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Indian Railways: Why New Pricing Principles Matter

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Every Budget season, Indians watch out for two decisions - tax rates and railway fares. This year's Union Budget offers policy makers the opportunity to revisit the principles that determine railway passenger fares and freight rates. As Indian Railways faces stiff competition from the roadways in both passenger and goods movement, a changed approach to pricing, rather than routine changes will better address the financial conundrum of freight rates subsidising passenger fares. File photo: The Hindu Archives.

India's forthcoming Union Budget presents an opportunity for policy makers to correct a chronic financial disorder haemorrhaging Indian Railways (IR) – very slender operating margins. This course correction, already much delayed, gains urgency in the wake of frequent train accidents - the latest being on January 22, which took at least 12 lives. Unless IR improves its operating ratio (OR), investments in safety and maintenance will continue to be compromised. Behind the high ORs lies the reality of freight rates subsidising passenger fares. This dependence on rates to cross-subsidise fares – on average only 57 per cent of travel cost is recovered – is unsustainable. Fixing this distortion requires deft and informed handling. Increasing fares is both politically sensitive and will affect an already declining traffic, with roadways having captured market shares in both freight and passenger traffic: While rail passenger transport constitutes a mere 6 per cent of the inter-modal mix, that of the bus sector is close to 94 per cent.

In this article, two railway professionals who served as Indian Railway Traffic Service (IRTS) officers, ***R. Badri Narayan, Retired Chief Administrative Officer, Traffic Transportation and Business Research Unit, Northern Railway****, and* ***A. Madhukumar Reddy, Retired Principal Executive Director, Railway Board****, analyse IR's pricing mechanisms and press for basic reforms in the long-held principles that determine fares and rates. They advocate a holistic approach to pricing and policy-making by factoring in differential pricing, providing both dynamic and discounted fares to ensure optimal passenger occupancy, rationalising freight rates through budgetary support, and, in the context of the new developments in freight movement, including the entry of private participants, stress the importance of an independent regulator to ensure a level playing field between IR and private participants.*

Pricing of goods and services lies at the heart of policy making. India's mixed economy, which started with the public sector as the main propellant of development, changed track in the 1990s when the private sector was given primacy of space as the engine of growth. The public sector too underwent several transformations, many were sold away, others saw reduced government control, and the remaining continue to be operated by the state but with changed strategies and approaches. Indian Railways (IR), owned and operated by the state, is confronted with competition from the operationally more nimble roadways.

This article examines IR's pricing distortions in both passenger and freight segments. It explores the situation prevailing for IR on account of the costs, pricing, and market share of its two business segments (passenger and freight) and their collective impact on its financial and operational health. In addition, it discusses policy options to make IR financially sustainable. Section I examines issues

relating to the passenger business and Section II focuses on the freight segment. Section III summarises the conclusions.

I. Moving people

The vast rail network of IR, of close to 69,000 route kms, carried over 23 million passengers every day in its pre-COVID-19 peak years and is catering to the needs of the world's most populous country. IR operates more than 12,500 passenger trains every day. In 2022-23, it carried 6,396 million passengers, logging 9,58,919 million Passenger Kilometres (PKMs), where one PKM represents the transport of one passenger by rail over a distance of one km. In the same year, it earned a sum of Rs. 63,416 crore from its passenger services and Rs. 1,60,158, crores through its freight business, out of its gross traffic receipts of Rs. 2,39,982[1]. This is reflective of IR's 'business-as-usual' revenue-mix, with 66 per cent coming from freight.

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Passenger fare structure

As a logistics provider catering to *all* sections of society in a country marked by severe economic inequalities, IR provides nine classes of travel, each with distinct features and pricing. Three of these are non-air-conditioned: the General (unreserved) Second Class, the Second-class Sitting Reserved, and the Sleeper Class Reserved coaches. The six air-conditioned classes are: AC Chair Car and Executive Class for intercity daytime travel, and AC 3- economy, AC-3 tier, AC-2 tier, and the first AC class for overnight travel.

In 2003-04, the fares of Rajdhani and Shatabdi Express trains were rationalised and fixed at 15 per cent above the Superfast Express train fares. Around the same time, the fare of air-conditioned classes was structured as a multiple of the Second-Class Mail/Express fare. For instance, the AC 2 tier was pegged at 7.2 times and the First AC was pegged at 14 times the Second-class Mail/Express fare. In 2008-09, these (non-Rajdhani/non-Shatabdi) fares were again rationalised to 6 times and 10 times the second-class Mail/Express fare. These relationships between classes and train categories may have shifted marginally due to subsequent fare adjustments.

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Telescopic rating

The central feature of IR's fare structure is telescopic rating, with the price charged per km dropping as the distance increases. Table 1 and Chart 1 illustrate this feature.

Table 1: Indian Railways

Telescopic Structure of Express Train Fares (Per km)

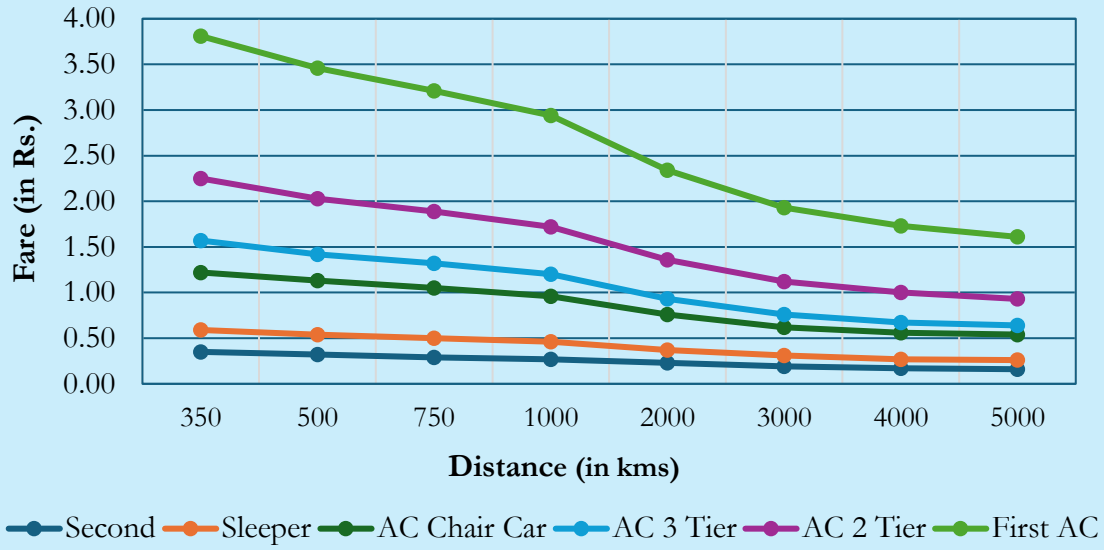
(in Rs.)

Class / Distance (kms)	350	500	750	1000	2000	3000	4000	5000
Second	0.35	0.32	0.29	0.27	0.23	0.19	0.17	0.16
Sleeper	0.59	0.54	0.50	0.46	0.37	0.31	0.27	0.26
AC Chair Car	1.22	1.13	1.05	0.96	0.76	0.62	0.56	0.54
AC 3 Tier	1.57	1.42	1.32	1.20	0.93	0.76	0.67	0.64
AC 2 Tier	2.25	2.03	1.89	1.72	1.36	1.12	1.00	0.93
First AC	3.81	3.46	3.21	2.94	2.34	1.93	1.73	1.61

Source: IRCA Fare Tables, 2020.

Chart 1: Indian Railways

Telescope Rates of Passenger Fares



Source: IRCA Fare Tables, 2020.

Telescopic rating enables passengers travelling longer distances to pay a progressively lower rate per km than those traveling shorter distances. This system ensures affordability for long-distance

travellers, which is essential in a country like India, where trains serve as the primary mode of long-distance travel for millions. In this context, it is relevant to note that even though the modal share of road is overwhelmingly high, the average distance travelled by an inter-city passenger by bus is approximately 400 km. On the other hand, IR carries passengers for much, much longer distances. For example, the Kerala Express traverses a distance of 3,033 km from Thiruvanthapuram to New Delhi, the Lohit Express running between Jammu and Guwahati covers a distance of 2,346 km, and the Mumbai - Dibrugarh Express, runs a total of 3,147 km across seven States from India's western coast to the north-east of the country. For the lower class passenger, IR is the most viable mode of transport. Hence, the significance of telescopic rating.

Recent Trend in IR's Passenger Business

In terms of passenger volumes, 2012-13 and 2013-14 were the peak years. The number of passengers carried in 2012-13 was 8.4 billion. The present volume of passenger traffic is far below the 2012-13 level (Table 2).

Table 2: Indian Railways
Passengers Carried

(in millions)

Category	2012-13	2022-23	2023-24*
Suburban	**4,476.56**	**3,792.20**	**3,852.50**
Non-suburban Upper Class	125.67	268.05	327.77
Non-suburban Lower Class	3,818.47	2,335.51	2,663.31
Non-suburban Total	**3,944.14**	**2,603.56**	**2,991.08**
Suburban + Non-suburban	**8,420.71**	**6,395.76**	**6,843.58**

***** Revised Target of Budget 2024-25

Sources:

1. For 2012-13 See *Indian Railways Facts and Figures 2013-14*. Ministry of Railways, p.2 for rounded up figures. [https://indianrailways.gov.in/railwayboard/uploads/directorate/stat_econ/IRSP_2013-14/pdf/Facts_Figures_Eng/2.pdf].
2. For years 2022-23 and 2023-24 – Union Budget Documents for 2024-25. See: Part V – Railway Statements; *Investment Part C Revenue Earning Traffic Performance Targets*, Ministry of Finance. [https://www.indiabudget.gov.in/doc/eb/railstat6.xlsx].

Similarly, the PKMs are yet to catch up with the levels witnessed in 2013-14.

Table 3: Indian Railways
Passenger Kilometres

(in millions)

Year	Suburban (All classes)	Non suburban				Total Non-suburban	Grand Total
		Upper class	Second Class				
			Mail/ Exp.#	Ordinary	Total		
2010-11	1,37,127	62,203	5,00,631	2,78,547	7,79,178	8,41,381	9,78,508
2011-12	1,44,057	72,148	5,48,861	2,81,546	8,30,317	9,02,465	10,46,522
2012-13	1,45,654	82,674	5,87,785	2,81,990	8,69,775	9,52,449	10,98,103
2013-14	1,68,589	89,117	6,12,475	2,88,561	9,01,036	9,90,153	11,58,742
2020-21	30,075	42,685	1,53,910	4,456	1,58,366	2,01,051	2,31,126
2021-22	69,798	1,17,568	3,84,496	18,355	4,02,851	5,20,419	5,90,217
2022-23	**1,14,350**	**2,03,298**	**6,03,982**	**37,289**	**6,41,271**	**8,44,569**	**9,58,919**

Also includes Sleeper Class.

Source: Indian Railways Year Books 2014-15 and 2022-23.

There has been a sharp fall in the passenger traffic measured in PKMs. The total PKMs are still a clear 17 per cent short of the level attained in 2013-14. However, the revenues have marked a sharp increase.

Table 4: Indian Railway
Passenger Revenues

(in Rs. Crores)

2012-13	2022-23	2023-24
31,323	63,417	73,000

Source: Union Budget 2024-25.

Despite a substantial drop in the number of passengers after 2012-13, earnings increased by 133 per cent between 2012–13 and 2023–24. This is on account of fare revisions in 2012–13, 2013–14, 2014–15, and the last one in January 2020. Apart from the direct fare increases, there was another factor which is discernible from the shift in the class-wise share of PKMs.

Table 5: Indian Railways Proportion to Total Traffic – Passenger kms *(in percentage)*					
	1960-61	2000-01	2010-11	2021-22	**2022-23**
Non-suburban:					
Second Class Ordinary	51.75	26.10	28.47	3.11	**3.89**
Second Class Mail/Express	28.65	48.70	51.16	65.14	**62.99**
Upper Class	4.45	5.75	6.36	19.92	**21.20**
Total	84.85	80.55	85.99	88.17	**88.08**
Suburban (all classes)	15.15	19.45	14.01	11.83	**11.92**
Grand Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Source: Indian Railways: Year Book 2022-23 p. 24.					

A major factor for the upsurge in passenger revenues is the increased share of Second-class Mail/Express and Upper-class – that is, by 12 percentage points and 15 percentage points, respectively, between 2010-11 and 2022-23. What is most significant is that the share of Second-class ordinary passenger has plummeted from 28.5 per cent to 3.9 per cent (Table 5). In 2020, over 500 Second-class ordinary passenger trains were converted into Mail and Express trains[2]. This resulted in an average overall increase in fares for the passengers travelling by these trains by nearly 86 per cent. This was due to the substantial fare differential between Second-class, ordinary (passenger) trains and Second-class, express trains.[3]

One noteworthy feature is that between 2013-14 and 2022–23, there has been an increase in the non-suburban category of passenger coaches by 31 per cent. Two aspects are glaring here. One is the drop in the total number of passengers, despite an increase in coaches. The second is the drop in the lower-class passengers' volume which has not bounced back even two years after the end of COVID-19 pandemic. The lower classes, that is, the Second class have seen a loss of over one billion passengers. Two factors explain this drastic change in pattern. One, the reduction of ordinary passenger trains and the increase of the Mail and Express trains. Second, when it comes to augmenting berth capacity, more priority has been given to upper class travel compared with lower classes (Table 6). This resulted

in a decline in the Second class seats and berths in the total holding from 86 per cent to 72 per cent over the past decade.

Table 6: Indian Railways
Class-wise Capacity in Berth/Seats
(in 1000s)

Class	2012-13	2022-23	Increase	Percentage
Air-conditioned Sleeper (2A + 3A)	411.70	1,194.09	782.39	190
Air-conditioned Chair Car	72.80	108.51	35.71	49
2nd Class	2,961.90	3,417.24	455.34	15

Source: Indian Railways Annual Statistical Statements 2022-23, Ministry of Railways.

Costs and Losses on account of Passenger Business

One well known feature of IR's passenger business relates to under recovery of costs. Every passenger is informed that the Railways recovers, on an average, only 57 per cent of the cost of travel. This is printed on every ticket and electronic reservation slip. This means, of course, that the under recovery is to the extent of 43 per cent. IR assesses its financial performance through the Operating Ratio (OR).[4]

Table 7: Indian Railways
Operating Ratios for Traffic
(in percentage)

Category of Traffic	2021-22	2022-23
Goods (Freight)	72.88	66.97
Coaching (Passengers)	237.38	180.82

Source: Indian Railways Year Book 2022-23.

The OR for passenger services in 2022-23 was 180.82 (Table 7). This means that for every hundred rupees of revenue earned from its passenger business, IR spent Rs. 181 as its operating expenditure. According to this ratio, IR incurred a loss of Rs. 58,998 crores in its passenger business in 2022-23.

Typically, each year this loss is subsumed by the profits made in the freight business. In 2022-23, the OR for goods was 66.97 and by this ratio, freight business, which had a revenue of Rs. 1,60,159 crores, had a surplus of Rs. 56,330 crores over the costs incurred,. This surplus, in effect, internally subsidises the losses in the passenger business. This cross-subsidisation of passenger business by freight operations has been a historically consistent factor in IR's finances.

IR follows a fully distributed cost approach wherein expenditure across key heads such as ordinary working expenses and allocation to pension fund, depreciation fund, and other safety and maintenance functions which are funded out of IR's revenues, are distributed between the two main businesses, namely passenger and goods, using an allocation ratio. According to the fully distributed cost method, IR suffers operating losses in all classes of travel, including its parcel[5] and catering services, barring the AC 3 tier class[6]. With the losses incurred in passenger segment, and the cross-subsidisation by freight, policy analysts have been recommending an increase in passenger fares year after year, with a view to making IR financially self-sustaining by generating more resources to fund its critical infrastructure. Two questions arise: First, is it possible for a state-run operator to do so? Second, are routine fare hikes the only option?

Price Sensitivity of Passenger Demand

It is commonly argued that demand for IR's freight services is price elastic and more elastic than the demand for passenger travel. However, the trend in passenger growth shows that the demand for passenger services too are sensitive to pricing. Between the years 2005-06, 2006-07, 2008-09 and 2009-10, the passenger fares on IR were gradually reduced. Initially, in the Second Class by 5 per cent and subsequently by another 2 per cent in all classes, along with a downward rationalisation of AC 2 tier and First AC classes. This resulted in a clear surge in the passenger volumes. There was a growth of a 7.2 per cent in the non-suburban category in 2011-12, over the previous year.

The converse is also evident. There were hikes in the fares of passenger services in January 2013 by 2 Paise to 10 Paise per km and again by 2 per cent as Fuel Adjustment Component (FAC) in October 2013. On top of this, in June 2014, there was a 14.2 per cent increase in all classes including the FAC. Owing to these hikes, passenger numbers fell for 4 years in a row, starting 2014-15.

Table 8: Indian Railways Fall in Non-suburban Passengers *(in millions)*						
Year	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**
Passengers	3,590	3,845	3,719	3,648	3,550	3,489
Source: Indian Railways Year Books -- 2014-15 to 2018-19.						

Comparison of Fares with Road Services

An exercise in correcting the under recovery of costs in passenger business should consider three aspects: The extent of the under recovery, the perceived value of the service, and the pricing of the competing mode. In the case of IR's passengers, road services constitute an accessible alternative for people to travel, especially for classes extending from the Second to the AC 3 tier. With view to aiding such comparison, the road and rail fares for non-air-conditioned travel and the air-conditioned travel have been tabulated in Tables 9 and 10, respectively.

Table 9: Fare Comparison of Non-Air-conditioned Services between Bus and Rail Transport					
From	**To**	**Distance** *(in Kms.)*	**Bus Fare*** *(in Rs.)*	**Rail Sleeper Class#** *(in Rs.)*	**Difference in Fare** *(%)*
New Delhi	Lucknow	480	509	320	59
Chennai	Bangalore	362	450	260	73
Hyderabad	Bangalore	685	800	405	98
Agra	New Delhi	200	300	174	72
New Delhi	Jaipur	299	290	233	24
Mumbai	Pune	192	318	172	85
***** Compiled from IXIGO & Go Ibibo websites (lowest bus fares on the sector taken).					
# From IRCA Passenger Fare Tables (including Reservation and Superfast charges).					

Table 10: Fare Comparison of Air-conditioned Services between Bus and Rail Transport					
From	**To**	**Distance** *(in Kms.)*	**Bus Sleeper Fare*** *(in Rs.)*	**Rail AC 3 Tier Class#** *(in Rs.)*	**Difference in Fare** *(%)*
New Delhi	Lucknow	480	740	771	-4
Chennai	Bangalore	362	500	635	-21
Hyderabad	Bangalore	685	910	1015	-10
Agra	New Delhi	200	349	525	-34
New Delhi	Jaipur	299	343	525	-35
Mumbai	Pune	192	399	525	-24
***** Compiled from IXIGO & Go Ibibo websites (lowest bus fares on the sector taken).					
# From IRCA Passenger Fare Tables (including Reservation and Superfast charges).					

As Tables 9 and 10 show, the IR offers much better fares for non-airconditioned travel compared with road transport, while buses give better prices for air-conditioned travel. The pricing of non-airconditioned sleeper class of IR is significantly lower, ranging between 24 per cent to 98 per cent than road fares. On the other hand, in air-conditioned services, specially of the lowest of the air-conditioned Classes, that is, the AC 3 tier, rail fares are relatively higher than road fares. The range for the air-conditioned fare difference in favour of buses, however, is narrower between 4 per cent and 35 per cent. This at-a-glance comparison of fares places IR very favourably for non-air conditioned travel, while bus transport is only marginally less expensive in the air-conditioned segment (compared with the fare differentials in non-air-conditioned fares).

For the air-conditioned classes, IR could follow a more dynamic model to ensure that the berth/seat capacity is optimally utilised. The dynamic pricing algorithm could not only take the prices upwards up to 1.5 times the base fare for popular trains and during peak seasons; it should also offer a discount up to 10 per cent of the base fare in a graded manner, so that the train does not depart with vacant air-conditioned berths. The discount should kick in only 48 hours before the departure of the train, depending on the percentage of seats vacant on the train.

Cost Inefficiencies

Under-recovery of fares can be on two counts – low fares or/and high costs. As rail fares are higher than those for buses in some fare segments, it is inferred that the under recovery is due to cost inefficiencies owing to the manner in which IR operates its passenger services.[7] For one, there is excessive, and perhaps needless, differentiation in the services offered by IR. Take the AC Chair car service as an illustration. IR operates regular Express trains, Jan Shatabdi , Garib Rath, Shatabdi, Tejas, Gatiman, Vande Bharat , Mahamana and such other services, all with differentiated colour schemes, pricing, and amenities within this class itself. Similar differentiation is offered in AC 3 Tier and AC 2 Tier classes with different classes of trains. Such disproportionate differentiation leads to excessive costs which *inter alia* includes maintenance of separate coaches, spare coaches, parking lines, in addition to other related operational inefficiencies. Reduction of the differentiation to just two or a maximum of three categories could reduce several inefficiencies in operation.

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Supply Side Constraints

One aspect in the context of the comparison with roads is the easy availability of seats/berths for bus travel during peak periods, more so at short notice. The supply constraints are less constricting for bus operators than it is for IR. The latter, therefore, lacks flexibility to expand passenger services all the way during peak seasons. There is a huge dearth of accommodation during the two peak periods which spread from April to June and between November and December when IR experiences higher levels of cancellations for want of confirmed accommodation. Despite increased capacity as pointed out earlier (Table 6), the two binding constraints persist are line capacity and congestion on trunk routes. The High-Density Network (HDN), which comprises the Golden Quadrilateral and the Golden Diagonals, constitutes 16 per cent (10,969 Km) of the entire network and transports 41 per cent of total traffic. All trunk routes are operated at levels of super-saturation[8].

Table 11: Indian Railways Existing Capacity Utilisation of HDN		
Capacity Utilisation	**Network KM**	**Share (%)**
<70%	189	2
70%-100%	2,003	18
100%-150%	6,326	58
>150%	2,450	22
	10,969	100
Source: *National Rail Plan 2030* Draft Final Report, Vol 1., p. xxiv, Table 0-20.		

Similar congestion, even if slightly lower, exists on other sectors too. The line capacity resource is a limiting factor as additional passenger trains cannot be operated on demand without an adverse impact on freight services and infrastructure maintenance. Road transport, however, does not face this constraint, as deployment of buses can be increased on the fly subject only to fleet and crew availability.

Market Share and Costs for the Economy

The International Union of Railways (UIC) [*Union internationale des chemins de fer* in French] which studied rail and road data from 2007 to 2021, observed that "In India, there has been a long-term decline in the modal share of rail passenger transport, dropping from 17 per cent to less than 6 per cent".[9] The exceedingly high skew in favour of road which now has a share of 94 per cent of passenger transport is not desirable from the viewpoints of environmental and logistical costs. The report of the National Transport Development Policy Committee points out that railways consume up to 21 per cent less energy for passenger traffic and that the unit cost of rail transport is lower than road by Rs. 1.6 per PKM. The social costs are also lower for the rail mode by Rs. 1.7 per km for the base year of 2000.[10] Given these advantages, as the national carrier, IR and the Union Government cannot be indifferent to the dwindling share in passenger traffic, especially in the lower segments for whom there is no alternative mode available for long distance travel.

Role of a National Carrier

IR is a departmental undertaking which owns and controls the entire railway infrastructure, which has immense relevance for intercity travel in a vast country like India. As a government departmental undertaking with substantial social obligations, it has to provide mobility, which is critical to ensure both livelihoods and affordable travel for its users. Today, low-cost airlines provide an accessible alternative mode of travel to upper-class passenger on most sectors. Travellers who can afford only lower-class travel do not have an alternative mode, especially for long-distance movement. This constraint on the mobility of the lower-class travellers is likely to have an adverse impact on livelihoods. For this prime reason, the national carrier cannot be indifferent to its mandate of providing affordable travel to the millions of its passengers.

Fare hike is not the only way to deal with losses in passenger services. Recognising this, the Vision 2020 affirmed that IR

> "shall provide efficient, affordable, customer-focused and environmentally sustainable integrated transportation solutions. It shall be a vehicle of inclusive growth, connecting regions, communities, ports and centres of industry, commerce, tourism and pilgrimage across the country".[11]

The vision document also noted that serving the Second-class passengers, who would continue to constitute the majority, at an affordable cost will be a key challenge and declared a strategy to "target the subsidy only to the needy sections of population" and explore "cost innovations in passenger operations to bring down the unit costs" for cost recovery.[12]

Budgetary support for rail operations; subsidies to boost travel

Across the world, governments continue to support railway systems recognising its environmental and social benefits. In 2005, the EU gave a subsidy of €73 billion to the rail systems in Europe of which €33 billion was for compensating the passenger rail transport.[13] In 2018, the French government had absorbed €35 billion to SNCF [The French state-owned railway company, *Société nationale des chemins de fer français*] to facilitate modernisation efforts of the French passenger rail corporation.[14]

Recently, Portugal announced a €20 green rail pass which gives tourist and locals unlimited train travel. This involves a subsidy of €29 on each such pass marking a huge push for affordable travel for its citizens with the government, viewing it as an investment in people in the environment and in the future.[15] Similarly, the German government allocated €12.5 billion to rail (Deutsche Bahn) from its Climate and Transformation Fund (KTF), according priority to the climate friendly mode of transport. An additional €11.5 billion raised from carbon emission surcharge on heavy goods road vehicles is also earmarked for rail.

With the merger of the Railway Budget with the Union Budget, two benefits accrued to Indian Railways. One, the dividend payable on the capital at large is no longer payable. Second, the Gross Budgetary Support has been increasing year after year. For 2024-25, there was a substantial allocation of ₹2,62,000 crores. Evidently, the Union government has made a clear declaration to support Indian Railways and fund the effort to modernise and remove supply constraints through an impetus to infrastructure creation.

A sustainable passenger business action plan

Across the world, there is evidence that governments are keen to tap into the environmental and social advantages of shifting to a higher modal share for rail transport systems. Against the backdrop of the price sensitivity of passenger demand; the recent fall in passenger volumes; the existing prices of the competitive mode, namely road services; and the mandate for supporting the lower strata with affordable transport, IR has to take a very cautious approach to passenger fare hikes. At the same time, there is the imperative of making the finances of IR sustainable. Therefore, in order to make IR's passenger business sustainable, the losses in passenger business should be tackled through a two-pronged action plan.

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The first part of the plan should focus on increasing cost efficiencies. IR should constitute an inter-disciplinary standing committee which should train its focus on eliminating cost inefficiencies. The second part of plan would be classify the GBS under two separate brackets – one, for compensating

IR for its passenger losses and two, for investing in critical infrastructure to meet its long-term vision. This will ease the pressure on the freight business and reduce its burden of cross-subsidising the passenger segment. The freight business plan can then focus on expanding its market share through a gradual rationalisation of its freight rates as the line capacity expansion rolls out.

II. Moving Goods

IR's freight business has three well known characteristics.

1. It is the bread earner for the organisation and subsidises passenger business.
2. The rail share of freight has gone down significantly over the last 75 years from a whopping 89 per cent in 1950-51 to less than 30 per cent in the last decade.
3. Coal brings in 48 per cent of volumes and 50 per cent of revenues for IR (2022-23 data). The consistent gains from this one freight segment do not incentivise IR to diversify its goods basket. Moreover, the effort involved in moving such large volumes of coal tend to inhibit the organisation from being more creative or aggressive in its marketing strategies for other commodities.

Every year experts suggest rationalising passenger fares to reduce the pressure of generating revenues from freight. As discussed in the previous section, there are limitations to that strategy. Earnest efforts are required to wean traffic away from road, rail's biggest competitor in freight, as it is in passenger traffic. However, most schemes and policies devised for this purpose seem to have had marginal impacts thus far. On coal dependence, in the medium to long term, railways would need to look at a more diversified freight basket. Yet the railways dependence on coal continues and it is the one commodity that acts as a saviour when things are looking grim for the railways.

The following policy initiatives would clearly signal a desire to shift traffic from road to rail.

Freight Rates and Distance Slabs

The fundamental problem with cross-subsidisation of passenger business with freight revenues is the distortionary effects on the economy. Freight fares are set for yielding higher margins resulting in a

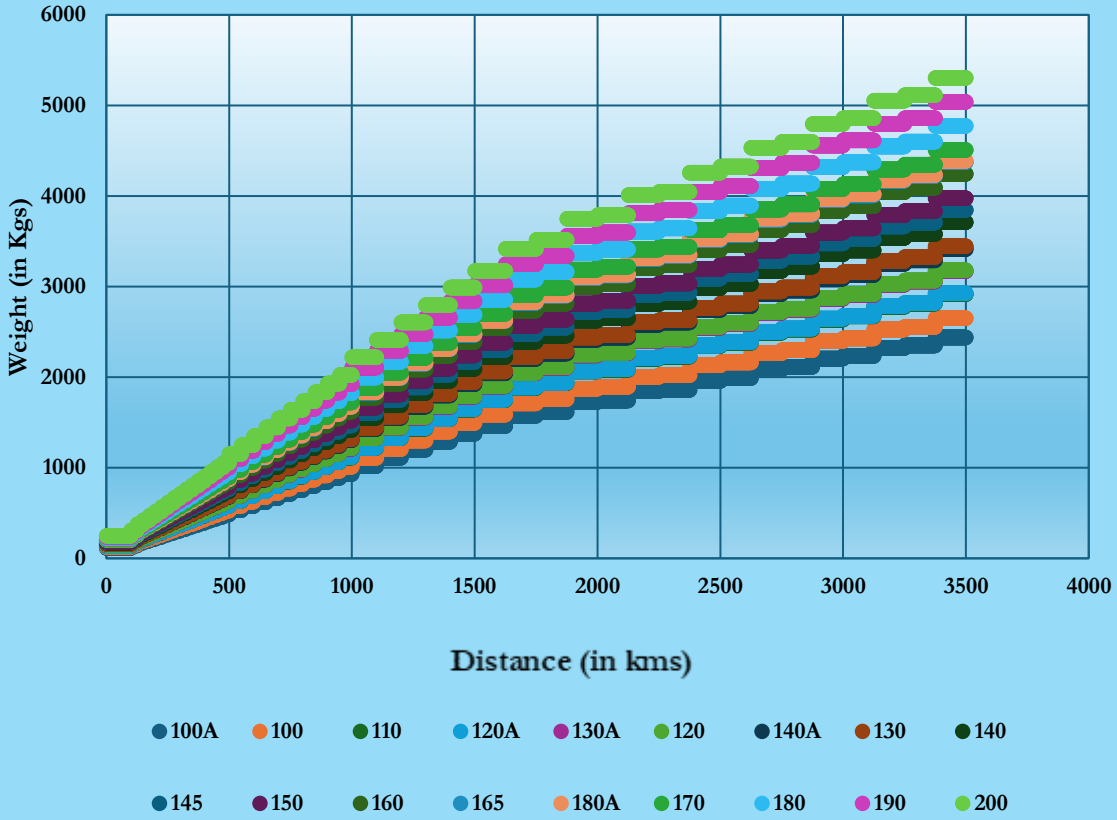
shift towards road transport, which is less environment friendly. Extreme dependence of the railways' financial health on freight leads to conservative, risk-averse pricing strategies to maintain freight revenues under all circumstances. Even the freight discount schemes are more about optimally utilising available wagon space during lean periods, rather than a market-oriented strategy.

Commodity Classification and Distance Slabs

Freight pricing has been based on the principle of 'ability to bear' and commodities are categorised into classes. Commodities that can bear a higher freight rate (more inelastic demand) are classified at a higher class and those that cannot are the lower-class commodities (more elastic demand). While petroleum products (Class 180A) are an example of the former and placed at the top end, Foodgrain (Class 130A) is an example of the latter and, therefore, would be classified at the lower end. Some of the other classifications include Salt (100), Sugar (120A), Cement (140A), Iron Ore (160), and Iron & Steel (165).

This is also referred to as Ramsey pricing. Sustained charging of higher freight does provide a rationale for investments in alternative modes of transport – a classic example being the pipelines for petroleum products. In the long-term, substitution possibilities exist and demand is more elastic. In other words, if 100 is the base class, higher classes were to have a proportionately higher per tonne rate. Over the years, however, the proportionality principle has been diluted to accommodate specific requirements for major commodities. The rate table for coal is very different from other commodities and has a steeply increasing function as well as smaller distance slabs for longer distances. Chart 2 shows the relationship amongst the commodity classes (excluding coal) and the rate per tonne as a function of distance.

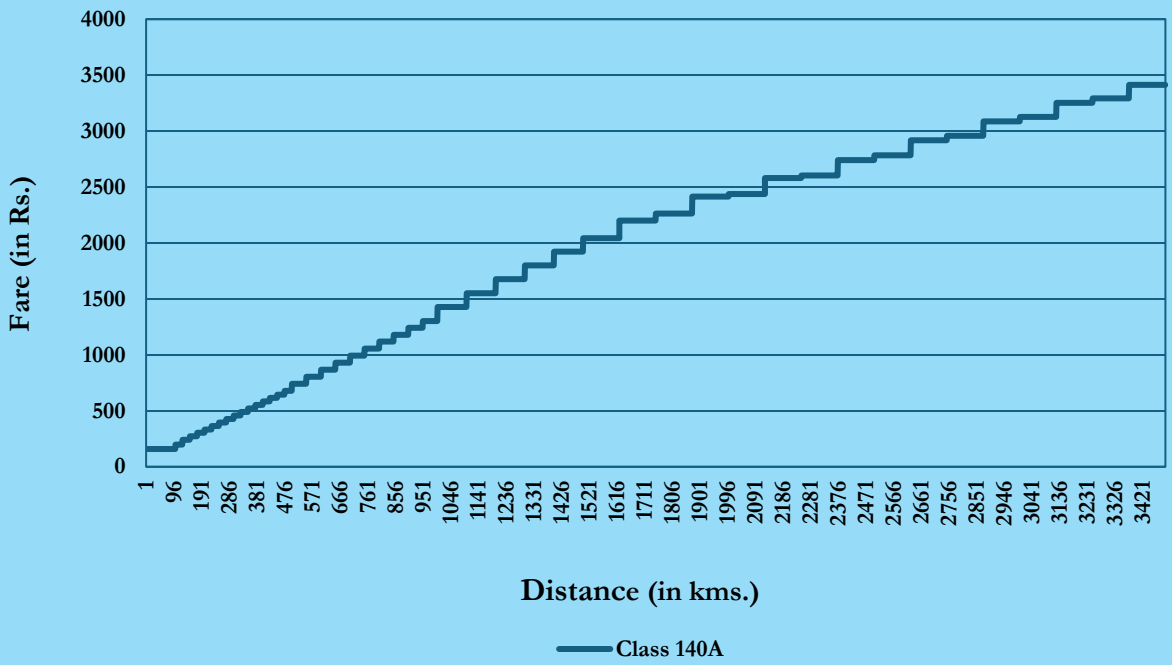
Chart 2: Indian Railways - Train Load Classes



Notes:
(1) Each colour code represents a specific commodity class.
(2) Charts 2 and 3 are only indicative and do not reflect current data. They show the relationship between classes as well as for a specific class. Their purpose is restricted to explaining the step function relationship between distance and fares and how a higher class means a higher step function.

Source: From *Freight Operations Information System [online]*, Ministry of Railways, Government of India. [https://www.fois.indianrail.gov.in/FOISWebPortal].

One can notice from Graph 2 that there are distance slabs over which the rate per tonne stays the same and there is a quantum jump in the rate as the slab changes. This is clearer by looking at one particular commodity class (140A for cement) and the rate function (Chart 3).



Source: From *Freight Operations Information System [online]*, Ministry of Railways, Government of India. [https://www.fois.indianrail.gov.in/FOISWebPortal].

In today's computerised world, the slab system has no justification and could easily be done away with.

The practice of having distance slabs is a legacy from the days of manual preparation of the freight bill. It was an easy ready reckoner for the goods clerk who first calculated the distance to be travelled by the commodity being shipped and checked the rate per tonne for that distance for preparing the bill. In today's computerised world, the slab system has no justification and could easily be done away with. Although retaining it does add a distortionary element to location and modal choices, there are numerous cases of certain freight terminals (serving the same city), being preferred over others, because the other terminals fall in a higher slab (even though they are just a few kms away). Anecdotal evidence suggests cement industry locating grinding units based on the distance slabs to optimise freight tariffs.

A much-needed reform would be to switch to a kilometre-based rate structure – *one where the rate per tonne gradually increases with every km instead of the sudden jumps with each change in slab*. For example, in the

current system the rate per tonne would remain the same for freight travelling for a distance of 501 or 530 or 550 kms. However, if the destination is 551 kms away, the rate would jump by say Rs. 50 or more[16]. In the proposed system, instead of discrete changes in rate, the rate would grow marginally (by less than a rupee) with each kilometre.

This simple rationalisation of the freight rates could potentially yield benefits both in terms of revenues and in terms of a more balanced distribution of the traffic over the network. The only reason the railways does not undertake such a reform is its conservativeness. As mentioned earlier, coal rates are closer to the proposed concept, with distance slabs of 10 kms beyond 1,500 kms[17]. The idea is not to rock the boat – stick with the old way of doing things as long as it still works. The point is that it works but adds an inefficiency, the magnitude of which is difficult to estimate. And the more important point is that it is fairly easy to switch to an alternative, per km rate function. If it is well designed even the likely negative revenue implications in the short run could be avoided.
The change from a slab-based regime to a km-based pricing system is not a complex reform (all that is required is replacing the current rate table with a larger rate table matrix) yet it is not being attempted. The impact of this reform will however be significant.

Rail Share of Freight Business

Railways have lost their predominant position in freight transport. Although total tonnage has shown growth and, in some periods, remarkable growth, it has not succeeded in increasing its share of the total freight business. Between 2002-03 to 2007-08 railway freight grew at an annualised rate of 8.12 per cent, and the next five years at 5.89 per cent. However, between 2012-13 and 2016-17, freight grew at a paltry 2.68 per cent annually. From 1,106.15 million tonnes in 2016-17, the freight tonnage increased to 1,512 million tonnes in 2022-23 and 1,591 million tonnes in 2023-24. The average lead is showing a downward trend, even while the yield per tonne is increasing.

Domestic Containers and Other Goods

The National Rail Plan (NRP) envisages a significant increase in domestic container movement and in the movement of goods currently clubbed under the category of 'Other Goods'. The NRP envisions nearly 7 per cent of IR's freight tonnage to come from domestic containers by 2030 (it is just above 1

per cent currently). It is also looking at an increased dependence of the railways on finished manufactured goods – away from the current dependence on coal and ores. The other major contributors like steel, cement, fertilizer, foodgrains and petroleum products will continue to be important.

IR has a complicated relationship with domestic container business. In 2006, it was decided to open up the container sector to private operators. Until then CONCOR was the only operator in the container sector. The entry of private players opened up the EXIM [export-import] traffic to multiple players, but CONCOR still retains its predominant position. On the domestic front, private freight train operators posed a new challenge for IR. They started carrying high value commodities like Cement, Iron and Steel, Sugar, Foodgrains, and Fertilizer in containers. IR saw this as a poaching of their traditional areas of business and quickly invoked a clause in the agreement to create a restricted list of commodities that were to be charged higher haulage rates. Ever since the private operators claim that the Railways have effectively prevented them from growing in the domestic container business[18]. They argue the higher haulage rates for these restricted commodities makes their movement by container trains unviable. The IR argues that the regular haulage rates for these commodities would lead to a shift from wagons to rail-based containers, yielding lower revenues for them. IR's ' view is that private operators should focus on other FMCG products that are currently either not moving by rail or moving in small volumes.

Now that the rail budget is merged with the general budget, the Union government could possibly take a holistic view.

Both sides have good arguments and IR cannot be expected to take a non-partisan view on this matter. Now that the rail budget is merged with the general budget, the Union government could possibly take a holistic view. Would it reduce logistics costs to allow the shift and would it benefit the economy[19]? Is there a way of compensating the railways for the revenue losses due to the lower revenues?

On the first question, haulage costs would definitely be lower if the restricted commodities list is revoked. The haulage rates would be back to the 'Freight All Kind" (FAK) rates being charged for all other commodities. When the railways carry it in their own wagons, they charge the commodity-based rates which are higher than the haulage rates. The other factor that affects costs is the throughput of

the railways – will container rakes offer the same tonnage or more or less tonnage as the conventional wagon train? Logistics costs with the conventional wagon-based transport would include the effect of multiple handling and last mile connectivity. *Prima facie*, it does seem that movement by domestic containers on trains (instead of wagons) even for products currently moving by rail, would imply lower logistic costs. In such a case, a policy shift to encourage intermodal containers in the domestic sector is needed to be able to compete with the door-to-door services of the trucking industry.

This raises a larger question – if the government is interested in shifting freight traffic from road would it consider supporting an across-the-board reduction in freight rates? In the short-run, the revenue losses could be significant. If the gamble works, and the railways gets an increasing share of the freight market, it may not need continued financial support. Of course, price reduction induced increase in market demand can be pursued only when the railways are fully prepared in terms of capacity to satisfy the generated demand. The commissioning of the dedicated freight corridors (DFCs) has added a major chunk to the freight carrying capacity of the railways.

The key issue is that to shift traffic from road, the railways will need a major policy change from the government (if passenger fares are to remain untouched). One policy option is to encourage a larger domestic container market, which could poach into the railways' traditional market and eventually bring in other high-valued commodities onto containerised rail transport. This option would rely heavily on the private container train operators to bring in FMCG products and other such traffic on to the rail network.

The other policy option is to facilitate an across-the-board cut in freight rates by directly subsidising passenger services. In comparison, the latter is a policy option focussing more on the Railways as an organisation. In effect, this calls for a separation of finances of freight and passenger businesses. Either way, a decision on this is imperative, given the environmental concerns and the desire to shift freight from the more polluting mode of road transportation.

Dedicated Freight Corridors

DFCs offer another opportunity for IR to alter the transportation game. The project is ready to yield benefits with the completion of the Eastern Corridor and 90 per cent of the Western Corridor.

However, even with access to dedicated tracks, there is not yet a perceptible difference in freight performance. Maybe it is a too early to foretell the impact.

In order to fully exploit this dedicated network, IR may have to alter its operational strategy. On the IR network, running mixed traffic with scheduled passenger train services, the operational view has been that freight services cannot be scheduled. On a dedicated corridor, it ought to be possible to schedule freight train services. With assured transit times and better speeds, scheduled services can be priced differently. The spillover effect of the dedicated corridor could be to schedule services on the existing network as well, especially the portions that have a direct interchange with the freight corridor. It is learnt that there are delays at the interchange points (the stations where the trains are handed over from the IR network to the DFC and vice versa). Scheduled trains would resolve this issue to quite an extent[20]. Essentially, scheduled freight services across IR network and DFC can lead to a new market for paths and a corresponding price for it. This again could pose a serious challenge to road traffic. In the EXIM sector the benefits could be across an entire trade corridor.

The Coal Template

The final aspect that this article would like to focus on is also one that has significant impact for the future not only of freight operations, but also that of IR itself given the centrality of freight for the organisation's financial performance: the over-dependence on coal.

Coal constitutes about half of both the freight tonnage and of freight revenues. Coal movement by rail is also over-priced[21] to generate sufficient revenues for IR. Improved efficiency in power generation, technologies that reduce the cost of transmission of energy (as compared with transportation of coal) and the growth of renewable sources of energy have led to a slowing down of growth in coal traffic coupled with shorter leads (average distance transported) over the last decade or more. What does the future portend?

As the country moves towards a less coal intensive energy system, railways would have to find alternative sources of revenue.

The country's dependence on coal as the main source of energy is an environmental concern and the railways dependence on coal as the main source of revenue is an organisational concern. As the

country moves towards a less coal intensive energy system, railways would have to find alternative sources of revenue. The coal-based financial strength of the railways is unsustainable. Yet railways have adopted a policy of increasing the relative price of coal transportation vis-à-vis other commodities. A clear indication of an attempt to generate higher revenues from coal, even while the power houses are looking at alternatives like pithead power stations, importing coal and even conveyor belts as ways to combat these high prices.

The Brookings India study cited above notes that for a notional power plant with a specific coal consumption of 0.63 kg/kWh (average value for mid-2016) located at varying distances between 100 km and 2,000 km from coal mines, the transportation cost of coal by railways per unit of electricity generated is as low as Rs. 0.13/kWh for 100 km and as high as Rs. 1.85/kWh for 2,000 km. Transportation costs are therefore a substantial part of the variable costs for electricity generation for power houses located far away from the coal mines. This is not sustainable. Railways cannot maintain its financial position by relying on coal and the changes in the energy sector could lead to a drastic shift within the space of the next five years if not in the next decade. Despite this clear emerging scenario, there are no indications that IR is actively looking at a non-coal-based strategy.

In addition to the suggestions regarding freight pricing, containerisation and other goods, and DFCs, IR needs to push for a greater role for private train operators. To capture the automobile market, the railways did introduce a scheme for automobile train operators as early as 2010 after the 2006-policy on container train operators. But again, the growth has not been very impressive, especially in the transport of passenger vehicles. An omnibus private freight train operator scheme with special clauses for certain commodity groups could be examined. Along with this, the railways need to revive the proposal of bringing in an independent regulatory agency as an assurance to private players. Currently the railways are playing the dual role of being a player in the market as well as the regulator. This does not augur well for growth in the private train operations.

III. Conclusion

The story of cross-subsidies and over-priced freight structure on the railways is an oft repeated fact. This article argues the case for basic reform in the pricing principles for both passenger and freight movement. These include introduction of dynamic/discounted pricing for passengers and shifting

away from the current slab-based system for freights. Further, a holistic view needs to be taken on the shift from road to rail and if there is a way to shift high value commodities on rail through containerisation, such a policy is worth looking at. Moreover, if passenger fares cannot be rationalised, can freight rates be rationalised with government support? In view of the enhanced capacity available due to the commissioning of the DFCs, there might be room for a different pricing regime based on scheduled paths. Finally, for private train operators to succeed in bringing FMCG products and other high value manufactured goods, an independent regulator is an absolute necessity.

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2. **Sastry, A.K. 2020.** **Many passenger trains to be converted into Express**, *The Hindu,* June 18. [https://www.thehindu.com/news/national/karnataka/many-passenger-trains-to-be-converted-into-express/article31859269.ece].

3. The average lead (average distance each passenger or tonne of goods is transported) of second-class, ordinary (passenger) is 120 km. The Express train fare is 86 per cent higher for this distance.

4. Indian Railways' operating ratio (OR) is the ratio of working expenses (excluding suspense but including Appropriation to Depreciation Reserve Fund and Pension Fund) to gross earnings.

5. Parcel services on IR are distinct and separate from freight services. The former are carried by space available on passenger carrying trains and in parcel vans attached to passenger carrying trains. In addition, parcel vans run as separate Parcel Specials – all with separate revenue accounting. Freight is carried by goods wagons and container trains, and the revenue is accounted separately.

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8. For a detailed analysis on the constraints posed by line capacity, see: **Reddy, A. M. 2024.** ***Indian Railways: Prioritising Safety on the Tracks***, The Hindu Centre for Politics and Public Policy. December 24. [https://www.thehinducentre.com/publications/policy-watch/indian-railways-prioritising-safety-on-the-tracks/article69018455.ece].

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15. **English, G. 2024.**You can soon travel across all of Portugal for just €20 – find out how, *The Irish Sun,* October 5. [https://www.thesun.ie/travel/13951943/train-travel-portugal-cheap/%60].

16. This assumes significance when multiplied the whole train load tonnage – a mere one km difference will mean a considerably larger freight bill leading to attempts to stay within a distance slab and avoid paying the higher rate of the next slab.

17. Beyond 700 kms, the slabs are of 30 km up to a distance of 1000 kms. From 1001 to 1500 kms the rate per tonne changes at every 20 kms and beyond 1500 at every 10 kms.

18. Some of the operators went to the Competition Commission of India (CCI) for relief but it ruled in favour of IR, saying the agreement did have a clause which enabled IR to do so.

19. Logistic costs in India are comparably higher than other countries, estimated to be 14 per cent of GDP as against 10 per cent in the U.S. and 11 per cent in Japan

20. Running scheduled freight trains is not an easy task. However, until an attempt is made to run scheduled services, the problems would always seem daunting enough to avoid it. The DFC provides a good opportunity to attempt this solution.

21. **Kamboj, P and Tongia, R. 2018.** *Indian Railways and Coal – An unsustainable interdependency*, Brookings India Report. [https://www.brookings.edu/wp-content/uploads/2018/07/Railways-and-coal.pdf].