

**UTILIZATION OF STANDARD GAUGE RAILWAY AND
ORGANIZATIONAL PERFORMANCE OF LARGE
MANUFACTURING FIRMS IN NAIROBI COUNTY**

BY

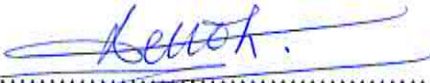
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**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF BUSINESS
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
AWARD OF THE DEGREE OF MASTER OF BUSINESS
ADMINISTRATION, UNIVERSITY OF NAIROBI**

2021

DECLARATION

This project is my original work and has not been submitted to any university for examination or issuance of a degree.

Signature  Date 09-12-2021

Dennis Mogare Ogechi

D61/65363/2010

The project has been submitted with my authority as the university supervisor.

Signature:  Date: 09-12-2021

ERNEST AKELO

DEDICATION

I dedicate this research project to my parents – my late dad, Samson Ogechi and my mum, Tabitha Ogechi for their support and wise counsel over the years. Equally my children Jayden Mogare and Bilha Mogare deserve a mention for keeping me grounded and for the time stolen from their young lives in order to accomplish this project.

KNOWLEDGEMENT

I am indebted to my supervisor, Mr. Ernest Akelo for his guidance and wise counsel while undertaking this research and subsequent reporting. I am also grateful to the staff and management of the large manufacturing domiciled in Nairobi for granting me the leeway to gather data from their establishments.

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ABBREVIATIONS AND ACRONYMS

AfDB:	African Development Bank
EU:	European Union
GDP:	Gross Domestic Product
SGR:	Standard Gauge Railway
UIC:	International Union of Railways
USA:	United States of America

ABSTRACT

This study aimed at investigating the impact of standard gauge railway on organizational performance of large manufacturing firms in Nairobi. The research sought to attain two objectives: To determine the utilization of SGR transportation services by large firms in the manufacturing sector based in Nairobi and to establish the effect of utilization of standard gauge railway on their performance. The descriptive survey design was employed. A sample of 89 was carefully chosen from a population comprising of 157 large manufacturing entities domiciled in Kenya's capital, Nairobi. The sampling technique applied was stratified sampling. Structured questionnaire administered to procurement personnel in the large manufacturing enterprises in Nairobi were used to obtain primary data. The mode of data analysis entailed determination of not only descriptive but also inferential statistics. The research established that large manufacturing firms based in Nairobi have embraced SGR transportation services to a great extent in the transportation of bulky materials as well as heavy machinery. The firms have also adopted the SGR transportation services to a moderate extent in transportation of partially manufactured products and transportation of raw materials to the factories. However, adoption of the SGR transportation services in transportation of obsolete products for disposal and return of defective products from end users. The SGR transportation services have also enabled the large manufacturing firms in Nairobi to reduce supply chain lead time, reduce costs associated with multiple inventory handling, reduce stockouts, reduce breakage shorten lead time for delivery of raw materials to a great extent. However, SGR does not seem to have enabled the large manufacturing firms in Nairobi to reduce prices of finished products significantly. reveal a significance level of 0.000 which show that the association between utilization of SGR and organizational performance was statistically significant. The regression coefficient results indicate that a unit change in utilization of SGR services results to 0.28 units positive and statistically significant change in organizational performance at 95% confidence level ($\beta = .288$, $t=4.31$, $p<0.006$). The study concludes that SGR transportation services have a statistically significant effect on the organizational performance of the large manufacturing firms in Nairobi. The study recommends the government should invest more in expansion of the SGR network to major towns and cities in order to allow wider usage. Manufacturing firms are also encouraged to utilize SGR services in order to realize the full potential and benefits of this mode of transportation throughout their supply chains where possible.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The contemporary environment in which businesses operate is highly dynamic and turbulent in nature. It is characterized by rapid changes in technology, globalization, frequent shifts in consumer tastes and preferences as well as stiff competition among business enterprises. Firms must therefore improve their operations in order to remain competitive. Developing countries are equally evaluating ways through which they can enhance their economic growth and achieve economic development. One of the most crucial tools that have contributed greatly to the economic growth of most of the industrialized countries is the existence of a good railway network for transportation of goods and people (Tolulope & Taiwo, 2011).

Researchers have indicated that railway transportation services play crucial roles towards the economic prosperity of any nation. Atack et. al., (2009) carried out an investigation to ascertain if availability of rail transportation led to growth of the economy in Midwest America between 1850-1860. The findings from their study revealed that improvement of rail led to economic prosperity. Similar positions were also held by other researchers such as Herranz (2011) in Latin America, Margo and Haines (2006) in the United States of America as well as Herranz-Loncan (2011) in Uruguay. These are only a few studies among the very many that have revealed that railway transportation plays a very critical role as far as economic growth is concerned.

In the recent decades, most African countries have realized the significance of rail transportation and as such a number of countries have been undertaking costly and challenging transportation infrastructure involving rebuilding of their railway networks. These decisions have been informed with the fact that railway transport is considered the most efficient and affordable

means of transport especially over long distances for both goods and people. The rebuilding of the railway networks among the African countries has come based on the realization that the colonial railway network has outlived its usefulness and did not add value to economic growth and development. Instead most countries have struggled to sustain the operations of the colonial railways (Sequeira, 2013).

Kenya is among the African countries that have undertaken costly and challenging transportation projects. In the year 2009, China Road and Bridge Corporation signed an agreement with the Kenya Railways Corporation to conduct a feasibility study and prepare preliminary designs for the construction of the Standard Gauge Railway (SGR). These were concluded and as a result the construction of the first phase of the railway began on November 2013 covering a total distance of 472.3 kilometers between Mombasa and Nairobi. This was constructed at a cost of Ksh.327 billion. This first phase of the railway was commissioned on May 30th 2017. The second phase of the SGR is being constructed to Naivasha and will finally proceed to Malaba to link Uganda and Rwanda. The first phase of SGR (Mombasa to Nairobi) that initially became operational as diesel driven is being electrified at a cost of Ksh.49 billion. A total of 609kilometers of rail track will be made electric following a deal reached with Uganda and Rwanda (Nduire, 2017).

1.1.1 Standard Gauge Railway

According to Falco (2012) SGR refers to a rail road whose gauge measures 1,435 Millimeters (mm). The SGR is referred by different names depending on the region and country. Some of the popular names include Stephenson gauge, UIC gauge, International gauge, uniform gauge, normal gauge and European rail. The SGR has turned out to be the most popular rail gauge in most parts of the globe in modern rail transport. More than 50 percent of the rail lines around the

world conform to SGR standards. A number of high speed rails across the world conform to the SGR standards with exception of a few countries. The gap between the interior walls of the rails is 1,435 mm in the SGR in most countries except in America (Falco, 2012).

The standard gauge railway is believed to be traceable back to the Roman Empire. The roman pace of the chariot wheels has since been established to be 1435 mm (The same as the Standard Gauge Railway). However, the introduction of the SGR is credited to the English Railway pioneer George Stephenson who converted a 4ft 8in line to 4ft 8 ½ in gauge to reduce binding on curves. By the year 1846, most of the railway line in the Europe had converted to SGR thus forcing the British government to convert to SGR too. In the same year 1846 a regulation was passed in the United Kingdom commonly referred to as the "*Regulating the Gauge of Railways Act 1846*" that advocated for the use of SGR (The Worker, 1947). The contemporary system of measuring the rail gauge came into existence as a result of a consensus made during the Berne rail conference of 1886. Since then several countries around the world have adopted the SGR based on its advantages of equipment interchange.

1.1.2 Organizational Performance

Brealey et al., (2009) assert that organizational performance refers to the approach through which a firm is organized to attain its objectives and goals and the modality for attaining them. Performance arises from activities carried out by a firm since they provide a nexus with not only the firm's core strategic objectives but also its client orientation and its contribution to the overall economic health of a nation (Salem, 2013). Performance and perpetuating it onto the future is the central focus of all business entities since it will enable them to take a sustainable

growth trajectory. Strategic decision making is a very important factor in management and is arguably a highly significant pointer of a company's performance (Corina et al., 2011).

Organizational performance is a crucial component and must be treated seriously since it is important for any business to survive. Unsatisfactory organizational performance may result to closure of business enterprises. Several factors influence whether an organization succeeds or not. These include the ability to organize financial matters accordingly. There exists evidence of a positive link between financial undertakings including professional financial advice, planning, obtaining external finance, maintenance of financial records and effective financial performance (Ismaila, 2011).

The survey used the balanced scorecard for performance measurement. The balance scorecard is measures both non- financial and financial aspects of performance. The balance scorecard, evaluates indicators of performance such as customer service, performance, employee stewardship and social responsibility. Therefore, the balance scorecard consolidates the management report and performance components that were initially in separate reports in a single report enabling senior managers to view the performance of an organization in a holistic manner.

1.1.3 Manufacturing Firms in Nairobi County

In the East Africa region, Kenya possesses the leading manufacturing industry. This sector adds more than 10% to the country's Gross Domestic Product (GDP), thereby becoming one of the key cogs in the country's economic pursuits. When compared to the other East African countries, Kenya has had a more developed manufacturing sector. However, statistics reveal that the manufacturing sector in Kenya has been growing at a slower pace than the rate of economic growth an indication that the above-mentioned share has been on a downward trend in the recent

past. If this trend persists then the other East African countries are likely to overtake Kenya and dominate the manufacturing sector (Were, 2016). Despite the above challenges Kenya still has an opportunity to develop its manufacturing sector since it is still the preferred investment destination in EAST Africa. With the establishment of the East African community there have been efforts to market East Africa as a preferred investment destination and this may work to the advantage of the manufacturing sector in Kenya (AfDB, 2014).

Nairobi has the highest concentration of manufacturing firms since it is the economic and political capital of Kenya. A large proportion of the manufacturing entities are in the line of producing fast moving consumer goods (FMCG) and in food as well as beverages production. Nairobi has the largest manufacturing firms in East Africa with a total of 17 firms featuring in the Africa Business Magazine as among the biggest firms in East Africa (Were, 2016). A large number of the large manufacturing firms domiciled in Nairobi have subsidiaries or branches in other nations within the East Africa region. Because of the wide range of their operations, the large manufacturing firms in Nairobi require efficient and effective transportation network to enable them transport both raw materials and finished products within the region. For a long time, they have relied on the colonial railway that had many disadvantages the main among them being lack of interconnectivity between the countries. The construction of the SGR is therefore perceived as one of the mechanisms through which these manufacturing firms can improve their operational performance.

1.2 Research Problem

The Standard Gauge Railway provides uniformity and easier connectivity between and among regions and countries around the globe. Approximately 55% of the countries in the world that

have a railway network have constructed the standard gauge railway since it readily supports both multimodal and intermodal transportation as well as equipment interchange. Railway transport is considered as the “*wheels of economic growth*” since it plays a critical role in spurring the growth of a number of countries around the globe economically (Tolulope & Taiwo, 2011). According to the World Bank (2016), manufacturing firms in Kenya experience a myriad of challenges that include: lack of access to financing, unfavorable government policies and unreliable access to infrastructure such as good transportation network.

In Kenya, the first phase of the standard gauge railway (commonly referred to as SGR) between Mombasa and Nairobi was commissioned on 30th May 2017. The commissioning of the SGR saw the first cargo train leave Mombasa for Nairobi. The government of Kenya has adopted a policy direction geared towards provision of lowering the cost for freight transporters with the aim of encouraging more firms to use railway transport in moving their goods from the coastal region to inland depots and further to neighboring countries. This is likely to lead to lower cost of transportation for firms. Studies conducted on the effect of rail transport on performance reveal mixed results. For instance, a study carried out by the World Bank (2017) attempted to link rail transport, road transportation and the productivity of business entities in Tanzania. The study revealed that although rail transport was found to be the cheapest mode of transportation, it was found to be highly unreliable due to poor condition of the colonial rail network. Firms that used rail transport were therefore forced to incur more inventory related costs. Sequeira (2013) also carried out a study linking infrastructure in the transport sector and the performance of firms in South Africa. The research established that access to rail transport had a negligible impact on performance of firms. Nyalwal (2013) carried out a study on the factors that are at the core of influencing the Rift Valley Railways’ performance in Kenya. The research established that

failure to integrate technology into railway transport contributes to a great extent to its poor performance. Wambui (2014) conducted a research on sustainable management of rail land. The research findings revealed that sustainable railway management is necessary in improving the city structure and design.

Studies involving the use of the Standard gauge railway are rare since most African countries are still struggling to reconstruct their railway networks in order to do away with the colonial rail network. Kenya has concluded the construction of the first phase of the SGR and it is already operational between Nairobi and Mombasa. There is evidence of increased use of the SGR to transport goods between Mombasa and Nairobi. However, since its commissioning, no study has been executed to analyze the effect of SGR on operational performance of the manufacturing firms in Nairobi yet there were firms that were already using it. In addition, there are mixed results concerning the effect of rail transport on performance of firms. All the above reasons have precipitated the need to carry out this study in order to bridge the gap. The study was guided by the question; what is the effect of utilization of Standard Gauge Railway on the organizational performance of large manufacturing firms based in Kenya's capital, Nairobi?

1.3 Research Objectives

The study pursued the following objectives:

- i. To determine the utilization of SGR transportation services by large manufacturing firms in Nairobi
- ii. To establish the effect of utilization of Standard Gauge Railway on organizational performance of large manufacturing firms in Nairobi

1.4 Value of the Study

The study's findings will be of utility to a number of individuals/entities. First, the study findings will be of significance to the manufacturing firms domiciled in Kenya. They will be able to understand the benefits of using SGR as a mode of transportation and what they stand to gain. It will also enable them make better and informed decisions concerning transport choices they make.

Second, the study will be of importance to the Kenyan government. It will assist the policy makers in the government with crucial information that will inform policy making concerning railway transportation in Kenya. It will enable them come up with policies that may enhance this mode of transportation.

The study will also be important to future scholars. This is a form of pioneer study since similar studies have not been carried out in Kenya. It will be able to guide future researchers as they explore further concerning the standard gauge railway in Kenya.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section reviews not only the theoretical but also the empirical literature associated with the study. The theories examined include the transaction cost theory, the stakeholder theory and the resource based theoretical orientation. Equally, a survey is done of other studies that have been carried out attempting to link the utilization of standard gauge railway and operational performance of various organizations or industries.

2.2 Theoretical Literature

This research is grounded on three theoretical perspectives. The first one is the Transaction cost theory, the second is the stakeholder theory and the last one is the Resource based view (RBT). We now delve into the details of these theoretical perspectives.

2.2.1 Transaction Cost Theory

This theoretical orientation looks at organizations as a variety of ways through which economic transactions may be organized. The theory posits that if a firm is able to produce or carry out its transactions at a much lower or cheaper cost compared to what prevails in the market, then the firm is bound to progress better. However, in a case where the firm is incurring high costs than what is prevailing in the market, then the obvious occurrence is that the firm may be forced to shrink or exit the market (Williamson, 1981). According to Coase (1937), firms are likely to grow as long as the firm has the ability to carry out its transactions at a lower cost compared to what prevails in the market. According to Williamson (1981), costs related to business activities are likely to increase in situations where a product has to be moved from one level to another.

This theoretical orientation is congruent with the study at hand since the study is based on the understanding that manufacturing firms as organizations are interested in reduction of transaction costs in order to maximize profitability. One of the means through which they can reduce costs is to ensure efficiency in transportation of products and raw materials. SGR therefore has the potential of enabling the large manufacturing firms in Nairobi to realize significant reduction in their transaction costs.

2.2.2 Stakeholder theory

Freeman (2004) defines stakeholders as people who are important or play a vital role that is central to the existence of a firm or an organization. Freeman (2004) argues that if directors do not discharge their duties as required, stakeholders have the right to take appropriate action against them. Friedman (2006) also asserts that a firm or company can be perceived as a collection of various stakeholders hence the main objective of the firm should revolve around the fulfillment and management of the interests of each of the stakeholders. This activity is assumed to be the main duty of the managers of the firm. Therefore, managers have the responsibility of ensuring that their activities are tilted towards satisfying the interests of the stakeholders. In this case therefore, managers are only agents who have been appointed by the stakeholders in order to manage the long term interests of each of the stakeholders.

This theoretical perspective has relevance to the study at hand since the study is based on the understanding that an organization has different types of stakeholders. Logistics and transportation service providers are key stakeholders of manufacturing firms since they make it possible for raw materials and finished products to move from one location to another. Without these important stakeholders the supply chain will be incomplete.

2.2.3 The Resource Based Theoretical Orientation

The RBV theoretical stance contends that firms endowed with strategic resources have a competitive edge over those which do not. Resources for instance cash and vehicles are not viewed as strategic since they can be easily acquired by the firm's rivals. Rather, a resource is deemed strategic based on the degree to which it is rare, valuable, non-substitutable and difficult to imitate. The proponents of this notion propose that firms should undertake an internal assessment of the company to establish sources of competitive advantage rather than evaluating the competitive environment (Barney, 1991). The RBV framework accords resources a critical role in enabling firms to attain higher firm performance.

Resources may be classified into tangible and intangible resources. Physical things for instance buildings, land, equipment, capital and machinery constitute the tangible. Physical resources grant a firm a short term competitive edge due to the fact that competitors can quite easily purchase the same and eliminate any competitive edge enjoyed hitherto. On the other hand, intangible assets are other items possessed by the firm with no physical components. Brand reputation, intellectual property and trademarks are examples of intangible assets. Brand reputation is different from physical assets since it is built over a longer timeframe and cannot be purchased by other firms in the market. Intangible resources are the firm's main source of sustainable competitive advantage (Ovidijus, 2013).

This theoretical stance is congruent with the study at hand since the study relates to the fact that large manufacturing firms require resources in order for them to operate effectively. They require both tangible and intangible resources. They require both internal and external resources such as transportation and logistics services.

2.3 Utilization of Standard Gauge Railway Transport Services

The development of the standard gauge railway has significantly improved railway transport around the globe. Among the areas that have experienced significant improvement is the freight logistics sector where many firms have found it more efficient to transport products and materials using railway transport system. However, the uptake of SGR transportation services in transporting freight across a number of countries around the globe largely depends on a number of factors (Mehta, 2018).

The SGR network is one intermittent system that is spread across different parts of the globe. There is evidence of a number of countries having constructed the Standard gauge railway but many more countries are yet to put up the infrastructure. Lack of uniformity in the construction of the SGR across countries and regions makes it impossible for transportation of products to occur. In cases where transportation traverses different national boundaries extending to regions, lack of SGR infrastructure limits the use of rail transport (Falco, 2012).

In some countries where SGR infrastructure is well developed and properly managed, uptake of this mode of transportation has been very successful. In countries such as China, USA, Japan, India and France SGR has been highly integrated with technology to ensure that the system runs efficiently. This has enabled most companies to adopt railway transportation services in transportation of products and other materials (Mehta, 2017).

2.4 Effect of SGR on Organizational Performance

A review of past studies conducted reveals that very few studies have tried to establish the effect of Standard Gauge Railway transport on organizational performance. For instance, Sequeira (2013) did a survey linking infrastructural development in the railway sector and the

organizational performance of firms. The research focused on countries from the Southern part of Africa. The study findings established that reconstructing the rail linking South Africa to Maputo port had a negligible impact on the transportation costs of the firm. It further revealed that railways' impact on economic endeavors is not only region but also country specific. The findings also indicated that there exists no association between rebuilding the railway and total factor productivity. It was finally established that the infrastructure in the rail sector has a soft side. It's this soft side that has an unsatisfactory performance leading to a moderating effect of rail on firm performance.

Kasimila (2013) also delved into privatization strategy and performance focusing on Tanzania Railways Limited. The study explored how the World Bank engineered privatization of public enterprises in the name of structural adjustment had impacted on the performance of the Tanzania Railways Limited. The application of a case study research design where interview guides and observation were applied as major data collection instruments. It was established that TRL's performance was declining. Privatization in this case failed due to hostile public mood, incompetence of the government and poor quality of the concession process.

Another study was carried out by Frederico and Cavenaghi (2017) on performance measurement in rail freight transportation firms. The research focused on a large Brazillian Railroad company over a longer timeframe due to lack of adequate literature. The study's results revealed that railway transport was key to the transportation matrix in Brazil hence the need to come up with an appropriate way of measuring its performance.

In a study evaluating the performance of rail transportation systems focusing on engineering factors, Azadeh, Salehi and Kianpour (2018) delved into the Tehran railway electrification as the

context. The study, in assessing the performance of rail systems, focused on four principal variables including: safety and resilience, health, and ergonomics. The study made use of data envelopment analysis in a bid to assess the effectiveness of the units engaged in decision making within the railway system. The results revealed an increase in the number of decision making units (67%) and a noticeable growth in mean value of the total efficiency level at 3.6%. The study further revealed that teamwork played a critical role in enhancing railway performance. The study concluded that resilience engineering plays a key role in enhancing system performance.

Oum and Waters (2009) undertook a survey focusing on the efficiency and productivity of rail transport. The study sought to establish the alternative measurement techniques to evaluate the productivity and efficiency of railways. Empirical evidence shows the revolutions and trends in railways over time. A common consensus in empirical studies shows that increased competition via deregulation and regulatory liberalization has improved efficiency. Most European studies document managerial autonomy to drive efficiency. To undertake a more logical comparison efficiency, various operating factors such as the characteristics of a rail network and traffic density should be given less weight.

Lan and Lin (2016) conducted a study, deploying the stochastic distance functions, to assess rail transport performance. The study examined 39 global railway systems between the time frame 1995 to 2002. Where the inputs constituted the number of cars carrying passengers, the cars involved in freight carrying, as well as the employees serving the system. The outputs entailed freight train kilometers, passenger train kilometers and ton –kilometers. The findings revealed that the technical inefficiency of railways and inefficiency in service delivery were adversely

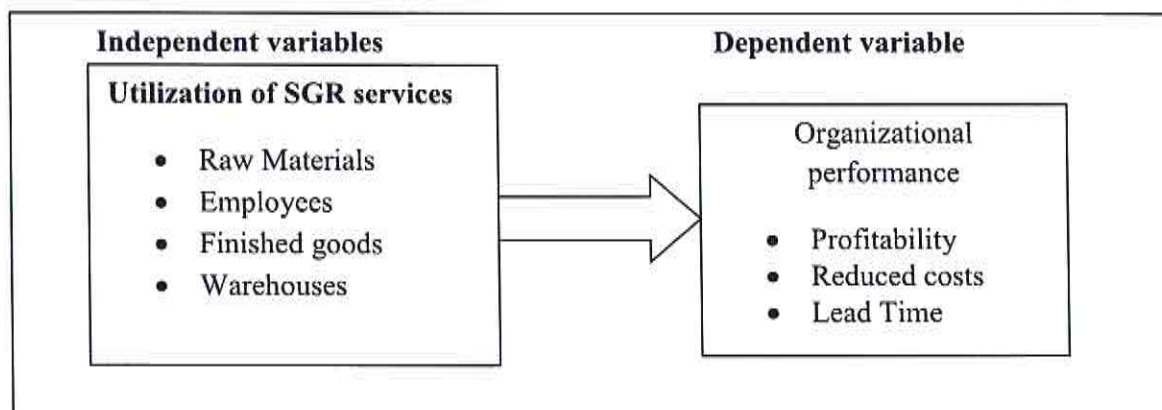
affected by line density, the gross national income (GNI) per-capita and percentage of rail lines that are electrified.

Kinuthia (2012) delved into the potential effect of railway transportation infrastructure on the connectivity of the area referred to as “Nairobi Metropolitan area”. The study’s sample frame comprised several institutions, residents of the community and users of railway network. The findings revealed that there was need to design a plan to provide a framework for effective planning and management in Nairobi Metropolitan. The study recommended the bringing together of all stakeholders to support railway infrastructure as well as engaging in public private partnerships and institutional capacity building.

2.5 Conceptual Framework

A conceptual framework ordinarily illustrates the association between the predictor variables and the exogenous variable. This study had its exogenous variable being utilization of SGR services. The dependent variable was “performance of the large manufacturing firms domiciled in Nairobi, Kenya”.

Figure 2.1: Conceptual Model



From the conceptual framework, the assumption made is that utilization of SGR transportation services by the large manufacturing firms will lead to better or enhanced organizational performance. This was measured using rating based on five-point likert scale.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter delves into the research methodology that was deployed to guided the study on the perceived impact of the standard gauge railway on organizational performance of large manufacturing establishments that are domiciled in Nairobi. Among the main contents of the chapter is a discussion concerning the research design used, the total population for which the study applies, techniques used to of select the sample and how the sample was reached, the type of data collected, the instruments used in collecting the data in question and the data analysis tools deployed.

3.2 Research Design

A research design guides the study by providing guidelines on the data that will be collected and how it will be analyzed. This study on the perceived impact of the standard gauge railway on “organizational performance of large manufacturing firms in Nairobi” was conducted using descriptive design. This is a design that describes phenomena by seeking the opinions of respondents (Kothari, 2005). A descriptive design was considered fit for this research since data was collected during a single period of time. This design also enabled the researcher to ascertain the relationship, if any, that existed between variables involved in the study (Teddlie & Tashakkori, 2003). The research design also assisted the researcher to collect a vast amount of data in a short span (Singleton, 2009).

3.3 Population of the Study

The study’s population comprised of the large manufacturing establishments domiciled in Kenya’s capital, Nairobi. The Kenya Association of Manufacturers (KAM) shows that there

were approximately 250 large scale manufacturers of which more than 63 percent were based in Nairobi. Therefore, the study's population constituted all the 157 large scale manufacturers in Nairobi.

3.4 Sampling Design

Abikoye and Adekoya (2010) define a sample as a number of members taken out of a larger group to participate in a study. It therefore represents a smaller unit that is hived out of a larger one for representation purposes. A sum of 157 large manufacturing establishments were based in Nairobi and it is from this number that a sample for this investigation was selected. Stratified and random sampling was employed in selecting the sample because the manufacturing industry in Kenya is divided into 14 sectors. Each of the sectors formed a stratum from which respondents were selected. The large-scale manufacturers in Nairobi were separated into strata based on the sectors they belong. Then simple random sampling was utilized in choosing the sample from the sectors. A total of 89 large scale manufacturers were selected from Nairobi.

Yamane's, (1973) formula; $n = \frac{N}{1 + N(e)^2}$

Where; n = Sample size

N = Population size (157)

e = the error of Sampling (7%)

Therefore; $n = \frac{157}{1 + 157(0.07)^2}$

Sample = 88.735 ≈ 89 respondents

Table 3.1: Selection of the Sample

Sector	Percentage it represents	Number Selected
Agriculture/Fresh Produce	2	2
Automotive	7	6
Building, Construction & Mining	4	4
Chemical & Allied	10	9
Energy, Electronics & Electrical	6	5
Food & Beverages	23	20
Leather & Footwear	2	2
Metal & Allied	10	9
Paper & Board	9	7
Pharmaceutical & Medical Equipment	4	4
Plastics & Rubber	4	4
Services & Consultancy	10	9
Textiles & Apparel	7	6
Timber, Wood & Furniture	2	2
Total	100	89

Source: Association of Kenya Manufacturers, 2018

3.5 Data Collection

The research utilized primary data sources. This data was largely gathered from procurement personnel of the said large scale manufacturers through a questionnaire. The questionnaire entailed three sections. The first section had questions relating to the respondents' bio-data; the second section contained questions on utilization of SGR transportation services whereas the third section carried questions relating to the effect of SGR on organizational performance.

3.6 Data Analysis

Among the initial steps of data analysis entailed sorting and coding before entering into the SPSS software version 23. The demographic information was analyzed using percentages and frequencies; the uptake of SGR services was analyzed using descriptive statistics such as mean

whereas inferential statistics was applied to compute the effect of utilization SGR on organizational performance. The simple linear regression model that was deployed was as follows:

$$Y = a + b_1x_1$$

Where Y represented organizational performance, which was measured using the average scores of rating from respondents

a represented organizational performance when X is zero

b_1 regression coefficients

x_1 was utilization of SGR transportation services

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

The study's purpose was to investigate the impact of standard gauge railway on performance of large manufacturing firms in Nairobi. The objectives were to measure the uptake of SGR transportation services by large manufacturing entities in Nairobi and to establish the effect of standard gauge railway on lead time and cost of inventories of large manufacturing firms in Nairobi.

4.2 Response Rate

The study's sample size was 89. A total of 89 questionnaires were presented to respondents who were selected from 14 different sectors in the manufacturing industry. A response rate of 70.8 percent was achieved. This implies that the study was successful in data collection hence the study's findings can be used to draw conclusions and recommendations on the entire manufacturing industry in Nairobi. The findings of this study will therefore be generalized on all manufacturing companies in Nairobi.

4.3 Demographic Information Findings

The study asked a few questions aimed at gathering personal biodata that assisted in determining the suitability of the participants in the survey. This section contains the findings on the demographic information.

4.3.1 Designation of Respondent

A request for respondents to indicate their designations was made in order to ensure that only the relevant people participated in the survey.

Table 4.2: Designation

	Frequency	Percent
Procurement manager	20	31.7
Procurement officer	8	12.7
Stores manager	31	49.2
Stores officer	4	6.3
Total	63	100.0

Source: Researcher, 2021

The results of the study elucidated that 49.2 percent of the respondents enumerated were stores managers, 31.7 percent were procurement managers, 12.7 percent were procurement officers and 6.3 percent were stores clerks. It was therefore evident that most respondents were managers in the procurement department who were engaged in decision making hence were able to provide reliable and accurate data.

4.3.2 Duration in Current Job

The investigator inquired the time frame in which the participants had held their current positions. The respondents were provided with different options in terms of the number of years served. They were required to indicate the duration they had served. The results are presented in Figure 4.1.

Figure 4.1: Duration of service

	Frequency	Percent
More than 10 years	28	44.3
7-10 years	20	31.7
4-6 years	13	21.4
Less than 3 years	2	2.6
Total	63	100.0

Source: Researcher, 2021

The research findings that are presented in figure Table indicate that approximately 44 percent of the respondents had held their positions for a time-frame of more than 10 years, 32 percent of the respondents had served in the position for a duration between 7 to 10 years, 22 percent had been in their positions for a duration of 4 to 6 years whereas 2 percent of the respondents had served less than 3 years. This was an evidence that most of the respondents were people with enough experience hence their information could be relied upon in drawing important conclusions concerning this study.

4.3.3 Respondent’s level of education

It was also necessary to establish whether the respondents had relevant education and training. The participants were provided with options ranging from Diploma certification to PhD and were asked to state the most advanced education level they attained. The results were as depicted below.

Table 4.3: Educational Qualification

	Frequency	Percent
Diploma	3	4.8
Degree	31	49.2
Masters	29	46.0
Total	63	100.0

Source: Researcher, 2021

The results show that 49.2 percent had degree level of education, 46 percent had Masters whereas 4.6% of the respondents had Diploma qualifications. This show that most respondents had appropriate qualifications and therefore had relevant knowledge that could inform the study.

4.3.4 Change of Job in Last Three Years

Each respondent was asked to confirm whether he had switched their jobs in the past 3 years. The aim of the query being to ascertain if the respondents had been in the manufacturing industry in Nairobi for a significant duration of time to provide relevant information. The results are presented below

Table 4.4 Change of Job

	Frequency	Percentage
Yes	12	19
No	51	81
Total	63	100

Source: Researcher, 2021

The study results reveal that 81% of respondents had been in their present jobs in the last three (3) years whereas 19 percent revealed that they had changed jobs. This was a reflection that a huge proportion of respondents had stayed long enough in the manufacturing industry in Nairobi and thus had better understanding of the issues raised concerning the study.

4.3.5 Age of the Respondent

The participants were further requested to indicate their age. They were provided with age categories each one representing a certain range of age. The responses were subjected to analysis using frequencies and percentages and the results are illustrated in Table 4.4. below.

Table 4.4: Age of Respondents

	Frequency	Percent
26-33 years	5	7.9
34-41 years	29	46.0
42-49 years	29	46.0
Total	63	100.0

The study results show that 46% of the participants were between 42 to 49 years old, another 46 percent were between 34 to 41 years old whereas 7.9 percent of the respondents were between 26 to 33 years old. This confirms that most of the respondents were older people who had served in their positions for long hence could provide relevant information.

4.3.6 Gender of the Respondent

Figure 4.3: Gender

	Frequency	Percentage
Male	48	76
Female	15	24
Total	63	100

The results on the gender of the respondent reveal that 76 percent of the respondents were males whereas 24 percent were females. This was a signal that the research involved respondents from either gender.

4.4 Utilization of SGR transportation services

The first objective the study sought to achieve was to investigate the uptake of SGR transportation services by the manufacturing firms in Nairobi. So as to address the objective, the respondents were asked questions related to uptake of SGR transportation services. They were requested to indicate the degree to which their firms had utilized the SGR transportation services in a five index scale “whereby 5= very great extent 4= great degree 3= moderate 2= small extent 1= very small extent”. The data collected was analyzed using descriptive statistics including the SD and the mean.

Table 4.5: Utilization of SGR Services

	N	Mean	Std. Deviation
Transportation of bulky materials	63	4.21	.972
Transportation of heavy machinery	63	3.62	.490
Transportation of partially processed products	63	3.49	1.04
Transportation of raw materials to factory	63	3.24	1.043
Return of containers for re-use and recycling	63	2.98	.553
Movement of finished products to warehouses	63	2.84	.601
Transportation of finished products to distribution centers	63	2.46	.502
Transportation of obsolete products for disposal	63	1.52	.969
Return of defective products from end users	63	1.43	.715
Movement of employees between production facilities	63	1.24	.429
Average	63	2.7	0.731

Source: Researcher, 2021

The study findings established that transportation of bulky materials using the SGR had a mean of 4.21 meaning that most of the manufacturing companies in Nairobi transport bulky materials through the SGR. Transportation of heavy machinery had mean of 3.62 an indication that most manufacturing companies in Nairobi transport heavy machinery using SGR to a great extent. Transportation of partially produced products had a mean of 3.49 implying that most of the manufacturing companies use SGR to transport the partially finished products to a moderate extent. Transportation of raw materials to the factory had a mean of 3.24 and this meant that most manufacturing firms used the SGR to transport raw materials to the factories to a moderate extent. Other aspects of SGR uptake that have been applied to a reasonable extend by the manufacturing firms in Nairobi include return of containers for re-use and recycling which had a mean of 2.98 and movement of finished products to warehouses with a mean of 2.84. The

research established that the manufacturing firms had adopted SGR transportation in transporting products to distribution centers to a small extent. This was evident from a mean of 2.46. Three aspects of SGR uptake that had been adopted to a very small extent by the manufacturing firms in Kenya include transportation of obsolete products for disposal which had a mean of 1.52, return of defective products from end users with a mean of 1.43 and movement of employees between production facilities which had a mean of 1.24.

4.5 Organizational Performance

The study sought to measure the degree to which organizational performance has been achieved by manufacturing firms in Nairobi over the last three years. The respondents were presented with different attributes of performance.

	N	Mean	Standard Deviation
The company has registered increased sales turnover	63	4.01	0.971
Delivery lead time has significantly reduced	63	3.98	1.011
Reduced instances of stock outs	63	3.86	0.999
Higher customer satisfaction	63	3.78	0.884
Reduced operational costs	63	3.65	0.781
Higher organizational profitability	63	3.30	1.112
Average		3.76	0.96

Source: Researcher, 2021

The findings demonstrated that majority of the participants agree that the company has registered increased sales turnover (M-4.01, SD- 0.971). Similarly, the respondents agree that the delivery lead time has significantly reduced (M – 3.98, SD- 1.011). Additionally, the study established that higher customer satisfaction and reduced operational costs has been realized as demonstrated means of 3.78 and 3.65 respectively. However, the respondents agree to a moderate extent that the firms have achieved higher profitability over the past three years as shown by a mean of 3.30. On average, it can be said that the companies have registered relatively high performance as

demonstrated by a grand mean of 3.76. The overall standard deviation of 0.96 implies that the responses were clustered around the mean response.

4.6 Effect of Utilization of SGR transportation Service on Organizational Performance

The research sought to establish the impact of utilization of SGR on firm performance of the large manufacturing firms in Nairobi. Regression was used to establish the impact. The predictor variable was utilization of SGR transportation services while the dependent variable was organizational performance. The aggregated mean for each of the variables was obtained and used for regression. The respondents were asked several questions relating to organizational performance and their average scores of rating were used as a measure of organizational performance. The results of regression analysis are presented are presented in

Model Summary

Model	R	R Square	Adjusted Square	R	Std error of the Estimate
1	.702 ^a	0.492	0.495		.80641

Source: Researcher, 2021

Table 4.8 : Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.843	1	9.461	14.548	.000 ^a
	Residual	39.018	61	.650		
	Total	76.862	62			

a. Predictors: (Constant), Utilization of SGR services

b. Dependent Variable: organizational performance

Table 4.9: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.245	.785		4.313	0.00
Utilization of SGR	.288	.101	.317	2.854	.006

a. Dependent Variable: organizational performance

The results as illustrated in Table 4.6 revealed that the coefficient of determination (R square) was 0.492 which implies that utilization of SGR services explain 49.2 percent of the variance on performance of the large manufacturing entities in Nairobi.

The analysis of variance results as illustrated in Table 4.7 reveal a significance level of 0.000 which show that the association between utilization of SGR and organizational performance was statistically significant. The regression coefficient results indicate that a unit change in utilization of SGR services results to 0.28 units positive and statistically significant change in organizational performance at 95% confidence level ($\beta = .288, t=4.31, p<0.006$).

4.7 Discussion of the Findings

The study's first objective was to establish the extent to which firms utilize SGR services in executing various functions that support production and delivery of final product to the consumer. To findings revealed that SGR was largely leverage by firms for transportation of bulky raw materials, heavy machinery and partially processed goods. It was noted that there was moderate utilization in transportation of partially processed raw materials to the factory. However, the study observed very low to zero utilization of SGR in transportation of finished products to distribution centers, movement of finished goods to warehouses, movement of employees between production facilities and movement of defective products to end-users. The

study notes that the low utilization as depicted by the overall mean was associated to inadequate infrastructure which limited the use of SGR services. The SGR network in Kenya is yet to be fully developed does not offer the effectiveness required by companies to realize cost reductions and save on time due to few rail terminals and destinations that compel firms to incur other costs and logistics to deliver products to the desired points. These findings agree with Falco (2012) who reported that lack of infrastructure and uniformity in construction across different regions limits the utilization of rail transport.

The second objective sought to evaluate the effect of utilization of SGR services on organizational performance of manufacturing companies in Nairobi. The regression analysis results show that utilization of SGR services has a positive and statistically significant relationship on firm performance. The finding contradicts with Sequera (2013) who documented that the utilization of rail transport has limited impact on firms' transportation costs and subsequently performance. Although the study reports that SGR utilization explain a large proportion of performance as demonstrated by the coefficient of determination score, Mehta (2018) held a contrary opinion that use of rail transport is not associated with any significant changes in firm sales or level of total factor productivity.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This section outlines a summary of the findings made, the conclusions drawn and recommendations the researcher is making. All the foregoing is presented in a manner to accord with the objectives guiding the study. The chapter concludes by citing the limitations encountered during research execution and suggestion for future studies.

5.2 Summary of Findings

The study results revealed that the large manufacturing firms in Nairobi have adopted some specific aspects of SGR transportation to varied levels. For instance, it was evident that the large manufacturing firms had adopted SGR transportation services to a great extent in the transportation of bulky materials as well as in transportation of heavy machinery. It was also established that the large manufacturing firms in Nairobi have adopted some two aspects of SGR transportation to a moderate extent. The large manufacturing firms do transportation of partially manufactured products using SGR to a moderate extent and also transportation of raw materials to the factory. Other aspects of SGR uptake include return of containers for re-use and recycling and movement of finished products to warehouses. However, it was clear that at the manufacturing firms had adopted SGR transportation in transporting products to distribution centers to a small extent. Aspects of SGR transport that were found to have been utilized to a very small extent by the large manufacturing firms in Nairobi include transportation of obsolete products for disposal, return of defective products from end users, and movement of employees between production facilities.

Results on regression analysis to explore the effect of utilization of SGR on organizational performance of the large manufacturing entities in Nairobi revealed that the utilization of SGR services had not only a positive but also a statistically significant impact on performance. Therefore, the utilization of SGR was found to be predictor of performance and firms that utilized SGR services were assured of superior performance. Utilization of SGR services was found to explain a significant variation in performance as demonstrated by the coefficient of determination value.

5.3 Conclusion

Large manufacturing firms in Nairobi have adopted SGR transportation services to a great extent in the transportation of bulky materials as well as heavy machinery. The firms have also adopted the SGR transportation services to a moderate extent in transportation of partially manufactured products and transportation of raw materials to the factories. However, adoption of the SGR transportation services in transportation of obsolete products for disposal and return of defective products from end users. The SGR transportation services have also enabled the large manufacturing firms in Nairobi to reduce supply chain lead time, reduce costs associated with multiple inventory handling, reduce stockouts, reduce breakage shorten lead time for delivery of raw materials to a great extent. However, SGR does not seem to have enabled the large manufacturing firms in Nairobi to reduce prices of finished products significantly. SGR transportation services have a statistically significant impact on the organizational performance of the large manufacturing firms in Nairobi.

5.4 Recommendations

There are clear indications that large manufacturing firms are slowly adopting SGR transportation services. However, it was evident that SGR uptake still remains wanting in several areas of the supply chains of the firms. In order for the large manufacturing firms to realize the full potential and benefits of this mode of transportation there is need to embrace SGR transport services throughout the supply chains of the firms where possible.

Since SGR transportation services have shown the ability to improve the efficiency of the firms, it may be necessary for the firms to be encouraged to increase utilization of SGR transportation in order to reap even greater benefits.

The impact of SGR transportation services on performance of the large manufacturing firms in Nairobi was found to be statistically significant, it will be important for the firms to be encouraged to increase uptake of this mode of transportation. The study revealed that limited SGR infrastructure more so limited uniformity across regions acts as a barrier to full utilization of SGR. The government should also invest more in expansion of the SGR network to major towns and cities in order to allow wider usage.

5.5 Limitations of the Study

The conduct of the research relied solely on the respondents selected from the large manufacturing companies in Nairobi. This was informed by the constraints both of time and finances. Therefore, the results may not clearly demonstrate the present situation in the manufacturing industry in Kenya.

In addition, this study is limited to the extent that it focuses narrowly on “large manufacturing firms in Nairobi”. There is no certainty of the results if a comparable study was done in other sectors and industries.

Finally, the study was also conducted during the period when Covid-19 was a concern globally and most organizations had put up precautionary measures to control the spread of the virus. Therefore, reaching out to the respondents to collect data required a lot of convincing.

5.6 Suggestions for Further Research

The SGR transportation services still have limited coverage in Kenya. The construction of the standard gauge railway is still being expanded to other town in the country such as Naivasha which has already been commissioned. This study may be repeated once the expansion has been done to other towns and cities in order to establish the impact.

There are a number of countries around the world where SGR transportation services are in use. It may be important conduct a comparative study with such countries in order to establish ways of making SGR transportation among the large manufacturing firms more popular.

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Appendix I: Research Questionnaire

Introduction

This instrument has been structured to assist in collection of data concerning the perceived impact of SGR on the operational efficiency of large manufacturing firms in Kenya. The questionnaire contains six sections. Kindly tick the most appropriate response for each question.

Section A: Demographic Information

1. Designation

- Procurement Manager
Procurement officer
Stores Manager
Stores Officer

2. Duration worked in the current job

- Less than 3 years 4-6 years 7-10 years More than 10 years"

3. Educational qualifications

- Diploma
Degree
Masters
Ph.D
Other (specify)

4. Have you changed jobs in the last three years?

- Yes
No

5. Kindly indicate your age

- 18-25 Years 26-33 Years 34-41 Years 42- 49 years 50 years and above"

6. What is your gender?

- Male
Female

Section B: Uptake of SGR services

Indicate the extent to which your firm has embraced the use of SGR as a mode of transportation in the following circumstances.

	Uptake of SGR services	5	4	3	2	1
1	Transportation of raw materials from source to factories					
2	Movement of finished products to warehouses					
3	Transportation of finished products to distribution centers					
4	Transportation of bulky materials					
5	Movement of employees between production facilities					
6	Transportation of heavy machinery					
7	Return of defective products from end users					
8	Return of containers for re-use and recycling					
9	Transportation of obsolete products for disposal					
10	Transportation of partially processed products					

Section C: Lead time and Cost of Inventory

To what extent in your opinion has the lead time and cost of inventory been affected by the use of SGR. "Use the scale of: 5= very great extent 4= great extent 3= moderate extent 2= small extent 1= Not at all"

	Lead time and cost of inventory	5	4	3	2	1
1	Has lead time for delivery raw materials been shortened?					
2	Has SGR reduced product delivery time?					
3	To what extent have stock outs reduced?					
4	Has SGR made it possible to reduce supply chain lead time?					
5	Is there a reduction in production time?					
6	Has the cost of manufacturing inputs reduced?					
7	Have the prices of finished products reduced?					
8	Has SGR reduced costs associated with multiple inventory handling?					
9	Has SGR reduced breakage handling costs of products?					
10	Is there a reduction in inventory costs such as security?					

Section D: Effect of SGR on Organizational performance

State the extent to which the following aspects of organizational performance have been affected by utilization of SGR transportation services. “Use the scale: 1= Very great improvement 2= great improvement 3= moderate improvement 4= minor improvement 5= No significant improvement”

	Effect of SGR on Organizational performance	5	4	3	2	1
1	Organizational profitability					
2	Organizational revenue					
3	Reduced Stockouts					
4	Reduced Lead time					
5	Reduction in operational costs					
5	Level of customer service					

END

