19.2.3 Cross-subsidization across Commodity Groups

There is cross-subsidization across various commodity groups. Commodities classified at higher classes are made to pay not only their appropriate share of general costs, but in addition; that share of the joint costs which the low rated commodities cannot afford to bear. Such cross-subsidization creates serious distortion in the market and reduces cost competitiveness of IR's container business. There is a need to reduce cross-subsidization amongst commodity groups. Move towards FAK rates as far as possible with only limited exceptions, can be considered.

19.2.4 Lack of Competition-based Pricing

Freight pricing policies for IR are based on the internal assessment of costs and value of the commodity. This contrasts with other transport modes, where the primary determinant of pricing policy is competition. Additionally, the inclusion of costs towards repair and maintenance of infrastructure (depreciation cost) is also significantly different for railways. In other transport sectors, the cost of long-term infrastructure investment is not included in the cost of individual operators other than through the collection of tolls and taxes (due to marginal cost pricing). However, the average cost-based approach for IR includes the fixed common and joint costs which are distributed over all traffic. This leads to higher freight tariffs as compared to other sectors.¹³ Lack of a standard market-based pricing system, as practiced on railways now, may lead to diversion of freight business to other transport modes offering a competitive rate, which further increases the fixed cost burden for remaining traffic.

Other transport modes, especially road, have a dynamic price setting approach. Trucking costs change almost daily in reaction to market forces. In contrast, fixation of freight rates for IR is centralized, with power to alter rates lying exclusively with the Central Government that is Railway Board as per the Railway Act, 1989. Thus, changes to tariff rates are less responsive to prevailing market conditions. Under the provisioning of the Railways Act, some efforts have been made to allow more decentralized price setting. The major move has been allowing the zonal railways to set specific STS rates for specific origin and destination (OD) points. These are rates prescribed by the zonal railways mainly for sections where traffic at the normal rates would be scarce, as other transport modes are cheaper, inadequate and concessional rates are expected to generate additional traffic.

Another factor contributing to the non-competitiveness of the railways with respect to road transport is the increasing overhead costs of IR, particularly on account of pension expenses. In 2000–01, overhead costs accounted for 20% of total freight cost, which increased to 25% in 2010–11. In 2020–21, overhead costs accounted for 35% of total freight cost. During the last two decades, between 75% and 80% of overhead costs were on account of pension expenses. Road transport operates differently and being a private sector is not mandatorily included under any pension regime. So, the administrative and pensionary expenses associated with the operations of railways add to the 'cost of service'.

19.2.5 Slab-based Pricing and Rationalised Routes

The Indian Railways practices slab-based system of pricing in which the shortest distance between the OD pairs is considered for charge for carriage of goods. However, the shortest route may not always be the preferred

¹³ Pricing also depends on several other factors such as political agendas/promises, health emergencies (e.g., the COVID-19 outbreak), etc.

route for travel for the operator in operational interest. The actual distance travelled by goods on an average is always 10–15% higher than the charged route. Railways are empowered to declare a longer rationalised route for charging due to operational convenience. Railways undertake a periodic exercise for ‘route rationalisation’ (see Chapter 4 of Volume I of the report for detailed discussion on route rationalisation) under which it prescribes charging of goods through a longer route instead of the shortest available route between two OD points. This is done to optimize IR’s capacity utilization by diverting traffic from congested routes; however, route rationalisation often results in delay in shipment and higher cost of transport to the consignor (as the cost is calculated based on the longer distance for the rationalised routes). Further, it has also been highlighted (see Chapter 4 of Volume I of the report) that despite technological and capacity improvements over years, the number of rationalised routes has kept growing. In a competitive market where road transport offers faster and shorter connectivity between two OD points, rationalisation of routes (with greater freight cost) may result in outflow of traffic to road, wherever possible. The slab-based system and the route selection process (either by shortest or by the rationalised routes, wherever in existence) in tariff act as irritant for the customer, especially when railways may not compulsorily carry goods by rationalised route. In operational interest it may carry goods by any route and not bound by the charge route.

IR may explore the concept of charging based on preferred route and the actual distance of freight movement between the two OD points. The preferred route generally based on operational convenience may be pre-determined and publicly known to the customers. This will not only generate greater transparency in charging of freight but also fetch more revenue for IR and bring parity with road transport.

19.2.6 Elasticity of Demand and Optimum Pricing Policy

A shipper needs to be charged in accordance with the price elasticity of demand for the commodity, as otherwise it would result in a shift in the shipper’s modal choice of transport. The price elasticity of demand is the measure of the responsiveness of the commodity to change in prices. An elastic commodity has a higher incentive to shift to other modes due to an unfavourable tariff change. Increasing the tariffs of such commodities can result in substantial revenue loss for the railways. We have seen a considerable increase in the traffic in road movement compared to the increase in traffic for IR, even in the case of traditional bulk commodities. Concessions provided to certain commodities delink pricing from elasticity and create distortions as, to cover the fixed costs IR imposes higher tariff on other commodities and effective rates for these commodities may not then reflect their price elasticities.

19.2.7 Speed and Quality of Service

Time saved is equivalent to money being earned for both the supplier and user of transport services especially with technological advancement and the globalization of trade. Speedy delivery of goods has now become an element of productivity especially when railways have lost majority of its traffic to road and air owing to this very reason. While speedy delivery increases the cost of service provided, it adds to the value of service component of the pricing principle. Unlike on the passenger side, where the fares of the Vande Bharat, Tejas, Gatimaan, Rajdhani and Shatabdi trains tend to reflect this aspect, IR does not recognize speed/quality of service as an integral component in its freight tariff fixation. Assured and timely delivery along with consignment tracking facility (like road transport) can boost consumer confidence. The ‘economic value of time’ saved can be incorporated in the charging principle of the freight tariffs especially in case of high value goods and services, and provided with faster and guaranteed transit time with tracking facility.

19.3 Rationalisation Efforts by Indian Railways

The Indian Railways uses two main methods for altering the tariff for a certain commodity if the present tariff is found to be uncompetitive or does not reflect the cost of transportation. The first method is to change the per-tonne rates for a particular rate class such that all commodity groups falling under that class are charged the updated rate. The second is to change the group to which a commodity is assigned or assign a commodity group to a different rate class.

Among the two approaches, changing the commodity class is more commonly practised, over the years Railway Board has notified several changes in commodity classification. The rates for each class are also periodically revised to adjust for inflation and to reflect any major changes in the cost of the transport.

IR has also taken some steps in the form of different freight policy measures with the aim to make it more cost competitive for specific types of commodities; of which empowering the zonal railways to set the STS rates could be considered as a key step towards some level of decentralization of fare setting. Under this, the zonal railways can offer some discounts on the original fare, given that there is an actual increase in the NTKMs associated with the commodity from the station and division. However, one cannot provide the discounts if the lower rates attract the traffic away from other nearby stations.

Policy measures also include some efforts to reduce the empty wagon runs by incentivizing the booking of round trips. Some efforts at price discrimination and better utilization of capacity have also been taken through the introduction of 12% busy season charge in 2015. Though it was levied on all commodities initially, due to economic slowdown in 2019 it was withdrawn from all commodities except iron ore and POL. It was reintroduced (notification dated September 27, 2022) starting October 01, 2022 on all commodities except coal & coke; container traffic; and automobile traffic.¹⁴ The rate was revised to 15% in 2018 which continues till date. Table 5 further describes some of the more prominent policies implemented in the recent past.

Table 5: Freight tariff policies of Indian Railways

Policy	Objective	Salient features
Station to station (STS) rates	To allow decentralization of tariff setting to attract more traffic	The zonal railways can provide percentage discounts on the normal tariff rate if it results in overall increase in NTKM of the station for the commodity considered. The maximum discount can be 30% and the rate cannot be lower than the Class 100 rate.
Freight Rebate scheme for traffic loaded in traditional empty flow directions (TEFD)	Reduce the movement of empty wagons on certain identified routes	Commodities (except iron ore, coal & coke, POL, chemical manures, RMC traffic, military traffic, and commodities under Classes 100, 100A, LR1, LR2, LR3 and LR3A) moving along the empty flow routes (short lead traffic of ≤100 km is also excluded) are offered concessions according to two slabs available at 15% and 20% of NTR subjected to floor limit of NTR of Class 100 (TL) and 110 (WL). It is presently in place till March 31, 2023 (corrigendum no. 06 to rate circular 13 of 2021, dated 24.05.2022).

¹⁴ Details are available at <https://indianrailways.gov.in/railwayboard/uploads/directorate/traffic_comm/Freight_Rate_2022/Resumption%20of%20Busy%20season%20charge.pdf>.

Policy	Objective	Salient features
Round trip tariff (RTT)	Reduce empty wagon trips	Discount is offered if traffic is booked in both onward and return direction. Effectively both onwands and return traffic/ commodities are charged at lower class.
Short-lead concession	Attract more short-distance traffic	Discount on base freight rate of 50%, 25% and 10% is granted to the traffic booked up to 0–50 km, 51–75 km and 76–90 km respectively, except coal & coke and iron ore.
Long-lead concession	Attract more long-distance traffic for coal & coke, iron ore and iron & steel	Discount on base freight rates: <ul style="list-style-type: none"> » Coal & coke traffic for distance >1400 km is granted 20% concession » Iron & steel for distance >1600 km and >700 km is granted 20% concession and 15% concession, respectively » Iron ore traffic for distance >1500 km is granted 20% concession.
Busy season surcharge	Higher revenues from increased demand and better utilization of track capacity	Imposed (starting October 01, 2022) at 15% rate on all commodities except coal and coke, container, and automobile traffic. When introduced in 2015 it was levied on all commodities at 12%, the rate was revised subsequently to 15% in 2018. Starting October 01, 2019, it was levied only on iron ore and POL.
Long-term tariff contract (LTTC)	To provide certainty in logistics operation for IR and for customers	<p>Introduced (starting March 30, 2017) to generate of additional traffic and revenue through long term revenue commitment from customers and providing customers assurance of supply of wagons and freight rate.</p> <p>Eligibility: customers with annual loading of at least 1 million tonne (MT) in previous year, for new traffic (commitment of > 3 MT for entire period and at least 1 MT in first year), not availing any other concessions (e.g., STS rate policy, Freight Forwarder Scheme, short-lead), will not avail any concurrent freight incentive concessions (except for 6% in case of North-East region).</p> <p>Exclusion: all commodities below Class 100, coal & coke, iron ore, military traffic, POL, RMC, container, automobile.</p> <p>Customers enter LTTC agreements with the zonal railways.</p> <p>It was discontinued from December 18, 2020.</p>

Note: See Chapter 12, Volume II of the report for detailed analysis of LTTC policy

Source: Rate Circulars accessed from IR

Price Responsiveness of 20 Major Commodities

20.1 Declining Average Lead

Indian Railways has been witnessing a declining trend in average lead for its freight operation as depicted in Figure 5. Over the three decades, average lead has fallen from 711 kilometres in 1990–91 to 578 kilometres in 2021–22. However, a careful look shows that the 1990s marked declining lead, followed by increasing trend in the 2000s, again a declining trend in 2010s. Historically, with increasing industrialization, the manufacturing and consumption centres started moving closer to each other, leading to decline in lead. Further, economic liberalization and withdrawal of uniform pricing system in cement and steel also changed the freight movement pattern.

Figure 6 depicts the average lead of different commodities. The declining trend observed (for all the commodities combined) in the last two decades is mainly due to the declining lead observed for coal, accounting for 33–48% and 42–50% of NTKM and tonnage, respectively.

The falling trend in average lead for coal transport since 2011–12 can be attributed to: (i) "...a one-time effort towards coal linkage rationalisation and also due to falling power plant load factors (PLFs)" (Kamboj and Tongia, 2018); and (ii) push for pit-head and port-based thermal power plants (with the National Electricity Policy of 2005 and formation of synchronous national power grid).

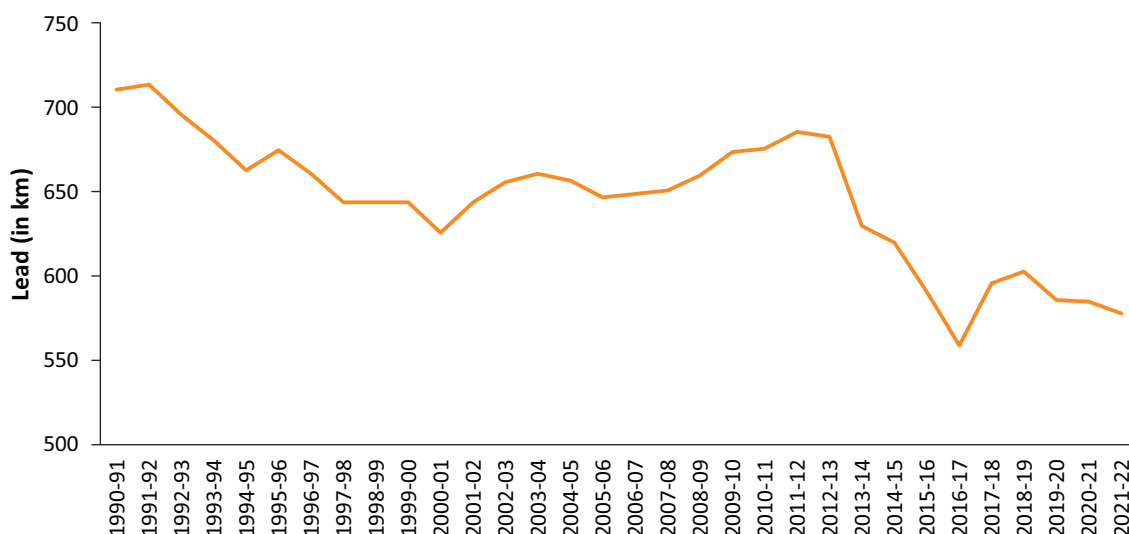


Figure 5: Average lead (1990-91 to 2021-22)

Source: Annual Statistical Statements (IR, various issues)

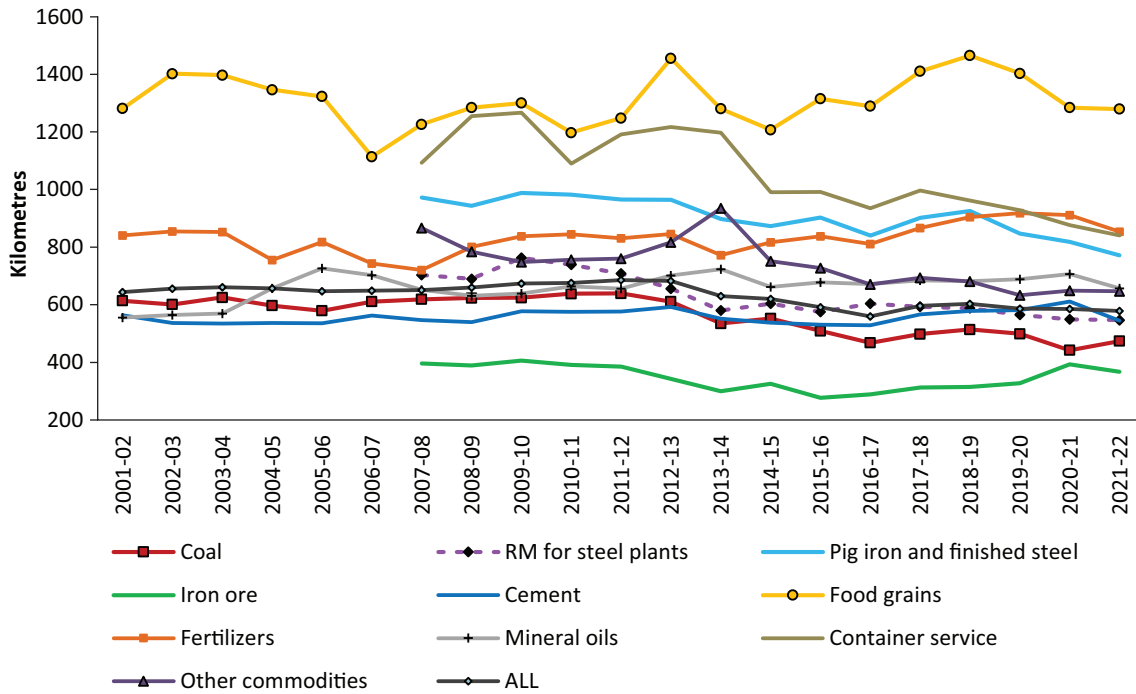


Figure 6: Average lead of different commodities (2001–02 to 2021–22)

Source: Annual Statistical Statements (IR, various issues)

20.2 Freight Rate and Demand Relationship

From the general principles of economics, a ‘normal good’ exhibits a downward sloping demand curve, signifying a negative relationship of demand with prices. The annual movement of freight demand (in NTKM) and the corresponding freight rates (paise/NTKM) are depicted in Figure 7.

Though the average freight rate over years has increased (see the average rate at current prices in Figure 7), it has failed to keep pace with inflation. Thus, the real value has declined over years (see the average rate at constant 2011–12 prices).¹⁵ The relative movement of the rates (at constant prices) and the NTKM demand confirms the negative relationship between the two. A linear regression (log-log model) of NTKM on average freight rate and sectoral GDP (of agriculture, industry, and construction) reveals a freight rate elasticity of -0.3560 for overall NTKM. So, a percentage increase in average freight rate (measured at 2011–12 constant prices) decreases the average NTKM by 0.36%. Thus, at an aggregate the commodities moved by the railways are price inelastic (as the magnitude of elasticity is less than 1). Presently, IR transports bulk commodities classified under 10 groups. Though at the aggregate level there is a negative relationship between the freight rate and demand, it is worthwhile considering the impacts of changes in freight rate on demand for each of these commodities (and the magnitudes of their price elasticities).

Figure 8 provides the revenue distribution of IR across different commodities since 2007–08 (at constant 2011–12 prices). Total revenue from freight traffic was INR 635 billion in 2007–08, which grew at an annual 2% rate to reach INR 869 billion in 2021–22. The peak earning of INR 910 billion was achieved in 2018–19.

¹⁵ Higher values of average rate at current prices than at constant 2011–12 prices after 2011–12 are due to base effect.

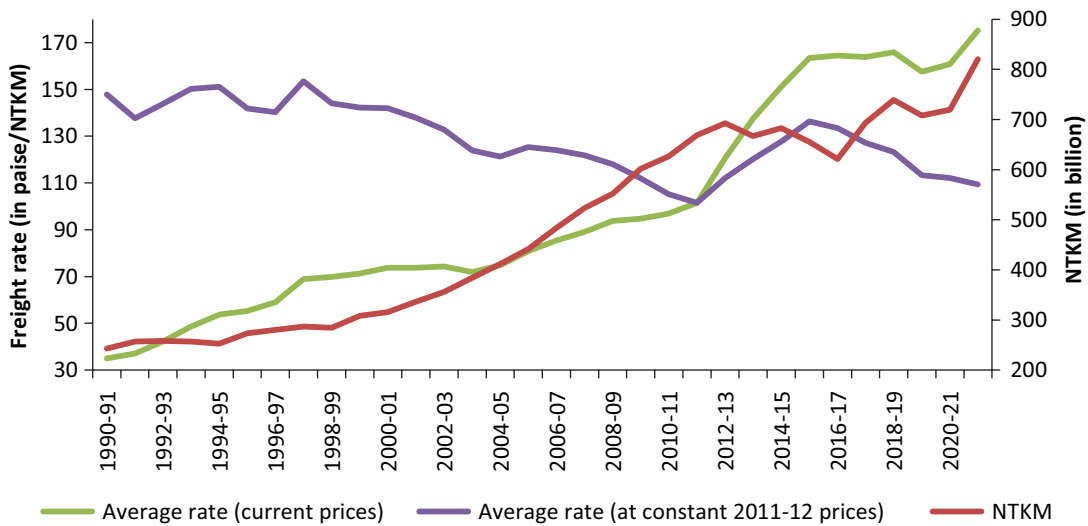


Figure 7: Relative movements of freight rate and NTKM

Note: Average freight rates at constant (2011–12) prices are calculated based on the GDP deflator for each year (ratio of current to constant GDP)

Source: TERI's estimate based on Annual Statistical Statements (IR, various issues), National Accounts Statistics (various issues) and RBI (2017)

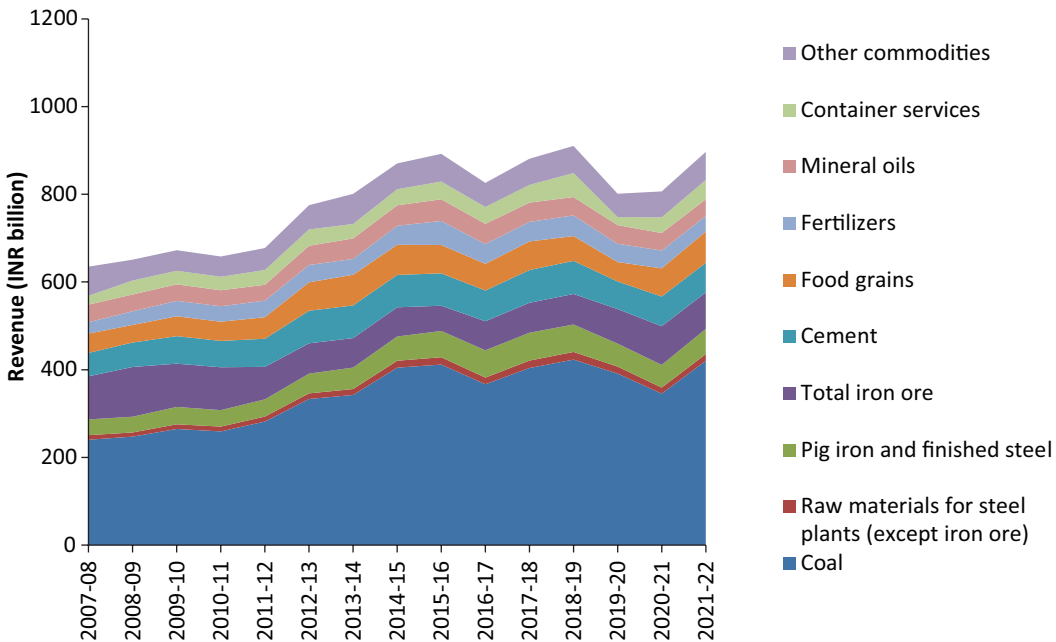


Figure 8: Sectoral shares of freight revenue

Note: Commodity classifications were changed in 2007–08. All figures at 2011–12 constant prices

Source: TERI's estimate based on commodity-wise NTKM, and applicable freight rates accessed from the Annual Statistical Statements (IR, various issues)

Historically, IR has been sourcing its major share of revenue from coal transport. In 2001–02, coal contributed 46% of IR’s earnings from freight traffic. It fell to 38% in 2007–08 and has grown thereafter. The peak in the last two decades was achieved in 2019–20 when it reached 49% share. However, in 2020–21, the share of coal in freight revenue fell to 43%, but increased to 47% in 2021–22 associated with economic recovery.¹⁶ The share of revenue from coal shipment to thermal power plants has been declining for quite some time, but still accounts for more than half of the total revenue from coal.¹⁷

Growing (and high) dependency for revenue and high percentage of freight operation on account of coal shipment indicates that IR is failing to diversify its revenue sources for its freight operation. A part of it is linked to an ‘implicit’ obligation in giving preference towards coal shipment (for thermal power stations and core sector industries) at the cost of other freight operations (reducing capacity of the railways to carry other commodities). In future, this may have serious implications for the overall revenue from freight operation when the requirement of coal gradually diminishes with phasing out of coal-based thermal power plants. The Ministry of Power, GoI has recently (January 2023) directed the use of ‘Rail-Ship-Rail’ (RSR) mode of coal transport for the thermal power plants located in the states of Gujarat, Rajasthan, Maharashtra, and Punjab. This may further reduce the revenue generation from coal transport for IR albeit increasing the cost of electricity generation (through higher freight cost and losses associated with longer multi-modal transportation).

For assessment of price responsiveness of rail freight movement, it is first important to track the historical movement in freight rates (measured at constant prices, for comparability). Figure 9 presents the comparative assessment of the freight rates at constant 2011–12 prices for different commodity classes since 2007–08.¹⁸

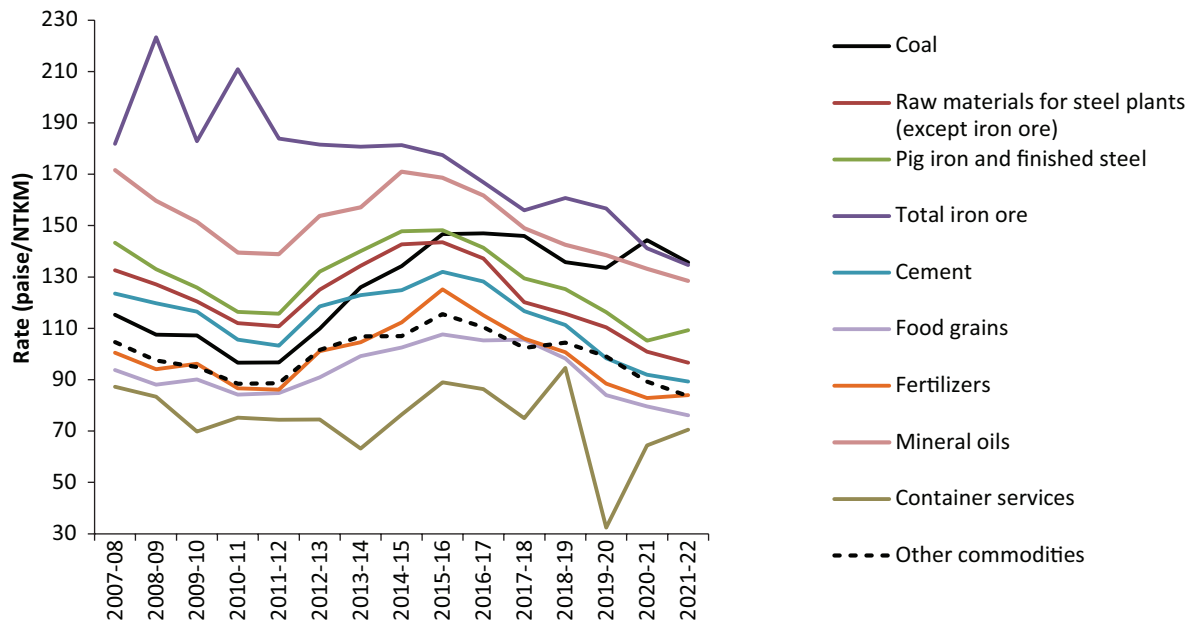


Figure 9: Historical freight rates (at 2011–12 constant prices)

Source: TERI’s estimate based on Annual Statistical Statements (IR, various issues); National Accounts Statistics (various issues); and RBI (2017)

¹⁶ It is to be noted that 2020–21 marks the onset COVID-19 pandemic and the nationwide lockdown.

¹⁷ Calculated using annual data on revenue earning and NTKM, available from Statement 13 of the Annual Statistical Statement (various issues), Indian Railways.

¹⁸ Starting year of 2007–08 is considered to account for the changes in classification of commodities.

Clearly, the rate charged to coal shows a continual rising trend over the last decade, whereas freight rate for iron ore shipment has been declining. The high rates for iron ore during the first few years can be attributed to the increased demand from China due to construction boom (particularly associated with Beijing Olympics) in Chinese economy. Freight rate for container services shows relatively greater fluctuations. A careful disaggregated analysis of freight rate and freight demand of bulk commodities is imperative to understand the issues plaguing the freight rate pricing of IR.

20.3 Disaggregated Demand Analysis: Bulk Commodities

The bulk commodities generate majority of the revenue for IR. These are also considered ‘bound traffic’ as these are considered relatively price inelastic for the railways. The panels below (Figure 10) present the relative movement of freight rate and demand over 2001–02 and 2021–22 for the bulk commodities.¹⁹

It is to be noted that some of the bulk commodities (pig iron and finished steel; cement; fertilizers; mineral oils) show long-term increasing trend in NTKM demand. Though the coal movement (in NTKM) has been increasing till 2012–13, there has been considerable volatility in the demand since then. Iron ore movement (in NTKM) declined till 2015–16 but since then it has witnessed considerable growth. Figure 11 displays the movement in freight loading of different commodities.



¹⁸ Starting year of 2007–08 is considered to account for the changes in classification of commodities.

¹⁹ For some of the commodities available data pertain to 2007–08 onwards due to changes in commodity classifications.



Figure 10: Relative movements of NTKM and freight rates of bulk commodities

Note: Average rate is measured at constant 2011–12 prices

Source: TERI’s estimate based on Annual Statistical Statements (IR, various issues); National Accounts Statistics (various issues); and RBI (2017)

Freight loading has increased for all the commodities, with food grains showing significant fluctuations. However, the share of railways in total shipment of major commodities (coal, cement, foodgrains, POL, and iron ore) had declined considerably between 2005–06 and 2019–20 with the steepest fall of 41% for POL and the least decline of 4.08% for iron ore (Table 6). However, share of railways in shipment of fertilizers increased by 13.8% over the same period owing to the existing fertilizer subsidy provided by Gov.²⁰

Table 6: Growth rates (2005–06 to 2019–20) of rail share in freight transport and average NTKM rate

Growth rates	Coal	Cement	Fertilizers	Foodgrains	POL	Iron ore
Rail share (%)	-9.09	-20.58	13.81	-33.84	-41.00	-4.08
Average rate (%)	1.68	-26.25	-2.89	-0.53	-29.33	-4.75

Source: Ministry of Railways

At the same time, the average NTKM rate (at constant 2011–12 prices) charged to each of these commodities has declined considerably, except for coal. Table 6 provides the growth rate comparisons of the rail share in freight transport for major commodities and the average NTKM rates. Despite the decline in average rate

²⁰ Ministry of Railways

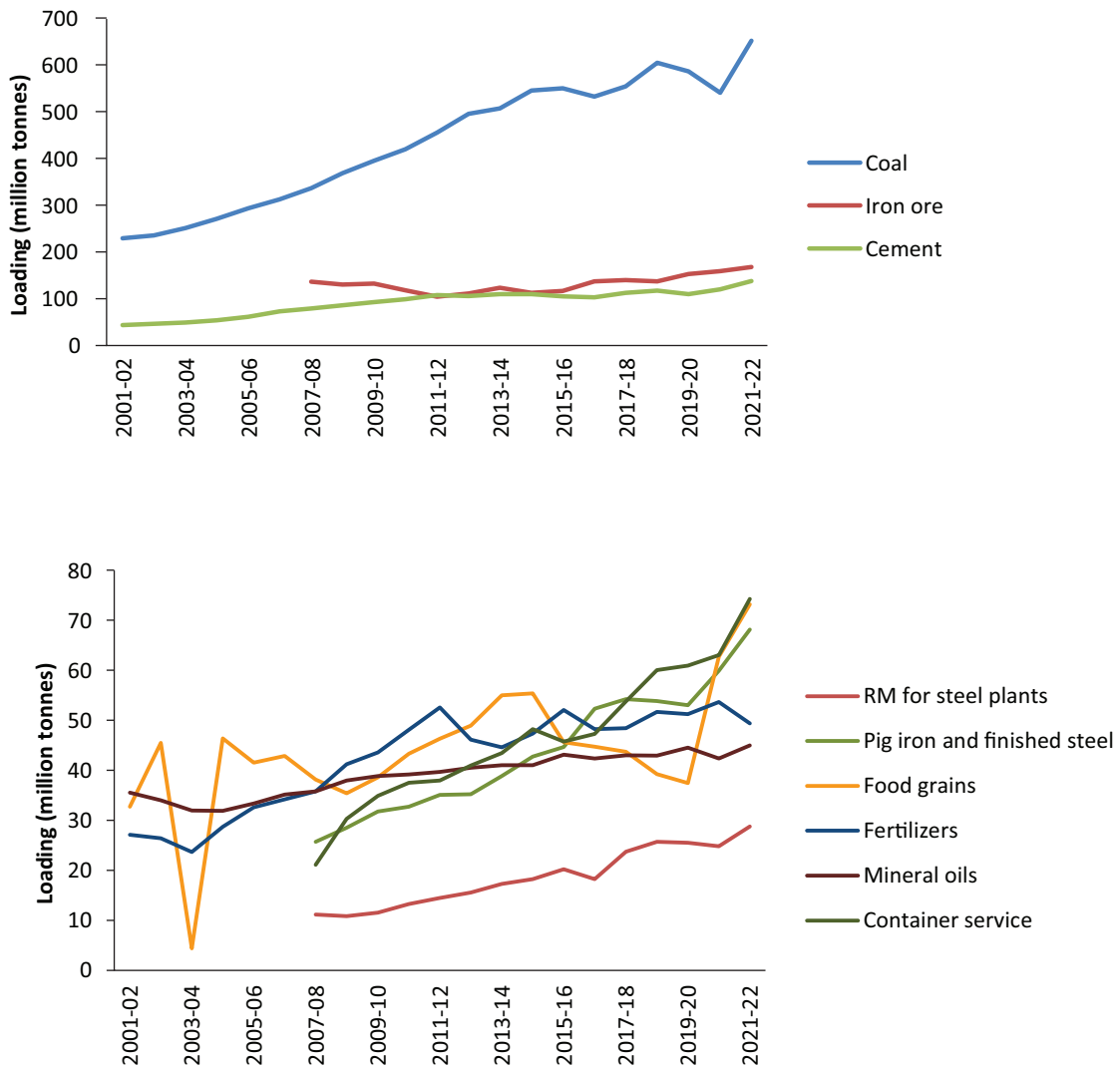


Figure 11: Loading (in million tonnes) of different commodities

RM-Raw material

Source: Annual Statistical Statements (IR, various issues)

levied by IR, share of railways in cement, food grains, POL, and iron ore shipment has declined over the years. The sharp decline in POL shipment can be attributed to the shift to pipelines. The Union Budget of 2023/24 proposed to increase freight transport via coastal shipping (through PPP mode with viability gap funding) to support 'green growth'. This modal shift in future may further reduce the share of railways in freight shipment.

20.3.1 Price Elasticity of Freight Demand

Price elasticity can be effectively utilized in transport analysis to estimate the responses of freight demand to freight rate (price). The price elasticity of demand for a commodity or service is the percentage change in quantity resulting from a percentage change in price.

$$\text{Elasticity } (\epsilon) = \frac{\% \text{ change in quantity}}{\% \text{ change in price}}$$

Thus, a high elasticity for freight service indicates that a relatively small change in price will cause a relatively large change in consumption of transport service. Alternatively, low price elasticity indicates that price changes have relatively little impact on the transportation of the commodity. Market segments that have a high elasticity will get a low mark-up on costs and segments that are not so price-sensitive (relatively inelastic) get a high mark-up, so that there will not be a large shift to competing products/services. In the case of railways, such a competing alternative may be road transport.

Elasticity of Demand

Unit elasticity refers to elasticity with an absolute value of 1.0, meaning that price changes cause proportional consumption change.

Elasticity values less than 1.0 in absolute value are called inelastic, meaning that prices cause less than proportional changes in consumption.

Elasticity values greater than 1.0 in absolute value are called elastic, meaning that prices cause more than proportional changes in consumption.

Table 7: Price (average freight rate) elasticity of freight demand (in NTKM)

Commodity	Elasticity
Coal	-0.697
Cement	-0.416
Fertilizers	-0.376
Food grains	-0.348
Pig iron and finished steel	-0.270
POL	-0.166

Note: Elasticities obtained by regressing NTKM on freight rates (at constant 2011–12 prices) and GDP (of agriculture, industry, and construction) (all in natural logarithm), accounting for autocorrelation (Prais-Winsten method)

Source: TERI's estimate

The price elasticities for the major bulk commodities are provided in Table 7. Negative elasticity for a commodity indicates negative relationship between the changes in freight rate and demand. It is to be noted that price elasticities have magnitude of less than 1, indicating that these commodities are price inelastic. For example, 1% increase in the freight rate of cement will reduce cement demand by 0.42%. Relatively higher price elasticity of coal demand may be associated with the decision to set up pit-head and port-based thermal power plants that reduce dependency on railways for coal movement.

Tables 6 and 7 present a conundrum. On one hand it is observed from Table 6 that the share of railways in freight movement of the bulk commodities (except for fertilizers) has declined over time; on the other hand, Table 7 indicates that the bulk commodities are price inelastic (less sensitive to price changes). Clearly, contrary to the general convention, price is then not solely responsible for decline in market share of IR in shipment of bulk commodities. Shippers often raise the issues of timely availability of rakes, stabling, route-diversion, damages to the consignments, etc. These factors pose serious challenges to their business and may play important role in demand for shipment via railways.

20.3.2 Need for the Satisfaction Index

A major challenge faced by IR is the issue of capacity constraint (FICCI and CRISIL, 2021). The pace of expansion of network (and additional capacity) to address expansion in overall freight demand for the economy has been a major factor of declining share of IR in overall freight movement in the country. However, several other factors may also constrict IR's expansion in market share. In this regard, factors such as: (i) timely availability of rakes; (ii) reliability and timely delivery (assured service); (iii) safe and damage-free transit for cargo; (iv) early settlement of claims; (v) rates offered by competitive modes of transport; and

“Freight rate is alone not responsible for declining share of IR in market-share of bulk commodities”

(vi) good connectivity between the source and destination, can be few other factors determining the demand for rail freight transport (some of these factors and their implications for IR's freight operations have been dealt in details in Chapters 9 to 15, Volume II of the study). IR can conduct detailed market research on selected customers of different commodities and collect information on their preferences over each of the mentioned factors along with the rate offered by railways, to construct a composite index (satisfaction index) to measure the performance of the Railways in freight transportation. This will aid IR to assess the main reasons behind its declining freight share despite the inelastic demand for bulk commodities. An example of designing a satisfaction index to measure the service rendered by IR in respect of terminal operation can be found in Chapter 6 (section 6.6) of Volume I of the study.

20.4 Container Business and Shipment of Other Commodities

Container operation and shipment of 'other commodities' continue to account for less than 20% of the freight revenue and between 2007–08 and 2021–22, the revenue earning from shipment of 'other commodities' has marginally declined (from INR 66 billion in 2007–08 to 64 billion in 2021–22, as indicated in Figure 12.

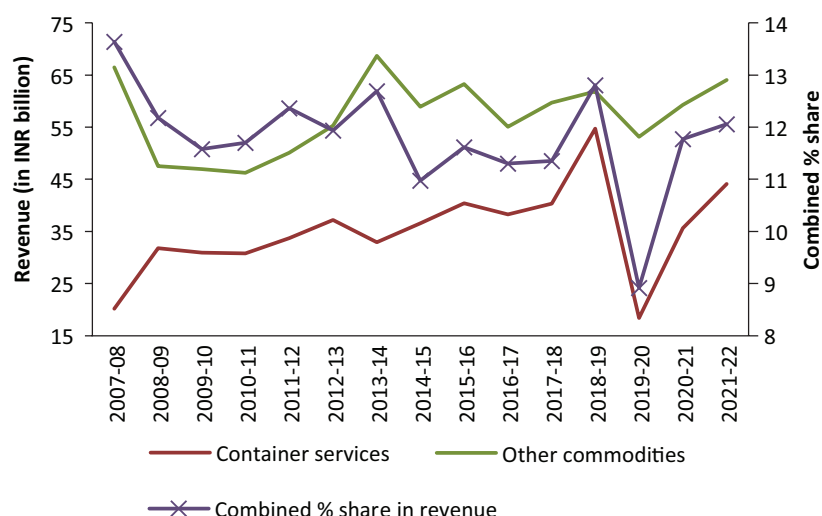


Figure 12: Revenue earning from shipment of container and 'other commodities'

Note: Values in constant 2011–12 prices
Source: TERI's estimate based on Annual Statistical Statements (IR, various issues)

Except for the COVID-19-induced slowdown in 2020–21, revenue earning from container business has grown the highest among all types of shipments. Between 2007–08 and 2019–20 it has grown by 10% per annum. However, the revenue earnings from other commodities have declined by annual rate of 1%. The overall effect (along with the business in other segments) has been a decline in overall revenue share of container and other commodities. In 2021–22, the share of railways in container shipment was about a fourth of the total container traffic, and for other commodities the share was 5% (p. 5, Gol, 2022). To increase the share of IR in shipment of other commodities as envisioned by IR in its 'Mission 3000 MT' target, rates need to be market friendly.

The major deterrent for use of railways as a mode of shipment of containerized and piecemeal traffic has been the lack of first-mile and last-mile connectivity and door-to-door shipment, where road transport has

advantage. IR in collaboration with India Post (Department of Posts) had launched a Joint Parcel Product (JPP) scheme in December 2022 in different parts of the country, where a consignee can send consignment weighing more than 35 tonnes, through a multi-modal door-to-door method. India Post provides the first-and last-mile pick-up and delivery services, whereas, IR provides the intermediate (middle-mile) shipment. This service has seen good response, can be a game changer if successfully operated. Further, issues like: (i) lack of assured transit time; (ii) inefficiencies in wagon utilization (idling of rakes and empty run); (iii) high cost of repositioning empty containers and wagons; and (iv) multiplicities of rates, pose challenges for expansion of the container business of IR (Annexure C3, Gol, 2022).

20.5 Unstable Growth in Freight Revenue

Revenue growth from freight traffic has been highly volatile for IR. Figure 13 highlights the fluctuating pattern of the growth rates of revenue since 2008–09. Container operation and food grains exhibit the highest variability (standard deviations being 34.8% and 17.1%, respectively), whereas, the revenue growth rate for mineral oils shows the least variability (standard deviation of 7.1%). There is a declining revenue growth trend observed for cement and fertilizers. Alternatively, if we consider data during 2008–09 and 2019–20 (to factor out the not-normal COVID-19 periods) the trend is same with standard deviations being 28%, 13.7%, and 7.3%, respectively.



Figure 13: Historical movements in revenue growth rates (in %)

Source: TERI's estimate

For efficient operation and economic viability of a commercial entity, stable growth of revenue is important. It is imperative that IR devises its freight policies in a way that it generates a steady growth in freight revenue. In the backdrop of declining share of railways in shipment of bulk commodities, increasing the movement of container traffic and shipment of other commodities are important for financial viability of freight operation. This is also pointed out by the National Rail Plan, particularly tapping the long-haul containerized and other commodities shipment through: (i) supporting ecosystem development; (ii) better and wide-spread network of terminal infrastructure, (iii) adoption of newer container designs (for example dwarf containers); and (iv) assurance of fast delivery (Gol, 2020).

Policy Analysis: Station to Station Rate

21.1 Background

The Station to Station (STS) rate policy allows decentralization of tariff setting to attract more freight traffic for railways. The prime objective of the policy is to increase the overall NTKM of a station/cluster for a particular commodity. STS rate scheme also ensures that the existing traffic operating from the stations in the vicinity of the proposed station in the scheme does not get diverted to it in view of lower tariff offered by the station.

Benchmark NTKM

Benchmark NTKM (monthly, quarterly, half yearly or annually) is defined as the average NTKMs of corresponding periods of previous 12 months. The average NTKMs are worked out by multiplying the distance carried with the weight as recorded in the Railway Receipts (RRs).

Under the Section 32(a) of the Railways Act, 1989 the railway administration (i.e., the zonal railways) has been given the statutory power to quote STS rate with respect to carriage of various commodities, and subject to certain conditions. In compliance with order given by the Railway Claims Tribunal (RCT), after due notice, the zonal railways can cancel, increase, or decrease a previously quoted STS rate (Section 32(b) of the Railways Act, 1989).²¹The zonal railways can also withdraw, alter, or amend the conditions for STS rate, other than those that are in compliance with any order made by the RCT (Section 32(c) of the Railways Act, 1989).

On this, however, the Ministry of Railways has released certain set of notifications and guidelines to implement the scheme with the motive to increase the freight traffic of IR. A consolidated and comprehensive guideline on STS was issued by railways in 2016 (Rate Circular No. 26 of 2016, dated 29.09.2016) and updated later in 2022 (Rate Circular No. 15 of 2022, dated 03.06. 2022). Under the latest guidelines implementing STS rate policy (Rates Circular No. 15 of 2022 dated 03.06.2022); a detailed outline of the policy regarding its modus-operandi is laid out, consisting of domain of applicability, eligibility criteria, permitted terminal access, regulatory structure, etc.

21.2 Application

The concessions under the policy are applicable to specific stream of traffic for a particular commodity within specific origin-destination (OD) points. The only caveat being that grant of any such concession should result in an overall increase of NTKM for that station/clusters without diverting any traffic from the adjoining stations, the onus of which lies on the zonal railways. To that extent, a benchmark NTKM has been defined in the circular dated 2016, to be calculated on monthly, quarterly, half-yearly or annual basis (as per customer's demand). The benchmark NTKM for a station or a specific commodity/user for a year is linked to that particular OD pair, defined as the average NTKMs of the corresponding periods of previous 24 months. The monthly, quarterly

²¹ RCT was established vide the Railway Claims Tribunal Act, 1987 and vide the Finance Act, 2017 it was provided the jurisdiction over the functions erstwhile reserved for the Railway Rates Tribunal (RRT).

or half-yearly benchmark NTKMs are calculated accordingly. However, the monthly/quarterly/half yearly benchmark provisions have been withdrawn subsequently through an amendment (corrigendum 1 to the Rates Circular No. 26 of 2016). The latest guideline of 2022 (Rate Circular No. 15 of 2022) however revised the calculation of the annual benchmark NTKM as the average of corresponding periods of previous 12 months. This was changed to expedite the application process and facilitate customers' needs.

21.3 Eligibility and Fixation of Benchmark NTKM

The concessions under the scheme are applicable to existing as well as new streams of traffic, which includes:

- » A new rail user offering traffic passing the benchmark NTKM for the commodity and the given station/cluster
- » A new commodity offered by existing/new rail user
- » A commodity offered by an existing user for a new OD pair of stations/clusters, however, subject to the NTKM of such a commodity for the new OD pair crossing the benchmark NTKMs for that particular commodity.

The concessions (granted to either the consignor or the consignee) can be granted only when the total NTKM of a particular commodity from that particular station crosses the benchmark NTKM for that station. If the NTKM remains the same due to a change of customer or the new originating station is within 150 km to the previous station, then the traffic will not be considered as new or incremental traffic. Thus, not only the individual benchmark NTKM for that individual has to be crossed, but also, the overall benchmark for NTKM for that stream of traffic/commodity has to be crossed from the particular station so as to avail the benefits out of the scheme. The regulation of crossing the benchmark NTKM is done through necessary software modifications by CRIS.

Thus, crossing all the following benchmarks makes a customer eligible for compensation under the scheme:

- » Cluster benchmark
- » Station benchmark
- » Customer benchmark
- » OD pair benchmark

A cluster of stations is defined for stations/points within close proximity to each other; the maximum distance between any two stations should not exceed 150 km. It is applicable for loading points only and the booking should not normally be from more than two stations in the cluster. It is the responsibility of the Chief Operating Managers (COMs) of the loading zone to define the cluster for a commodity and decide the modus-operandi in case of overlapping clusters in adjoining railways with other COMs.

21.4 Retention of Traffic

For retention of traffic, concession under STS rate policy may also be granted at the current benchmark NTKM of the station and the individual customer. In such a case, the benchmark NTKM is arrived by scientifically analysing the traffic during the previous three years to establish a declining trend shown by the traffic. The benefit from STS rate policy can also be extended if the rail coefficient of the commodity/customer is very high and with added product dispatches, it is maintained at the same level. The concession is offered on the incremental volume of traffic only if the benchmark NTKM is met. For example, if a customer produced 10 lakh tonnes of a commodity in year 1 (assuming no import) of which 90% (i.e., 9 lakh) was transported by railway (rail coefficient of 90%). In next year (year 2) the customer produced 20 lakh tonnes of the commodity and maintained the rail coefficient of 90%, i.e., transporting 18 lakh tonnes through railways. In that case the

customer will be eligible for concession on only the additional volume of traffic (i.e., 18-9= 9 lakh) generated in year 2, subjected to crossing the benchmark NTKM.

21.5 Permitted Terminal Access and Exceptions

Under the STS rate policy all terminals including goods shed, sidings, ports, private freight terminals (PFTs), container rake terminals (CRTs) are permissible for access. STS rates are applicable for all commodities with classification above Class 100 except the following:

- » All commodities under main commodity head coal & coke
- » Iron ore (all types)
- » Military sidings; petroleum, oil, lubricants (POL); railway material consignments (RMC)
- » Motor vehicles or automobile traffic

21.6 Conditions

The concession under this scheme is applicable to only those customers who cross the pre-determined benchmark NTKM. The 2016 guideline directed that the concession under policy is to be given from the next rake after the specified NTKM benchmarks have been crossed. For example, if the benchmark NTKM is crossed with the 9th rake, the customer is eligible for concession from 10th rake onwards. The concession is applicable to block rake, two/multi point rake, mini rake, etc., on wagonload or trainload basis. However, the latest circular dated 2022 (no. 15 of 2022) defines the applicability of STS rate concession based on railway receipts (RR) instead of rakes. Though this may have resulted in revenue loss for the railways, its purpose was to provide benefits to the customers. For example- suppose a customer achieved the benchmark NTKM with 8.5 rakes; the concession earlier was applicable to that customer from 10th rake. That resulted in unavailability of concession for the additional shipment carried by the half of the 9th rake. A movement to RR-based application of concession in this case means that the customer can then make two separate RRs, one for the shipment using 8.5 rakes and a separate one for the shipments using remaining half of the 9th rake. This change benefits the customer.

Rail Coefficient

Rail coefficient is an index of the market share of railways in the industry. It is defined as the percentage of freight transported by rail over the total availability (calculated as the sum of internal production plus imports).

Concession under the policy is presently granted based on annual NTKM benchmarking. The period of agreement, however, should not be less than one year. Normally, the concessions under the policy are granted to the volume of traffic which is not availing benefits out of any other scheme as a percentage discount on the Normal Tariff Rate (NTR).²² Freight rate realized after allowing concession under the policy should not be lower than the NTR of Class 100.

The maximum percentage of discount under STS rate policy shall be up to 30% for attracting incremental traffic and for retention of traffic, a maximum of 15% concession can be granted. The factors influencing the discount offered are: volume of traffic, road rates, margin over Class 100 freight rates for that commodity. In case of container traffic, only notified commodities being charged at the 'container class rate' are eligible with the maximum discount given up to 15%.

²² Except for the traffic originating from and destined for the North Eastern Region, which is granted a separate 6% concession.

If a consumer is willing to offer higher volume of traffic or for longer period of time, a higher rate of concession can be given subject to a maximum limit of 30% or 15%, as the case may be.

The concessions granted under STS rate policy need to be commensurate with: (i) the cost of service principle, and (ii) retention of rail coefficient and/or overall increase in the NTKM. These should lead to increasing net revenue for the railways from freight and the policy should be financially sustainable.

21.7 Modalities: Regulatory Structure at the Zonal Level

The zonal railways can suitably modify the procedures outlined as per field requirements for grant of concession under STS. The method to be followed for granting concessions is as follows

- » The customer is required to submit the application to the concerned Divisional Railway Manger (DRM) detailing the traffic offered, OD pair of stations for proposed movement of traffic, and details of traffic offered (for same commodity(s)) during previous years, if any, between the same OD points.
- » The DRM nominates a Divisional Empowered Committee (DEC) and approves the report through concerned Senior Divisional Commercial Manager (Sr DCM) which is then sent to the headquarters for processing the concession. The DEC comprises Commercial Inspector (CMI) and Travelling Inspector of Accounts (TIA).
- » The Commercial Branch processes the case and puts it up to the Principal Head of Department (PHOD) committee comprising Chief Operating Manager (COM), Chief Commercial Manager (CCM) and Financial Advisor & Chief Account Officer (FA&CAO) for their approval of the percentage of concession to be granted or any other recommendation and obtains the final approval of the General Manager (GM).
- » After the approval is received, necessary instructions are issued to the applicant by the DRM (or an authorized officer), and a formal agreement is signed between the railways and the applicant (customer).

21.8 Safeguards and Amendments

It is the responsibility of the zonal railways to ensure that the grant of concessions does not lead to manipulation through formation of cartels by driving traffic away from adjoining terminals/points to avail the benefits. Any alteration in the freight rate due to change in commodity classification or base freight rate (excluding surcharges) is not applicable on the customer during the agreement time frame or one year, whichever is less. However, after one year the rate has to be duly revised and new concession to be worked out based on the new freight rates. If the freight rate falls, the party has the option of withdrawing from the scheme after a three-month notice period. The agreement under STS rate policy can be entered for a maximum period of three years at a time and not less than one year. Each year, a fresh agreement has to be provided as the benchmark NTKM along with other circumstances like freight rate of alternate modes would change.

There have been multiple amendments to the initial guidelines provided by the Rates Circular No. 26 of 2016 (RC 26_2016). A revised guideline dated 23.08.2019 withdrew the provisions of monthly/quarterly/half-yearly benchmarking of NTKMs. Corrigendum 1 to the RC 26_2016 (dated 11.09.2019) withdrew the provision of monthly, quarterly and half-yearly concessions available earlier. Thus, all future agreements (only annual STS rate concessions) had to be signed on the basis of yearly benchmark NTKMs only, calculated as defined before. Corrigendum 2 to the RC 26_2016 (dated 03.01.2020) dropped the use of 'road rates' as one of the determining factors of the maximum percentage of discount offered under the STS rate policy. The new Rates Circular 15 of 2022 (dated 03.06.2022) (RC 15_2022) introduced the calculation of the benchmark NTKM based on average of the corresponding 12 months period of previous year (reduced from the existing criteria of 24 months). It also introduced the provision of STS rate concession based on RR instead of the existing criteria of applicability based on rakes. Motor vehicles and the automobile traffic were also excluded from the purview of STS rate

concessions. A maximum period of two years for revision of benchmark NTKM was also introduced (earlier it was supposed to be revised annually), and after three years the benchmark has been provisioned to be based on average of three years (and subsequently for future).

While the guidelines laid down under the scheme are broad in nature, with zones having administrative flexibility depending on the situation. However, it was clarified that for fixing the benchmark NTKM, commodities under the same commodity head can be considered as one commodity. Till date, Bangladesh traffic remains excluded from qualifying under STS rate concession as it has its own separate quota. Joint decision making of the adjoining railways COMs was stressed upon to operationalize the scheme so that traffic is not diverted from one station to another to avail the benefits under the scheme.

Empowering the DFCCIL network to quote STS rate

As the Dedicated Freight Corridor Corporation of India Limited (DFCCIL) has been granted the status of a railway administration, the power to provide concessions to traffic has been extended to the network (vide TCR/1618/2020/DFCCIL/1 dated 04.09.2020). The Managing Director (MD) of DFCCIL has been vested the same powers as the general managers of the zonal railways to implement the scheme under Circular No. 26 of 2016.

“... the commercial rules of Indian Railways will be applicable on DFCCIL mutatis mutandis like a Zonal Railway till Indian Railway is the sole operator.”

The MD can quote STS rate concession on traffic originating and terminating on the DFC network including container traffic. IR will be the recipient of the traffic revenue generated through STS and it will be a part of the key performance indicators (KPIs) of the DFCCIL, to be firmed up by the Infrastructure Directorate of Railway Board for the purpose of the rewards or penalties.

21.9 Facts and Figures

Based on the data sourced from the Ministry of Railways (Table 8), the following inferences can be drawn:

- » SR leads with 100% approval rate, followed by ECOR and SCR.
- » WCR and NCR rejected the maximum number of STS Proposals at 86% and 80%.
- » WR has 100% of the proposals pending approval, followed by NER at 86%.
- » ECOR received the highest number of proposals in the entire railway network, followed by WCR. The zone also leads in the proposals approved overall with 40% of the proposals approved.
- » WR has the maximum percentage of proposals pending at 65%, followed by NER at 23%.
- » 63% of the proposals were rejected/withdrawn in WCR, followed by SCR.

Till November 2020, out of the 16 zones no STS rate policy has been utilized by: ECR; NR; NFR; NWR; SER; and WR, which is reflected in the earnings and concessions under the STS rate policy shown in Figure 14.

Different zonal railways offer different commodities under the STS rate policies. Table 9 lists the commodities under the STS rate policies of respective zones (wherever STS rate policy is utilized, latest available information till November 30, 2020).

21.10 Issues Identified

The STS rate policy, except for very few zones, has hardly been utilized efficiently to attract more traffic. Some major issues hindering the effective implementation of the policy have been explained below.

Despite the statutory power given to the zonal railways, Railway Board frequently issues guidelines and notifications on STS rate policies. Such interference from Railway Board and lack of trust between the Ministry

Table 8: Zone-wise STS rate policy proposals statistics (as on April 29, 2019)

Railway zone	Received	Approved	Pending/under process	Rejected/withdrawn
CR	0	0	0	0
ER	0	0	0	0
ECR	0	0	0	0
ECOR	24	23	0	1
NR	0	0	0	0
NCR	5	0	1	4
NER	7	1	6	0
NFR	0	0	0	0
NWR	0	0	0	0
SR	15	15	0	0
SCR	10	9	1	0
SER	0	0	0	0
SECR	0	0	0	0
SWR	14	7	1	6
WR	17	0	17	0
WCR	22	3	0	19
Total	114	58	26	30

CR- Central Railway; ER- Eastern Railway; ECR- East Central Railway; ECOR- East Cost Railway; NR- Northern Railway; NCR- North Central Railway; NER- North Eastern Railway; NFR- Northeast Frontier Railway; NWR- North Western Railway; SR- Southern Railway; SCR- South Central Railway; SER- South Eastern Railway; SECR- South East Central Railway; SWR- South Western Railway; WR- Western Railway; WCR- West Central Railway

Source: Ministry of Railways

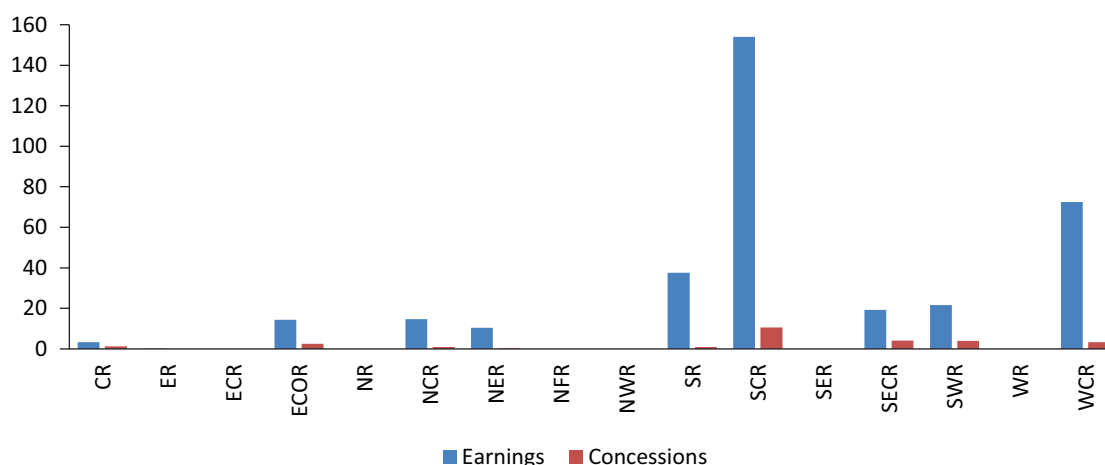


Figure 14: Zone-wise earnings and concessions under STS rate policy (from 2016 till November 30, 2020)

Source: Ministry of Railways

Table 9: Commodities offered under STS rate policy

Railway zone	Commodities
CR	Dolomite
ER	Stone
ECOR	Maize, paddy
NCR	Wheat, maize
NER	DORB (De-oiled rice brand)
SR	Cement, billets, copper slag, gypsum
SCR	Maize, laterite, cement, clinker, gypsum, sand, yellow peas, wheat and pulses, limestone, DORB
SECR	Clinker
SWR	Maize, granite
WCR	Clinker, sand

Source: Ministry of Railways

of Railways and the zones inculcate risk-averse behaviour of the executives at the zonal level. As a result, STS rate policy is underutilized with only around half of the proposals being approved and a quarter of the proposals as pending (table 5).

Removal of road rates as a determining factor for granting concessions under the scheme in a subsequent circular has eroded the competitive pricing model that could otherwise be adopted for commodities whose rail coefficient has declined in the past years.

The STS rate policy having statutory backing under the Railways Act, 1989 was supposed to be granted on a flat rate basis based on local conditions and demands. However, lack of utilization of the scheme by the zonal railways led to the issuance circular in 2016 offering concessions on a percentage basis. This has defeated the importance of devolution of pricing powers at the local level.

21.11 Way Forward

The STS rate policy, for all practical reasons has become unimplementable in its present form as it is complex and not easily enforceable. The guideline of 2016 and its subsequent revision in 2022, with the intention to ensure proper utilization of the scheme, has instead resulted in further deviation from the intended spirit of the law. Thus, despite numerous amendments and policy revisions, core issues pertaining to the policy continue to subsist. For a commercial operation, stability in policies and minimum scrutiny is essential. However, instability in the policy guidelines and interference from Railway Board has created a trust deficit and lack of utilization of the STS rate policy by the zonal railways.

The Indian Railways Act, 1890, for example vested the power to fix a 'maxima-minima' rate for the freight transport upon the Central Government. However, the Freight Structure Enquiry Committee, 1955–57 introduced tariff reforms with a percentage system of classification of freight rates instead of earlier rates with no relation between

“The Central Government may by general or special order fix maximum and minimum rates for the whole or any part of a railway, and prescribe the conditions in which such rates will apply.”
Indian Railways Act, 1890 (Section 29.1)

wagon and class rates, and abolished the maxima-minima freight rates being used in freight charges of IR. The reforms were introduced with a motive to unify the different regional railways existing in the country and bring standardization in the railway freight rate structure. A unified freight structure while necessary during the initial decades after independence, has now led to rigidity and inflexibility in the rating system in IR. Regional variations and sensitivities are not accounted for when uniform pricing structures are adopted.

Reintroducing the concept of maxima-minima rates will allow the zonal railways to incorporate the regional variations in market demand, cost as well as competition from alternate modes to attract more traffic. This requires devolution of power from the Central Government to the zonal railways in fixing freight tariff (which is presently under the domain of Railway Board) within the maxima-minima band fixed by the Central Government. Greater discretion to the local authorities and empowering the concerned individuals can assist in reducing the operational inefficiencies associated with the vertical decision gap in IR.

To begin with, commodities like cement (where there is stiff competition from road transport, particularly due to the flexibility associated with movement of bulk cement via road) can be targeted for such a maxima-minima rate system. Presently several incentives and concessions are provided by IR (by Railway Board and the zonal railways) for freight transportation. These provide limited dynamism in otherwise uniform rate system of IR. Further, with *a priori* knowledge about available incentives/concessions, road freight sector can anticipate the actual rate offered by IR for a commodity and can always undercut to attract traffic. With implementation of the said maxima-minima rating system, all incentive/concession policies need to be eliminated. Efficient management of the zonal railways can be determined by their operation close to the maxima rate and the reversal of freight traffic to rail they entail from road.

Commodity and region-specific freight rate in IR, adapting to local cost and competition conditions, can be suitably achieved within the maxima-minima framework without resorting to complicated policy implementation obstacles. This may in turn eliminate the dependence on STS rate policies. Accordingly, economic considerations in offering better pricing to the consigners can be implemented to attract more traffic. In case of unutilized capacity, rates can be offered to at least cover the marginal cost of operations.

International Experiences:

22 Reforming the Railways

22.1 Russian Railways

The Russian railway system was a profit-making industry and cross-subsidized passenger traffic, before the dissolution of the Soviet Union (USSR) in 1991. The industry entered challenging times by 1995 as freight and passenger traffic plunged by 52% and 32%, respectively. Consequently, freight tariffs were raised to compensate for the overall losses, which eventually depressed the freight traffic even further. Share of freight volumes declined, the share of loss-making passenger traffic increased, and operational productivity declined impulsively; leading to increasing economic losses from the operation. The Government of Russia decided to adopt some ambitious railway reform programmes to tackle the challenges (ECMT, 2004). The major goals decided under the Edict Number 426 (1997) for railway reforms were:

- a. Stabilizing the quality and safety;
- b. Preserving a pan-Russian institution and ensuring economic development;
- c. Ensuring interoperability of the system;
- d. Reducing costs associated with the system; and
- e. Meeting demand for transport services.

Decree Number 448 (1998) subsequently added: end of cross-subsidies, improvement of the tariff-setting supervision, and increase in transparency of financial flows in the industry (Transport and ICT, 2017). Towards the reform and restructuring process, a preliminary phase established the legal framework of the reforms and included the transfer of the services to appropriate ministers and encouraging the private players to participate in the industry reforms. Russian Railways divided the reforms into three phases:

- » **Phase 1:** The Federal Law on Railway Transport in the Russian Federation came into effect in the year 2003, which eventually separated the Russian Ministry of Railways into: the Federal Railway Transport Agency (FRTA) and Russian Railways (RZD). FRTA became a Ministry of Transport agency that would regulate the rail transport, and RZD became a state-owned company that took the charge of railway infrastructure and train operations for freight and passengers. This law defined the relationship between the train operations, railway infrastructure services, and government. The law created a legal basis for railway carriers and operators and required Russian Railways to provide open access to railway infrastructure for carriers and operators.
- » **Phase 2:** Decree No. 585 in 2003, established RZD as a joint-stock holding company and separated many institutional activities which eventually created 63 subsidiary companies that would focus on serving niche markets. This enabled the companies to focus upon certain serving niche market only. By the year 2005, one-third of the country's freight moved in privately owned wagons, and by 2013, private operators owned 80% of the wagon fleet.
- » **Phase 3:** The phase focused upon creating competition, RZD formed First Freight Company (FFC), and capitalizing it with 200,000 wagons, and formed Second Freight Company (SFC), and capitalized it with 217,000 wagons. Both faced competition from operating companies set up by some key natural resource

companies and from independent operators as well. In 2012, RZD completed the sale of its shares in FFC. By that time, RZD had transferred a substantial portion of its wagon inventory to its subsidiaries and had subsequently sold shares of some of the subsidiaries, thereby, creating a competitive market for freight wagons and container operations. The shift in wagon ownership to private companies and subsidiaries meant that RZD itself needed fewer repair and maintenance facilities.

Table 10: Phases in Russian Railways reform process

Phases	Timeframe	Steps
Preliminary phase	Pre 2001	<ul style="list-style-type: none"> » Establishing the legal framework of the reform » Transfer of social services to appropriate ministries » Encourage private sector participation
Phase 1	2001–03	<ul style="list-style-type: none"> » Establishing the joint-stock holding company » Encourage private wagon ownership
Phase 2	2003–06	<ul style="list-style-type: none"> » Separate subsidies into independent companies » Phasing-out cross-subsidization of passenger traffic
Phase 3	2006–10 and beyond	<ul style="list-style-type: none"> » Developing competition » Increasing private participation

Source: *Transport and ICT (2017)*

The freight market experienced a positive growth after these reforms and between 1995 and 2009, freight turnover enhanced by 87%.

Russia follows a government-determined tariff setting policy with respect to its freight transportation. Prior to the disintegration of the USSR, the Ministry of Railways was responsible for all matters related to policy regulation of the sector including tariff setting. With the transition of the Russian economy from a centrally planned economy (as erstwhile USSR), there were numerous revisions and modifications in the tariff fixation policy of the government.

The Federal Service for Tariffs (FST) was made responsible for tariff setting and regulation in all the natural monopolies of Russia including railways. The FST’s decisions are binding and the rail tariffs are set after consultations with the Ministry of Transport and the Ministry of Economy. However, the private operators as well as the subsidiaries are free to set their own market driven rates and are not regulated.

The tariff rates are fixed broadly for three classes: (i) raw materials (such as coal, cement); (ii) intermediate goods (like grain, fertilizer); and (iii) finished goods (including cotton, inorganic chemicals and steel). However, within these classes the tariff rates are fixed separately for the numerous commodities in different sub-classes. Raw materials are low-profit commodities paying lower tariffs whereas; finished goods have higher profits associated with it. The basis for class division is to ensure transport costs are a target percentage of the price of the product (Transport and ICT, 2017). Distance, commodity class, and wagon type are the major factors affecting the price setting in the freight segment (Murray, 2014).

The tariffs are fixed on the fundamentals of the macroeconomic conditions prevailing in the economy and the funds required for covering the operating costs and loan repayments. They are also subjected to annual or supplemental indexation as well. Since 2003, the freight tariffs have been divided into infrastructure and locomotive tariffs, further modified in 2011 to allow for private wagon usage rates based on market forces. It led to differentiated pricing with respect to locomotives in the rail freight transport sector. In 2013, the railways were allowed to temporarily alter the FST determined tariff rates within certain limits, under certain conditions

offering greater flexibility to the railways. Thus, a gradual transition to flexible market-based pricing can be seen in the reforms adopted for development of Russian railway system.

22.2 US Railways

The US Railways follow a 'differential pricing' model, under which, they price their services in such a manner so that they cover the variable costs and realize different contributions to fixed costs from different clients. For railroads, this model is the most efficient way to cover the full costs of providing services across the network (AAR, 2022). The vast majority of the freight railroad companies own, build, maintain, operate and pay for their infrastructure with little or no government assistance. Fixed costs are borne by the different customers based on their ability to pay. The US rail network consists of more than 630 mostly privately-owned railroad companies. The two major categories of freight railroads are:

- » Class I: The seven private Class I railroads are the largest railway carriers, and account for the majority of the rail infrastructure in the country. They operate over nearly 92,000 route miles across 46 states. Outside of the Northeast Corridor, tracks owned by Class I host much of Amtrak's intercity passenger rail operations and in many places also host commuter rail operations.
- » Short Lines: Approximately 630 short line railroads (Classes II and III) operate over approximately 45,000 route miles in 49 states. For large areas of the country and particularly for small town and rural parts of the US, short line rail services connect farmers and businesses to the national railroad network.

The US railroads were not the same as they are now, as back in the 1970s, major railroads in the Northeast and several main Midwestern railroads went bankrupt. These bankrupt railroads accounted for more than 21% of the nation's rail mileage. During 1970–79, the return on investment became insignificant. By 1978, the railroad share of intercity freight had fallen to 35% from 75% in the 1920s. They even lacked funds for maintaining their tracks.

The US Congress passed the Staggers Rail Act of 1980, recognizing that in the US freight railroads: (i) the majority are private establishments operating on the infrastructure they build, maintain, own; (ii) they face high competition for the majority of their traffic, but excessive regulations avert them from competing efficiently. Hence, the Staggers Rail Act of 1980 provided them a common-sense regulatory system that permitted them to act like most other businesses in terms of managing their assets and pricing their services.

The Staggers Act abolished many regulations that used to hinder the efficiency, and cost-effectiveness of freight rail service. The Staggers Rail Act of 1980:

- » Permitted railroads to price competing routes and services. They could now price according to the market demand and operate over their most efficient routes.
- » Permitted shippers and railroads to enter into legal contracts.
- » Expanded regulator's authority to exempt categories of rail traffic from regulation if regulation was not needed to protect shippers from an abuse of rail market power.²³

The rail freight business has seen a decline over the past years but is still the most efficient mode of transport in the country.

Before the implementation of the Staggers Act (1980), the rail freight tariff structure was defined by infrequent interventions and politically imposed distortions. Post deregulation by the government, the US rail freight rates fell in both real and nominal terms. The deregulation was accompanied by the introduction of Contract

²³ AAR (2020)

Tariffs which were prohibited earlier. The voluntary contract agreements between shippers and railroads are not subject to regulation. The deregulation of the rail tariff was guided by the presumption of adequate competition in the transport market. Functioning of the Contract Tariffs was provided legal sanctity so that confidentiality of the contracts are maintained by both the parties involved, and legal action can be undertaken in case of any breach of contract.

Majority of the rail freight traffic moves with a unique tariff structure for each commodity based on contract tariffs, distance, railroad, and competition. There is essentially little to no traffic moving on the standardized rates and simplified goods tariff booking. Thus, the US has a wide range of variations in the rail freight tariffs owing to flexible pricing structure with respect to market conditions.

22.3 China Railways

The Railway Act 1991, similar to railway laws in majority of the countries, directs the functioning of the railway sector in China. Prior to 2013, the Ministry of Railways administered the entire functioning of China Rail, including the operations carried out by the 18 Regional Rail Authorities (RRAs). In the 1990s, the non-core activities of the railways such as construction and maintenance were separated, along with rationalisation of railway staff, resulting in higher labour productivity. The formation of Asset Operation Liability System (AOLS) resulted in the dissemination of powers with the managers of RRAs being accountable for return on profitability, output, safety and capital. It increased the financial performance of the RRAs and also improved the financial performance of the China Rail. Corporatization of RRAs was also undertaken post 2005 through abolition of secondary administrative structure of the regional authority.

The reform of 2013 had two major objectives: (i) maintaining financial sustainability of railways, and (ii) enhancing the capability of rail operator to respond to market competition. The policy and regulatory functions were separated from the commercial functions in the railways directed by the State Council, effectively dissolving the Ministry of Railways. The reforms also proposed compensation to the newly formed China Rail Corporation (CRC) for its Public Service Obligations (PSOs) along with the implementation of full cost accounting system. However, China's rapid network expansion and industrialization continues in a highly centralized administrative structure.

The reforms recommended by the National Development and Reform Commission (NDRC) restructured the railway administrative system of China under three separate entities:

- a. Ministry of Transport– For planning and development policy
- b. National Railways Administration– For setting technical and safety standards, assessing the quality of service and construction
- c. China Railways Corporation (CRC)– Newly established 100% state-owned enterprise for managing the commercial operations

Pre-reforms, the now defunct Ministry of Railways was responsible for nearly all economic regulations while both the passenger and freight tariffs had to be approved by the State Council. In practice, the regulation and approval of the rail tariffs as well as setting tariff on the new lines were undertaken by the NDRC. The purpose of tariff regulation was not to maximize profits but to broadly break-even or earn nominal surplus.

Although, the commercial and policy functions of the China Railways are now separated under the CRC and the Ministry of Transport, the rail tariffs continue to be guided by the NDRC. Although, the CRC does independent pricing power to some extent, nonetheless, there are certain regulatory and administrative restrictions on the commercial functioning of the sector. However, there is some hope for policy reform in the pipeline to adopt

market driven tariff setting in China Rail, allowing the CRC to operate as a market-driven enterprise (Transport and ICT, 2017).

China’s railway freight rate management can be analyzed in four stages (Li and Guo, 2019), namely:

Stage 1: Centrally Controlled Rates (1949–82)

This stage was marked by highly centralized tariff control by the government. The government unified freight tariff nationwide in June 1955, followed by a long-term low-freight tariff policy. Though it was associated with economic growth and social development, such policy suppressed low rate created imbalance between demand and supply, hindering long-term freight movement via rail.

Stage 2: Deregulated Rates (1982–2002)

With the transition from a socially planned economy to a market economy, the tariff rates were deregulated in this phase. There was a gradual transition from government pricing to government-guided pricing. Various adjustment measures like railway construction fund fees, short distance surcharges and electrical surcharges were employed in this stage. Such a diversified freight rate structure promoted rail freight movement and made the system resilient to market changes.

Stage 3: Rapid Adjustment of Rates (2003–13)

The development of the socialist market system brought further adjustments to the freight rate according to the market conditions. This stage witnessed alteration of the unified pricing system with some degree of flexibility.

Stage 4: Market-oriented Rates (2013–present)

With the goal of market-oriented reforms in mind, the government started transitioning from government-guided prices to a market-based independent pricing of freight traffic. There were further relaxations in price control by the government. The organizational reforms in the railway sector, followed by the freight reform within the CRC enabled it to adjust some prices independently based on market conditions. This stage ushered in gradual realization of market-oriented reform of freight pricing in China.

At present, China freight rail tariffs are composed of unified prices, power surcharges, railway freight transport extension service fee and transportation miscellaneous fees. Due to the ever evolving freight market demand in China, a variety of freight rates have been adopted (Table 11) to meet the market demand, e.g., basic freight rate, new road freight rate, special cost compensation freight rate, special regional freight rate and floating freight rate (Li and Guo, 2019).

Table 11: Rail freight rates in China

Freight rates	Description
Basic/Uniform freight rate	» Distinct freight rates according to the type of commodity transported and the transportation distance
New road freight rate	» Supplement to the basic tariff rate » To undertake double line or electrification
Special cost compensation	» Supplement to the basic tariff rate » Increases the cost through electricity price rise or electricity surcharges » Link between railway freight rate and price
Special regional freight rate	» Linked to the basic tariff rate » For commodities transported in specific areas and routes as well as handled in fixed transportation conditions
Floating freight rate	» Fluctuating rate within limits of national price policy » Based on the market forces of demand and supply

Source: Li and Guo (2019)

22.4 UK Railways

The rail industry in the UK was one of the last public utilities to be privatized in the country. The reforms were initiated in 1993 with the legal and regulatory framework being set up by an Act of Parliament. However, prior to the privatization and franchising process, several structural reforms had already been initiated including complete horizontal and vertical separation in the railway industry.

The process of privatization and reforms in the UK occurred in a relatively short span of time. Pre-restructuring, British Rail was a state-owned public body with managerial autonomy. The railway infrastructure was state-owned with unified services and infrastructure component.

Owing to high level of public subsidies and need for faster modernization to improve traffic and productivity levels, the reforms were undertaken opening up the market for competition in both passenger and freight segments. Rolling stocks started being leased to firms with complete separation between infrastructure and services. The railway infrastructure was owned by Railtrack, a private rail company, and it managed the infrastructure including signalling, tracks, stations, electric power supply. It was also responsible for its maintenance, new investments and train operations (timetables and coordination). In 2002, after financial difficulties, most of the operations under Railtrack were transferred to the now state controlled non-profit company Network Rail.

Network Rail sells access to the infrastructure to the passenger and freight operating companies. It sets track access charges, which needs to be agreed upon by the rail regulator under an openly published criterion via regulatory policy statements.

Post reforms, the following two independent regulatory bodies were constituted:

- » Office of Rail Regulation (ORR)– Monitors the overall functioning of the railways in Britain and regulates the access to the national track system through price capping of access charges.
- » Office for Passenger Rail Franchising (OPRAF)– Supervises and administers the entire passenger business.

Apart from the above regulators, there are also other offices such as Secretary of State for Transport with a supervisory role, and a Health & Safety Executive as a safety regulator.

The franchisees are train operating companies based on former British rail transport operating units. The freight companies, however, are less important than the passenger companies in the British Rail system. The rolling stock leasing companies provide operational support the train operating companies by leasing them wagons and locomotives. Even the infrastructure engineering sector in the railways is provided competitively by the private companies.

Thus, the British rail industry is a private industry system in both services and infrastructure provision with regulatory institutions at different levels. The ORR regulates the overall system with OPRAF managing the passenger services, and Network Rail in charge of the infrastructure services. The ORR has been successful in attracting private investment through bolstering competition and fairness, and has improved efficiency of the system.

Access prices for freight operators are relatively more flexible as compared to the passenger services. Certain principles were established by the rail regulator regarding the relationship of Railtrack with the freight operators. First, the prices cover the avoidable costs incurred in carrying that particular freight between the origin and destination. Second, the prices set should be lower than the costs which would be incurred by an

efficient competitor and finally there is to be no undue discriminatory charges. Thus, the rating structure reflects the value of access of rail infrastructure to the users as well as recovers the costs sustained by infrastructure provider.

The prices are set on the basis of a 'price control formula' where price is directly proportional to the difference between the retail price index and the fixed cost (efficiency) parameter. These prices are revised every five years and remain fixed until the next adjustment. They are adjusted in order to promote traffic and ease of entry to operating companies. To ensure that the train operators earn only a fair return on their investments, the UK relies upon the rate of return regulatory approach.

Railtrack's regulation of infrastructure consisted of a price adjustment mechanism wherein the rate of return for the firms is linked to a variable productivity parameter. Freight operators pay charges which includes a variable component (covering the direct costs associated with freight movement) and a share of the fixed charges of the network. However, the fixed component is levied only on those sections where the market can bear the costs and there is no competition from the road (such as coal and iron ore). Thus, the UK with its complete separation in provision of services and access to infrastructure has gone for track access charging for its freight transportation.

22.5 Lessons for India

There are a few takeaways for IR from the international experiences of railway reform. These are:

- » Phasing out of passenger cross-subsidization from freight operation.
- » Move towards a market driven freight tariff policy, by at least allowing need-based departure from any institutionally determined freight tariff.
- » Contract-based pricing for each commodity (as followed in the US) can bring flexibility in freight rate structure where such dynamic rates can be linked to the demand, competitive rates, distance, etc.
- » Differential pricing model (as followed in the US and the UK) as opposed to a fully distributed cost model can improve the efficiency in freight pricing. Charging the shippers exactly according to the variable costs and distributing the fixed cost by the principle of 'ability to pay' ensures that fixed costs are covered by railways and no excess pricing for a shipper to force them look for other competing modes (e.g., road transport). The UK for example levies the fixed cost burden only on those sections where traffic can bear and where there is no competition from road.
- » Need for independent regulator to develop market confidence and attract private players. Among the four major countries studied in this section, ORR in the UK is the only independent regulator. It has helped in attracting high and stable investments along with significant efficiency gains.

Increasing Competitiveness:

23 Need for a Regulator?

Indian Railways over the years has lost its share in overall freight operation in India (despite increasing freight loading), mainly owing to the higher rate charged to the freight operation to cross-subsidize the passenger operation. The monopoly advantage once IR enjoyed in freight transportation has eroded with betterment of road infrastructure, and cross-subsidization of passenger operation from freight earnings has made it uncompetitive. The monopoly power of IR (being the sole owner, operator, and regulator) along with its social service obligations (particularly, for passenger operation) have led to relatively higher freight rates that are delinked from market realities (competitive prices). Deteriorating financial situation of the railways and associated challenges (for infrastructure maintenance, expansion and quality of service) have further added to its inefficiency of operation as a commercial entity. These may have been pivotal in declining preference for railways as a mode of freight transport.

It has been highlighted by Bibek Debroy Committee that private sector participation (service contracts, management contracts, leasing agreements, concessions, joint ventures, private ownership) in IR can enhance its performance (Gol, 2015). Several attempts have been made in the past to attract private players in IR through: (i) different wagon investment schemes, (ii) liberalization of container policy, (iii) special freight train operator scheme (SFTO), (iv) automobile freight train operator scheme (AFTO), (v) special parcel train operator scheme (SPTO), (vi) allowing private freight terminals, and (vii) construction and opening of the dedicated freight corridor(s).

However, these policies have not been fruitful so far due to lack of trust between private sector and IR, in the absence of an independent regulator. Issues such as: (i) delayed and vague guidelines, (ii) tedious procedures set by IR, (iii) absence of level-playing field and preferential treatment of public sector undertakings (PSUs), (iv) poor implementation of policies such as SFTO, SPTO at zonal and divisional levels, and (v) excessively high pricing for policies such as AFTO (Gol, 2015).

23.1 The Railways Act and Provisions

Railway Board was constituted under a Government of India resolution (the Indian Railway Board Act, 1905) to discharge most of the administrative and executive functions vested on the Government by the Indian Railways Act, 1890. A notification issued in 1905 (dated March 24) by the Department of Commerce and Industry, Gol vested all the functions and powers of the Central Government on Railway Board. The Railways Act, 1989 subsequently replaced the previous act, and recognizes the authority of the Central Government, and

defines the zonal railways as the 'railway administration' for government railways. Railway Board still enjoys its administrative and executive powers and assists the Ministry of Railways of the Central Government in discharging its responsibilities as enshrined by the Constitution of India in its 'Union List'.

"A railway administration shall not make or give any undue or unreasonable preference or advantage to, or in favour of, any particular person or any particular description of traffic in the carriage of goods." – Railways Act, 1989 (Section 71)

The powers to: (i) fix rates for passenger and goods carriage (and the modes, viz., whole country vs. partial; different rates for different classes of goods), and (ii) classify (reclassify) commodities and change class rates, are vested on the Central Government (Railway Board) by the Railways Act, 1989. The act bestowed the powers to quote a STS rate and make necessary modifications to the rate upon the zonal railways.

Further, the Indian Railways Act, 1989 confers the following powers (non-exhaustive list) to the zonal railways:

- » Impose conditions for receiving, forwarding, carrying, or delivering of goods
- » Issue railway receipts
- » Determine normal carrying capacity per wagon and recover penalty for overloading
- » Detain consignment in lieu of failure to pay freight or other charges by consignor, consignee, or the endorsee
- » Disposal of unremoved goods at 'notified stations'
- » Responsibility for loss, destruction, damage/deterioration, non-delivery of consignment under normal conditions (non-deliberate).

The following powers are conferred upon the Central Government by the Railways Act, 1989:

- » In public interest the Central Government through special orders can direct any of the zonal railways to:
 - (a) provide special facilities for or give preference to specific goods (by the Central or any of the state governments);
 - (b) carry any good or goods or class of goods by designated route(s) and rates;
 - (c) restrict or refuse acceptance of designated goods at or to designated stations for carriage.
- » Fixation of maximum carrying capacity limits for the class of axle under the wagon.
- » Making rules regarding dangerous or offensive goods; rates of penalty charges for overloading; the manner of giving open delivery; regulation of carriage of goods by the railways etc.
- » Power to declare 'notified stations'.

The Railway Claims Tribunal (RCT) as a statutory authority oversees the complaints against the zonal railways. The complaints can be based on: (a) undue preferences towards person(s), traffic(s); (b) unreasonable rates for carriage of commodities between two stations; and (c) levy of other charges unreasonably. The tribunal is bound to report to the Central Government of its proceedings, and has the power to make regulations (consistent with the Railways Act) with prior approval of the Central Government. Also, the tribunal does not have jurisdiction over: (a) classification (reclassification) of commodities; (b) fixation of demurrage and wharfage charges; (c) fixation of rates for carriage of freight and passenger; and (d) fixation of lump-sum rates.

Though the Railways Act, 1989 does not explicitly mention the modalities of private sector participation in rail transport, the Industrial Policy Resolution, 1991 restricted the domain of private sector operation to all activities except haulage and creation/maintenance of railway infrastructure. Later in 2014, Gol revised the industrial policy to allow FDI in construction, operation and maintenance of: (i) suburban corridors, (ii) high speed trains, (iii) dedicated freight lines, (iv) rolling stocks, (v) electrification, (vi) signalling, (vii) terminals, (viii) infrastructure in industrial parks, and (ix) mass rapid transit (pp. 1-2, Gol, 2014). Container operation, which was handled only by the Container Corporation of India Limited (CONCOR, a PSU) since 1989, was liberalized in 2006. Since then 16 private companies have been provided licence for containerized freight transport (except for few restricted commodities). But, an issue that has plagued the business of containerized rail freight transport is the allegations of preferential treatment towards CONCOR by IR in access to its infrastructure (p. 77, Mehta, 2014), along with the first mover advantage of CONCOR in the container business (Gol, 2015). The legacy of the unique monopoly power (in rail transport) enjoyed by the Central Government (through Railway Board) in operation, policy framing, administration, and regulation of the railways has constricted private investment in the system.

23.2 Recommendations of Major Committees and Current Status

Rakesh Mohan Committee (Gol, 2002) suggested the separation of policy making, regulatory, and management roles to three separate entities, of which an independent regulatory authority (Indian Railway Regulatory Authority) was envisioned. There has been a long standing demand particularly from the freight customers for setting up of a regulatory authority for rail tariff, mainly in view of cross-subsidization of passenger fares by freight fares. Sam Pitroda Committee (Gol, 2012) advised on constitution of Rail Tariff Regulatory Authority (RTRA) to provide level-playing field to the different stakeholders involved in/with IR. All activities related to costing, market research, and price sensitivities were envisioned to be assigned to RTRA. In 2014, setting up of a Rail Tariff Authority (RTA) was approved by the cabinet and it was to be made a part of the Railways Act, 1989 through an amendment. RTA was supposed to advise Railway Board in tariff setting in a transparent manner. However, till date it has not been enacted.

Bibek Debroy Committee (Gol, 2015) suggested the establishment of an independent regulator, a Railway Regulatory Authority of India (RRAI). The Committee envisioned that RRAI would only recommend on passenger tariff fixation (leaving freight tariff to be market determined based on rules of competition laid down by the Ministry of Railways) and deal with anti-competitive disputes.²⁴ The proposed RRAI was supposed to be accountable to the parliament and with separate budget be independent of the Ministry of Railways. The Cabinet approved on April 05, 2017 the constitution of a Rail Development Authority (RDA) with the following objectives:

- » Pricing of service reflective of the cost
- » Enhancement of non-fare revenue
- » Protecting consumers' interest by ensuring quality of service and cost parity
- » Promoting efficiency, economy, and competition
- » Encouraging market development and creating pro-investment environment
- » Efficient resource allocation within the sector
- » Benchmarking quality of service with international norms and standards
- » Providing framework for open access to dedicated freight corridor infrastructure for others
- » Providing measures to absorb new technologies
- » Human resource development.

The RDA was envisioned to be constituted of a chairman and three members: member (tariff); member (PPP); and member (efficiency, standards, and benchmarking). However, the appointment of the chairman and the three members were proposed to be done by the Central Government (making RDA accountable to the Central Government). Apart from ensuring level playing field (fair-play) for stakeholders, and setting efficiency and performance standards, one major function of RDA is to assist the Central Government in tariff determination. Though, the formation of RDA (under the aegis of the Central Government) was approved in 2017, it is yet to be established.

23.3 Role of a Regulator

The roles of a regulator are to:

- » Rationalise business operation by restructuring pricing (and costs)
- » Protect interests of all the stakeholders in an unbiased manner and settlement of disputes
- » Increase transparency of the operation of the sector and imbibe sense of trust in private sector

²⁴ The committee believed that though there is precedence of the Competition Commission of India dealing with disputes between private freight train operators and CONCOR-IR (p. 181, Gol, 2015), an independent regulator such as RRAI would be better poised to handle such disputes in future.

- » Ensure quality of service
- » Prevent anti-competitive environment
- » Ensure survival of the industry (and also other competing industries, particularly road transport, in case of regulator for IR).

Under the Indian governance structure a regulator can be 'independent' or act as an 'attached office' to a ministry or department of the government. As an attached office with dedicated staff (larger manpower) and more granular decision-making, a regulator can significantly aid Railway Board in informed decision-making. However, with movement of newer types and greater volume of goods as envisioned by the National Rail Plan (Gol, 2020) in future, an independent regulator is imperative for PPP development and attracting capital; as it delinks the guidelines and rules from the jurisdiction of the executive.²⁵ In the context of international railway systems, a major independent regulator is the ORR overseeing the railways in the UK. It regulates rail activities, access to rail network, licences the operators of railway assets, and funding requirements. It has improved the efficiency of the railways in the UK considerably.

23.4 Regulator for Indian Railways

In its effort of liberalizing the economy through the economic reforms of the 1990s, several statutory regulators were introduced in different sectors.²⁶ These were necessitated to attract private players by creating a transparent policy regime with level-playing field for all stakeholders. Among these, an independent regulator overseeing the telecom sector (the Telecom Regulatory Authority of India, TRAI) and several independent regulators in the electricity sector (the Central Electricity Regulatory Commission, CERC and the State Electricity Regulatory Commissions, SERCs) were constituted.

TRAI was established by the TRAI Act, 1997 as an independent body to regulate the telecom sector, fix/revise tariff, protect interests of consumers and service providers, and ensure healthy growth of Indian telecom sector. Though mostly independent, Section 25 of the TRAI Act vests certain powers to the Central Government to issue binding directives to TRAI. The CERC and the SERCs were established by the Electricity Regulatory Commissions Act, 1998 as regulators in central and state electricity sectors respectively, to regulate the sector by tariff rationalisation, and deciding on transparent subsidy policies. However, the Central Government and the state governments are provided with limited binding powers over the CERC and SERCs respectively, under Sections 38 and 39 of the Electricity Regulatory Commissions Act, 1998 (and Sections 107 and 108 of the Electricity Act, 2003). To maintain a balance between neutrality of independent regulators and democratic accountability, the parliament scrutinizes the regulators through: (a) question hour sessions; (b) discussion sessions; or (c) parliamentary standing committees (Sanyal, 2016). Further, many of these acts also provide for regular submission of detailed reports from the regulators to the parliament for transparency.

Presently, due to lack of separation of the regulatory; policymaking; and operator roles of Railway Board, freight tariff setting is not linked to market principles and there is lack of trust from private stakeholders. Allegations of favourable treatment of CONCOR, and adhoc changes in policies have raised concerns about the interest of Railway Board in promoting market (Gol, 2015). Also, there have been concerns about transparency of guiding principles for changes in policies (Gol, 2015). An independent statutory regulator in railways, through market research (for costing and demand management) and periodic impact evaluation of its regulatory actions, can bring transparency in their operations. Particularly, for reversal of the declining trend of rail share in freight

²⁵ When the executive has regulatory role, the rules of operation may be influenced by political factors and may have negative impact on market confidence (see https://www.unescap.org/ttdw/ppp/ppp_primer/53_structure_of_regulatory_authority.html, accessed on February 03, 2023).

²⁶ There are 36 members of the Federation of Indian Regulators, which is a registered society of regulators in India, including TRAI; CERC; and 29 SERCs.

Increasing Competitiveness: Need for a Regulator?

transport; an independent regulator for freight tariff determination is a *sine qua non*. Towards this, first step can be establishing a tariff regulator working as an attached office to Ministry of Railways (also in line with the past decisions taken by the cabinet on RTA or RDA, but are yet to be established), and a gradual shift towards a statutory independent authority.

Recommendations

24 and Way Forward

Over last few decades the tonnage carried by IR (Figure 9) as well as the revenue (Figure 6) have been showing increasing trend. However, the issues of declining share of railway in freight movement, failure to attract non-bulk traffic (container and 'other commodities'), lack of diversification of revenue sources albeit increasing overhead costs raise concerns with financial sustainability of IR. Among these, declining share of railways in shipment of bulk commodities (despite their price inelastic nature) is a serious concern. Further, the Central Government enjoying the roles of both regulator and operator (and executive) raises the questions of transparency in the commercial function of IR. There are some policy suggestions that may be considered for increasing the loading in railways along with greater share in overall freight traffic. These are discussed below.

24.1 Reassessment of the Break-Even Class and Incentivizing Efficient Loading

The Class 100 in rating policy of IR is considered as the break-even class for which IR does not earn any surplus. However, the classification is based on the recommendation of the Freight Structure Committee (1955–57) and there has not been any assessment of the 'break-even' nature of the base class thereafter. Railway Board needs to periodically estimate the break-even point based on market conditions and inflation and reclassify the base class. Also, regular reclassification of all the commodities that are carried by IR is *sine qua non* for greater financial viability of the freight operation.

Also, for incentivizing efficient loading on existing infrastructure, discounted pricing can be considered for each of the rate classes and distance slabs giving an incentive to use/introduce wagons with better payload. For example, within same distance slab, if shipper A transports greater payload of a good X compared to shipper B by wagons of higher capacity, shipper A can be charged discounted freight rates for good X as incentive for better utilization of infrastructure.

24.2 Simplification of Rate Structure

Freight pricing policy should be simple with few conditionalities so that it can be easily adopted. Since the main purpose is to maximize the share of railways, focus should be on carrying a major portion of the produce that is increasing overall share of railways. As a simplification measure, IR may consider subsuming different charges (e.g. siding and shunting, terminal charges, seasonal charges) in the freight pricing itself thereby including all charges from placement for loading to placement for unloading into freight pricing. IR may also consider charging based on a combination of preferred route between OD points and the actual distance instead of the present system of shortest and rationalised routes in combination with a slab-based system.

24.3 Re-introduction of Maxima-Minima Rates

The Freight Structure Enquiry Committee, 1955–57 abolished the then used maxima-minima freight rates to bring standardization in railway freight rate structure. However, a unified and fixed rate notified by IR can always be undercut by the road sector with possible traffic diversion towards itself. Reintroducing the concept

of maxima-minima rates in some commodities to begin with; where railways faces stiff competition from road, will bring dynamism in consonance with the market requirements.

The cost of carriage has to be accounted for when determining the competition limit within the maxima-minima framework. The minimum rate needs to be fixed to ensure that railways does not reduce its charges below this rate in competition. Initially, this rate can be based on average cost of haulage in the country which could be modified to inculcate the marginal cost of transportation post accounting reforms. The maxima in the rating structure can be determined on the basis of 'what the market can bear' principle taking into account the market conditions.

Such rates can be set by an independent tariff regulatory authority in the long run, as and when it becomes functional. Meanwhile, Railway Board can amend its rate fixation policies to incorporate the maxima-minima policy in their pricing mechanism. In view of regional variations in rates offered by road transport, it would be prudent if Railway Board delegates the powers to fix rates within the maxima-minima band to the zonal railways, while Railway Board defines the maxima-minima.

24.4 Alternative Pricing Models

Historical statutory fixation of rates did not necessitate the need for an elaborate accounting system. However, as the competition from other modes increased along with the need for inter-modal transport coordination; a sophisticated expertise on traffic costing is urgently required to make sound economic decisions. IR follows a fully distributed cost pricing decided at Railway Board level which leads to a model facilitating inefficient asset utilization. Uncongested lines are charged higher resulting in further idle capacity whereas heavy density lines are under charged causing further congestion on such routes.

The marginal cost approach to pricing can be implemented initially in the underutilized/unutilized sectors of IR, to cover at least the cost of operations where the railways are operating on a loss. This resembles a route-based pricing approach, where overutilized routes are charged more in comparison to underutilized routes. Costing in IR must include costs incurred to: construct and maintain the infrastructure, pay for the energy and fuel (including the associated labour), and provide and maintain the vehicles. Thus, freight charges, especially with regards to the track access charges, needs to at least cover the above factors to reduce the operating losses to a minimum. A simple mechanism can be to provide concessions to the underutilized routes by the extent of the percentage of overhead costs in total cost of IR.

As an alternative, Class 100 rates (or the rates pertaining to the reassessed break-even class) can be charged on these sectors for all commodities (above Class 100). This will ensure that IR does not operate on profit margin in these sectors and is able to attract more traffic towards these. However, such a policy will not have any impact on Class 100 commodities.

Another alternative can be the 'differential pricing' model followed in the USA and the UK (see chapter 22). Under such a model, tariff is set excluding the capital cost of investment and only considering: (i) operating costs (including labour, fuel), and (ii) repair and maintenance costs. Such prices can be taken as a minimum ensuring that at least the operational costs of movement of freight is covered. Over and above these costs, based on their ability to pay, the consumers can be charged accordingly to cover as much capital costs as feasible.

24.5 Increasing Competitiveness

The freight rate structure needs to be more flexible and responsive to the market changes. In the present competitive market, the rates quoted by IR should be determined by variable costs, rates of competitive modes

of transport (especially road), total cost to the users, and the quality of service provided. Speedy delivery of goods has now become an element of productivity, especially when railways has lost majority of its traffic to road and air owing to this very reason. IR does not recognize speed/quality of service as an important component in its freight tariff fixation. The 'economic value of time' saved can be incorporated in the charging principle of the freight tariffs, especially for transshipment services and shorter routes. There is a scope for improvement especially with regards to the value/quality of service component by improving train speed, amenities, and ease of doing business, etc.

Commodity-specific pricing policy based on suitable OD pairs, market demand analysis, and forecasting can further assist in making the rail tariffs more competitive. A comparative study of total cost to the user, including: freight charges; packing; handling; and local carriage costs, for movement of goods can be conducted. This could include identification of OD links over the rail network with a single commodity traffic pattern where the traffic offering can be provided by closed circuit movement of dedicated rakes and locomotives. Some examples of such nodal points may be cluster of plants (such as cement, fertilizers) or mines having defined linkages with specific destinations. Conversely, this would also include the supply of raw material from certain origin points to these plants.

24.6 Diversification of Commodity Basket

Railways are more suitable for transport of bulk commodities for long-haul along with regular flows of low to medium-value density goods between fixed OD points (p. 31, NITI Aayog, *et al.*, 2021). However, the apparent advantage railways has in transportation of bulk commodities are also not fully exploited for several reasons and railway's market share has been declining in bulk commodities like steel and cement. Additionally, there are commodities like motor vehicles, containers, and other non-bulk goods that can be aggregated into trainloads for movement by railways. Railways can cater to these specialized segments and capitalize on the potential demand of fast-moving consumer goods sector, expanding its commodity basket. For aggregate and small goods, alternate modes like road can be complementary in the objective to achieve an efficient inter-modal transport system, and schemes like Joint Parcel Product (see Section 20.4) can be useful if carefully implemented.

An unexpected decline in the transportation demand (and revenue mobilization) for bulk commodities due to: availability of alternate modes like pipeline and roads; market disturbances; construction of pithead and port-based thermal power plants, needs to be offset by increasing the share of containers and 'other goods' in the freight basket of IR.

24.7 Social Service Obligation: Financial Viability

Grants and hidden subsidies help in keeping the prices down; however, these are not conducive for a market-friendly system where prices do not reflect the real costs associated with a service. Subsidies, where justified on account of social welfare, should be more transparent. IR presently cross-subsidizes its passenger operation through revenue mobilized from its freight operation. This social obligation distorts the freight rates and may be a deterrent for freight demand with increasing competition from road freight transport.

The passenger segment of IR's operation needs to be financially viable and market-driven with any subsidization to the marginalized from the Union Budget itself, maybe under a separate targeted subsidization scheme, under appropriate ministries (like the phase 1 reform in Russia). Such delinking of social obligation from the commercial operation will rationalise the freight rates (Paranjape, 1986; Briginshaw, 2013). It can also be done from the budgetary resources of state governments or at the municipal level (particularly for suburban passenger rail system).

24.8 Introduction of the Satisfaction Index

Despite the inelastic nature of bulk commodities IR is losing its share in movement of these commodities (see Section 20.3). Railways can conduct detailed market research from selected customers of different commodities on their preferences over freight rates and different factors (mentioned in Section 20.3) and construct a composite satisfaction index to measure the performance of Railways in freight transportation. This will aid IR to assess the main reasons behind its declining freight share despite the inelastic demand for bulk commodities.

24.9 A Separate Regulator

An independent regulator ensuring competitiveness and safeguarding against quasi-monopoly practices is relevant for ensuring transparency and accountability of the railways. In line with the parliamentary decision (in 2014) to establish an independent RTA, a statutory (through amendments of the Railways Act, 1989) regulator with separate budget needs to be established. This will ensure that its functioning is independent and unbiased. Also, involvement of private players (e.g., container operation) in different functions of the railway operation in India requires an independent regulatory authority for fostering competition and devising unbiased rules for all the parties involved.

Given the distortions in present freight rate structure of IR, it is essential to establish a regulator to at least regulate the freight operation by: (i) analysis of market conditions and competitions from other modes of transport, and (ii) rationalising the pricing system (encompassing issues such as: reassessment of the break-even class, marginal cost pricing, re-introduction of maxima-minima rates, route-based pricing). As a first step, a tariff regulator as an attached office to the Ministry of Railways can be established, with gradual shift to a statutory (independent) regulator in future.

24.10 Miscellaneous

The Indian Railways should:

- » Promote long-term arrangements with corporate clients that will provide assured traffic (like the now discontinued LTTC scheme). For this IR can adopt growth of business volumes through negotiated package instead of commodity-wise concessions presently being followed.
- » Consider elimination of haulage charges for short distance (<300 km) empty haulage of containers to attract more container traffic to IR's network.
- » Promote cargo aggregators and other new types of business streams as potentially high revenue segment.
- » Enable the mechanisms for revenue maximization from idle assets and underutilized capacities with speedy offer of rates.
- » Check rising overhead expenses, particularly on account of administrative and staff expenses. A few revenue sources for asset creation (capital expenditure) can be: (i) PPP-based station development with commercial rights to private investors; (ii) a build-operate-transfer based PPP model for few of the selected circuits.

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Annexure I

The table below collates the relevant sections from the Railway Acts of 1890 and 1989 pertaining to tariff fixation.

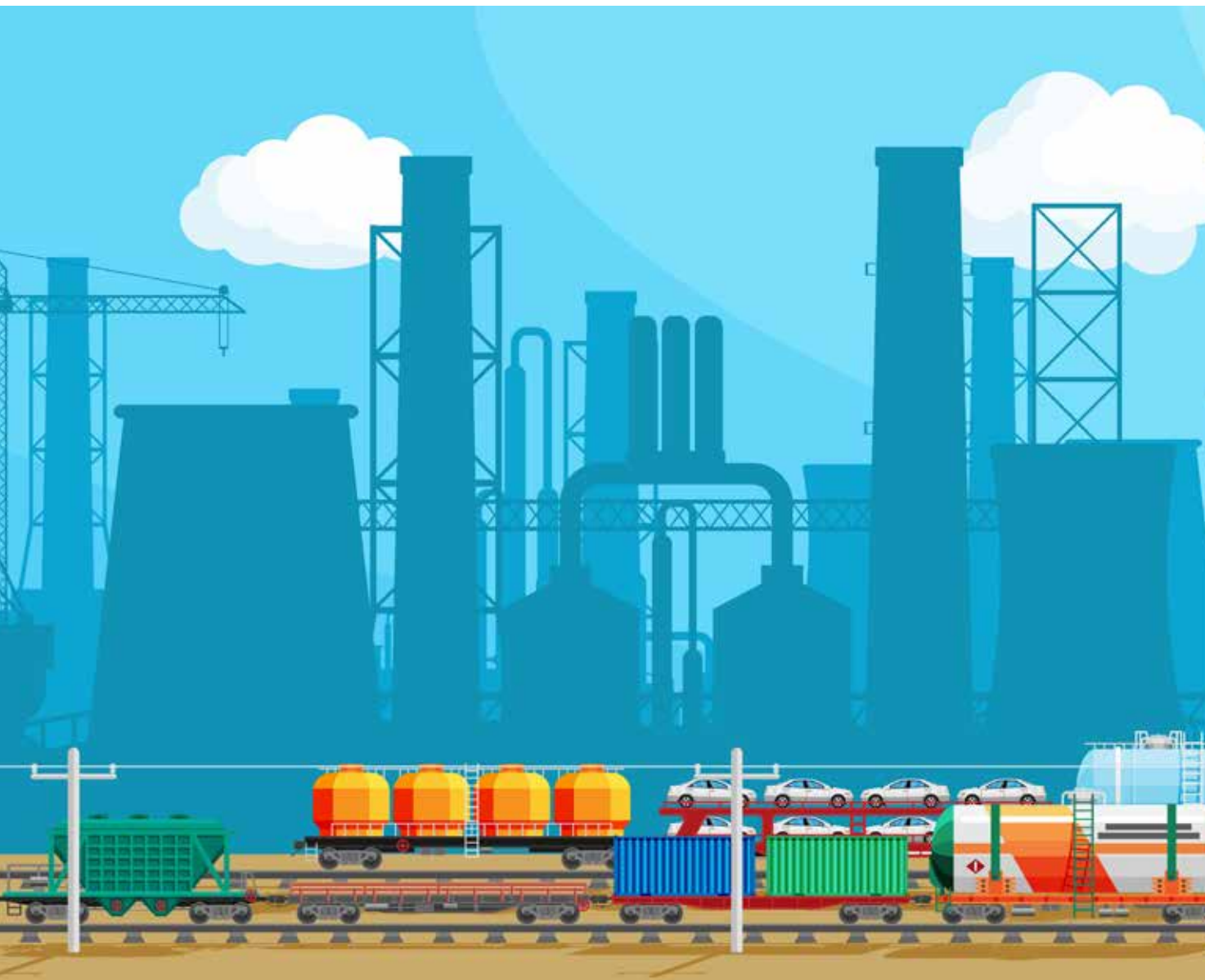
Act	Section	Power	Description
Railways Act, 1989	30	Power to fix rates	<ol style="list-style-type: none"> 1. The Central Government may, from time to time, by general or special order fix, for the carriage of passengers and goods, rates for the whole or any part of the railway and different rates may be fixed for different classes of goods and specify in such order the conditions subject to which such rates shall apply. 2. The Central Government may, by a like order, fix the rates of any other charges incidental to or connected with such carriage including demurrage and wharfage for the whole or any part of the railway and specify in the order the conditions subject to which such rates shall apply.
	31	Power to classify commodities or alter rates	<p>The Central Government shall have power to:</p> <ol style="list-style-type: none"> a. classify or reclassify any commodity for the purpose of determining the rates to be charged for the carriage of such commodities; and b. increase or reduce the class rates and other charges.
	32	Power of railway administration to charge certain rates	<p>Notwithstanding anything contained in this chapter, railway administration may, in respect of the carriage of any commodity and subject to such conditions as may be specified—</p> <ol style="list-style-type: none"> a. quote a station to station rate; b. increase or reduce or cancel, after due notice in the manner determined by the Central Government, a station to station rate, not being a station to station rate introduced in compliance with an order made by the Tribunal; c. withdraw, alter or amend the conditions attached to a station to station rate other than conditions introduced in compliance with an order made by the Tribunal; and d. charge any lump sum rate.

Contd...

Act	Section	Power	Description
Indian Railways Act, 1890	29	Power of the Central Government to fix maximum and minimum rates	<ol style="list-style-type: none"> 1. The Central Government may by general or special order fix maximum and minimum rates for the whole or any part of a railway, and prescribe the conditions in which such rates will apply. 2. The Central Government may, by a like order, fix the rates of any other charges for the whole or any part of a railway and prescribe the conditions in which such rates of charges shall apply. 3. Any complaint that a railway administration is contravening any order issued by the Central Government under sub-section (1) shall be determined by the Central Government.
	42	Power to classify or reclassify commodities or to alter rates	The Central Government alone shall have power- <ol style="list-style-type: none"> a to classify or reclassify any commodity; b to increase or reduce the level of class rates and other charges.
	46	Alteration and cancellation of certain station to station rates	<p>Notwithstanding anything contained in this Chapter, a railway administration may, in respect of the carriage of any merchandise by goods train-</p> <ol style="list-style-type: none"> i quote a new station to station rate; ii increase or reduce or cancel after due notice in the manner prescribed by the Central Government an existing station to station rate, not being a station to station rate introduced in compliance with an order made by the Tribunal; or iii ***** iv withdraw, alter or amend the conditions attached to a station to station rate other than conditions introduced in compliance with an order made by the Tribunal.

Note: Some of the sections under Indian Railways Act, 1890 were latter repealed/replaced

Source: The Indian Railways Act, 1989 and the Railways Act, 1890



'This report is part of a larger study 'Strategies to Increase Railway's Share in Freight Transportation in India'. The study has identified and discussed three key aspects concerning the growth of the freight business: Terminal Development and Operations, Freight Marketing Policies, and Rail Freight Tariff Policies.

Rest of the reports, policy briefs, and opinion pieces can be accessed using this link/QR code. <https://www.teriin.org/project/strategies-increase-railways-share-freight-transportation>



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