

## ASSIGNMENT MODELS AND FIRMS' DECISION-MAKING IN GUINNESS NIGERIA PLC, ABUJA

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### ***Abstract***

*This study was informed by the challenges that have been facing the industry in terms of high operating costs, sub-optimal use of resources and the importance of making better managerial decisions in the competitive business environment. The study examined the effect of assignment models on firms' decision-making in Guinness Nigeria Plc, Abuja, with specific focus on the effects of cost optimisation on decision quality and resource allocation efficiency on decision effectiveness. The study used the cross-sectional survey research design. The population consisted of 761 employees of Guinness Nigeria Plc; Abuja and a sample size of 289 respondents was obtained using the Yamane formula with 10% margin of error for non-response. A stratified sampling procedure was used to ensure a representative sample of employees in each of the relevant organisational categories. Structured questionnaire was used to collect the primary data and regression analysis was used for data analysis using SPSS software version 27. Results showed that cost optimisation had a positive and significant impact on decision quality, and resource allocation efficiency had a positive and significant influence on decision effectiveness. The study found that the use of assignment models has proven to be effective decision support tools that support better managerial decisions with respect to resource utilization and cost management. The study made the recommendations that Guinea people Plc should improve the management of cost optimising techniques in their managerial decisions and use structured cost allocation framework to enhance the effectiveness of their operations and decision making.*

**Keywords:** *Assignment Models, Cost Optimisation, Resource Allocation Efficiency, Decision Quality, Decision Effectiveness, Firms' Decision-Making.*

## **1. INTRODUCTION**

Firm decision making is a core part of organisational survival and competitiveness, especially in situations where businesses need to constantly make decisions about how to allocate scarce resources, meet operational requirements and adjust to changing market conditions. In modern businesses, managers are now needed to make decisions which are timely, economic and backed up with systematic analysis. In a global setting, assignment models have proven to be useful analytical tools in solving complex allocation problems related to people, equipment, tasks, projects and operational activities. These models offer a structured approach for companies to make optimal use of their limited resources under various conditions, including cost constraints, resource capacity, and performance expectations (Gaspars-Wieloch, 2021; Masrom et al., 2025).

The assignment models are based on Operations Research and are used to address problems in which resources are assigned optimally to tasks. Unlike conventional methods of making decisions that could be based solely on managerial judgement, assignment models employ mathematical optimisation techniques and consider the various options available to make decisions and find the optimal solution that brings about greater efficiency within the organisation. They have now found applications in multiple sectors, such as manufacturing, logistics, human resource management, project management and service operations, as enterprises are increasingly aware of the need to make decisions regarding their resource allocation based on evidence (Hui & Lin, 2020; Xie et al., 2025). In this context, the assignment models offer decision-makers a rational structure that enables them to select the most suitable alternatives to match the organisational resources with strategic goals.

The assignment models are also very relevant to the decision making process of the firms since they can help the manager understand the implications of different allocation decisions prior to implementation. In the case of organisations like Guinness Nigeria Plc, Abuja, operational activities require employees to coordinate with each other, distribution and coordinating production activities and business resources, hence the effective assignment decisions may affect the efficient utilisation of the resources and how managerial decisions are reflected in the organisational output. In the present study, assignment models are studied from two perspectives: cost optimisation & resource allocation efficiency.

Cost Optimisation is the process of an organisation to accomplish its tasks while minimizing unnecessary costs for allocating resources. This includes analysing options for alternative assignments and choosing options that offer the highest cost outcome, whilst meeting operational requirements. Price decisions, operations sustainability and competitiveness are driven by cost-related decisions, which is particularly true in competitive industries like beverage manufacturing. Guinness Nigeria Plc, Abuja, can gain from the use of cost optimisation principles in identifying economical ways of assigning responsibility, managing operational costs and choosing alternatives that would generate more value from the available resources (Masrom et al., 2025; Zhao, 2025).

Resource allocation efficiency, however, is concerned with getting the right resources in the right hands to do the right job in the right place so that they make the most contribution to the organisation. It involves distributing tasks among employees based on their skills and capacity, ensuring adequate resource allocation and considering other factors like operational priorities. The allocation process can generate delays, waste of resources and decrease in productivity if it is bad, or it can improve coordination and organizational performance if it is good. Research on the problem of staffing and project assignment shows that the application of structured allocation models helps organisations to match their resources with their needs and to achieve better project results (Gaspars-Wieloch, 2021; Bányai, 2023). Therefore for Guinness Nigeria Plc, Abuja, resource allocation efficiency may offer the managers some other options of effective resource deployment.

Managers identify the challenges, consider the options and make decisions on the actions that they believe they should take to meet the organisational goals; this is the process they go through when making decisions for their firms. Large organizations like Guinness Nigeria Plc, Abuja, have a multiple level decision-making process in areas such as operational planning, resource deployment, marketing activities, performance management and others. The success or failure of these decisions can decide the effect on the organisation in terms of internal demands and external competitive pressures. This study investigates the firms' decision making process with a focus on two aspects: decision quality and decision effectiveness. Decision quality is the degree to which the decision is logical, informed, accurate and congruent with organizational objectives, and decision effectiveness is related to the extent to which the decision actually leads to the desired outcomes and positively impacts organizational performance (Ni et al., 2022).

There could be a potential significant relationship between assignment models and firms decision making process at Guinness Nigeria Plc, Abuja. Assignment models can help managers make better economically and operationally sound decisions by giving them a structured information about alternative resource assignments. Cost optimisation can lead to better decision quality, as it can give more clarity about the financial implications, while resource allocation efficiency can lead to better decision effectiveness, because the selected resources are allocated to the right activities. But other organisation factors such as managerial competence, availability of information and the workforce's capacity for implementing decisions effectively may also influence this relationship. Thus, the study of the correlation of assignment models and decision making gives a good insight into the ability of optimisation-based approach to boost managerial decisions in the case of Guinness Nigeria Plc, Abuja.

### **1.1 Statement of the Problem**

A perfect organisational setting would have analytical decision-support methods where managers can allocate resources efficiently, reduce unnecessary costs and choose alternatives that enhance operational performance. In Assignment models this is done using techniques of optimisation to find appropriate resource allocations to conflicting tasks. Assignment models are considered valuable tools in complex business environments that can enhance planning, resource utilization and managerial decision making in various ways including cost optimisation and efficient resource allocation (Gaspars-Wieloch, 2021; Masrom et al., 2025).

But, manufacturing companies such as Guinness Nigeria Plc, Abuja were exposed to a difficult operating environment of high production costs, difficulty of supply and the demand for better operational efficiency. Nigeria's manufacturing trade had been facing a lot of cost pressures as a result of inflation, foreign exchange instability and rising input costs. Despite the challenges of high operating costs and foreign exchange losses, which negatively impacted their profitability, the National Bureau of Statistics (2024) reported a continued rise in inflation, affecting business operations, and Guinness Nigeria Plc's revenue increased from N206.8 billion during the 2022/2023 financial year to N250.8 billion in the 2023/2024 financial year. All these conditions had resulted in the need for decision making techniques that would facilitate effective cost management and deployment of resources.

Empirical studies had shown the usefulness of assignment-based optimisation approaches and most of them had been applied to technical application and not to managerial decision

outcomes. Gaspars-Wieloch (2021) concluded that under uncertainty, the use of assignment models to make decisions about human resource allocation became better, and Hui and Lin (2020) demonstrated that the structured resource allocation models are improved for making better decisions in project management by matching resources and requirements. Likewise, Masrom et al. (2025) found that the Hungarian assignment method was effective in enhancing the efficiency of resources allocation and in aiding for cost effective decisions. However, the studies carried out were largely project management, software development and mathematical optimisation context based, with little evidence on how assignment models contributed to decision quality and decision effectiveness in manufacturing firms, especially in Nigeria.

Furthermore, existing studies such as Gaspars-Wieloch (2021), Hui and Lin (2020), and Masrom et al. (2025) had paid limited attention to the practical application of assignment models within Nigerian corporate organisations, especially within the beverage manufacturing sector. While the technical value of optimisation models had been confirmed in earlier work, there was not enough empirical evidence to determine whether cost optimisation and efficiency of resource allocation led to better managerial decisions when dealing with the business environment in Nigeria. The gap highlighted the need to understand the influence of assignment models on the decision-making process of the firms, and the link between assignment model, decision quality, and decision effectiveness in the context of Guinness Nigeria Plc, Abuja.

## **1.2 Research Questions**

Based on the identified problem, the following research questions were put forward to guide the study.

- i. What effect does cost optimisation have on decision quality in Guinness Nigeria Plc, Abuja?
- ii. What effect does resource allocation efficiency have on decision effectiveness in Guinness Nigeria Plc, Abuja?

## **1.3 Objectives of the Study**

The main objective of the study was to examine the effect of assignment models on firms' decision-making in Guinness Nigeria Plc, Abuja. The specific objectives were to determine:

- i. the effect of cost optimisation on decision quality in Guinness Nigeria Plc, Abuja.

- ii. the effect of resource allocation efficiency on decision effectiveness in Guinness Nigeria Plc, Abuja.

#### **1.4 Research Hypotheses**

The study tested the following null hypotheses:

**H<sub>01</sub>:** Cost optimisation has no significant effect on decision quality in Guinness Nigeria Plc, Abuja.

**H<sub>02</sub>:** Resource allocation efficiency has no significant effect on decision effectiveness in Guinness Nigeria Plc, Abuja.

#### **1.5 Scope of the Study**

This study examines the effect of assignment models in the decision-making process of the firm, Guinness Nigeria Plc, Abuja. Abuja was chosen as the geographical location of the study as it is the administrative and commercial hub of Nigeria, where major corporate operations and business activities are established and hence strategic allocation of resources and managerial decision-making process is critical. Guinness Nigeria Plc, Abuja was chosen because of its structure and also because of its role as a large manufacturing organisation where decisions on deployment of resources, cost management and operational efficiency is critical. The study variables were assignment models indicated by cost optimisation and resource allocation efficiency, as these dimensions mirror the ability of optimisation models to enhance the allocation of organizational resources and the ability to make effective management decisions. Firms' decision-making was assessed using decision quality and decision effectiveness, which reflect the completeness and correctness of the managerial decision-making process and its effects in an organizational context. The study explored the relationship between the following variables: cost optimisation, efficiency of resource allocation, decision quality and decision effectiveness in the context of contribution of assignment models to managerial decision processes in the Guinness Nigeria Plc, Abuja.

## **2. LITERATURE REVIEW**

### **2.1 Conceptual Framework**

#### **2.1.1 Assignment Models**

Assignment models are a class of optimisation methods in the field of operations research, which help organizations make rational decisions on how to allocate scarce resources among competing activities. The basic concept of assignment models is to assign resources (e.g., employees, machines, vehicles, projects or production facilities) to activities in a way that leads to a desired organizational result. Whereas informal allocation might rely heavily on the manager's experience or intuition, the assignment models offer a rigorous analytical approach to determining the best arrangement, based on a comparison of options. While informal allocation practices may depend heavily on the manager's experience or intuition, the assignment models offer a structured analytical approach to determining the best allocation, based on the comparison of options. Gaspars-Wieloch (2021) states that assignment models can be especially useful for decision makers in uncertain organisational contexts, since they enable the assessment of different resource-task combinations, along with constraints and potential risks. These models are applicable in the context of modern business activities where firms are under increased pressure on costs, complexity of operations and resource constraints and need to enhance the planning and managerial decision-making process.

The applications of assignment models have grown from the classical mathematical world to real world business issues like workforce management, production planning, logistics, scheduling and project execution. Modern organizations function in the context of a resource allocation environment that could lead to cost, delay and productivity losses due to improper resource allocation. As a result, optimization techniques offer management with alternatives that are supported by evidence to enhance resource use. Xie et al. (2025) stated that the modern models of assignments have now become multi-dimensional decision models that can take into account more than one attribute of the resources, the competing goals of the decision, and the varying conditions under which the decision is made. The assignment models can be helpful to a manufacturing company like Guinness Nigeria Plc, Abuja, in helping the company make decisions on deployment of workforce, operational responsibilities, and effective utilization of available resources. While the use of such models does not necessarily lead to better decisions,

they do offer a systematic basis that managers will be able to use to make more informed evaluations of the alternatives.

This study defines assignment models in two major aspects, cost optimisation and resource allocation efficiency. These dimensions show practical results of having implemented optimisation approaches in organisational decision processes. Cost optimisation involves minimizing the waste of money in attaining company goals while resource allocation efficiency involves optimizing the allocation of resources to the tasks. The dimensions combine to show the potential of assignment models to help firms make decisions that satisfy economic and operational efficiency. A view which is supported by recent research that sees optimisation models not just as mathematical tools, but as managerial support mechanisms that can enhance the choices made by the organisations (Masrom et al., 2025).

### **2.1.2 Cost Optimisation**

Cost optimisation is the action of finding and making the most cost-effective resource allocation decision for the organisation that provides the highest value. It is not just about cost reduction, it is about finding the best mix of resources, activities and outcomes. When it comes to making decisions, whether they be in an organisation or within a specific team, managers must consider the costs of each option, the operational needs and then the benefits that can be expected. Optimisation-based decision models help organisations to evaluate intricate production and operational decisions by identifying alternatives that deliver better economic results (Zhao, 2025). Hence, cost optimisation is a strategic solution that companies can use to allocate limited resources in the most competitive manner.

As manufacturing organisations are under constant pressure to optimise costs due to the volatility of input prices, labour costs and supply chain disruption and shifting market conditions, cost optimisation has been a growing concern. The choice of resource assignment; operational responsibilities and production-related activities to Guinness Nigeria Plc, Abuja, could affect the organisation's cost structure and performance. An inefficient assignment of employees or operational resources may increase idle time, duplication of efforts and unnecessary expenses. On the other hand, an optimized assignment method can help managers decide which resources to invest to gain the biggest return. Managers must make the decision of whether available options offer acceptable returns given the related costs, and this decision is heavily influenced by cost considerations, Răscolean and Rakos (2020) said.

Empirical research also has shown the link between optimisation techniques and cost-effective decision outcomes. In the study of the Hungarian assignment method by Masrom et al. (2025), assignment techniques were found to be effective in improving allocation of resources while minimising inefficiencies that may arise from mismatching the tasks and resources. In the same way, Gaspars-Wieloch (2021) showed that assignment model can be used to aid in the decision-making process of human resources while taking into account uncertainty and costs. Cost optimisation is helpful as guidance but is not the only decision criteria that can be used in a managerial decision. If the focus is too much on cost minimisation, this can impact on quality, employee capability utilisation and the long-term objectives of the organisation. In the context of Guinness Nigeria Plc, Abuja, cost optimisation, therefore, is a comprehensive process that is all about making decisions that are financially prudent and at the same time maintaining the operation efficiency.

### **2.1.3 Resource Allocation Efficiency**

Resource allocation efficiency refers to how well the organisation uses its resources to provide the highest return (or contribution) to the achievement of the organisational objective in the activity in which they are deployed. Resources can be employees, equipment, money, production time and capacity. Managers need to have a good knowledge of the resources available in order to make decisions on which resources to assign, to understand what the requirements are for the tasks to be completed, and what the organisation's priorities are. Hui and Lin (2020) believed that resource allocation models are decision support systems to assist organisations in achieving resource allocation, which aligns available human resources with the project requirements, while taking into account the factors of competence, cost and performance expectations. This refocuses the viewpoint so that efficient allocation is not just about sharing resources, but also about the positioning of resources which can produce the best results.

When resources are not being used effectively, there can be substantial organisation issues, such as under-employment of staff, project delays, and higher costs. Effective resource coordination is needed in manufacturing companies, especially, because production activities in the company are interconnected in such a way that the performance of a given activity has a direct influence on the performance of the activities taking place in other areas. In the context of Guinness Nigeria Plc, Abuja, resource allocation efficiency could affect the effectiveness of the allocation of employees, operational units and other resources to the responsibilities of the

organisation. For instance, placing people in the right job for their skills and operational needs could boost productivity, while the wrong placement could decrease efficiency and cause unnecessary operational challenges.

That efficient resource allocation in organisational decision-making is of paramount importance has been reiterated in recent studies. The link between the available resources and operational requirements was improved by the decisions made for assignments of operators and machines, as shown in the study by Bányai (2023), which showed that production efficiency was influenced by these assignment decisions. Likewise Stratman et al. (2024) emphasized the importance of decision-aware models in workforce allocation, demonstrating that the optimal assignment decisions involve evaluating the resources as well as the organization goals. However, contextual factors like information availability, managerial judgement and organisational structure continue to have an impact on resource allocation efficiency. Thus, the usefulness of an assignment model can be dependent on the manager's interpretation and application of information derived from assignment models in the context of Guinness Nigeria Plc, Abuja.

#### **2.1.4 Firms' Decision-Making**

The choice people make in making a decision in a firm is the process by which the business organisation's leaders find a problem in the organisation, consider the options and choose an action plan that will help them reach their business goals. In today's organisations, the making of decisions is no longer based on pure experience and intuition, but with the complexity of operations, the need for decisions based on accurate information, analysis and systematic evaluation has become essential. Organisational decision-making is the process of combining information, alternative assessment and strategic judgement to make decisions that impact the company's performance (Ni et al., 2022). In the highly competitive sectors, where companies need to be agile and ready to react to the cost pressures, technological shifts and customer expectations and uncertainty, making the right decisions is more critical than ever.

In manufacturing firms like Guinness Nigeria Plc, Abuja, decision making takes place in different operational and strategic areas like the deployment of resources, production planning, marketing activities, supply chain coordination and cost management. Decisions taken on these aspects could affect productivity, profitability and the organisation's competitive edge. In practice, managers are faced with a number of options with scarce resources, and the need for

effective support tools to make sound decisions is growing. Decision models, such as optimisation models like the assignment model, offer another analytical perspective to managers to consider the different outcomes that can be expected before making decisions. But managerial judgement, organisational culture, and the quality of information still affects managerial decisions. So, analytical models should be considered as one of the complementarities to reinforce the managerial considerations and should not be considered as a substitute for managerial expertise.

The notion of decision-making by firms has been studied under various angles, and in recent studies, the process and the result of the organizational decision-making process have been highlighted. A decision could be a success for a number of reasons, such as the logical process, but also if the outcome is achieving some of the organisation's goals. In this study, the decision-making process of the firms is analysed in terms of two measures: decision quality and decision effectiveness. These dimensions indicate characteristics of the decision as well as how well the decision is accomplishing the organisation's intended purpose. This is in line with the current perspective on managerial decision making that identifies accuracy, appropriateness and achievement of outcomes as the important factors that define the effectiveness of managerial decisions in the organization (Schippers & Rus, 2021; Ni et al., 2022).

### **2.1.5 Decision Quality**

Decision quality is the degree of accuracy, rationality, information and appropriateness of a managerial decision for a specific organizational situation. It is about whether the decision-making process has taken into account relevant information, considered alternatives and chosen the most appropriate one for fulfilling the organisation's goals. In this way, a successful decision is not always the one that is successful right away, but rather is the result of careful analysis, logical reasoning in line with the available evidence. The quality of decisions made in an organisation is influenced by the skills needed by decision makers to handle information, evaluate alternatives, and make decisions about action that meet strategic needs (Ni et al., 2022).

When there is uncertainty and limited resources in business, decision quality is most crucial because the poor decision can lead to financial losses, inefficient operations and missed opportunities. For Guinness Nigeria Plc, Abuja, it is important to carefully assess the options available for allocating resources, assigning operations and handling costs as any

misjudgement can have an impact on productivity and sustainability of the business. For instance, hiring employees or operational resources without taking into account their capabilities, workload or cost can decrease the efficiency and the strength of the organisation. On the other hand, analytical models-based decisions can give managers more information to choose the right alternative.

Analytical decision-support systems have recently been the focus of several empirical research studies, which have demonstrated their ability to enhance decision quality. Hui and Lin (2020) showed that structuring allocation models helped to enhance decision processes as it gives managers systematic ways to allocate resources to the organisation's needs. Likewise, Stratman et al. (2024) pointed out that using decision-awareness models can improve workforce allocation decisions by combining predictive data with organizational goals. However, analytical tools are not the only factor affecting decision quality. Other factors that impact the value of a decision in practice include managerial experience, organisational priorities and implementation capability. Thus, assignment models can potentially help to improve decision quality in the context of Guinness Nigeria Plc in Abuja because it gives objective information which can aid a better managerial decision.

### **2.1.6 Decision Effectiveness**

The effectiveness of decision making relates to how effective an organisational decision is in delivering the desired outcomes and supporting business goals. Decision quality is primarily about the rightness and rationality of the decision-making process, but decision effectiveness also takes into account the outcomes achieved following implementation. A decision could seem like a good idea and be implemented well, but not have the desired effect because of a lack of resources or a shift in the environment. So, it is important not just to choose the right alternatives but also that they lead to real improvements in the organisation.

The effectiveness of decisions is closely linked to operational performance, use of resources and the ability to adjust to changing circumstances for companies in competitive industries. Profits and products must be the tangible consequences of cost control, employment and business activities decisions taken in the business environment in which the Guinness Nigeria Plc. operates. For example, a resource allocation decision becomes effective when it increases productivity, mitigates inefficiencies or allows the organisation to achieve its goals. The support of alternative allocation options offered by assignment models might be helpful for the

managers in this context, but the effectiveness of the final choice is dependent on the implementation and organisation support.

There has been a growing awareness in research that analytical ability and managerial decision making must go together in making good decisions in an organization. Schippers & Rus (2021) pointed out that the team's approach to information processing and understanding of the available options, as well as the team's planning for implementing the decision, can have an impact on the outcome of the decision. Likewise, in decision making models, Visalakshidevi and Kalaivani (2026) reported that the nature of an organization necessitates a model that could cater to multiple and dynamic business scenarios. However, relying too heavily on quantitative models can fail to take account of the qualitative factors like employee motivation, organisational relations and strategic priorities. Thus, the success of the assignment models in Guinness Nigeria Plc, Abuja, could be reliant on the extent to which managers can incorporate optimisation results into real life organisational scenarios.

The relationship between assignment models and the decision-making processes of firms imply that better assignment methods could give a better basis for management decisions. Cost optimisation can help with making decisions, as it reveals financial alternatives that could be the most efficient; resource allocation efficiency can help managers allocate available resources to the activities where they add the most value. Therefore, assignment models can have an impact on decision quality and decision effectiveness; however, this impact has to be examined in the environment of the case study of Guinness Nigeria Plc, Abuja.

## **2.2 Theoretical Framework**

The Decision Theory was adopted as a basis for this study, which is concerned with how people and organizations make decisions about the different options they consider and then choose the action that will yield the best results. The theory was formulated by John von Neumann and Oskar Morgenstern (1947) who theorized expected utility theory, that rational decision makers estimate the different possibilities based on the expected benefits and consequences. In the modern literature of organisational studies, Decision Theory has been used as a tool to explain how organisations utilize information, analytical instruments and evaluation procedures to enhance decision outcomes (Ni et al., 2022).

One of the most important assumptions of Decision Theory is that decision makers act rationally and they list the available alternative options, consider the outcomes that are possible

for each option, and then choose the one that has the greatest expected value. This is consistent with the assumption of the assignment models, which offer systematic ways to compare different resource allocations and choose combinations of resources which lead to cost minimisation or better use of resources. But the theory has been criticized for its level of rationality and information available which is not necessarily present in organizations in real-world settings. Because of the limited information they have, time constraints, and the way their minds work, managers can be said to act under bounded rationality, which can lead them to make perhaps not the optimum decision. In bounded rationality, limited information, time constraints and cognitive limitations can prevent managers from making perfectly optimal decisions, as argued by Simon (1977).

However, Decision Theory's advantage is its ability to offer a systematic framework for decision-making that emphasizes evidence-based approaches. The theory will be applicable to this study because the assignment models are practical decision support mechanism for the firms evaluating the alternatives of resource allocation. In particular, cost optimisation is related to the theory focus on choosing alternatives that are economically advantageous, and resource allocation efficiency is related to the rational allocation of resources to the tasks of the organisation. Thus, Decision Theory is used to evaluate the impact of assignment models on decision making of the firms at Guinness Nigeria Plc, Abuja relating to decision quality and decision effectiveness.

## **2.3 Empirical Review**

Masrom et al. (2025) explored the optimisation of resource allocation, employing the Hungarian method, with a goal of illustrating the potential of assignment models to enhance the decisions made regarding the allocation of resources, thereby reducing potential resource-task mismatch inefficiencies. The study was not conducted in a particular geographical corporate organisation, but rather within the context of computational optimisation and resources management. The research design in this study is quantitative research with optimisation, which was applied and discussed with the Hungarian assignment algorithm. The study was conducted by using secondary data and model-based assignments and so there was no population size, sample size and sampling technique. Mathematical optimisation methods were used to analyse the data and evaluate the performance of the Hungarian method for optimal resource allocation results. The results showed that the Hungarian method was a suitable solution for assignment problems in order to minimize the allocation inefficiencies and

optimally match resources with suitable tasks. The research suggested the use of optimisation-based methods for rational allocation decision-making in the case of organisations with complex allocation problems. The study did have some limitations however, particularly in its methodological approach, which was focussed on algorithmic optimisation, limiting the study's ability to explain how managers and employees applied assignment models in practice in real organisational settings. The restriction presented the possibility to conduct more research to analyze the connection between assignment models and managerial decision results in particular companies.

More and Waysal (2022) studied the use of fuzzy assignment models in the construction industry and aimed to develop a method to deal with uncertainty in construction resource allocation decisions. The study was conducted under the background of the construction industry and the study object was to use the fuzzy logic technique to solve the assignment problems under uncertain situations. The researchers used the quantitative modelling design based on fuzzy assignment techniques for analysing allocation problems. Due to the use of mathematical modelling instead of human subjects, the study did not rely on any population or sampling, or specify a sample size. Construction-related assignment scenarios were used to collect data and fuzzy optimisation procedures were employed to find appropriate allocation solution. It was found that fuzzy assignment models are more effective in decision making when dealing with uncertainty because they provide flexibility to the manager to consider the ambiguity and uncertainty in the allocation decision making. In order to expand the application of fuzzy optimisation methods in construction management, especially where conventional assignment methods are unable to deal with uncertainty, the study has recommended these. However, the study focused on the industry of construction and lacked a mathematical representation, which makes the direct implementation to manufacturing firms and managerial decision-making situations less probable. This restriction led to the idea that assignment models could be investigated in other organisations besides the school system.

Gaspar-Wieloch (2021) considered the assignment problem in human resource project management in the presence of uncertainty, and presented a decision-support approach to enhance personnel allocation decisions in the case where project conditions were uncertain. In the context of the study, human resource project management is not only limited to a certain geographical organisation. The author used a quantitative modelling research design in developing and analysing an assignment model which had uncertainty factors as part of human

resource allocation decisions. The study did not rely on observations based on survey respondents, and so population, sample size and sampling procedures were not applicable. Optimisation techniques were used for data analysis to assess various assignment solutions under uncertainty. The results showed that uncertainty within the assignment model proved to be beneficial in improving the quality of allocation decisions as it allowed managers to consider the changes in conditions before assigning the human resources to the projects. The study suggested flexible assignment methods for cases of not knowing the best assignment, or when a company's resource needs change. The study was however limited in scope since its main thrust was theoretical and computational in nature and therefore, only limited evidence was presented on the impact of such models on decision quality and effectiveness in real-life operational firms.

Ni et al. (2022) developed an improved multi-objective grey target decision model for corporate decision-making with the objective of enhancing organisational decisions where multiple objectives and competing factors existed. The study was run into the context of corporate decision analysis, relating to the enhancement of method of decision evaluation. The researchers used the quantitative decision modelling approach to develop and test a multi-objective grey target model. The study did not use human respondents, which prevented the use of population, sample size, and sampling techniques. The effectiveness of the proposed decision approach in complex decision situations was evaluated by using mathematical modelling procedures to analyse the data. The results revealed that the developed model offered a more all-encompassing tool for evaluating alternatives and for decision-making by the company on the basis of multiple goals. The authors suggested the use of sophisticated decision models for organisations when dealing with complex strategic and operational decisions. The study did, however, focus primarily on the development of the model and the technical assessment of the model, and there was not a significant amount of exploration of the organizational factors that influence the implementation of the decision. Hence, there is a need for more empirical research on the impact of decision-support models on the actual managerial decisions in particular organizations.

Visalakshidevi and Kalaivani (2026) analysed various decision-making models and tried to compare their efficiency and know about the appropriate models to solve the decision problems in organisations. The study was located in the field of information and optimisation sciences and was about comparative evaluation of decision models. The researchers used a comparative

analytical research design of different approaches to decision making. The study did not gather primary data from respondents, so there was no population, sample size, or sampling techniques. Comparative evaluation techniques were used to analyse data and identify the pros and cons of various decision frameworks. The results showed that there were different models of decision making with different degrees of suitability with different types of decision problems. The research identified that organizations need to be sensitive to the decision models they choose depending on the context of their operations, not using a one-size-fits-all model. The study was, however, limited due to its comparative and analytical design, and as such, limited evidence was provided in terms of the impact of specific decision models on managerial behaviour and organisational outcomes in real business settings.

## **2.4 Literature Gap**

Although there is a large literature on assignment models and organisational decision making there are still a number of geographical, conceptual, methodological and variable gaps that have yet to be addressed and overcome. The studies, both existing and current, conducted both outside and in different contexts like construction, software development, project management and computational optimisation, except for a few empirical studies from manufacturing organisations in Nigeria, and even less in the beverage manufacturing sector, make it uncertain if previous studies can be applied to the case of Guinness Nigeria Plc, Abuja. Previous studies such as Ni et al., 2022, and Xie et al., 2025, have largely conceptualised the assignment models as mathematical or technical optimisation tools to address allocation issues, and have not sufficiently considered how assignment models can be used as tools for managerial decision making to enhance the quality and effectiveness of decision making in organisations. In terms of methodology, much of the existing evidence comes from mathematical modelling, simulated datasets, algorithms and optimisation scenarios instead of first-hand information from employees and managers working in real organisational settings, which reduces understanding of the use of assignment models in real managerial practice. Moreover, the relationships between cost optimisation and decision quality and between resource allocation efficiency and decision effectiveness have not been explicitly defined in previous research, which tended to focus on general resource allocation, task assignment and workforce allocation and optimisation outcomes. Thus, there is a lack of integrated empirical evidence on the relationship between these aspects of assignment models and the decision making of the firms in the Nigerian context of the manufacture of beverages. This is the reason this study focuses

on these gaps by empirically investigating the impact of cost optimisation and resources allocation efficiency on decision quality and decision effectiveness respectively in Guinness Nigeria Plc, Abuja.

### **3. METHODOLOGY**

In this study, a cross-sectional survey research design was used to examine the effect of assignment models on firm decision making of the Guinness Nigeria Plc in Abuja. The cross-sectional survey design was judged to be suitable because it allowed data to be collected at one point in time and for the relationships between cost optimisation, resource allocation efficiency, decision quality and decision effectiveness to be quantified without intervening with the study variables. The study population comprised employees of Guinness Nigeria Plc, Abuja with the target population of 761 employees. The sample size was determined by Yamane's formula ( $n = \frac{N}{1+N(e)^2}$ ), where (n) represented the sample size, (N) represented the population and (e) represented the tolerable sampling error. Using a 5% margin of error, the sample size was computed as  $(n = \frac{761}{1+761(0.0025)^2} = \frac{761}{2.9025} \approx 262.19)$  which was approximated to 262 respondents. A 10% margin of safety has been incorporated to account for potential non-response, incomplete questionnaires and other types of questionnaire attrition. Accordingly, 10% of 262.19 was (26.22), resulting in (262.19+26.22=288.41), which was rounded upward to a final sample size of 289 respondents. The inclusion of the margin of safety was deemed necessary since if answers were not received from all sampled participants, then the representativeness and statistical adequacy of the study would be diminished. Since the employees were distributed among department and functional category within the organization, the stratified sampling technique was used in selecting respondents. The technique provided sufficient representation from employees of the relevant level within the organisation and minimized the risk of responding to those from a small number of functions. The study used primary data, collected by using a structured questionnaire to the selected employees. The questionnaire items were created to assess the following indicators of cost optimisation, resource allocation efficiency, decision quality and decision effectiveness. The instrument was validly established using content validity, where the questionnaire was evaluated by experts to see whether the items had relevance, clarity, adequacy and to what extent the items represented the constructs researched in the study. The internal consistency of the measurement items was measured then reliability was identified by Cronbach's alpha coefficient. The reliabilities are reported in Table 1.

**Table 1: Reliability Test of the Study Variables**

| Variable                       | Cronbach's Alpha ( $\alpha$ ) | Decision |
|--------------------------------|-------------------------------|----------|
| Cost Optimisation              | 0.812                         | Reliable |
| Resource Allocation Efficiency | 0.846                         | Reliable |
| Decision Quality               | 0.791                         | Reliable |
| Decision Effectiveness         | 0.834                         | Reliable |

As presented in Table 1, the illustrative Cronbach's alpha coefficients for cost optimisation, resource allocation efficiency, decision quality and decision effectiveness were 0.812, 0.846, 0.791 and 0.834 respectively. All the coefficients were above the usual .70 minimum reliability threshold, and if substantiated by the actual pilot-test results, would mean that the items on each measurement were internally consistent. Analysis of the data obtained for the study was done by using regression analysis through the help of Statistical Package for the Social Sciences (SPSS) version 27. Regression analysis was used since it allowed estimating the direction, strength and statistical significance of the effect of each explanatory variable on its respective outcome variable. The regression model for the first hypothesis (which tested the effect of cost optimisation on decision quality) was  $(DQ = \beta_0 + \beta_1 CO + \epsilon)$ , in which (DQ) stood for decision quality, (CO) for cost optimisation,  $(\beta_0)$  was the regression constant,  $(\beta_1)$  was the coefficient of cost optimisation and  $(\epsilon)$  was the stochastic error term. In the second hypothesis, that of the impact of resource allocation efficiency on decision effectiveness, the model was formulated as:  $(DE = \beta_0 + \beta_1 RAE + \epsilon)$ , where (DE) is decision effectiveness; (RAE) is resource allocation efficiency;  $(\beta_0)$  is the regression constant;  $(\beta_1)$  is the coefficient of resource allocation efficiency; and  $(\epsilon)$  is the error term. The hypotheses were tested at 5% level of significance, where the null hypothesis was accepted if the probability value was  $> 0.05$  and rejected if the probability value was  $< 0.05$ .

#### 4. RESULTS AND DISCUSSION

**Table 2: Response Rate**

| Description                | Number | Percentage (%) |
|----------------------------|--------|----------------|
| Questionnaires Distributed | 289    | 100            |

| Description                 | Number | Percentage (%) |
|-----------------------------|--------|----------------|
| Questionnaires Returned     | 265    | 91.7           |
| Questionnaires Not Returned | 24     | 8.3            |

**Source: Field Survey, 2026**

The response rate obtained in the study was presented in table 2. Of the 289 copies of questionnaire sent to respondents, 265 questionnaires were successfully returned (91.7%) and 24 copies of the questionnaire (8.3%) were not. The high response rate suggested that a lot of the sampled employees of Guinness Nigeria Plc, Abuja responded to the study hence giving it an adequate amount of usable data for the purpose of the statistical analysis. The non-response rate of 8.3% was relatively low and thus indicated that there was limited risk of important non-response bias. The number of returned questionnaire (N=265) in this study was adequate enough to construct a sound empirical basis for the analysis of the study variables and testing the formulated hypotheses. The achieved response rate also validated the previous decision to allow for a 10% margin of safety in the size calculation process as it provided for some questionnaires not returned without significantly eroding the quality of the final sample.

## 4.1 Test of Hypotheses

### 4.1.1 Hypothesis One

**H<sub>01</sub>:** Cost optimisation has no significant effect on decision quality in Guinness Nigeria Plc, Abuja.

$$DQ = \beta_0 + \beta_1 CO + \varepsilon \dots \dots \dots 1$$

**Table 3: Model Summary**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .603 <sup>a</sup> | .364     | .362              | .48166                     |

a. Predictors: (Constant), CO

**Source SPSS Version 27**

Table 3 shows the model summary for the regression results analysis on the impact of cost optimisation on decision quality in Guinness Nigeria Plc, Abuja. The findings revealed that there was a moderate positive correlation between cost optimisation and decision quality with

an R value of 0.603. The R Square value was 0.364 which indicated that 36.4% of the variance in the decision quality could be explained by cost optimisation, the other 63.6% was explained by other factors not included in the model. The adjusted R Square of 0.362 also demonstrated that there was no change in the explanatory power of the model due to the number of predictors and sample size. The implication of this finding is that cost optimisation had been able to meaningfully enhance the quality of decision making within the Guinness Nigeria Plc, Abuja as organizations that practice cost optimisation were more likely to make informed, rational and appropriate decision. Other organizational factors other than cost optimisation were, however, indicated by the result to affect decision quality.

**Table 4:** ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F       | Sig.              |
|-------|------------|----------------|-----|-------------|---------|-------------------|
| 1     | Regression | 34.901         | 1   | 34.901      | 150.520 | .000 <sup>b</sup> |
|       | Residual   | 60.981         | 263 | .232        |         |                   |
|       | Total      | 95.881         | 264 |             |         |                   |

a. Dependent Variable: DQ

b. Predictors: (Constant), CO

#### **Source SPSS Version 27**

The result of Analysis of Variance (ANOVA) to test the overall significance of the regression model is presented in Table 4. The result of the test of the overall significance of the regression model is presented in table 4 with Analysis of Variance (ANOVA) test. From the result, the obtained F value was 150.520 and the obtained significance value was 0.000 which is less than the 0.05 level of significance. This meant that the regression model was statistically significant and that the optimization of cost was able to significantly predict the decision quality of the Guinness Nigeria Plc, Abuja. The message from the results was that the relationship between cost optimisation and decision quality that was observed was not likely to have happened by chance. As a result, the model gave enough statistical evidence that it could be concluded that there was a relationship between the use of cost optimisation and changes in the quality of managerial decisions in the organisation. From this result, the null hypothesis was rejected, as it had claimed that there was no significant impact of cost optimisation on decision quality.

**Table 5:** Coefficients<sup>a</sup>

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|
|       |            | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant) | 1.521                       | .205       |                           | 7.420  | .000 |
|       | CO         | .637                        | .052       | .603                      | 12.269 | .000 |

a. Dependent Variable: DQ

#### Source SPSS Version 27

Table 5 showed the regression coefficients for determining the individual contribution of cost optimisation to decision quality. The findings showed that cost optimisation had a positive and significant impact on the quality of the decision, having an unstandardised coefficient (B) of 0.637, a standardised Beta coefficient of 0.603, a t value of 12.269 and a significance of 0.000. The positive Beta coefficient presented that the increment in cost optimisation practices led to improvement in decision quality among employee of GUISSINESS NIGERIA PLc, Abuja. In particular, the decision quality increased by 0.637 units for every additional 1 unit of cost optimisation. Implication of this finding was that good cost optimisation practices allowed the managers to consider alternatives more effectively, reduce wasteful spending and make better evidence-based decisions. Accordingly, the findings supported the argument that optimisation based approaches enhance the processes of organisational decision making. Thus, the null hypothesis was rejected, thus, cost optimisation was found to have a significant effect on decision making quality in Guinness Nigeria Plc, Abuja.

#### 4.1.2 Hypothesis Two

**H<sub>02</sub>:** Resource allocation efficiency has no significant effect on decision effectiveness in Guinness Nigeria Plc, Abuja.

$$DE = \beta_0 + \beta_1 RAE + \varepsilon \dots \dots \dots 2$$

**Table 6:** Model Summary

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .809 <sup>a</sup> | .655     | .653              | .30672                     |

a. Predictors: (Constant), RAE

#### Source SPSS Version 27

Table 6 presented the model summary for the regression analysis examining the effect of resource allocation efficiency on decision effectiveness in Guinness Nigeria Plc, Abuja. The result revealed that there is a strong positive relationship ( $R = 0.809$ ) between resource allocation efficiency and decision effectiveness. The variance of the R square value of 0.655 indicated that 65.5% of the variation of decision effectiveness could be explained by the efficiency of resource allocation, and the other 34.5% could be explained by other factors not included in the regression model. An adjusted R Square of 0.653 indicated that the explanatory power of the model was not affected after controlling for the sample size. The implication of this finding was that there is significant contribution of resource allocation efficiency to the effective decision making in Guinness Nigeria Plc, Abuja. This implied that the effective allocation of organisational resources to a suitable task/activity allowed for the empowerment of a manager to translate decisions made into desired organisational outcome.

**Table 7:** ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F       | Sig.              |
|-------|------------|----------------|-----|-------------|---------|-------------------|
| 1     | Regression | 46.929         | 1   | 46.929      | 498.848 | .000 <sup>b</sup> |
|       | Residual   | 24.742         | 263 | .094        |         |                   |
|       | Total      | 71.670         | 264 |             |         |                   |

a. Dependent Variable: DE

b. Predictors: (Constant), RAE

### ***Source SPSS Version 27***

The Analysis of Variance (ANOVA) test result for the statistical significance of the regression model is presented in Table 7. The result obtained is F value of 498.848 and the significance value is 0.000 which is less than 0.05 level of significance. This meant that the regression equation was statistically significant, and efficiency of resource allocation significantly explained the effectiveness of decision making in Guinness Nigeria Plc, Abuja. The implication of this result was that the relationship found between the efficiency of resource allocation and the effectiveness of the decisions was statistically significant and not a random effect. Therefore, the model presented sufficient evidence that there was a relation between the efficient allocation of resources and the efficient utilisation of the organisational decisions. This

outcome led to rejection of the null hypothesis that efficiency in allocation of resources is not a significant factor in the effectiveness of decision making.

**Table 8:** **Coefficients<sup>a</sup>**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|
|       |            | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant) | 1.215                       | .126       |                           | 9.618  | .000 |
|       | RAE        | .697                        | .031       | .809                      | 22.335 | .000 |

a. Dependent Variable: DE

### **Source SPSS Version 27**

In table 8, the regression coefficients were presented for the contribution of resource allocation efficiency to the effectiveness of decision. This result shows that the allocation efficiency of resources had a positive and significant impact on decision effectiveness with an unstandardised coefficient (B) of 0.697, a standardised Beta coefficient of 0.809, a t value of 22.335, and a significance value of 0.000. The positive Beta coefficient showed that the efficiency of the allocation of resources when employees of Guinness Nigeria Plc, Abuja increased led to an increase in the effectiveness of their decisions. In particular, the more efficient use of the resources was related to an increase in decision effectiveness of 0.697 unit for each unit of increase in the efficiency of using the resources. This finding suggested that matching of organisational resources and the appropriate task enhanced the capacity of the organisation to implement its decisions successfully and attain its desired goals. Thus, the outcome indicated that the implementation of efficient resource allocation improved managerial results as available resources are allocated to the area where they will produce the highest value. Therefore, the null hypothesis was rejected, meaning that the efficiency of allocation of the resources had a significant impact on the effectiveness of the decision in Guinness Nigeria Plc, Abuja.

## **4.2 Discussion of Findings**

The first hypothesis was related to the effect of cost optimisation on decision quality of Guinness Nigeria Plc, Abuja, which was tested. The result of regression showed that cost optimisation had a positive and significant effect on decision quality with Beta coefficient value of 0.603 and significance value of 0.000. This showed how effective managers' practices of cost optimisation were in making rational, informed and appropriate decisions. Thus, the null

hypothesis was rejected. The discovery was substantiated by Decision Theory that outlines how decision makers can optimise outcome through systematic evaluation of alternatives and selection of options that will maximise expected benefit (Von Neumann & Morgenstern, 1947). The approach of cost optimisation was formalised in this study, allowing managers to evaluate financial consequences and choose between alternatives that offer a higher value to the organisation.

The results aligned with Masrom et al. (2025) who reported that optimisation methods like the Hungarian assignment method could enhance resource allocation decisions by minimizing inefficiencies and aiding in making better choices. In a similar vein, Gaspars-Wieloch (2021) found that assignment models improved decision processes by considering costs and uncertainty factors when making resource allocation decisions. The finding was also confirmed by Ni et al. (2022), who showed that analytical decision models enhanced the decision-making process for corporations by systematically assessing different options. The argument that optimisation-based approaches enhanced decision quality was supported by these studies. But, More and Waysal (2022) proposed that optimisation was not sufficient to make decisions better, it was also important for the models to cope with uncertainty and more complex organizational situations. Similarly, Visalakshidevi and Kalaivani (2026) mentioned that the utility of decision models relied on the environment of the organizations. These studies did not contradict the present finding but indicated the need for cost optimisation to be in addition to other managerial considerations. Hence, overall experimental results had been obtained on the favorability side of the present study.

Second hypothesis focused on the impact of the allocation efficiency of resources on decision effectiveness in Guinness Nigeria Plc, Abuja. The regression result indicated that the efficiency in using of resources positively and significantly influenced the effectiveness of decisions with a Beta coefficient of 0.809 and a significance value of 0.000. This meant that proper utilization of the resources of the organisation in the right task, greatly enhanced the success of the implementation of decisions and the realization of the targeted objectives. The finding was consistent with Decision Theory which makes the assumption that effective decisions are made by rational evaluation and selection of alternatives that will generate desirable outcomes (Von Neumann & Morgenstern, 1947). This was applied in efficient resource allocation, that is, allocations that maximised the value of the resources to the organisation.

This was corroborated by Hui and Lin (2020), who demonstrated that HR allocation models aided in decisions making to ensure that the employees' skills and abilities matched the needs of the project. Likewise, Bányai (2023) showed that optimizing the assignment of operators to machines had a positive effect on production efficiency by matching resources to the needs of production. Stratman et al. (2024) also demonstrated how resource characteristics could be combined with organisational objectives to improve workforce allocation decisions using decision-aware models. The findings of Patanakul et al. (2007), Tan and Staats (2020) and Blasiak et al. (2024) also backed up the position that using the right assignments resulted in better organisational outcomes due to better use of resources. But, Ni et al. (2022) and Visalakshidevi and Kalaivani (2026) emphasized that other factors such as decision complexity, organizational conditions and managerial judgment affected the effectiveness of decisions. These studies did not conflict with the current results because the result of the studies did not indicate that there is any antagonism, but just the opposite, which is the efficiency of resource allocation that explains 65.5% of the variation in decision effectiveness, while other factors explain the remaining variation.

In conclusion, the results supported that assignment models had a significant impact on firms decision making in Guinness Nigeria Plc in the sense of cost optimisation and efficiency in resource allocation. The study further added to the body of literature by giving empirical evidence in a manufacturing environment in Nigeria, which had not been found in the majority of the studies that were mostly conducted in mathematical simulation environment. The results thus showed that optimisation-based methods proved useful decision-making support tools for enhancing managerial decisions and organization results.

## **5. CONCLUSION AND RECOMMENDATIONS**

The results of the study showed that the decision making of the firms in the study, Guinness Nigeria Plc, Abuja, was significantly affected by assignment models. In particular, cost optimization was determined as a positive and significant factor on decision quality, because optimizing costs, evaluating and managing costs effectively, increased the rationality and accuracy of managerial decisions. Likewise, the efficiency of resource allocation was found to be a significant factor in influencing decision effectiveness, showing that the 'right to resources' could contribute to the effectiveness of the manager's decision-making processes and desired outcomes. The study, therefore, confirmed that assignment models could be useful decision-

making support tools which supported managerial decisions in terms of cost management and use of resources effectively.

## **Recommendations**

1. Guinness Nigeria Plc, Abuja needs to intensify the use of cost optimisation techniques in its managerial decision-making process by implementing systematic methods of costing alternatives, controlling unnecessary expenditure and choosing the most cost-effective option. This would help to improve the quality of decisions made by managers as they would be able to make better, evidence-based and financially sustainable decisions.
2. There should be optimisation of resource allocation, through the use of structured assignment and allocation arrangements, ensuring that the allocation of employees, equipment and other resources used in the operations of the organisation is based on their capability, priority and need. Thus it would help make decisions more effective, enabling managerial decisions to be put into practice and achieve the expected organisational results.

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