CHAPTER 1
INTRODUCTION

1.1. Research Object Overview

1.1.1 PT KAI (*Persero*) Profile

PT Kereta Api Indonesia (Persero) (abbreviated as KAI or PT KAI) is an Indonesian state-owned corporation that provides rail transportation services. PT KAI transports both passengers and freight. To encourage Perumka to become a commercial firm, the government issued Government Regulation No. 19 of 1998 on the Transfer of the Form of *Perusahaan Umum* (Public firm/ Perum) Kereta Api into *Perusahaan Perseroan* (Persero) on February 3, 1998. After that, the name was changed to Perusahaan Perseroan (Persero) PT Kereta Api, also known as PT Kereta Api (Persero). Under its new status, the Company now operates as a profit-oriented commercial entity. The government provides Public Service Obligation (PSO) cash to allow a public service organization to continue performing one of its functions.

The House of Representatives enacted Law Number 23 of 2007, which stressed that private investors and local governments were given the chance to administer rail transportation services in Indonesia, at the end of March 2007. As a result of the legislation's adoption, PT KAI's monopoly on railway operations in Indonesia was essentially ended. On May 11, 2010, the Board of Directors of PT Kereta Api (Persero) issued Board of Directors Instruction No. 16/OT.203/KA-2010 regarding the name change from PT Kereta Api (Persero) to PT Kereta Api Indonesia (Persero) or KAI.

PT Kereta Api Indonesia (KAI) is the national rail way company of Indonesia, responsible for the operation of public rail transport in the country as the pioneer and only company operating the rail transportation in Indonesia.

Figure 1.1 Logo of PT KAI

Source: PT KAI (Persero), 2022

1.1.2 Vision and Mission

In order to continue growing in transportation industry, especially train mode, PT Kereta Api Indonesia (Persero) has to be update in accordance with the purpose, vision, and mission of the company. The vision is "To be the best transportation ecosystem solution for Indonesia". While the misson of PT Kereta Api Indonesia are:

1) To provide a safe, efficient, digital-based, fast-growing transportation system to meet customer needs.
2) To develop integrated mass transportation solutions through investment in human resources, infrastructure, and technology.
3) To promote national development through partnerships with stakeholders, including initiating and implementing the development of important infrastructure related to transportation.

1.2 Research Background

The transportation industry and business in accordance with its development in the process of production and service affect the particular part in the economic and social aspects in the societies, improving the capability, ability, and quality of the industry in accordance with great effects on the social and economic activity of other sectors. Transportation is a very important means of supporting the success of development, especially in supporting the economic activities of the

community, including in rural areas. The existing transportation system is intended to improve population mobility services and other resources that can support the economic and social growth of rural areas (Perhubungan, 2017).

The three different modes of transportation such as land, sea, and air are categorized according to the context of the road or the surface of the road and also according to the mode of transportation. (Kamaluddin, 2003). The first type of transportation, namely land transportation, is any form of transportation that uses roads on land to transport passengers or goods. The second type of transportation, namely sea transportation, is transportation that is suitable for archipelagic countries consisting of waters and suitable for transporting large goods that require more space. The last type of transportation, namely air transportation, is the latest option of transportation due to its high cost and high technology in the process.

From the three types of transportation listed above, people use land transportation the most. Compared to other modes of transportation, land transportation provides a broader variety of modes. Land transportation is a component of the national transportation infrastructure that contributes significantly to the economic development of a region. Regions that have land transport networks will have faster economic growth than isolated areas (Badan Pusat Statistik, 2020). As the railway transportation is an important part of the railway transportation system.

The mobility of Train transportation in Indonesia especially in Java island and specifically commuting in Jabodetabek area has high demand. Over time, PT KAI (Persero) has change in companies form as a commercial company in 2007. The rail transportation in Indonesia covering the Java island and some Sumatra area. As a single operated company in rail transportation, PT KAI has no objective to compete in a way of making comparison in area of performance.

The performance productivity of these Railway and Train industry is not evaluated comprehensively till date, and no studies seem to be available on the subject in the literature. Given that the scope of operational, including passenger

transportation, cargo movement, train route system, and commercial facilities, essentially evaluating their performance to optimal allocation of resources and providing technical infrastructure is particularly needed. One of the Indonesian land transportation mode is train.

Train or rail industry in Indonesia organized by the government namely PT Kereta Api Indonesia (*Persero*). By the data shown below, PT KAI has the minimum number of accidents per year.

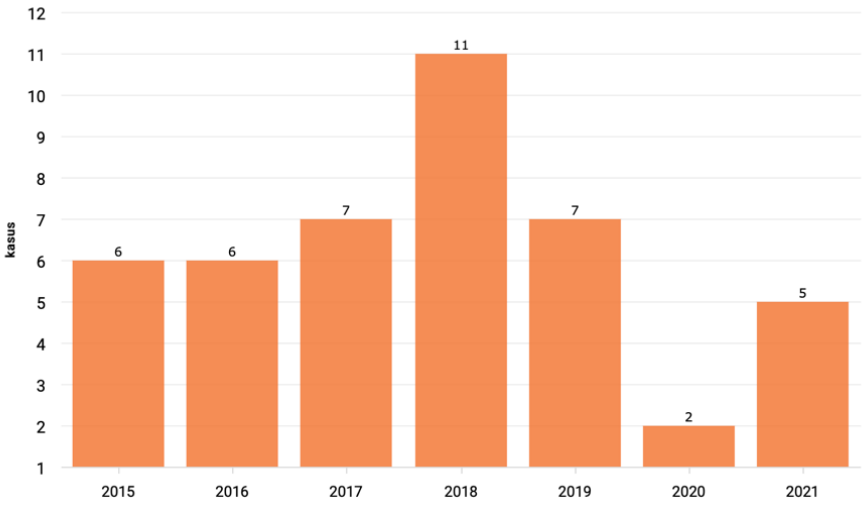

Figure 1. 2 Number of Railway Accidents, 2015 – 2021

Source: Databoks, 2021

Number of Accident in Train (see Figure 1.2) from 2015-2021 is slightly low. As shown in the figure, in 2015 and 2016 there are 6 accident. However, in 2017 increased, one case to 7 case of accident and become higher which is 11 case in 2018 which resulting in highest number during the period. In 2019 decreased by 7 cases. Continue with 2020 with lowest case of accident, only 2 cases then increased to 5 cases in 2021. Thereby, rail transportation mode become one of the most safest transportation mode that available in Indonesia.

Train transportation is one of the safest transportation, supported by the data of accident by year above. Therefore, the number of usage on train transportation increase the revenue of PT KAI *(Persero)*. The data below shows the revenue by year period during 2011-2021.

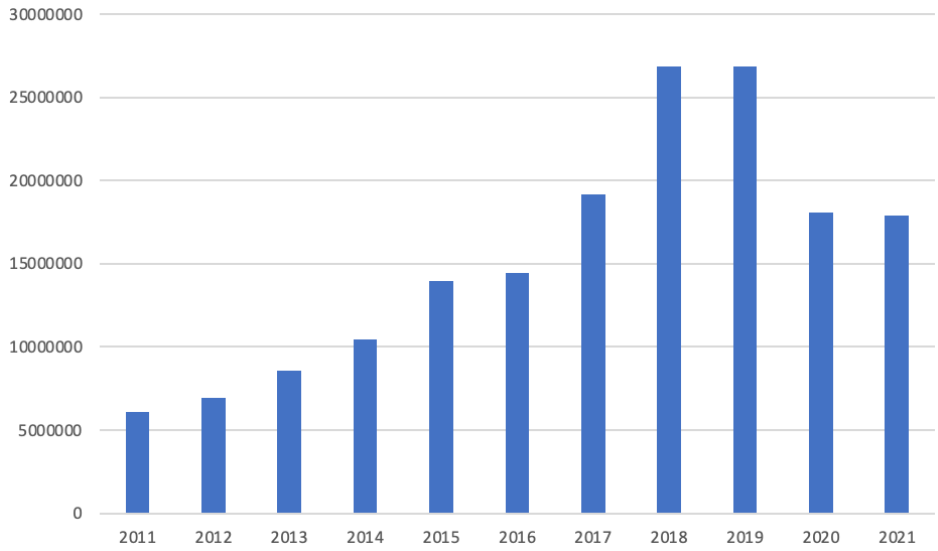

Figure 1.3 Number of Revenue , 2011-2021

Source: Company Profile PT KAI (2023)

From the Figure 1.3, the data shows in 2011, the revenue of PT KAI is at 6.094 trillion rupiah. In the next year the revenue increase to 6.966 trillion rupiah. 2013 increased by 8.600 trillion which in the next year slightly increase to 10.478 trillion as the next 4 years always increase the revenue to 26.864 trillion. But then, 2020 has fallen by pandemic effect the revenue comes down by 18.074 trillion as well as 2021 to 17.916 trillion rupiah. The PT KAI service transporting people from one place to another also the cargo load that become the company's main revenue. The table below shows the number of passenger movements by pax and also the number of cargo loaded by the ton.

Table 1.1 Rail Transport Traffic Movements PT KAI (*Persero*)

Description	Passenger Movement (Pax)	Cargo (Ton)
2012	202.881.026	22.079.119
2013	221.700.101	24.710.000
2014	280.331.927	30.685.307
2015	257.530.195	29.717.399
2016	280.588.767	32.494.599
2017	394.134.634	40.060.714
2018	423.846.257	45.236.309
2019	429.259.565	47.621.204
2020	186.832.349	45.125.346
2021	154.537.582	50.261.778

Source: PT KAI (Persero), 2022

From the Table 1.1, shows that the passenger movement (pax) in 2012 have number of 202.881.026 pax and cargo 22.079.119 ton. Increasing in the next 2 year, which has 280.331.927 pax and 30.685.307 ton cargo movement. Decreasing on the next year, 2015 with 257.530.195 and 29.717.399 ton of cargo movement. While in the next 4 year, the continous growth relatively high with the number of 429.259.565 of passenger and 47.125.346 ton of cargo movement. In 2020, the graph was going very low on Passenger movement decrease to 186.832.349 while 45.125.346 ton of cargo movement which has the small number of decrease. While in the same year of the pandemic hit, 2021 the number has decrease to 154.537.582 and the 50.261.778 for ton cargo movement as the increase of the number. The Increase number of passenger and cargo on 2016-2019 due to the support by the government on improving the facility and infrastructure. According to KAI, the increase in passenger volume certainly does not necessarily occur casually, besides the continuous service improvement.

The decrease number of passenger movement and cargo in 2020 occur in relation to the government regulation due to the pandemic as stated the rule that is the legal basis for this emergency *PPKM* (Enforcement of Restrictions on Citizen Activities) is the Instruction of the Minister of Home Affairs of *PPKM Darurat* in Java and Bali. The instruction of the Minister of Home Affairs of emergency PPKM with Number 15 of 2021 concerning the Implementation of Restrictions on Emergency Community Activities of Corona Virus Disease 2019 in the Java and Bali Regions (detik.com, 2021). This regulation is supported by the PT KAI (*Persero*) by stricted the health regulation and minimizing the capacity of passenger in the train. Train industry in Indonesia may have some evlolution, in accordance with learning and development of evolution that may occur over the year, performance need to be evaluated in comprehensive way.

To support the process of measurement in efficiency, given that the efficiency of subprocesses in a system is vital in evaluating its overall efficiency (Foroutan & Bamdad, 2021). Based on the occurrence and current financial records, there is a chance of fluctuations in the company's production level from year to year. During the study, (S. S. Roy & Kulshrestha, 2020) states that the operational indicators such as annual Operating expenditure, manpower, Operating Service level, Revenues earned, freight carried, and passenger volumes carried. The goal of Input oriented Models was to decrease inputs while receiving a given output service, whereas the goal of Output Oriented Models was to maximize output services while keeping inputs constant. One of the greenest and safest transportation methods is the railway or train, which is a reliable mode of transportation. The study and enhancement of the effectiveness of the current systems, raising the quality of service, safety, and overall productivity of the system, is the focus of many types of research given the benefits of railway transportation. (Mahmoudi et al., 2020). The result of the revenue process is an outline of operating and non-operating revenues; increasing the number of passengers carried and trains at the station can enhance the station's operational income, necessitating the investment in new railway lines and the improvement of the railway assets. Efficiency is a metric used to assess a company's performance. A

business is said to be efficient if it can maximize output from input or use the least amount of input to produce output. Efficiency is determined by comparing the output to the input. Efficiency is one of the theoretical performance metrics, the performance that drives all other performance inside an organization (Octrina & Mariam, 2021).

Financial measurement element alone becomes insufficient to give a clear view of the actual position of the organization, and it was necessary to add other indicators related to non-financial aspects of performance operational efficiency (Matselva et al., 2020). Since the performance of the annual were not comprehensive for several reasons. First, the measurement on financial parameters performance using financial account, individually. Second, the overall comprehensive performances need to be evaluated as effectivity measurement of input and output. Accordingly, a comprehensive way method, in this case using DEA (Data Envelopment Analyis). As efficiency is significant measure to look and evaluate the improvement of the railway industry in Indonesia. Data envelopment analysis (DEA) can be applied to analyze the efficiency of operational strategies on railway transportation systems (Mahmoudi et al., 2020).

The Malmquist Productivity Index (MPI) technique can possibly be used to estimate the degree of productivity at PT KAI (Persero), which can be observed in the results of processing the specified input and output data. The Malmquist Index is a component of the DEA (Data Envelopment Analysis) approach, which evaluates the productivity level of each corporate organization so that changes in efficiency and technology employed may be seen based on specified inputs and outputs. The Malmquist index is also used to examine changes in performance over time. When looking at the technical development, the transportation sector can be said to be in decent form. Regardless of these circumstances, the company's performance must be appropriately maintained. According to (Octrina et al., 2020) Company performance is related to the company's level of profitability, its ability to work productively, and its efficiency in managing its inputs and outputs. Profitability and how companies manage their inputs and outputs productively and efficiently are two measures of

financial performance, with companies expected to minimize inputs while generating optimal output.

This study is based on earlier research provides to the existing literature on production economics by encouraging increased productivity and provides new empirical evidence of productivity growth and technological change that is constantly evolving in this business sector.

The data availability formed the factor in the choice of indicators variable. As stated in journal from (S. S. Roy & Kulshrestha, 2020), the models formulation use the input oriented models to minimize the Inputs while obtaining a fixed output service. In this study, A number of variables are used as a guide to determine the productivity of a rail transportation company. The inputs used are Manpower and OPEX (Operating Expenditure). The output variables can be seen are Passenger, Cargo, and Revenue.

Based on the results of previous research conducted by Roy & Kulshrestha (2020), it shows that the above variables drive the productivity growth that occurs in the train industry. The various approaches include the growth accounting approach, the index number approach, the econometric approach, which determines what level of output can be produced at any point in time given the existence of a particular amount of various inputs, and the total productivity of factors (Petrovic et al. 2015).

Malmquist index is a well-known indicator of productivity change in the rail industry and other industries. The overall change in productivity is measured, and the influence of technical advancement and efficiency improvements on productivity growth is estimated. The statistic is utilized by policymakers, regulators, and management to evaluate the performance of rail firms and find areas for improvement. Comparatively to other companies in the same industry, the Indian railway company's station modernization, improved governance, establishment of an independent Railway Regulator, and introduction of private partners as a source of capital, professional know-how, and managerial expertise are all measures that could significantly contribute to the efficiency improvement of the Services. From this research, it is said that rail industry entails an improvement both technical and technological efficiency. After we observe the phenomenon and collect the necessary

data, we will name the study as “Analysis of Productivity at PT Kereta Api Indonesia (*Persero*) using Malmquist Productivity Index”.

1.3 Problem Statement

The Rail transportation sector in Indonesia is growing rapidly. Therefore, people worldwide, especially in Indonesia, feel the importance of the presence of this mode of transportation. In the background discussion, PT KAI (*Persero*) is a company under the direct control of the government and importance related to the population density, economic growth, environmental sustainability, and safety of mode transportation in accordance with demand for transportation. Currently, PT KAI is the only company runs the rail transportation in Indonesia. As the supply of the service will be centralized on PT KAI (persero), the company growth are relatively in the bare minimum. The usage of train and cargo still can be increased with the improvement from PT KAI. The details related the problem over a year will be analyzed as the key factor of efficiency and effectivity. Since the indicator of performance in the annual financial report were not comprehensive for several reasons. First, the measurement on financial parameters performance using financial accoutn, individually. Second, the overall comprehensive performances need to be evaluated as effectivity measuremenent of input and output. Accordingly, a comprehensive way method, in this case using DEA (Data Envelopment Analyis) specifically Malmquist Productivity Index (MPI).

The authors decided to conduct a the financial performance analysis of this company using the DEA (Data Envelopment Analysis) as the methodology due to the multiple inputs and outputs will be used specifically, the Malmquist Productivity Index. While, the SFA tend to not meet the objective of research due to the technical error occur as well as the requirements of assumption. So, to analyze the performance of money management at PT KAI (*Persero*) the questions to be studied is:

How are the productivity at PT KAI (*Persero*) using the Malmquist Productivity Index?

1.4 Research Purpose

Based on the formulation of the existing problems, This study's goals are as follows: To find out the productivity at PT KAI (*Persero*) using the Malmquist Productivity Index.

1.5 Benefit of Research

Based on the research objectives to be achieved, this research is expected to have direct and indirect benefits. The benefits that can be taken in this research are as follows:

1. Theoretical Aspect

   For further researchers, it is hoped that they can provide knowledge and understanding of productivity that is processed using predetermined input and output variables. So that it can provide broad thinking for further researchers regarding knowledge related to productivity levels with the Malmquist Index Productivity (MPI) approach in the tourism industry, especially the rail section on company productivity.

2. Practical Aspect

   For companies, it is expected to provide important information for company management in making decisions to optimize inputs and outputs variables.

1.6 Research Systematic

Writing in this study consists of 5 chapters consisting of several sub-chapters. The systematics of research writing in outline are as follows:

CHAPTER 1: INTRODUCTION

This part outlines the research's foundation, including the following points: Overview of Research Objects, Research Background, Problem Formulation, Research Objectives, Research Questions, Research Benefits, and Systematics of Final Project Writing.

CHAPTER II: LITERATURE REVIEW

This section discusses the theoretical basis used to conduct this research and as a basic theory that helps solve the problems in this research, some of the points discussed are Theory, Previous Research, Framework, and Hypotheses.

CHAPTER III: RESEARCH METHODS

This section discusses the methods used to conduct research, some of the points discussed are Types of Research, Operational Variables, Implementation Stages, Population and Samples, Data Sources, Data Analysis Techniques.

CHAPTER IV: RESEARCH RESULTS AND DISCUSSION

This chapter discusses the description of research results and discussion of research results from the data that has been collected and discusses research analysis to test hypothesis analysis.

CHAPTER V: CONCLUSIONS AND SUGGESTIONS

This chapter discusses the findings of the study that was conducted in response to the problems raised and suggestions that can be used as references or recommendations for actions that can be used by related parties.