An Analysis of Railway Costs and Prices

J M Healey

There is evidence that Railway passenger services do not cover their costs; that coal, and possibly foodgrains and salt, are transported at rates substantially below their estimated costs of haulage; that the subsidy to these services and freight traffic is financed from revenues on other freight categories.

This policy is open to several objections.

For much of the 1951-60 period, demand for wagons exceeded supply and freight transport over long distances met with little competition from road transport. A rise in freight charges would have raised the surplus earnings of the Railways and made a more substantial contribution towards the high level of fixed capital formation in the Railways during the period.

It would have raised costs for industry, of course, but there is little reason to believe that the growth of Indian manufacturing industry would have been seriously impeded by such a policy. Indian industry has largely served a highly protected domestic market and demand for manufactured goods has been buoyant.

ON railways the annual operating surpluses have not risen commensurately with the growth of the capital stock or gross earnings. Indeed the surplus has fallen from Rs 37 crores or 12.5 per cent of gross earnings in 1951-2 to Rs 21 crores or 5 per cent of gross earnings, in 1959-60. The average rate of return on capital invested has fallen from over 2 per cent in 1951-2 to less than 1 per cent in 1959-60. An analysis of costs and charges indicates the main factors at work.

It is difficult to make an estimate of costs per unit of output on railways owing to the problem of measuring real output. An index of costs per unit of output during 1951-1959 can, however, be obtained by dividing the annual wage bill interest charges, etc, by the gross earnings of railways at constant (1951-2) prices. This shows that wages, salary and materials costs per unit of output did not change, depreciation and maintenance costs rose 13 per cent and interest costs rose 27 per cent, between 1951-2 and 1959-60. In other words it was capital costs which accounted for the entire rise in costs per unit of output during this period.

Costs and Charges

Over the same period average charges per passenger-mile did not change. Freight charges per ton-mile were raised on average by 16 per cent, through revisions in 1955 and 1958. The failure to raise average passenger charges, during a period when the general price level rose 19 per cent, can be attributed to a reluctance to raise charges on a service which is used heavily by low income groups. The reluctance to raise freight charges more substantially, particularly those for special types of freight (coal, foodgrains, ores, etc), has arisen from a fear that such a policy would be inflationary and would discourage industrial development generally and in particular regions.

In 1958, for example, the Railway Board decided not to accept the recommendation, made by the Railway Freight Structure Enquiry Committee, for a 12.9 per cent increase in revenues through a revision of freight rates. Instead, the general increase in rates was confined to the objective of a 4 per cent increase in revenues. This decision was made, according to the Minister of Railways, "having regard to the imperative need at the present time to refrain from any measure which may tend to raise the prices of commodities unduly."

Concern for Industrial Growth

During the decade, the railways have continued to show their traditional concern with the encouragement of domestic industry in two main ways. First, the railways have established a structure of freight rates for coal, mineral ores, oreflint and other heavy materials, which taper off, with the increased distance of haulage, much faster than those for higher class freight (including many finished manufactured or processed products). The aim has been to seek a regional redistribution of industry by strengthening the position of industries developing in areas remote from the regions where coal and mineral resources are heavily concentrated. These industries gain from steeply tapering rates for the transport of raw materials without losing much from the higher costs of transporting finished goods over shorter distances to local or regional consuming centres. By this policy major low rated freight (coal, cement, ores, manures) has been charged less than its estimated marginal cost over distances exceeding 300 miles.

Secondly, it would appear, from the data available, that charges for certain types of freight have not covered their average cost of haulage on the system as a whole and have been subsidised by other types of freight. The Table (p 17) brings together data on charges for various categories of freight and their estimated cost of haulage in 1959-60. A study of these data yields the following conclusions.

1. The average charges for revenue earning freight covered the estimated average cost of haulage on the broad gauge system but not on the metre gauge system. However, since broad gauge lines carried 35.417 m ton-miles of freight compared to 6.668 m ton-miles on the metre-gauge in 1959-60, it can be assumed that average charges for all revenue-earning freight covered the estimated average cost of haulage on the system as a whole. In fact, the surplus earnings on freight traffic for 1959-60, on this basis, works out at Rs 39.4 crores. This compares with a total surplus of Rs 21 crores on Indian railways as a whole in 1959-60. It suggests that railway passenger traffic did not cover its cost in 1959-60 and was subsidised to the extent of some Rs 18.4 crores from freight traffic reve-

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nues; a conclusion which would not be unexpected in view of the unchanged passenger fares and rising overhead costs indicated earlier.

(2) Estimated costs of haulage of all revenue-earning freight on the metre gauge were about 90 per cent higher per ton-mile than on the metre gauge system. Although charges on the metre gauge were also higher they still failed to cover costs for both coal and other revenue earning freight.

(3) The average charge for revenue earning coal freight did not cover its estimated cost of haulage per ton-mile on either broad or metre gauge and the discrepancy, or subsidy for coal freight, was 13.5 per cent of the cost per ton-mile on the broad gauge and as much as 41.5 per cent on the metre gauge.

It can be calculated on this basis that for the whole system, the total annual loss attributable to revenue-earning coal freight in 1959-60 was Rs 5.95 crores.

(4) Estimated costs of haulage are not available for particular categories other than coal. However, it is possible, by inference, to make some assessment of the relationship between charges and costs.
for a few commodities. First, the cost of hauling ores is not likely to be substantially different from that for coal; ores have the same robustness, ease of loading, low risks of carriage and carriage in heavy bulk consignments. Manganese ores have a high average length of haul, approaching that of coal. Iron ores and other ores are hauled only half the average distance of coal but this cost raising factor may be offset, to some extent, by the reduced incidence of empty wagon running. It seems reasonable to assume, therefore, that these heavy materials would cost little more to carry than coal. Thus, the charges for these materials on both gauges more than covered their costs (see Table).

A second, more tentative, inference can be made with respect to freight like foodgrains, oil seeds and salt. The cost of hauling these may well approximate to the average cost of hauling all (non-coal) revenue-earning freight (for which an estimate exists, see Table). The lowest costs of haulage apply to ores but clearly foodgrains, sugar, oilseeds and salt would not be as easily loadable as ores and would need greater protection in transit from damage and theft. On the other hand, they are transported over long distances and would not be as difficult to handle and hence as costly to transport, as manufactured goods. If the assumption is made that the cost of hauling these goods is, in fact, close to the average cost of all revenue-earning freight (excluding coal) then charges for foodgrains and salt fall below this cost on both gauges and oilseeds on the metre gauge only (see Table). This would mean that foodgrains and salt freight incurred losses of Rs 8.02 crores and Rs 1.85 crores respectively, in 1959-60. These losses must have been subsidised from other freight revenue since revenue from all freight traffic covered its cost.

Questionable Subsidy

To sum up: there is evidence that passenger services did not cover their cost; that coal, and possibly foodgrains and salt, were transported at rates substantially below their estimated costs of haulage; that the subsidies to these services and freight were financed from revenues on other freight categories. This policy is open to several objections.

Firstly, it can be argued that charges for each service and commodity should reflect, as closely as is practicable, their own estimated costs, so that the user of these services pays the true cost and the pattern of demand for these different services is not distorted.

Secondly, even if a subsidy to certain services were desired in the national interest, it does not follow that it should be financed by charges on other kinds of railway freight (as has actually happened). This may have been a convenient arrangement but it was clearly preferable for the desired subsidies to be met from general government revenues.

It is difficult to see the economic justification for not revising average passenger charges between 1951 and 1959, particularly as they did not apparently cover costs in 1959-60. Keeping charges low and below cost presumably stimulated demand for passenger services. If demand was elastic with respect to rates then an upward revision of rates would have reduced the pressure on capacity and released resources for investment in freight capacity which was under great strain during this period. If passenger demand had been inelastic then a rise in rates would have increased the surplus earnings of railways from reinvestment.

### Table: Estimated Costs of Haulage and Charges per Ton-Mile of Different Categories of Freight.

<table>
<thead>
<tr>
<th>Freight</th>
<th>Broad Gauge</th>
<th></th>
<th>Metre Gauge</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average cost of haulage per ton-(nps)</td>
<td>Average charge per ton-mile (nps)</td>
<td>Average cost of haulage per ton-(nps)</td>
<td>Average charge per ton-mile (nps)</td>
</tr>
<tr>
<td>Coal carried for public use</td>
<td>3.85</td>
<td>3.33</td>
<td>5.70</td>
<td>3.33</td>
</tr>
<tr>
<td>Revenue-earning freight except coal</td>
<td>5.28</td>
<td>6.30</td>
<td>9.18</td>
<td>7.13</td>
</tr>
<tr>
<td>All revenue-earning freight</td>
<td>4.48</td>
<td>5.86</td>
<td>8.46</td>
<td>7.25</td>
</tr>
</tbody>
</table>

Average charges below average cost of freight haulage (excluding coal):
- Grains: 4.68 nps
- Salt: 5.05 nps
- Iron Ore: 5.70 nps
- Marble & Stone: 6.03 nps
- Manganese Ore: 6.79 nps
- Cement: 7.53 nps
- Wood: 7.58 nps
- Other ores: 7.63 nps
- Oil seeds: 6.95 nps

Average charges above average cost of freight haulage (excluding coal):
- Marble & Stone: 5.80 nps
- Sugar: 9.27 nps
- Wood: 6.30 nps
- Oil Fuel: 9.59 nps
- Other ores: 6.37 nps
- Oil seeds: 6.93 nps
- Vegetable Oils: 7.46 nps
- Iron Ore: 7.33 nps
- Iron & Steel wrought: 9.48 nps
- Oil fuel: 6.64 nps
- Cement: 9.85 nps
- Cotton: 14.80 nps
- Cotton Manufactures: 16.00 nps


The estimated cost of haulage includes interest at 3% per cent. The cost of haulage of coal is approximated. The railways have been unable, on the basis of their existing records, to make estimates of the cost of transporting any particular freight except coal.
Overlooking the Arabian Sea at Bombay stands a gigantic new building. It's named 'Yogakshema'—a Sanskrit word connoting 'welfare'—a very apt name for the headquarters of the LIC, which the Prime Minister, Shri Jawaharlal Nehru opens on Thursday, December 26, 1963. We hope the LIC policyholders everywhere will share our joy on this occasion. Because 'Yogakshema' is more than a very handsome six-storey edifice—it's a statement of trust by the Corporation in the future of life insurance in India. And it is the measure of stability of an institution which guards the future of many millions.

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due for Higher Freight Rates

The aim of the subsidy to coal freight-rates (which cost Rs 6 crores ill 1959-60) was ostensibly to give a general stimulus to industrial development. However, this subsidy to coal has been financed from charges on other industrial freight, like high rated manufactured and processed goods (cotton, iron and steel, cement, manufactures, sugar and vegetable oils). Moreover, these industrial freight have also borne the cost of subsidising passenger services and probably foodgrains and salt charges. This policy is most unlike-ly to have given a net stimulus to industrial development in general. If charges were more closely relat-ed to costs, and the subsidy to coal charges had been financed from general government revenues, a more effective stimulus to industry would have been given.11

Foodgrains and salt freight charges have also been kept very low and possibly below their cost. This policy was clearly based on equity considerations. Although only 70 per cent of total foodgrains production and imports are carried by rail, this is the portion which is marketed. A large revision of food-grains freight charges would have had a considerable effect on the price of food to urban low-income consumers especially. However, if the burden of this subsidy had been planned on general Government revenues, this would have reduced the distortion of the freight rates structure. Salt concession rates also fall into the same category although expenditure on salt constituted a smaller part of the budget of low-income consumers than foodgrains or high-rated sugar.

Freight charges generally should have been raised more drastically. For much of the 1951-60 period the demand for wagons exceeded the supply of wagons and freight transport over long distances met little competition from road transport.13 A rise in freight charges would have increased the surplus earnings of railways and made a more substantial contribution towards the high level of fixed capital formation during this period.

It would, of course, have raised costs for industry as a whole but there is little reason to believe that the growth of Indian manufacturing industry would have been seriously impeded by such a policy. Indian industry has largely served the domestic market and has been heavily protected against foreign competition by tariffs and stringent foreign exchange controls during this period. Domestic demand for manufactured goods has been buoyant and if prices of manufactured goods had been raised this would have had little effect on the cost of living index for working class families.

Conclusion

Altogether, there has been scope for the railways to raise their sur-plus earnings substantially to help finance their large investment programme.

As I M D Little has said "where it can be seen that a particular in-dustry could make good profits without any apparent 'distortion' of output, then it seems manifestly wrong that it should throw the whole burden of finding the savings required for its own investment on to the government or the rest of the economy."13 Railways did find some of their own savings: between 1955-6 and 1959-60, the total railway surplus of Rs 105 crores financed rather less than 20 per cent of their estimated net fixed capital formation. Rs 256.4 crores and more than 50 per cent was financed by domestic borrowing or running down the depreciation reserve fund. However, private large scale undertakings financed a much higher proportion of their investment from re-gained profits. Data collected by the Taxation Enquiry Commission 1953-4, showed that, from 1946 to 1951, retained profits constituted 57 per cent of net fixed capital forma-tion by 448 private manufacturing companies.14 It is true that a policy of higher charges to make the rail-ways earn a larger surplus Represents a form of indirect taxation which could be regressive in its effects. This might be true for in-creases in rail passenger fares. But there is not likely to be a signifi-cant effect on low income groups from a rise in industrial raw mate-rial freight charges. In any case, it was unlikely that surcharges on rail-way services would have been more regressive in their effects than the existing system of indirect taxa-tion.15 It seems more expedient to have adjusted charges on public undertakings to ensure substantial surplus earnings for reinvestment wherever possible rather than allow increased purchasing power to re-main in private hands and try to raise finance for investment, with more difficulty, through market loans, small savings and a tax sys-tem which is slow and subject to evasion.

Notes

1 Ton-miles of freight and passenger miles are not interchangeable.
2 The main sources of data on railways have been the Railway Board Reports (Annual), Vols I and II
3 Quoted in "The Economic Weekly" 8 September, 1958. p 1159.
4 The coefficient of localization of coal mining in India in 1951 was 0.67 (P S Florence index). This coeffi-cient was calculated by using the State-wise distribution of employment in coal mines.
6 This average cost was calculated by weighting costs and charges by the share of traffic carried by the broad and metre gauges. It ignored the narrow gauge railways which carry a very small volume of freight.
7 The higher costs on the metre gauge system probably stem from the location of these lines. There are few in the main industrial areas and they are concentrated in areas like the south of Madras State, Rajasthan, Kutch and Assam, where the density of freight traffic is lower. Net ton-miles per route-mile (per year) and per engine-hour were very much lower on the metre gauge than the broad gauge (see "Railway Board Report", Vol II, Statistics). Indivisible costs (which would include a substantial proportion of wages and salaries) are not spread so effectively over a larger ton-mileage as on the broad gauge system. It is also noticeable that cost per ton of coal consumed as fuel, on the metre gauge, was gene rally higher than on the broad gauge, presumably because of the greater re moteness of most of these lines from the coal mining regions.
8 Except for iron ore on the metre gauge where charges just equal the cost of coal haulage.
9 It is interesting to note that the "Preliminary Report on Transport Policy" makes a different calculation. It shows that charges for grains have lagged behind the rise in the overall level of charges, between 1938-9 and 1958-9. It calculates that, if grain rates had risen at the same pace as other rates, the extra earnings from grain freight in 1958-9 (given the same volume of freight) would have been Rs 15 crores. The surplus earn-ings of railways in 1958-9 were Rs 16 crores.
10 It has been estimated above that the loss on passenger traffic may have been about Rs 18.4 crores in 1959-60.

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The subsidised rates for coal have also altered the ratio of raw material costs to finished goods costs. Together with the more rapid taper of rates, for coal and ores compared to finished industrial goods, over long distances, this policy would, by itself, have encouraged the dispersal of industry from the geographically concentrated coal and ore mining areas. This policy, however, has been carried out in isolation by the railways and not as part of a national integrated plan. For example, there were disparities in electricity tariffs in neighbouring States (see "Third Five Year Plan", p 406) and these could well have had effects on the location of industry which nullified those intended by the railways.


ibid, p 68. It is noticeable that revenues from highly regressive excise duties rose from 15 per cent to 28 per cent of total tax revenues, between 1951 and 1959.

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