

POLICY BRIEF

The Economic Cost of the State-Owned Enterprises (SOEs): A Market Based Solution

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Motivation of the study

Pakistan Railway is a very important SOE in Pakistan because it is giving a huge employment to the people of Pakistan. Initially in 1950-55 PR was giving employment to 100,734 citizens which was later increased to 137,730 in 1975-80 where the currently PR total employees are 67,627 in the year 2018-19 (Railways, 2019). The governance failure has declined the efficiency of Pakistan Railway and the railway had to burden huge losses on the Pakistan economy.

According to (Ahmed, 2021) PR has suffered Rs. 1.19 trillion losses in the last three years. In the year 2018-19 Pakistan Railway has suffered a loss of Rs. 32.7 billion, Rs. 50.15 billion in 2019-20 and 36.28 billion in the initial eight months of the fiscal year 2020-21.

Pakistan Railways importance and expectations are rising and the organization efficiency of service and quality is declining (Nayak, 2021). The deteriorating conditions of Pakistan Railways have started after the Independence of Pakistan in 1947 (Malik, 1962). The transport policy of Pakistan was favored as a pro-road in the Second Five Year Plan (Planning Commission, 1960). The amount which was allocated to the PR was very low as compared to the amount allocated for the roads (Imran, 2009). This policy of preferring roads over the railways have declined the performance of PR. Because of the lack of investment, the railway lost to compete in passengers' traffic and freight traffic (GOP G. , 2013-14).

Insufficient investment is the main reason for deterioration. The rising passenger and the employees of railway shows a generalized issue of over-employment and corruption, which have burdened the enterprise and become worse in an era in doing business. When the state itself is financially inefficient with the declining tax/GDP ratio have arose the issues of financially efficiency. In the first five-year plan, Pakistan prepared a strategy to recover track first and the rolling stock later (GOP, 1957). This plan was never followed. Both the rehabilitation of rolling stock and the Track length was declining. The strategy didn't match at the time with the state findings, which was declined in the macroeconomic difficulties in the recent years.

Pakistan Railways can be summed up as a system of utilized and superfluous capacity. The demand for railways is deprived. The population is increasing by 2 percent annually and the Gross Domestic Product (GDP) by 4-5 percent. The environment degradation and energy deficit are increasing. Petroleum imports are the one-third of the total imports. About 35 percent fuel mix for power generation is based on oil. The cost of generation of oil is increased due to the increased in the prices of oil (SBP, 2013). Environmental degradation cost in Pakistan is around 6 percent of the GDP and to the airborne lead pollution the contribution is 0.7 percentage points (Bank, 2006). For environmental sustainability and economic productivity, the intermodal transport policy is very important.

This study validates the economic efficiency of Pakistan Railways using the Data Envelopment Analysis (DEA) for the time series data from 1970 to 2019, years are treated as a DMU (Decision Making Units) for the analysis of Product Efficiency, Earnings Efficiency and Financial Efficiency.

Data

The data collection includes the Quantitative methods, where the quantitative data is collected from the (Year Book 2018-19) of Pakistan Railways. The data includes two type of variables for the analysis. First are the Input variables and second are the Output variables. Both the Input and Output variables are collected for the product, financial and earnings efficiency analysis.

The time series data includes the total number of years 50 years from 1970-2019.

Data Description

A framework for the study is developed to analyze the economic efficiency of the deteriorating conditions of Pakistan Railways using the DEA (Data Envelopment Analysis) model. The study is divided in three types of efficiency analysis. The Product Efficiency, Financial Efficiency and Earnings Efficiency.

Table 1: Data Description of Efficiency Analysis

	Inputs	Outputs
Product Efficiency	1. No. of Employees 2. No. of Locomotives 3. No. of Freight Vehicles 4. No. of Passengers Vehicles	1. Passenger KM 2. Fright KM (all variables in thousands)

Earnings Efficiency	1. Average Rate Charged per Passenger KM 2. Average Rate Charged per Ton Per KM (all variables in Rupees)	1. Average Revenue per Passenger 2. Average Revenue per Ton (all variables in Rupees)
Financial Efficiency	1. Operational Fuel 2. Repair and Maintenance 3. Operating Staff 4. Operation other than staff and fuel 5. Administration expenses 6. Miscellaneous expenses (all variables in Millions)	1. Fright Earnings 2. Passenger Earnings (all variables in Millions)

Methodology

In this study a methodology is developed to estimate the performance of Pakistan Railway. Following the methodology of Tahir and Tahir (2020), Window analysis is used to analyze the efficiency change in the efficient unites by tracking them over time. This study is based on the basic CCR-BCC DEA Output Maximization Model for estimation of product, financial and earnings efficiency. The Years of the periods are treated as a DMUs (Decision Making Units) from 1970-2019. If there are ‘n’ units and ‘k’ periods of time, ‘nk’ units need to be assessed simultaneously. It is the moving average method of measuring efficiency in each DMU over the period of estimation. Each time period is a single DMU which is compared with another DMU in the same year (Ramanathan & Ramanathan, 2011).

To find the frontier of inputs and outputs, DEA uses linear programming. Value of 1 is assigned as efficiency score when comparing it with other units and value of less than 1 represents an inefficient unit. Inefficient units show deviations from the production frontier. After estimating the efficiency scores, cross-evaluation matrix introduced by Sexton et al. (1986) was used for complete ranking in DEA. This matrix calculates efficiency of each DMU n times by using optimal weights. It uses the concept of peer evaluation method to rank efficiency scores (Sueyoshi & Goto, 2001).

Results

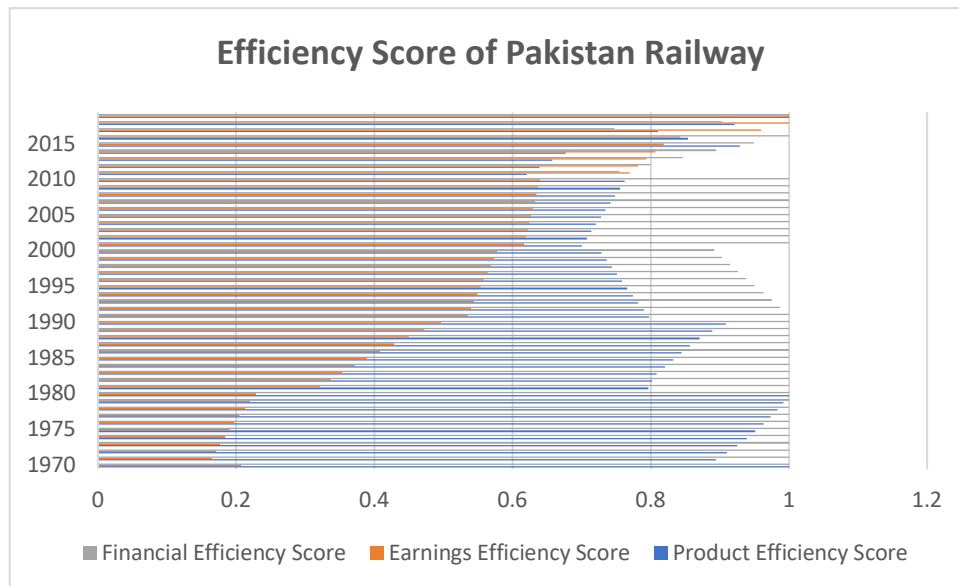


Figure 1: Efficiency Score of Pakistan Railway

Source: Authors estimation.

The results showing the efficiency score of Pakistan Railway in the above graph for Product, Earnings and Financial efficiency. The efficiency score is ranging from 0 to 1, where 1 means efficient and less than 1 is considered to be inefficient. The results estimated that Pakistan railways has lost the product and earnings efficiency over the years. Various studies validate that the importance of maximizing the revenue is important, but the structure of cost and the cost effectiveness needs to be considered. This study estimated that the product inefficiency leads to the earnings and financial inefficiency. The outputs Pakistan railway is producing can be produced with fewer inputs. This shows the mismanagement and political interference in the context of policy formulation which resulted the inefficiency.

Policy Recommendation

After analyzing the performance of Pakistan Railway, the policy recommendation to improve its performance would be to adopt a market-based approach. The market-based approach could be demand oriented.

1. Firstly, the government shall refine its policy of increasing passengers' trains and reducing the freight trains. The passenger's trains had travelled thousands of kilometers

without the good number of passengers carried. This policy had lost the competition of freight trains with private logistic companies. Because freight trains have not shown significant improvement in the past.

2. Secondly, the government shall focus on the inputs which produce outputs, for instance, the infrastructure and the rolling stock are the inputs which produce the outputs of track kilometers for both passenger and freight. The infrastructure is in a very bad condition which is eating the highest amount of repair and maintenance cost and increase the operation cost. A dire need of investment is needed to improve the infrastructure.
3. Thirdly, PR should increase the electrification capacity. The electric locomotives are very rarely used in PR. While our neighboring country India have increased significantly their electric locomotives.
4. Fourthly, Pakistan Railway shall be autonomous in their decisions. The Track Access Policy was initiated in 1993 and in 2021 the policy is not in developed. This shows the lack of incompetency and political interference in the decisions of PR. Various years the enterprise was run by not a railway personal but was run by various groups of civil servants and Army Generals. Such inductions bring barriers in the policy formulation which needs to be adjusted in a positive manner.
5. Fifthly, Pakistan government shall invest in Pakistan Railway because railway is environmentally friendly transportation. Adopting road policy in 1960 have increase the roads everywhere and polluted the environment of every city. Investing in railways will protect the environment from pollution.
6. Last but not the least, PR shall start ML-1 as soon as it possible because with the ML-1 the PR infrastructure will be developed. The private sector will be given the opportunity to take benefit of the PR track.

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