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The Role of Negative Ties in Understanding the Link Between Social Networks and Organizational Creativity

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Abstract

The aim of this study is to develop propositions for determining the relationship between negative ties of social networks and organizational creativity and to examine the effects of organizational networks on organizational creativity from an interpretative research perspective by considering negative bonds. Firstly, the basic information in the literature on organizational change and organizational networks was examined. Then, propositions were developed for determining the relationship between social networks and organizational creativity by considering the negative ties. To be competitive, organizations must also be innovative, making organizational creativity a crucial capability. Accordingly, the past decade has seen increasing attention among scholars in the field of creativity. Most of the organizational network studies focus on positive ties and relations obtained through ties that reflect relational forces and they ignore the differential factors that arise as a result of negative ties. In this context, the importance of negative ties was discussed. The interpretative approach tries to find answers to research questions with theoretical explanations in cases where there is not much information about the concept for the first time to reveal the theoretical relationship of the concepts specified in the current literature.

Keywords: Social networks, Organizational networks, Negative ties, Organizational Creativity

Introduction

As globalization becomes ever more ubiquitous, the need for creative responses increases dramatically. Multinational companies, start-ups, local SMEs, and even individuals need to be creative to survive. Creativity is emerging as a crucial resource for firms to act globally. The creativity embedded in an organization is so-called organizational creativity, as it arises through individuals working together in a complex social system, influenced by individual and group creativity and the organizational setting (Borghini, 2005). Organizational creativity is defined as the purposeful creation, application, and implementation of novel ideas within a job role, team, or organization.
to achieve the best results for that organization (West, 1989). To increase the organizational creativity information sharing, innovation, creative work environment, team motivation, change, and flexibility are important. For having sufficient organizational creativity organizations better analyze their location in their social network.

In this research, propositions were developed according to organizations’ central and peripheral locations. Centrality is the number of direct ties an actor has in the network (Burt, 2004). Gaining a central position for the organization is seen as beneficial to receive diverse information and exercise influence over other agents, i.e., a central position defines an information broker who accesses and integrates information through social links. This notion has wide implications on status, roles, and leadership in organizations (Yan, Liu, Liu, Cai, Su and ZheYanng, 2018). In this research, negative organizational ties were discussed. In their study Moerbeek and Need’s (2003) study specifically examines the effects of negative ties in work environments, providing an alternate conceptualization of negative workplace relationships and they define negative relationships in the context of social capital rather than in terms of the interactions between individuals. Moerbeek and Need (2003), term relationships that have a negative effect ‘sour social capital’; besides this in his research Burt (2004, 2005) states the power of weak ties.

When organizational network studies are examined, it is seen that most network researches focus on the results obtained through ties that reflect relational forces, ignoring the discriminating factors that arise as a result of negative ties (Everett and Borgatti, 2014). In other words, researchers often analyze ties in such a way that the fact that they are negative doesn’t matter. However, the results that emerge as a result of network relationships based on positive relationships may not occur in networks with negative relationships. For this reason, the results of negative ties in network relations should also be examined. In accordance with the purpose of the study, first of all, the basic information in the literature about organizational creativity and organizational networks was examined and suggestions were developed to determine the relationship between these two subjects by considering the negative ties.

**Theoretical Background**

**Social Network**

The networking approach is rooted in various disciplines such as social psychology, sociology, economics, mathematics, anthropology, and political science (Katz, Lazer, Arrow and Contractor; 2004). In the field of social psychology, the most important current in the study of networks; studies on inter organizational networks, which are within the scope of social network theory and based on social network analysis; focus on structures, relationships, and outcomes (Dhanaraj and Parkhe; 2006). Social network analysis determines the positions of organizations in the network. Therefore, it focuses on the internal dynamics and determining the future development of the system by examining the network structure at a given time (Grandori and Soda, 1995).
between organizations and the dimensions of social relations can be analyzed with the 'network mechanism' approach. The network mechanisms perspective is embedded in the network mechanisms of economic action of social relations. Network mechanisms consist of individuals and organizations, and these organizations and individuals are connected to each other by social relations (such as friendship, resource transfers, and overlapping memberships) (Gulati, Dialdin and Wang, 2002). While network mechanisms theory shows the effect of individuals' resilience on their behaviors, the same discussion is made for organizations (Gulati 1998, Gulati 1999, Burt 1982). Organizations, each of which forms a separate network mechanism, are in connection with other organizations in a social and economic context. Linked relationships consist of suppliers, commercial associations, resource transfers, overlapping board memberships, individual relations of employees and previously established alliances (Gulati et al., 2002: 281).

There are different classifications of network mechanisms in the literature. Those types that explain the structural configurations of bonds are weak and strong bonds (Baker, 1990; Granovetter, 1973; Granovetter, 1983; Granovetter 1985; Uzzi 1996). Strong ties support trust and reciprocity and enable the transfer of proprietary information and critical resources. Granovetter (1973) explained weak and strong ties in his study of 'strength of weak ties'. Granovetter (1973) defined strong ties as a function of three factors: 1. relationship frequency, 2. reciprocity, relationship-based obligations and favors, 3. friendship and intimacy. As the interaction between individuals increases, friendship ties are established and a psychological bond is formed between them. This psychological attachment disappears as the bonds weaken (Granovetter, 1973). Strong ties are not bridging ties. For weak ties, the sparseness of the relationship is decisive. Negative ties have the same effect like weak ties both for individuals and organizations. Granovetter (1973) argues that weak ties that create distance in relationships in the network mechanism are beneficial in providing individual benefits and integrating individuals into societies. Individuals or organizations with weak ties can reach more individuals or small groups and allow innovations to spread (Granovetter, 1973: 1367,1376). In addition, the mobility provided by weak ties helps the individual in the workplace to access information that they do not have (Granovetter, 1983: 205). Burt (1997), supporting Granovetter's thoughts, states that inter-organizational solidarity is formed as a result of weak ties. Burt (2005a, 2005b) describes the weak links of organizations in the network mechanism as gaps and these structural gaps provide organizations with a competitive advantage. The actors in the network setup have enough information to fill in the structural gaps, thus keeping the control of the network communication. Adler and Kwon (2002) draw attention to the fact that with the bridges created by weak ties in social networks, organizations become stronger in society and that these organizations have different information compared to others. Uzzi (1999) defined instantaneous, weak ties as relationships at arm's length. Relationships at arm's length happen without the need for any social connection.

Baum, Calabrese, and Silverman (2000) state in their work that network assemblies consist of vertical and horizontal ties. In vertical network setups, the relationship
structure is hierarchical, predefined, and information flow is unidirectional from top to bottom. In vertical relationships, communication takes place with clear rules and social connections are not much. The biggest problem among actors in horizontal network mechanisms, in other words, competitors, arises from opportunistic behaviors (Gulati and Singh, 1998). Direct and indirect ties play different roles in the innovation process of organizations. Direct links are the essence of accessing resources and information; indirect links are the main source of access to information. Both direct and indirect ties have a positive effect on the output of the innovation, but the effect of indirect ties is determined by the number of direct ties of the organization (Ahuja, 2000).

The final classification to be examined in the network level approach is the ties arising from the central and peripheral locations. The centrality of the actor in the organizational network mechanism is explained by his/her close relations. In other words, centrality is the number of direct ties an actor has in the network (Burt, 2004). The actor with a large number of ties is in an advantageous position. The degree of centrality enables the actor to learn and obtain information (Gulati et al., 2002). Galaskiewicz (1979) also emphasized the importance of centrality and argued that centrality is the direct control of resources. According to Sargut (2006:6), since the actor in the center has easy access to information and resources, the dependency of the actors in the periphery on those in the center will increase. The centrality of an organization, on the other hand, is the extent of the organization’s relations and how it has widespread relations with other actors on the network through direct or indirect ties (Gulati, 1999). Burt (2004) states that the actors in the center become even more central when the actors in the periphery communicate with the other actors with whom they communicate. Therefore, as the communication of other actors increases, the centrality degrees of the central actors will also become stronger. In social network mechanisms with a high degree of centrality, actors are deficient in decision-making mechanisms and in completing their insufficient knowledge, so there are differences between the actors in the center and periphery of the network. Peripheral actors take advantage of ‘structural holes’, as Burt (2005) argues, and explain their ideas by filling in the gaps. For this reason, they become more effective in decision-making by sharing information with the central actors.

**Organizational Creativity**

Creativity refers to one’s capabilities of generating creative and practicable ideas (Amabile, 1983) and it is an essential determinant for effective employee and firm performance (Shalley & Gilson, 2004; Zhang & Bartol, 2010). Researchers and managers have realized the importance of creativity and the necessity to foster it in the workplace. Shalley et al., (2004) defined creativity as; it is the generation of new and useful ideas from an employee or groups of employees working together (Shalley et al., 2004). Organizational creativity which is embedded in an organization arises through individuals working together in a complex social system, influenced by individual and group creativity and the organizational setting (Borghini, 2005). Creativity is about divergent thinking, questioning the understanding and thinking of others, unconventional thought patterns, original connections, unconventional perspectives and views, unorthodox ideas, and the search for unusual answers by new pathways.
(Kraft, 2005). Sauto (2022) states that; therefore, creativity implies originality, novelty, unusualness, imagination, spirit of discovery, curiosity, experimentation, risk-taking, mental flexibility, and metaphorical thinking, and also focusing on the creation of value and usefulness.

Impact of Negative Ties to Organizational Creativity and Development of Propositions

Gulati (1998), states that there is a general belief that economic activities are affected by the social context in which the organization is located and that these actions will be affected by the position of the actors within the social network structures. Different locations in a network provide different degrees of access and control to valuable resources (Burt, 1992). For this reason, it is possible to use the position of an actor determined by the center-periphery distinction in the network to explain the behavior of that organization. Centrality can be defined as the degree to which the organization is directly or indirectly linked to other organizations. Central position of an organization in the network will indicate that it has a very important strategic position in the network order (Freeman, 1979). It can be defined as the centrality of an organization, the breadth of its relations, and how it has common relations with other actors on the network through direct and indirect ties (Gulati, 1999). Also, in the central position in the network order, center organizations have the opportunity to control other organizations and resources (Gulati, 1999). Findings that the individual in the central position in the network mechanism will acquire faster and more information than the ones in the environment and that the acquired information will be transmitted to the others faster have been given a lot of attention, and it is stated that it is advantageous to be in the central position in the social network mechanism (Alan, 2017:116). The centralized organization has more power to coordinate other interdependent organizations because of its control over information and physical resources (Pfeffer and Salancik, 1978). In this context, it can be criticized as that an organization that is at the center of the network will have an impact on the behavior of other organizations with which it is in contact. For having organizational creativity, being a central organization can be seen as an advantage. Centrality provides the organization with more access to up-to-date information on external environmental changes (Ferreira and Armağan, 2011). This means that the organization has an advantage in innovation, change, and creativity. Baldwin, Bedell, and Johnson (1997) stated that negative ties that the organization has, will prevent the organization from accessing important information flowing in the network and the social support it will receive from the network. The greater the centrality of individuals, the less they are exposed to negative relationships and ties within the group (Baldwin, et.al, 1997). This situation will have a negative impact on the organization’s work on the above-mentioned innovations, changes, and creativity. Based on these considerations, the following proposition can be developed.

Proposition 1: It is expected that the organization, which is the center of the network, has less negative ties and will positively affect creativity in terms of that organization.
The central organization can prevent the information flows around the negative link, deliberately distort it or even completely terminate it (Marineau and Labianca, 2021). With the effect of the dynamic nature of networks, the position of the organization in the network is a result of its past relationships and the past relationships of other organizations within the network, and this position may change (Gulati, 1995). In this case, the organization, which is located in the center and has the opportunity to control both the network and all the resources that the network will offer, will want to keep the behavior of the organizations in the periphery under control in order to maintain this advantageous position. The absence of any negative link, such as a competitive relationship, between the actors in the network mechanism will cause the central organization to be content with this static network order as much as it allows. Baum and Ingram (2002) state that, for this reason, an organization within the network can balance the information asymmetry by establishing intermediary relationships with organizations that are not connected to its own network, and it can provide a significant autonomous autonomy against the negativities of others. Based on these considerations, the following proposition can be developed.

**Proposition 2:** It is expected that the negative ties of the organization that is in the center of the network will have a negative effect on creativity in terms of that organization.

As Burt (2005) argues, peripheral actors take advantage of 'structural holes', and explain their ideas by filling in the gaps. For this reason, they become more effective in decision-making by sharing information with the central actors. Burt (2005) states that, structural holes are the empty spaces in social structure and a structural hole between two groups need not mean that people are focused on their activities such that they do not attend to the activities in the other group. The value-potential of structural holes is that they separate non-redundant sources of information sources that are more additive than overlapping (Burt, 2005). Everett and Borgatti (2014) mentioned that, negative relationships lead to low in-group cohesion as they are related to the perception of conflict between actors. For this reason, when environmental organizations encounter negative relations with other environmental organizations that are equivalent to them in terms of power and status, they are likely to use the strategy of communicating with intermediaries that can provide communication with others (Stevenson and Greenberg, 2000) and this can affect the organizational creativity. In that context, it can be thought that the negative bond relations between environmental organizations can bring dynamism to these organizations. Based on these considerations, the following proposition can be developed.

**Proposition 3:** The negative ties of the organization, which is in the periphery within the network, with other organizations in the environment, positively affect creativity in terms of that organization.

The actors in the periphery have some disadvantages compared to the powerful actors in the center, there are also thoughts that some actors may consciously choose to stay in the periphery position and use the network strategically in this way (Stevenson and Greenberg, 2000). Sargut (2006) states that since the actors in the central position in the
network can easily access information and similar resources, the dependence of those in the periphery on those in the center is pleasurable, and therefore, these actors in the periphery will be in a dependent and powerless position. In a network with negative ties, the actor in the environment may want to stay in this position in order not to be excluded and exposed to oppositional movements (Stevenson & Greenberg, 2000). Negative relations, especially with the central actor, may cause the loss of all opportunities offered by the network. The organization, which has a central position in the network mechanism, has the opportunity to control the network mechanism they are in according to the organizations in the environment. In this case, the peripheral actor, who does not have an intense relationship with other actors, may face the problem of expanding his relations within the network. For having organizational creativity information flow and communication are the dominant factors. In addition, peripheral organizations, which have a negative relationship with the central organization, do not have the opportunity to quickly observe the learned reactions of this organization, which has high legitimacy, in the face of situations, so they may not be able to react to the uncertainty in order not to be unsuccessful. Based on these considerations, the following proposition can be developed.

**Proposition 4:** Negative ties of the organization, which is at the periphery of the network, with the organizations located at the center negatively affect creativity in terms of that organization.

**Conclusion**

In this study, the effects of organizational networks on creativity are discussed by considering the effect of negative ties. In the study, first of all, the basic information in the related literature about organizational networks and creativity has been included and the relationship between these two concepts has been tried to be revealed by considering the negative ties.

Accordingly, it is expected that the intensity of the negative relations of the central organizations will have a negative effect on the organizational creativity cause of information flow, while the intensity of the negative ties of the peripheral organizations will be directly proportional to the organizational change. As Burt (2005) states, those negative ties allow organizations to have structural holes and they give strategic advantage to the organizations so that organizations can be more creative. In addition, it is expected that the effect of negative relations of environmental organizations on change will differ according to the fact that they are with central organizations and other environmental organizations. Both organizations and individuals should accept those negative relationships are inevitable. Different and opposing views should be allowed to be expressed and discussions should be seen as a good opportunity. As a result, in line with the evaluation of the views in the literature and the evaluations that had been made regarding these views, various proposals have been developed to determine the effects of organizational networks on organizational change by using a perspective in which negative ties are taken into account.
In the literature, most studies ignore negative ties. It would be useful to evaluate the effects of negative ties on organizational creativity by reducing them more specifically and by considering frequently used parameters related to organizational networks. For this purpose, evaluations were made by taking the position of the organizations in the network as a reference in the study. The collaborative and interactive nature of social networks facilitates socialization processes among major exchange stakeholders. Therefore, it is better for managers to evaluate the advantages and disadvantages of being centralized or periphery as an organization while having organizational creativity.

References


Application of Linear Programming to Game Theory in Finance

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Abstract
The study examines the application of linear programming to game theory in finance using how the Telecommunication firms determine the optimal strategy from television and radio advertisements given that each company seeks to gain the largest market share. The methodology used involved a Game Theoretic approach and linear programming. The result of the analysis showed that for MTN to maintain its position as the leader in the industry, it should invest 0% of its M billion Naira in Television Advertisement and 100% in Radio Advertisement when competing with Airtel, Globacom and 9Naija. This will yield a pay-off of ₦9M billion. Findings revealed that for Globacom to gain the largest market share in the industry, it should invest 0% of her ₦N in Television Advertisement and 100% in Radio Advertisement when competing with MTN. This will produce a benefit of 9N billion Naira. The results also showed the optimal resource allocations for Airtel and Globacom for each firm to gain the largest market share in the industry when competing with MTN. Findings also revealed the pay-offs for both firms when they compete with MTN. It is therefore recommended that Nigerian Telecommunication firms use Game Theory in optimizing resource allocation between strategies.

Keywords: Linear Programming, Game theory Telecommunication, Strategies, MTN, Globacom, Airtel, 9Naija

1. INTRODUCTION
Organizations are set up to achieve goals and objectives. In trying to achieve the goals and objectives, decisions are to be made and resources have to be deployed. Some of the techniques that can assist managers of business organizations in operation research are game theory and linear programming. It assists managers in making effective decisions
in order to achieve efficiency, increase productivity and overall corporate performance (INFORMS, 2005).

In a competitive market, a producer or seller (party) always need to weigh the expected responses of their rivals. The issue is the approach adopted by each party to secure some competitive advantage. Mentioned below are some approaches that are currently used in underdeveloped countries like Nigeria. According to Osaze (1998), some approaches currently use in Nigeria for strategic management include hunch, intuitive and anticipatory, opportunistic, formal–structured, incrementing and adaptive.

Generally, allocation problems are concerned with the utilisation of limited resources to best advantage (Lucey, 2002). If there were no resource constraints, the organisation perhaps could allocate without optimising or optimise without considering the allocation implication but not both (Olayemi and Onyenweaku, 1999). Greater emphasis upon efficient utilisation of the existing resources and combination of enterprises in an optimal manner is paramount.

According to Akingbade, Luck and Patal (1991) linear programming in operation research is a problem-solving science-based activity using analysis and modelling as a basis for aiding decision-makers in organisations to improve the performance of the operations under their control. It is concerned with analysing complex problems and assisting decision-makers work out the best means of achieving objectives. It can be said to have been in existence since the beginning of mankind (Agbadudu, 2006). However, the concept emerged in 1940 during world war II, when a team of scientist was called upon by the military management in England to develop ways to make the most effective use of limited military resources (Anderson, Sweeney &Williams, 1997 and Taha, 2002). Their mission was to formulate specific proposals and plans for aiding the military commands to arrive at decisions on optimal utilisation of scarce military resources and also to implement the decisions effectively. The name “Operations Research” originated because the team was handling research on (military) operations. The United States military management took a leaf from the British military management and started the use of Operations Research.

Due to the successful utilisation of linear programming by military management in Britain and United States, managers of business organisations became interested in using the techniques to solve organisational problems. Consequently, in the early 1950’s, business organisations began to absorb some of the Operations Research men which trickled out of the military (Ekoko, 1999). Today, linear programming and game theory are dominant and indispensable decision making tools and are widely used in business organisations in western countries.

1.1. Focus of the Study

The study focuses on the Global System of Mobile Communication under Telecommunication industry in Nigeria. The study therefore limits its scope to MTN, Airtel, 9Naija and Globacom. The Telecommunications industry is undoubtedly a critical and strategic industry for any economy that desires to achieve economic growth; this is because of its positive contribution to the outputs growth of other sectors.
Telecommunication services are required for the smooth running of every firm in every industry. The sector also attracts foreign direct investment, thereby opening up the domestic economy to the global market. Although, the first use of telecommunication involved the use of a cable connection between the colonial office in London and Lagos in 1886, telephone services were later provided to government officials in 1893 and further later extended to Ilorin and Jebba. Also, a three channel line carrier system between Lagos and Ibadan was commissioned and later extended to Benin, Kano, Enugu, Kaduna and Osogbo, between 1946–1952, (Ajayi, 1999).

2. Literature Review

2.1. Linear Programming

According to Taha (2002) Linear programming is a technique for resolving problems of resource allocation. It is designed to assist management in its optimisation decisions involving the use of competing resources. It offers a simplified technique for specifying how to use limited resources or capacities of a business to obtain a particular objective such as least cost, least time or highest margin when these resources have alternative uses. There are situations where a business organization is faced with the problem of allocating its resources which include money, materials, land, machine time and labour time. It helps in the process of selecting the most desirable course of action from a number of available courses of action thereby giving management information for making effective decisions about the resources under its control. Its applicability is however restricted to problems that are entirely linear. The general formulation of a linear programming problem is given as:

\[
\text{Optimize } Z = \sum c_i x_i \\
\text{s.t } \sum a_{ij} x_j \leq b_i, \quad \sum a_{ij} x_j \geq b_i \]  

Where:

\( x_j \) = Decision variables
\( c_i \) = Coefficients in the objective function
\( Z \) = The objective to be optimized (either maximization or minimization)
\( b_i \) = The set of constraints
\( a_{ij} \) = The coefficients of the decision variables

Linear programming problems can be solved using the graphical method, the matrix method or the simple method (Spyros, 1999).

Given the dynamic nature of the environment, linear programming technique offers the type of flexibility management might require to cope with changing conditions. Results obtained through linear programming can be easily re-evaluated for changing conditions through sensitivity analysis (Ekanem & Iyoha, 2002).
2.2. Games Theory

A game is a description of the strategic static or dynamic interaction between opposing, or co-operating, interests (players) where the constraints and payoff for actions are taken into consideration and may or may not be known by the players before the game commences. On the other hand, a player is a basic entity in a game that is tasked with making choices for actions. A player can represent a person, machine, or group of persons within a game. Players can also represent lines of code and attack scripts. Player and firewalls strategically interact as they contend for network resources. Pay-off in an organisation can range from availability of bandwidth to more secured network environment which will result to better network performance and lower losses.

Game theory describes multi-person decision situations as games where each player chooses his/her actions which result in the best possible rewards for self, while anticipating the rational actions from other players. A player is the basic entity of a game that makes decisions and then performs actions. A game is a precise description of the strategic interaction that includes the constraints of, and payoffs for, actions that the players can take, but does not pay attention to the actions they actually take (Roy, Ellis, Shiva, Dasgupta, Shandilya & Wu, 2010).

There are four basic characteristics of a typical game as it applies to game theory. They include: Multiple player (two or more), Competitive in nature, Rules that guide every game and Payoffs for player.

Games theory provides a framework for analysing decision making among firms in a competitive situation. In the business world, many decisions are made in competitive situations where the decision of a competitor affects the decision of a firm. According to Camerer (2003) all situations in which at least one agent can only act to maximize his utility through anticipating (either consciously or just implicitly in his behaviour) the responses to his actions by one or more other agents is called a game. The purpose of the game is for each player to select the strategy that will result in the best possible payoff or outcome regardless of what the player’s opponent does. The term player is used to denote each firm, which takes part in games related to decision making. Each player in a game faces a choice among two or more possible strategies. A strategy is a predetermined programme of play that tells a firm what actions to take in response to every possible strategy its competitors might use. The best strategy for each player is known as the optimal strategy. When each player in the game adopts a single strategy as an optimal strategy, then pure strategy game exists. On the other hand, when the player adopts a mixture of strategies, then it is a mixed strategy game. A pure strategy game can be solved according to the minima decision criteria while a mixed strategy game can be solved using expected gain and loss method or linear programming (Ekoko, 1999).

2.4. Theoretical Background

Game Theory often referred to as the Science of Strategy explains how players make decisions in conflicts or competition. It was initially applied to examine the economic
behaviour of firms, markets and consumers. It has been widely applied to the behaviour of producers with few competitors. Game Theory enables firms to make appropriate choices and helps in understanding or predicting the behaviour of competitors. Modern game theory was introduced with the publication of the book ‘Theory of Games and Economic Behaviour’ authored by Morgenstern and Von Neumann (1953). Morgenstern and Von Neumann examined cooperative games involving various players in their book. It was later applied to other areas of specialization aside from Economics to social network formation, ethical behaviour, biology and other fields of specialization.

A game can be described as the mathematical representation of conflicts in which the players involved get results. It was originated by Antoine Augustine Cournot in 1838. The agents involved are usually called players (individuals or firms). Some of the components of a game include rules, pay-offs and strategies. Rules govern the conduct of the players; they are an important source of power in games. Strategies are courses of action taken to achieve the goals of the players. They influence the decision making process. In applying Game Theory to the competitive behaviour of firms, firms face a number of strategic decisions which can be taken to realize a desired pay-off. A pay-off is the outcome of adopting a strategy such as win, lose or draw often represented by a Pay-off Matrix. Firms can derive a range of pay-offs from the strategies they use. Such pay-offs can include greater profit for shareholders, increase in market share, improved chances of survival and eliminating a rival.

A game can be either Static or Dynamic. Static games involve players taking their decisions, without the knowledge of the actions of their competitors. Actions do not have to be taken at the same time, but rather it is as if the decisions are made simultaneously. Thus, the element of time is excluded from these kinds of games. Static games are described in strategic forms. The Prisoner’s Dilemma is an example of a static game wherein two suspects are arrested for a crime and are interrogated in separate cells. One of the suspects will be set free and the other will be imprisoned, if the first confesses and the other refuses to own up. If neither owns up, both of them will receive a lower punishment, than if they both confess. Each suspect is afraid the other will confess and thus is quick to confess to be released. In Dynamic games often represented in extensive forms, the players are able to know the actions of competitors before making their move. Dynamic games can be repeated a number of times. This enables the competitors to know and work with the result of previous rounds.

Some models describe only the behaviour of two companies in the studied market (duopoly). The firms can choose to cooperate or compete. When competing, firms in a duopolistic market usually resort to non-price competition to achieve corporate goals such as profit-maximisation and increase in market share. The firms may have information about the decisions of their rival. This influences the strategies they adopt in achieving their goals. Others describe several companies with the same level of power (cartel). Others also assume that one of the companies has a dominant position in the market.

2.5. Empirical Literature
Several projects have been conducted in the area of Game Theory. Different methodologies have also been employed on such studies.

Araujo (2012) conducted a research on capital budgeting under competitive markets in the telecommunications industry in Portugal. The study focused on the economic feasibility of Fiber-to-the-Home networks using latest techniques. The methodological approach included the use of Game Theory, capital budgeting algorithms with real options and Monte Carlo simulations. These were adopted to analyse project risk. Results showed that with the use of Game Theory, Capital Budgeting Algorithm and Monte Carlo Simulation, firms in the telecommunications industry can evaluate the economic potential of their projected networks.

Guldmann and Kucukmehmetoglu (2002) analysed water resource issues with Game Theory taking Tigris and Euphrates rivers as a case study. They adopted a linear programming model that allocated water resources among agricultural and urban uses of Turkey, Syria, and Iraq. Cooperative game theory concepts such as Core and Shapley value were used to determine stable water allocations.

Gkonis and Psaraftis (2007) adopted a Game Theoretic approach to the analysis of the investment rules and competitive patterns in LNG (Liquefied Natural Gas) shipping market. The research revealed some useful insights. It demonstrated that it is important to consider the reaction of other players when making a decision. It also revealed that it is critical to gain information about the types of competitors in a game.

Fernandez (2008) applied the concept of Game Theory to examining the sharing of penalties and rewards in projects. The study examines how to divide the total reward and penalty among project activities. A game theoretic approach is used to determine a set of stable allocations of the total penalty and reward. Findings showed that the total reward for the project does not need to be equal to the summation of the rewards for the subprojects.

Mattos, Vieira, Schmitz, and Alencar (2014) used Game Theory to analyse incremental funding method in Software projects. The Incremental Funding Method (IFM) is a popular technique for maximising the financial return of software projects in a monopolistic market structure. Gambit, a tool for solving finite games, was used in determining all Nash equilibria. The findings of the research demonstrated that in a competitive market the equilibrium solutions enable competitors to choose the optimal monopolistic implementation order.

Serghini (2003) analyses water resource issues in multipurpose dam projects in Morocco through a Game Theoretic approach. He adopted the methodology of the FDC (Fully Distributed Costs) allocation rules, and applied it with the Shapley value and the Nucleolus. The multipurpose use of water in Morocco includes hydroelectric power, irrigation, and urban supply. There are usually conflicts over tariffs between the ministries that manage the entire infrastructure. The author examined two methods for allocating the costs: the FDC methods and the main apportioning methods.

Achugamonu, Inyama and Onuoha (2012) examined the objective project optimisation for the Nigerian Telecommunications Sector with the use of Game Theory. MTN Nigeria
and Globacom Nigeria were used as the case studies. Primary and Secondary data were used for the investigation. The methodology employed was linear programming. Findings showed that competitors in the Nigerian telecommunications industry should employ Game Theory in taking actions for optimal results in achieving company objectives. It was recommended that MTN Nigeria and Globacom Nigeria use the results of the study in allocating resources and planning to ensure better results.

Oziegbe (2011) applied the concept of Game Theory to examining business strategy in undeveloped countries adopting Nigeria as a case study. The methodology employed was a strategic form of a game. Results showed that game theory is an essential tool for examining the strategies of managers when determined by the actions of a competitor.

Lippai and Heaney (2000) applied Game Theory to present a method for determining efficient and equitable impact fees for urban water systems for each user, based on the type of demand on the system. The study assessed the significance of assuring a fair assessment of impact fees for an urban water supply system. The methodology used was cooperative game theory allocation solutions. The conclusion of the research was that the cost of the project needs to be equitably allocated among all existing and new users.

Fudenberg and Levine (1988) applied the concept of Game Theory to open-loop and closed-loop equilibria in dynamic games in the case of many players. Non atomic games in which the pay-off of a player is not influenced by the actions of a single rival were examined. The limits of a finite game approaching an atomic game were also examined. The objective was to demonstrate that equilibria in the non atomic game are approximately the same as those in the approaching finite game and that the limit of equilibria is an equilibrium and every sequence of equilibria has a limit. Two-period models were adopted for the analysis. Findings showed that as strategic possibilities increase with the game and the set of closed-loop equilibria expands, it becomes more difficult to guarantee that closed-loop equilibria are close to the open-loop equilibria.

Montero (2005) examined the behaviour of competitors when they bargain. The results indicated that altruism may be beneficial in bargaining when there is competition for bargaining partners. The results also indicate that the similar features of preferences that are beneficial in two-player bargaining can be detrimental when competition exists between bargaining partners. None of the studies conducted on the telecommunications industry have addressed the competition among GSM operating firms in Nigeria.

3. RESEARCH METHOD

The study employed secondary data, that is, data on the amount spent on television advertisement and radio advertisement by each GSM firm was collected. Data was sourced from Media Monitoring Services Limited and Internet. The period of the study covers from June 2014 to June 2015. The Linear Program Solver that is based on the efficient implementation of the modified simplex method was used for the computation.
of the results. The application is used for solving linear, integer, goal programming problems and for conducting sensitivity analysis.

3.1. Model Specification

Assuming two GSM operating firms A and B have M billion Naira" and “N billion Naira respectively for adopting television advertisement and radio advertisement as strategies.

The Solution for firm A is represented by the following Linear Program Problem:

Maximize $\sum_{j=1}^{n} c_j x_j$

Subject to $\sum_{j=1}^{n} a_{ij} x_j \leq b_i, i = 1, 2, \ldots, m$

$x_j \geq 0, j = 1, 2, \ldots, n$

Where $x_j$ represents the strategy

The Solution for firm B is the Dual of the Solution for firm A. This is represented by the following Linear Program Problem:

Minimize $\sum_{i=1}^{m} b_i y_i$

Subject to $\sum_{i=1}^{m} a_{ij} y_i \geq c_j, j = 1, 2, \ldots, n$

$y_i \geq 0, i = 1, 2, \ldots, m$

Where $y_i$ represents the strategy

The competition between Nigerian GSM firms can be analysed through the prisoner’s dilemma game. Nigerian GSM companies produce products and services that are functionally the same. They can either cooperate or compete. If they both cooperate, they can charge monopoly prices; this would translate to having the same market share. However, they usually choose to compete, this is due to the fact that a critical goal of each firm is to maximize market share. In a bid to achieve this, each firm reduces the price of their product to achieve a higher market share. Examples of this strategy is GSM operating firms reducing their tariff for making calls and offering low prices for Internet services.

In any Game Theoretical Framework, linear programming algorithm has been found to be an effective tool in finding the optimal strategy of any firm in a competitive economy. According to Fabayo (2009), Linear Programming is a mathematical optimisation technique which is designed to determine the optimal allocation of scarce resources among competing products or activities. The optimal outcome can be maximum profit or minimum cost. Linear programming has been employed to determine advertising budgets to allocate resources to television, radio, billboard and newspaper advertisements.

4. PRESENTATION AND ANALYSIS OF RESULTS

The objective of this project is to determine the pay-off from television advertisement and radio advertisement for each GSM firm. To achieve this, yearly data on the expenditure on television advertisement and radio advertisement by each firm were
collected. The period of data collection was from June 2014 to June 2018. This information is presented in the table 1.

**Table 1:** Firms’ Expenditure on Television Advertisement and Radio Advertisement from June 2014 to June 2018

<table>
<thead>
<tr>
<th>Firm</th>
<th>Expenditure on Television</th>
<th>Expenditure on Radio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Advertisement (Billion Naira)</td>
<td>Advertisement (Billion Naira)</td>
</tr>
<tr>
<td>MTN</td>
<td>1.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Globacom</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td>Airtel</td>
<td>1.2</td>
<td>0.4</td>
</tr>
<tr>
<td>9Naija</td>
<td>1.1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Source: Media Monitoring Services Ltd (MMSL)

**Table 2:** Approximated Total Expenditure on Television Advertisement and Radio Advertisement from June 2014 to June 2018

<table>
<thead>
<tr>
<th>Firm</th>
<th>Expenditure on Television</th>
<th>Expenditure on Radio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Advertisement (Billion Naira)</td>
<td>Advertisement (Billion Naira)</td>
</tr>
<tr>
<td>MTN</td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>Globacom</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Airtel</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>9Naija</td>
<td>11</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Author’s computation (2019)

Tables 1 and 2 can be used to describe a two-person duopolistic game. This game can be solved by employing the Simplex Method of Linear Programming and the Linear Program Solver.

### 4.1. Competition between MTN and Globacom

Let $x_1$ be the probability representing Television Advertisement and $x_2$ the probability representing Radio Advertisement. Let the value of the game for MTN be represented by $V_M$. Using the entries in Table 1 and 2, the study formulates the following Linear Programming for MTN Solution.

#### 4.1.1. MTN Solution
Maximize \( x_0 = x_1 + x_2 \)
Subject to \( 7x_1 + 4x_2 \leq 1 \)
\( 18x_1 + 9x_2 \leq 1 \)
\( x_1, x_2 \geq 0 \)

Solving the Linear Programming Problem with the Simplex Method and the Linear Program Solver, it becomes;
\( x_0 = 1/9, x_1 = 0 \) and \( x_2 = 1/9 \)

Since we are maximizing \( V_M = 1/x_0 = 9 \)

The required proportions (probability) is
\( X_1 = x_1/x_0 = 0 \times 9 = 0 \)
\( X_2 = x_2/x_0 = 1/9 \times 9 = 1 \)

**4.1.2. Globacom Solution**

Globacom’s minimisation problem is the dual of MTN’s maximisation problem. Using the Duality Theory, the conversion is as follows.

Let \( y_1 \) be the probability representing Television Advertisement. Let \( y_2 \) be the probability representing Radio Advertisement and \( V_G \) represent the value of the game for Globacom. Using the Duality Theory we have

Minimize \( y_0 = y_1 + y_2 \)
Subject to \( 7y_1 + 18y_2 \geq 1 \)
\( 4y_1 + 9y_2 \geq 1 \)
\( y_1, y_2 \geq 0 \)

Solving the Linear Programming Problem with the Simplex Method and Linear Program Solver, we have:
\( y_0 = 1/9, y_1 = 0 \) and \( y_2 = 1/9 \)
\( V_G = 1/y_0 = 9/1 = 9 \)

The required proportions (probability) is
\( Y_1 = y_1/y_0 = 0 \times 9 = 0 \)
\( Y_2 = y_2/y_0 = 1/9 \times 9/1 = 1 \)

The results show that when competing with Globacom, for MTN to maintain its position as the leader in the Nigerian GSM Industry, it should invest 0% of the M billion Naira funds available to the firm into Television Advertisement and 100% into Radio Advertisement. This will yield a pay-off of M billion Naira. Thus the optimal allocation of resources for MTN is

Television Advertisement = 0%
Radio Advertisement = 100%
The findings also show that for Globacom to change the structure of the Nigerian GSM Industry by attaining the position of the leader in the industry and thus gaining the largest market share, it should allocate 0% of the N billion Naira funds available to the firm into Television Advertisement and 100% into Radio Advertisement. This will produce a pay-off of 9M billion Naira. Thus the optimal allocation of resources for Globacom is:

Television Advertisement = 0%
Radio Advertisement = 100%

4.2. Competition between MTN and Airtel

Let a₁ be the probability representing Television Advertisement and a₂ the probability representing Radio Advertisement. Let the value of the game for MTN be represented by \( V_M \).

Using the entries in Table 1 and 2 we formulate the following Linear Programming for MTN Solution.

4.2.1. MTN Solution

Maximize \( a_0 = a_1 + a_2 \)
Subject to \( 12a_1 + 4a_2 \leq 1 \)
\( 18a_1 + 9a_2 \leq 1 \)
\( a_1, a_2 \geq 0 \)

Solving the Linear Programming Problem, we have:
\( a_0 = 1/9, a_1 = 0 \) and \( a_2 = 1/9 \)

Since we are maximizing \( V_M = 1/a_0 = 9 \)

The required proportions (probability) is
\( A1 = a_1/a_0 = 0 \times 9 = 0 \)
\( A2 = a_2/a_0 = 1/9 \times 9 = 1 \)

4.2.2. Airtel Solution

Airtel’s minimisation problem is the dual of MTN’s maximisation problem. Using the Duality Theory, the conversion is as follows.

Let \( b_1 \) be the probability representing Television Advertisement. Let \( b_2 \) be the probability representing Radio Advertisement and \( V_A \) represent the value of the game for Airtel. Using the Duality Theory we have

Minimize \( b_0 = b_1 + b_2 \)
Subject to \( 12b_1 + 18b_2 \geq 1 \)
\( 4b_1 + 9b_2 \geq 1 \)
\( b_1, b_2 \geq 0 \)
Solving the Linear Programming Problem, we have:

\[ b_0 = \frac{1}{9}, \quad b_1 = 0 \quad \text{and} \quad b_2 = \frac{1}{9} \]

\[ VA = \frac{1}{b_0} = \frac{1}{9} \times 9 = 9 \]

The required proportions (probability) is

\[ B_1 = \frac{b_1}{b_0} = \frac{0}{9} = 0 \]
\[ B_2 = \frac{b_2}{b_0} = \frac{1/9}{9} = \frac{1}{9} \times 9 = 1 \]

The results show that when competing with Airtel, for MTN to maintain its position as the leader in the Industry, it should invest 0% of the M billion Naira funds available to the firm into Television Advertisement and 100% into Radio Advertisement. This will yield a pay-off of M billion Naira. Thus the optimal allocation of resources for MTN is

Television Advertisement = 0%
Radio Advertisement = 100%

The findings also show that for Airtel to change the structure of the Industry by attaining the position of the leader and thus acquiring the largest market share, it should allocate 0% of the M billion Naira funds available to the firm into Television Advertisement and 100% into Radio Advertisement. This will produce a pay-off of M billion Naira. Thus the optimal allocation of resources for Airtel is

Television Advertisement = 0%
Radio Advertisement = 100%

4.3. Competition between MTN and 9Naija

Let \( c_1 \) be the probability representing Television Advertisement and \( c_2 \) the probability representing Radio Advertisement. Let the value of the game for MTN be represented by \( V_M \). Using the entries in Table 1 and 4.2 we formulate the following Linear Programming for MTN Solution.

4.3.1. MTN Solution

Maximize \( c_0 = c_1 + c_2 \)
Subject to \( 11c_1 + 5c_2 \leq 1 \)
\( 18c_1 + 9c_2 \leq 1 \)
\( c_1, c_2 \geq 0 \)

Solving the Linear Programming Problem with the Simplex Method, we have:

\[ c_0 = \frac{1}{9}, \quad c_1 = 0 \quad \text{and} \quad c_2 = \frac{1}{9} \]

Since we are maximizing \( V_M = \frac{1}{c_0} = 9 \)

The required proportions (probability) is

\[ C_1 = \frac{c_1}{c_0} = 0 \times 9 = 0 \]
\[ C_2 = \frac{c_2}{c_0} = \frac{1/9}{9} = \frac{1}{9} \times 9 = 1 \]
4.3.2. 9Naija Solution

9Naija’s minimization problem is the dual of MTN’s maximization problem. Using the Duality Theory, the conversion is as follows.

Let \( d_1 \) be the probability representing Television Advertisement. Let \( d_2 \) be the probability representing Radio Advertisement and \( V_E \) represent the value of the game for 9Naija. Using the Duality Theory we have

Minimize \( d_0 = d_1 + d_2 \)
Subject to
\[ 11d_1 + 18d_2 \geq 1 \]
\[ 5d_1 + 9d_2 \geq 1 \]
\[ d_1, d_2 \geq 0 \]

Solving the Linear Programming Problem, we have:
\( d_0 = \frac{1}{9}, \ d_1 = 0 \) and \( d_2 = \frac{1}{9} \)

\( VE = \frac{1}{d_0} = \frac{1}{9} \times 9 = 9 \)

The required proportions (probability) is
\( D1 = \frac{d_1}{d_0} = 0 \times 9 = 0 \)
\( D2 = \frac{d_2}{d_0} = \frac{1}{9} \times 9 = 1 \)

The results revealed that when competing with 9Naija’, for MTN to maintain its position as the leader in the Nigerian GSM Industry, it should invest 0% of the \( M \) billion Naira funds available to the firm into Television Advertisement and 100% into Radio Advertisement. This will yield a pay-off of \( 9M \) billion Naira. Thus the optimal allocation of resources for MTN is

Television Advertisement = 0%
Radio Advertisement = 100%

The study also showed that for 9Naija’ to attain the position of the leader in the Industry and thus gain the largest market share, it should allocate 0% of the \( K \) billion Naira funds available to the firm into Television Advertisement and 100% into Radio Advertisement. This will produce a pay-off of \( 9K \) billion Naira. Thus the optimal allocation of resources for 9Naija’ is

Television Advertisement = 0%
Radio Advertisement = 100%

5. CONCLUSIONS AND RECOMMENDATIONS

Game Theory can be a significant tool for GSM firms for optimising resource allocation between strategies. Firms usually face the challenge of deciding on the best allocation of scarce resources on competing needs in a bid to gain the largest market share. An inefficient allocation of resources leads to waste and incurring losses. This can be prevented by adopting a Game theoretic approach.
Game Theory enables firms to optimise the allocation of limited resources among various strategies in gaining the largest market share. It also enables firms to derive the allocation of resources that will yield an optimal benefit.

Nigerian GSM firms can determine the pay-off from the strategies available to them with the use of Game Theory. Such organisations are often concerned about the pay-off from their actions. They intend to know the benefits obtainable from their strategies before committing resources to such decision. This enables them to determine whether their strategies are profitable or inefficient. This is possible with the use of game theory. Game theory can serve as a tool for determining the pay-off from the strategies firms are considering in acquiring the largest market share. Thus game theory can enable firms to evaluate the effectiveness of the strategies available to them.

5.1. Recommendations

Based on the results of this research, it is recommended as follows:

i. GSM firms should employ Game Theory in determining the optimal strategy from television advertisement and radio advertisement in gaining the largest market share.

ii. GSM firms should use Game Theory in determining the pay-off from the optimal strategies they adopt.

iii. GSM firms should employ Game Theory in optimising resource allocation between television advertisement and radio advertisement.

iv. GSM firms in the Nigerian Telecommunications Industry should consider the strategies of their competitors in determining the best decision to adopt.

References


Dynamics and Implication of COVID-19 Pandemic on Inflation Volatility in Selected African Countries: A Dynamic Panel Data Analysis

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Abstract
The unending posture of COVID-19 pandemic is given rise to concern of policymakers around the globe, of which several studies have been conducted investigating the challenges of the pandemic. Meanwhile, studies suggested the need for more investigation on the implications of COVID-19 pandemic on macroeconomic indicators which has not been exhaustively investigated. Thus, this study attempt to investigate the impact of COVID-19 pandemic and other variables on volatility of inflation in some selected African countries using monthly data from January 2020 to December 2020 and employed GMM estimation techniques for the data analysis. The results revealed that the number of COVID-19 cases trigger the volatility of inflation, while the COVID-19 policy measures put in place significantly reduced the volatility of consumer price index in the selected African countries. Finally, the findings implications for policymakers in the selected countries and similar countries in nature were presented in the study.

Keywords: African countries; Inflation; COVID-19 pandemic; Policy measures; Generalized Method of Moment (GMM).

Introduction
The implication of COVID-19 is not only a concern for public health, but its devastating effect on the socio-economic situation around the world is apparent (Chakraborty & Maity, 2020; Habib et al. 2020; Raza et al. 2020). For instance, Sharma et al. (2020) observed that the emerging countries that are already bedeviled with slow growth rate, poor health infrastructure, and huge population where majority of them lives in extreme
poverty are greatly dealt with by the pandemic. COVID-19 and other similar pandemic are known to severely impact the human capital of the nation invaded (Odugbesan & Rjoub, 2020; Odugbesan et al. 2020; Shahzad et al. 2020). Hence, the total expenditure on healthcare becomes increasing (Odugbesan & Rjoub, 2019; 2020). Differently from the impact on human life, Nakada & Urban (2020) and Shehzad et al. (2020) opined that COVID-19 pandemic also impacted economic and social life, which gives room for the increase in the uncertainty in daily life (Caggiano, Castelnuovo, and Kima, 2020). For instance, Dunn, Hood & Driessen (2020) observed that the pandemic has brought about abrupt and severe disruptions to economic activity, among which is the “social distancing” that sharply decreased consumer spending, especially in sectors that are more sensitive to these measures. Meanwhile, consumption was observed to have collapsed during the lockdown, while at the same time, upward pressure was experienced on the real output (Apergis & Apergis, 2020). In addition, Erdogan et al. (2020) observed that the sectors that make valuable contributions to combating the pandemic were observed to experienced significant improvement during this period.

In this regard, policymakers are not only interested in the sectoral development, but also the general economy improvement. Owing to the fact that, at the time there is collective sectoral basis assessment of positive and negative development, there is possibility of making an inference that a recession has happened in all economies during the pandemic process, with attendant effect on recession exacerbation, as well as growth rates reduction that leads to economic challenges like increase unemployment and public revenue reduction. During the pandemic period, the total demand compressions, as well as the production input price reduction are positive factors for addressing inflation. Meanwhile, it is worthy to note that there was difficulty in the supply of intermediate and capital goods, which was as a result of supply chain disruption and this lead to a decrease in production. Under an ideal situation, the prices reduction was a result of the demand contraption, but if the supply reduced same as demand, prices increase may happen. Therefore, there could be a challenge of inflationary trend control owing to the imbalance between demand and supply.

The present pandemic (COVID-19) is identified as one of means through which uncertain economic policies distorted the vision for the economy, has impact on the market participants, and illustrate the global economy’s interconnections (Al-Thaqeb, Algharabali, & Alabdulghafour, 2020). In addition, some studies opined that the pandemic has a significant influence on the world’s supply and demand at both macro and micro levels (Ma et al. 2020; Shi et al. 2020), which resulted to business closures, government-imposed quarantines, ban on travels, curfews, that have put the world in a “Great Lockdown” with attendant effect on every sector. In addition, Coibon, Gorodnichenko, and Weber (2020) observed that labor market has drastically reduced and the effect is evident on the outputs of goods and services. For instance, COVID-19 pandemic was observed by IMF (2020) to be the most severe economic downturn ever experienced since the “Great Depression”. Given the negative implications of COVID-19 pandemic on the local economies and the observed increase in the risk among the developing nations, especially the Sub-Saharan African countries, it becomes imperative to investigate inflation, owing to its direct influence on many macroeconomic variables.
Most studies during this period of COVID-19 pandemic dwell much on the influence of the policy implementation towards addressing the negative impact of the pandemic on the economy, as well as the direct impact of the Pandemic on the economic indicators, with less emphasis on the impact of the pandemic on some macroeconomic variables like inflation. Meanwhile, it is important to study the pandemic impact on each of the macroeconomic variables for more robust policies in addressing the fallout of COVID-19 pandemic. For instance, during this period of pandemic, some expansionary monetary policies were initiated with the aim of alleviating the negative impact of recession. Meanwhile, the investigation of the significant impact of the pandemic on the macroeconomic variables has not been exhaustively investigated. The available view studies were concentrated on the developed nation, with less focus on developing nations. Whereas, developing nations are bedeviled with some challenges even before the broke out of the pandemic, therefore, it is expected that the arrays of measures being put in place during the COVID-19 pandemic period would have impact on the volatility of consumers’ consumption pattern.

Thus, it becomes imperative to investigate the tendency of the inflation rate in the period of increasing unemployment with the view of guiding the policy makers in formulating policies that will combat the recession. In view of these, having a useful investigation on the inflation level is important to ascertain how the COVID-19 (cases) and other variables like domestic oil price and Covid-19 containment index influence inflation during pandemic. This present study will address two important questions which are: (i) Does the pandemic increase or decrease inflation rate in African countries in the midst of expansionary policies implementation? (ii) What other variables influence inflation rate during the pandemic period. Hence, the study aim is to examine the influence of COVID-19 and other determinants on inflation in selected Africa countries during the pandemic period. The choice of Africa countries is based on the nature of the countries as developing countries which were bedeviled with several economic challenges before the COVID-19 pandemic. Second, there is paucity of studies that investigate the implication of the pandemic on the inflation rate, especially in the context of SSA countries. Therefore, this present study will contribute to the literature by exploring the impact of COVID-19 and other determinants on inflation rate during pandemic period using GMM panel data estimator.

It is a fact that COVID-19 pandemic and the consequent great lockdown results increased uncertainties and changes in consumption trends. Moreover, inflation could possibly arise owing to the continuous “low touch” production and consumption. During the pandemic period, most of developing countries experienced increase of exchange rates which could be attributed to the foreign capital outflows. More so, cash in national currency were converted into reliable foreign currencies by the investors, due to unpredictability of the pandemic end time. The consequence of the uncertainty and increase of exchange rate triggers increase of production cost and aftermath price increase. In view of this, and with the intention of increasing demand, most country’s government introduced monetary expansion. This is with the hope of alleviating the contraction tendencies in their economies. Whereas, a monetary expansion that is not in tandem with production increase, will leads to inflationary pressure (Erdogan et al.
However, Victor et al. (2021), observed the emphasized superiority of fiscal policy measures by Keynes over monetary policy, where the government plays a role in regulating macroeconomic variables through direct government intervention. These measures as suggested by Victor et al. (2021) would directly have impact on aggregate demand via the tax rates and direct government spending adjustment. According to Abdullahi et al. (2016), a stable prices and excess capacity, where the output is determined by aggregate demand is assumed in a simple Keynesian model. It is also expected that a multiplier effect on the income level via aggregate demand would occur due to fiscal expansion. Similarly, Jahan et al. (2014) opined that monetary policy exerts short-term impact on inflation, as well as the country-wide demand for goods and services. In the inflationary period, the price levels are reduced through contractionary monetary policy that either reduced money supply or increase interest rate; and the significant issue associated with this include the time lag between the policy changes and economic outcomes.

Empirically, some studies placed much emphasis on the influence of COVID-19 pandemic on the uncertainty and spending, as well as some economic sectors that are mostly affected (Altig et al. 2020; Apergis and Apergis, 2020; Devpura and Narayan, 2020; Fu and Shen, 2020; Haroon and Rizvi, 2020; Ilyke, 2020; Narayan, 2020; Salisu and Sikiru, 2020; Vidy and Prabheesh, 2020; Wang et al. 2020), with few studies investigates the implication of COVID-19 pandemic on inflation rates. For instance, Altig et al. (2020) conducted a comparative study on US and UK examining the economic uncertainty indicators like business growth uncertainty, stock market volatility, as well as GDP growth uncertainty before and during COVID-19 pandemic. The study found significant reactions of economic outcomes to the uncertainty caused by the pandemic, and concluded that volatility was observed to be on increase towards the February ending and got to the peak in the middle of March, but decline towards the end of the month, while the stock price started to recover, while a sharp decline was also noted in the industrial production during the period. Similarly, canonical epidemiology model was utilized by Eichenbaum et al. (2020) to investigate the influence of the COVID-19 pandemic on U.S. economic decisions. It was demonstrated in the study that the consumption which exacerbated the severity of the recession owing to the pandemic was cut back.

The implication of COVID-19 pandemic on consumer spending was demonstrated in the studies of Baker et al. (2020) and Dunn et al. (2020) The study of Baker et al. (2020) found an increase in the credit card spending, retail, and foods in the early period of the pandemic, but observed a sharp reduction in retail and restaurant in the following months, while a significant impact of the pandemic was found on the accommodation and restaurant in the second week of March, 2020 (Dunn et al. 2020). Moreover, the household spending pattern and their macroeconomic expectation was investigated in the study of Coibion et al. (2020) using a survey method covering about 10,000 respondents. The study revealed that about 50% of the respondents lost their income and wealth owing to the pandemic, while the respondents in addition expects a lower inflation in the long-run, foreign stocks into liquid forms of saving, and higher uncertainty. Another study by Pellegrino et al. (2020) that examined the effect of policy
uncertainty reduction on GDP in the context of European Union utilized non-linear VAR and found that pandemic has a higher impact on the economy uncertainty shocks during the periods of negative outlook in the long-run. In addition, revealed that the induced-uncertainty owing to COVID-19 pandemic on industrial production got a peak value at a loss of -15.4% “year-over-year growth” in September 2020, as well as about 1.5% decline in CPI inflation.

The changes in consumer patterns of expenditure that influenced CPI was investigated in another study (Cavalo, 2020), where the study found the inflation resulted from the pandemic in U.S. to be higher than the official CPI (see Table 1). The study concludes that while more spending on food and other categories with increasing inflation were caused by the social distancing precautions and behaviors, this measure also results to losses on transportation and related categories which experience significant deflation. The COVID-19 weights derived from the spending changes in Canada and the U.S. are generally similar. In an average basket for all the economies in the dataset, food and housing have large weights, while recreation and culture, and restaurants and hotels have small weights (Table 5). However, the adjustments to the weights of clothing and footwear and transport differ. Canada’s spending changes imply a larger adjustment to the weight on clothing and a smaller adjustment to the weight on transport. This difference between the weights based on Canada and the weights based on the U.S. can have a noticeable effect on the results (Mitchell et al. 2020).

Table 1. COVID-19 Basket Weights implied by Spending Changes in Canada and the US (Global Averages)

<table>
<thead>
<tr>
<th>COICOP Division</th>
<th>CPI Weight, Price-updated to April 2020</th>
<th>COVID-19 Weight, based on Spending in Canada</th>
<th>COVID-19 Weight, based on Spending in the US</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 Food and non-alcoholic beverages</td>
<td>27.1</td>
<td>38.2</td>
<td>36.7</td>
</tr>
<tr>
<td>02 Alcoholic beverages, tobacco, and narcotics</td>
<td>4.0</td>
<td>5.1</td>
<td>5.6</td>
</tr>
<tr>
<td>03 Clothing and footwear</td>
<td>5.3</td>
<td>2.1</td>
<td>3.9</td>
</tr>
<tr>
<td>04 Housing, water, electricity, gas and other fuels</td>
<td>17.7</td>
<td>21.8</td>
<td>22.6</td>
</tr>
<tr>
<td>05 Furnishings and household equipment and maintenance</td>
<td>5.4</td>
<td>5.5</td>
<td>5.0</td>
</tr>
<tr>
<td>06 Health</td>
<td>4.1</td>
<td>3.9</td>
<td>2.5</td>
</tr>
<tr>
<td>07 Transport</td>
<td>11.9</td>
<td>7.0</td>
<td>4.6</td>
</tr>
<tr>
<td>08 Communication</td>
<td>3.5</td>
<td>3.8</td>
<td>4.4</td>
</tr>
<tr>
<td>09 Recreation and culture</td>
<td>5.6</td>
<td>1.3</td>
<td>2.1</td>
</tr>
<tr>
<td>10 Education</td>
<td>2.7</td>
<td>2.5</td>
<td>3.5</td>
</tr>
<tr>
<td>11 Restaurants and hotels</td>
<td>6.3</td>
<td>2.8</td>
<td>3.2</td>
</tr>
<tr>
<td>12 Miscellaneous goods and services</td>
<td>6.4</td>
<td>6.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Source: Mitchell et al. (2020), and Cavallo (2020).
Similarly, the influence of pandemic on the expected inflation and their volatility in the contest of US economy was investigated by Apergis & Apergis (2020), using swap rates. The authors argued that COVID-19 pandemic increase the inflation expectations and their volatility. This study is similar to the work of Jaravel et al. (2020) who studies the inflation dynamics at the time of pandemic in United Kingdom. The study found the inflation rate in the first month of the lock down to be 2.4% which is considered to be 10 times higher than the rate in the preceding months. Based on this, the study argued that in the preceding year, about 50% of the households experienced inflation, while the rest experienced deflation, and opined that the UK economy may be at risk of stagflation.

In the context of Switzerland, the nexus between inflation and COVID-19 pandemic was investigated by Seiler (2020), using debit card transactions. The study aimed at examining the changes in Swiss consumer price index and consumer spending, and found a higher inflation during the lockdown than the CPI inflation. Meanwhile, a sharp decline in inflation rates during the quarantine process in Canada was demonstrated in the study of Lane (2020), which was argued to be as a result of decrease in gasoline prices, travel services, as well as changes in spending. The study argued further that the fall in inflation experienced during the lockdown could be lower than the conventional CPI measure, and thus stressed the significance of the monetary policy to be future-oriented than usual.

In addition, a potential drivers and dynamics of inflation during the pandemic period were examined by Ebrahimy et al. (2020). The authors revealed inflation of the food prices in the early period of the pandemic, while no evidence of inflation was found in broader indexes. The possible government intervention impact on inflation during the pandemic period was explained in the study of Bresser-Pereira (2020). The study explained that while the monetary policy by government through the buying of securities from the Treasury for the purpose of financing exceptional spending does not against the inflation constraints, it could be in conflict with the fiscal constraints. Bresser-Pereira (2020) stressed further that excess demand that could results to imports increase, and current account deficit that could appreciate the nation currency, trigger inflation, as well as result to currency crisis would not occur from the monetary financing of COVID-19 pandemic. Meanwhile, in contrast to some findings in the literature, the investigation of consumer inflation expectation in the US during the COVID-19 pandemic by Armantier et al. (2020) found no consistent increase or decrease trend at the time the authors completed the research. But, the study opined that there is an indication of unprecedented upward trend in individual inflation uncertainty in the data. From the literature review, it is evident that there is paucity of studies that investigates the impact of COVID-19 pandemic on the inflation during the pandemic in the context of Africa countries, thus the aim of this present study to fill the gap. The remainder of the paper is structured as follows. The next section (section 2) presents the data and method employed for data analysis, while the findings and interpretation were presented in section 3. The discussion of findings and conclusions rounded up the paper in section 4 and 5.
Methods

This study aim is to investigate the impact of COVID 19 pandemic and other variables on the volatility of inflation during pandemic period in some selected African countries covered the period from January 2020 to December 2020. This study utilized COVID 19 number of cases as a proxy for COVID 19 pandemic which is in congruent with some studies (Albulescu, 2020; Iyke, 2020; Ma et al. 2020; Nakada & Urban, 2020). The dynamic inflation variable was proxy using consumer price index (CPI) as suggested in the literature (Bacon, 1991; Curry & Weiss, 2000; Warr, 2008). Other variables employed are real domestic oil price and COVID 19 containment and health index. The real domestic oil price was obtained from multiplication of oil price and exchange rate which is consistent with the study of (Jiménez-Rodríguez & Sánchez, 2005), while COVID containment and health index was used as a measure of policy responses to COVID pandemic (Hale et al. 2021). The COVID cases data was sourced from (Our World in Data, 2021), CPI and exchange rate data were sourced from International Financial Statistics, while oil price data was sourced from U.S Energy Information Administration database. All the variables used in the model are in logarithmic. This study used the monthly data of 18 selected African countries\(^1\) for 2020.

In this section, first of all the tests that are necessary before estimating the model are explained, then the methodology, variables, and the model are described. The first step in the empirical analysis is performing unit root tests. For this reason, we used test such as Maddala and Wu (1999) and Pesaran (2007) panel unit root tests (CIPS). for panel unit root test. The choice of these tests is based on the assumption of MW test that is based on a simple average of the individual “Augmented Dickey-Fuller (ADF) t-statistics” of individual cross-section, while CIPS test assumes cross-section dependence which is in form of a single unobserved common factor. For the data analysis, the generalized method of moment estimator (GMM) was employed for investigating the COVID19 impact on volatility of consumer price index. The GMM is used where the specific unobservable effects of every section and lags of the dependent variables as explanatory variables are the fundamental problems in estimating the models. It is based on dynamic panel models (Barro and Lee, 1996). Linear GMM estimator in the literature of economics was first introduced by Hansen and Singleton (1982). This estimator has quickly become one of the popular econometric techniques, both in the estimation of cross-sectional data and panel data because it is very flexible and requires only weak assumptions. It is necessary to specify the instrumental variables in this approach. The consistency of the GMM estimator is based on the validity of the assumption of no serial correlation between error terms and instruments. This can be performed by the tests that were presented by Arellano and Bond (1991), Arellano and Bond (1995) and Blundell and Bond (1998). The first test that is necessary in this approach is Sargan test. It tests the validity of the instruments which are used in estimation.

The second test is the Arellano-Bond test. This test surveys serial autocorrelation in the error terms of first-order difference. In both tests, if the null hypothesis is not rejected, it

---

\(^1\) Madagascar, Mauritius, Rwanda, Uganda, Zambia, Benin, Burkina Faso, Gambia, Mali, Mauritania, Senegal, Sierra Leone, Togo, Cameroon, Botswana, Lesotho, Namibia and South Africa
provides evidence for assumptions such as the validity of instruments and no serial autocorrelation. It is very important to note that the number of sections (N) is greater than time period (T) in this method (N>T) (Baltaji, 2008; Bond, 2002).

One method to estimate the GMM model is Arellano and Bond method (1991). Arellano and Bond suggested a first-order difference approach for stimulating the model. GMM Estimator makes it possible for researchers to eliminate the problems of serial correlation, heteroskedasticity, and endogeneity of some variables. In this method, the lags of dependent variables are used in the model to consider the dynamic effects. Dynamic relationships are modeled with inserting the lags of dependent variables as explanatory variables in the model. When the lag of dependent variables appears on the right side of equation, OLS estimators are not consistent (Hsiao et al. 1995). Thus, we should use the two-stage least squares method (2SLS) or the generalized method of moment (GMM) to estimate the model. Matyas and Sevestre (1992) believed that the 2SLS estimator may give high variances for coefficients because of the difficulty in selecting instruments, and it is possible that estimates not be statistically significant. Therefore, the GMM technique has been proposed by Arellano and Bond (1991) to solve this problem. This estimator increases the stability of estimation by reducing the sample bias.

Arellano and Bond (1995) suggested two-step GMM estimators using these conditions. As Blundell & Bond (1988) and Arellano & Bond (1995) explained, the asymptotic standard deviation for two-stage estimators has a downward bias and the one-step estimators relative to two-step estimators are asymptotically inconsistent even if the variance of the error terms is equal. Windmeijer (2005) by using Monte Carlo analysis showed that the two-stage estimator has less bias and standard error than the one-step estimator. In this research, we use the two-step estimator because it is more efficient than the one-step estimator. According to theoretical and experimental studies such as Assenmacher and Gerlach (2008), Edwards (1989), and Jalili (2014), the empirical model is as follows:

\[
SCPL_{it} = \alpha + \beta SCPL_{it-1} + \theta cov_{it} + \lambda X_{it} + \varepsilon_{it} + \delta_{i} \tag{1}
\]

where :

\(cov_{it}\): total covid cases for country i in period t

\(scpl_{it}\): volatility of consumer price index for country i in period t

\(X_{it}\): Vector of regressors and control variables, such as domestic oil price and Covid-19 containment and health index\(^2\), affecting the price.

\(\varepsilon_{it}\): Errors terms Special effects for sections (random or fixed)

\(\delta_{i}\): Special effects for sections (random or fixed)

\(^2\) This is a composite measure based on thirteen policy response indicators including school closures, workplace closures, travel bans, testing policy, contact tracing, face coverings, and vaccine policy rescaled to a value from 0 to 100 (100 = strictest) (source) COVID-19: Containment and Health Index, May 31, 2021 (ourworldindata.org)
Dynamics in the model has been shown as the lag of dependent variable with $SCPI_{t-1}$.

**Results and Discussions**

Before estimating the model, it is necessary to conduct stationary tests for the variables. If the variables are non-stationary, spurious regression might occur. For this reason, we used tests such as Fisher-ADF tests of Maddala and Wu (1999) and IPS test of Pesaran (2007). These unit root analyses indicate the null hypothesis to be the presence of a unit root against the alternative of mean reversion. Two modes are employed for the unit root tests in levels and first differences by specification with trend and without trend. The results as presented in Table 2 indicate that under the Maddala and Wu test without trend, all the variables except oil price which becomes stationary after first difference are stationary at level, while the result under CIPS without trend is similar with all the variables are stationary at level except COVID containment which was found not to be stationary at both level and first difference. Meanwhile, the COVID containment and other variables were found to be stationary at level with Maddala and Wu test under specification with trend, while under CIPS, CPI and COVID-19 cases were found to be stationary at levels, while domestic oil price was found to be stationary after first difference. In summary, all the variables in this study were integrated on I(0) and I(1), and none of them is I(2), which implies that the data are valid and reliable and are good for further analysis.

Table 2. The Results of Stationary Tests for Variables in Levels and First Difference

<table>
<thead>
<tr>
<th>Test variables</th>
<th>Specification without trend</th>
<th>Specification with trend</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADF-Fisher chi-square</td>
<td>ADF-Fisher chi-square</td>
</tr>
<tr>
<td></td>
<td>Level D(1)</td>
<td>Level D(1)</td>
</tr>
<tr>
<td>loilpd</td>
<td>37.434</td>
<td>167.811*</td>
</tr>
<tr>
<td>lscpi</td>
<td>79.048*</td>
<td>97.529*</td>
</tr>
<tr>
<td>lcov</td>
<td>715.496*</td>
<td>358.465*</td>
</tr>
<tr>
<td>lcchi</td>
<td>1019*</td>
<td>490.006*</td>
</tr>
</tbody>
</table>

*Significant at 1%, ** significant at 5%, *** significant at 10%. loilpd – log of domestic oil price, lscpi – log of consumer price index, lcov – log of number of covid cases, lcchi – log of covid containment and health index.

**Descriptive Statistics and Correlation Matrix Tests**

To regress the primary model, this study applied two statistical validations: statistical descriptive test and relationship matrix test. The findings of the descriptive statistical analysis are laid out in Table 3. According to Table 3, the definitive statistical test shows figures related to maximum values, minimum values, standard deviation values, mean values, and observations value, the sample overall, and between the sample countries. The findings suggest that there is an essential difference between countries and between countries. The results rationalize the implementation of the panel regression approach.
Table 3. The Results of descriptive statistics

<table>
<thead>
<tr>
<th>variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std.Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>lscpi</td>
<td>216</td>
<td>0.92117</td>
<td>0.59822</td>
<td>0.00166</td>
<td>3.1127</td>
</tr>
<tr>
<td>dlcov</td>
<td>178</td>
<td>10.4249</td>
<td>2.85024</td>
<td>0</td>
<td>17.1421</td>
</tr>
<tr>
<td>dloilpd</td>
<td>216</td>
<td>9.24039</td>
<td>2.15362</td>
<td>5.66126</td>
<td>13.5172</td>
</tr>
<tr>
<td>dlcchi</td>
<td>195</td>
<td>3.64702</td>
<td>0.84805</td>
<td>-0.65392</td>
<td>4.39383</td>
</tr>
</tbody>
</table>

Table 4 presents the relation matrix among the used independent determinants in the current study. The findings suggest there is no evidence for a high relationship between volatility inflation and economic determinants. Therefore, this study can proceed with the estimation of other determinants; the scale of relationship is acceptable between and within the used variables. Overall, the analysis can be taken into consideration as a safe estimation from the multicollinearity issue.

Table 4. The Results of Correlation

<table>
<thead>
<tr>
<th></th>
<th>lscpi</th>
<th>dlcov</th>
<th>dloilpd</th>
<th>dlcchi</th>
</tr>
</thead>
<tbody>
<tr>
<td>lscpi</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dlcov</td>
<td>-0.2247</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dloilpd</td>
<td>-0.1665</td>
<td>-0.3140</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>dlcchi</td>
<td>0.0043</td>
<td>0.6851</td>
<td>-0.6944</td>
<td>1.000</td>
</tr>
</tbody>
</table>

In reference to Equation (1), this study examines the effects of COVID cases on the volatility of CPI for selected Africa countries. In this model, domestic oil price and COVID containment and health were used as control variables for analysis. The lag of price that reflects the dynamics of the model and is used in GMM method was inserted as an explanatory variable in the model. The results of the model’s estimation using the generalized method of moments are presented in Table 5.

Table 5. The Results of GMM Estimation

<table>
<thead>
<tr>
<th>CPI : Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>dLscpi(-1)</td>
</tr>
<tr>
<td>dlcov</td>
</tr>
<tr>
<td>dloilpd</td>
</tr>
<tr>
<td>dlcchi</td>
</tr>
<tr>
<td>CONS</td>
</tr>
</tbody>
</table>

Number of instruments 14
No of groups 18

Test | Value | Probability |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sargan test</td>
<td>13.49</td>
<td>0.142</td>
</tr>
<tr>
<td>Arellano- Band test for autocorrelation</td>
<td>AR(1)</td>
<td>-2.70</td>
</tr>
<tr>
<td>AR(2)</td>
<td>-0.39</td>
<td>0.698</td>
</tr>
</tbody>
</table>
From the results presented in Table 5, we found \(dlcov\) to have a positive and significant impact on the volatility of CPI. This is an indication that a percentage change in number of COVID-19 cases holding all other variables constant will significantly increase the volatility of CPI by 0.07% at less than 1% confidence level. This implies that COVID-19 changed consumers’ spending patterns, as well as changes in demand patterns during the pandemic. Meanwhile, our analysis shows \(dlcchi\) to have a negative and significant impact on volatility of CPI. The result as presented in Table 4 indicate that a percentage increase in COVID-19 containment decrease volatility of CPI in the selected African countries holding all other variables constant by 0.21% at 5% confidence level. However, the significance of domestic oil price as a determinant of CPI volatility during pandemic period could not be established. Subsequent to the analysis, some tests were observed to ensure that estimates from the analysis are devoid of bias. As presented in Table 4, Sargan test shows that the assumption of the presence of any correlation between the instrumental variables and residuals is rejected. Based on this test, instrumental variables used in the model are valid. To ensure the absence of serial autocorrelation of first-order difference in residuals, the first and second order serial autocorrelation test proposed by Arellano and Bond (1991, 1995) is used. The null hypothesis of this test is the absence of serial autocorrelation which should be greater than 5% in the second order and less than 5% in the first order. Based on the results mentioned above, the null hypothesis, no second-order serial autocorrelation in residuals of first order difference, is not rejected. Therefore, the method of estimation is suitable for this model. Additionally, the first order autocorrelation probability is less than 5% and the null hypothesis of the test is rejected. The results of the observations are compatible with the research of Arellano and Bond (1991). According to the results in Table 5, as we expected, the lag of volatility of inflation to have a positive and significant effect on the volatility of inflation; this result implies the dynamics of the volatility of inflation over time, so volatility of inflation in the current period will be extended to the next period. This means that increase of the inflation volatility in the previous period increases the inflation volatility in the current period.

To check the robustness of our results we used fixed OLS and random OLS estimation. The coefficient estimates in GMM seem to be fairly robust across different estimation techniques in terms of signs and statistical significance.

<table>
<thead>
<tr>
<th>Table 6a, Random effect regression result</th>
</tr>
</thead>
<tbody>
<tr>
<td>lls CPI</td>
</tr>
<tr>
<td>0.69832*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 6b, fixed effect regression result</th>
</tr>
</thead>
<tbody>
<tr>
<td>lls CPI</td>
</tr>
<tr>
<td>0.48672*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hausman test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient estimator</td>
</tr>
<tr>
<td>FE-RE</td>
</tr>
<tr>
<td>(\chi^2 (\text{Prob} &gt; \chi^2))</td>
</tr>
<tr>
<td>167.47(0.060)</td>
</tr>
</tbody>
</table>

* significant at 1%, ** significant at 5%, *** significant at 10%
However, in order to obtain a single voice in terms of price elasticity, the Hausman test is employed to ascertain the preferred estimator. Under the null hypothesis (H₀) of the Hausman test, there is no systematic difference between the designated efficient estimator and the designated consistent estimator. Non rejection of H₀ implies that the designated consistent estimator is consistent but the designated efficient estimator is both efficient and consistent and thus is the preferred estimator. Rejection of H₀ however implies that the designated efficient estimator is inconsistent which makes the consistent estimator the preferred estimator. From Table 6 it can be inferred that the RE-OLS estimator is preferred to the FE-OLS estimator.

Conclusions

Though, studies abound on the COVID-19 pandemic and associated challenges, but the studies that investigate the impact of COVID-19 pandemic on individual macroeconomic variable like inflation are scant, especially within the context of Sub-Saharan Africa countries. Therefore, this present study aimed at filling the gap by examining the effect of COVID-19 pandemic on the volatility of inflation during the pandemic period in selected African countries (Madagascar, Mauritius, Rwanda, Uganda, Zambia, Benin, Burkina Faso, Gambia, Mali, Mauritania, Senegal, Sierra Leone, Togo, Cameroon, Bostwana, Lesotho, South Africa) for the period between January 2020 to December 2020. This study applied GMM technique to achieve a valid estimation being one of the efficient dynamic panel data estimator. In addition, to ensure the robustness of the estimates, static panel data estimators (fixed and random effect OLS) were utilized. This is with the aim of ensuring that the inference from the estimates will be sound and devoid of any methodological error.

In reference to the empirical results from this study, it is evident that COVID-19 pandemic trigger the inflation volatility during the period under study. This finding is consistent with similar previous studies. For instance, Apergis & Apergis, 2020 and Cavalo, 2020 (US economy), Jaravel et al. 2020 (UK), and Seiler, 2020 (Switzerland). These studies argued that the COVID-19 changes the consumer spending pattern and demand during the pandemic period. In addition, the increase in inflation during the pandemic in selected African countries could be as a result of some monetary policy measures introduced during the period to cushion the pandemic effect. Meanwhile, our finding is contrast to the position of Lane (2020) who found a decrease in the inflation rate during the pandemic period in Canada. Though, the finding is not surprising, because most of African countries economies are known for relying on “consumption-driven growth” and “service sectors” job, hence any adverse shock like the COVID-19 pandemic is expected to trigger the inflation. Moreover, this present study demonstrates that during the pandemic period in the selected African countries, the containment measures put in place contributes significantly to the reduction in the volatility of inflation during the period.

From the findings of this present study, we have been able to contribute meaningfully to the literature by providing answers to some salient questions that remain unanswered especially in the African context in respect of knowing if the pandemic increase or decrease the inflation during the pandemic period in African countries; and also, to
know what other factor contributes significantly to the volatility of inflation during this period. Hence, this study demonstrated that while COVID-19 trigger the volatility of consumers’ consumption pattern during the pandemic period, the containment measures drives down the inflation during same period. These findings address some observed gaps in the literature and constitute the novelty of our study.

Based on the findings from this study, the pandemic is no doubt has brought a severe recessionary trend in the economy of some African countries. During this period, the fall in economic growth is observed with an increase inflation rate. Thus, it becomes imperative for policymakers in Africa countries to develop self-sufficient strategies in most of economic sectors in case of any global disasters. The policies to be put in place should be both short and medium-term policies that will ensure faster recovery and long-term stability of the economy. Though, the influence of external shocks cannot be totally eliminated, but some critical sectors that are germane in time of disaster should be initiated and supported. In addition, an aggressive direct spending strategy could be adopted by the African countries government to keep the consumption demand high, which will enable a fillip to the production sector.

Though, our study finding provide evidence to argue for the detail investigation of COVID-19 impact on specific macroeconomic factors, and address the gap of paucity of studies in this regard in the context of Africa, our study has some limitations. The limitations lie in the limited number of determinant variables employed in the study, and the paucity of data to cover large number of African countries. Therefore, this study suggests that further studies should investigate other determinant factors of inflation to ascertain their effect during the pandemic period, as this will address possible variable omitted error, as well as expand the countries in the panel for a more robust and generalized results.

**List of abbreviations**

- ADF - Augmented Dickey Fuller
- CPI - Consumer Price Index
- GDP - Gross Domestic Products
- GMM - Generalized Method of Moment
- SSA - Sub-Saharan Africa
- UK - United Kingdom
- US - United State
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Organisational Leadership on Implementation of Strategic Plans in Tanzania’s Local Government Authorities

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Abstract

The study determined the influence of organisational leadership on the implementation of strategic plans in Tanzania’s Local Government Authorities (LGAs). The study used Pragmatism as the philosophy where a survey design was adopted using mixed methods particularly explanatory sequential strategy and time horizon was cross-sectional which allowed data to be collected at a single point of time. Both quantitative and qualitative methods and tools were applicable to triangulate the study finding. The sample size of 155 respondents drawn from target population of 290 employees in selected five (5) local government Authorities in Morogoro Region. Data were collected using questionnaires and interviews; and thereafter quantitative data analysed through descriptive and inferential statistics while qualitative data were analyzed through content analysis. The study revealed that, organisational leadership contributes about 27.5% of all initiatives on implementing strategic plans in Local Government Authorities while 72.5% is explained by other factors which were not studied. Therefore, organisational leadership do influence implementation of strategic plans in Tanzania’s LGAs; and hence, LGAs should encourage leadership that may create effective implementation of strategies by imparting skills on supervising and coordinating subordinates in their organization.

Keywords: Mixed method approach, organisational Leadership, strategy, Local government Authorities, Tanzania
1. Introduction

Scholars in Leadership argues that, organizations failure is caused in most cases by leaders failure to sell their vision to employees, or they are not able to influence their ideas to be passionate, and hence makes employees become disloyal to the organization (Kihara et al., 2016; Offord et al., 2016). As a result, employees’ efforts dwindle and less is realized. Also, given that organizations have set targets, it is leaders who influence how members of an organization make contributions towards accomplishing pre-determined goals and objectives(Ikiara & Kariuki, 2018). However, some leaders have failed to lead their organizations successfully due to environmental turbulence (Kirigi, 2020), at the same time, absence of good leadership in an organization is a big constraint(Kabetu & Iravo, 2018).

In Tanzania, the Local Government Reform Program of 1999 intended to bring the assumptions of decentralization by devolution into practice whereby a policy of administrative decentralization being one among the four policies was initiated in Local Government Authorities (LGAs). The policy itself administers the LGAs the power to plan, recruit, promote, reward, develop, discipline and fire their employees. It also maintained that LGAs will be the appointing authorities and employers for all employees in their jurisdictions including health staff and teachers (URT, 1998). These reforms were thought as necessary for improving quality and efficiency of public services but also to boost accountability in public sector. Regrettably, these efforts did bear little fruits on the ground as confirmed by (Kihara et al., 2016; Michira & Anyieni, 2018) who then declared that in reality, organisational leadership in LGAs is not clear to drive employees towards a particular vision. It is against this backdrop that this study was set out to establish the influence of organisational leadership on implementation of strategic plans in Tanzania’s LGAs.

2. Theoretical Review

Many organizations are increasingly developing an interest in the study of leadership rather than management (House & Aditya, 1997; Offord, Gill & Kendal, 2016; Kirigi, 2020). Also, scholars argue that, there was positive significant relationship between leadership and implementation of strategies which influence the performance of local government authority (Kirigi, 2020). However, employees in public sector organization were not satisfied due to unfair organisational leadership caupled by conflicts between technical experts and elected leaders (Kihara et al., 2016; Kirigi et al., 2020), therefore improvement is needed to rectify leadership issues in public sector organization in order to enhance the performance.

2.1. Theories underlying this study

Theoretical literature review refers to the review of relevant theories and concepts related to the study from books or other different scholarly materials relevant to the research problem being investigated under the study.

The contingency theory

While elaborating the relationship between contingency theory and leadership style, Koech and Namsonge, (2012) argued that contingency theory draws the idea that there
is no one or single best way or style to managing or leading organizations. Leaders should adopt leadership style which are appropriate in each situation. Hence, for a working body to achieve its maximum potential, leaders must determine the best leadership style and strategies for the individual situation, as there no leadership style or strategy which is appropriate in all situations.

2.2. Conceptual Framework

This study was guided by the following conceptual framework which shows the relationship between organisational leadership and implementation of strategic plans in Local Government Authorities (LGAs).

Figure 2.1: Conceptual framework

Source: Researcher’s construct, 2022

The conceptual framework portrays that, while other things remain constant, organisational leadership with good directives, supervisions, coordination and staffing positively influence implementation of strategic plans in Tanzania’s Local Government Authorities (LGAs).

3. Methodology

The study philosophy was pragmatism where both positivism and interpretivism were integrated, with a major emphasis on the deductive approach to theory development. This study used explanatory sequential design, which entails to collect and analyse quantitative data followed by qualitative data that explain the quantitative findings (Chandran, 2004; Feilzer, 2010; Cooper & Roger, 2012; Wilson, 2014; Bryman, 2016;). The study was carried out in five (5) out of nine (9) LGAs in Morogoro region including: Morogoro Municipal Council, Malinyi District Council, Mlimba District Council, Ifakara Town Council and Mvomero District Council. Both both probability and non-probability sampling techniques were used for selecting a sample of 140 respondents out of targeted population of 290 employees including the management teams and employees. Qualitative data were collected from fifteen (15) key informants (i.e. 5 District Council Directors and 10 Heads of Departments 2 HoDs from each council). The sample size of 140 was regarded as enough for statistical tests since other scholars like Mugenda and Mugenda (2003); Creswell (2015); Kothari and Garg (2014) and Gibson, (2017) suggested that, a 10% sample from a target population is sufficient for drawing conclusion from a population.
4. Results
This sections provides research findings after analysing data which were collected using interview and questionnaires to sampled sample size of 140 respondents. The data were collected from five (5) LGAs in Morogoro Region namely Morogoro Municipal Council, Malinyi District council, Mvomero District Council, Ifakara Town Council, and Mlimba District Council.

4.1. Descriptive Analysis
This section shows descriptive findings in respect to organisational leadership on implementation of strategic plans in LGAs. The details of descriptive analysis is indicated below.

4.1.1. Influence of organisational leadership on implementation of strategic plans in LGA
The study considered four (4) sub-variables (termed as leadership functions) that defines organisational leadership while managing and leading LGAs, these are directive leadership, supervision, coordination and staffing which were studies to establish their influence on implementation strategic plans. These leadership functions were surveyed by using a five-point likert as follows: 1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree or 5= Strongly agree. The result is explained in the following :

**Directive leadership to organization performance**
The aspects of direction of leaders to organization performance was examined by asking the respondents whether leaders had ability to direct subordinates, capability toward organization direction, and the availability of multiple skills in leading organization. On the first aspect, that whether leaders had ability to direct the subordinates, the results in Table 4.7 indicate that out of 140 respondents, the majority about 20.0% and 26.4% strongly agreed and agreed that leaders had ability to direct subordinate respectively; while about 28.6% were neutral; and the remaining (20.0%) and (5.0%) disagreed and strongly disagreed that leaders had ability to direct subordinates respectively. Another question needed respondents to know whether there are multiple skills in organization direction. The results in Table 4.7 show that 32.1% of respondent strongly agreed and 38.4% agreed while 21% were neutral. Others, 2.1% and 5.7% of respondents disagreed and strongly disagreed respectively. These findings differs with the findings by Rajasekar, (2014), who reported that, employees normally respond to appreciation which expressed through recognition of their good work because they feel proud if their work is valued.

**Supervision**
The respondents were asked to indicate whether leaders had close supervision to subordinates. The results in Table 4.7 show that out 140 of respondents 34.3% strongly agreed and 14% agreed while 34.4% were neutral. Others, 1.4% and 8.6% of respondents disagreed and strongly disagreed respectively.Also respondents were asked to indicate whether there are efficiency of supervision to subordinate by leaders. The results in Table 4.7 show that out 140 of the respondents, 34.3% strongly agreed and 37.9% agreed while 22.1% were neutral. Others, 5.7% of respondents disagreed
respectively. On the question whether there are enough time in supervision of subordinate by leaders. The results in Table 4.7 show that out 140 of respondents 42.1% of respondents strongly agreed and 30.0% agreed while 20.7% were neutral. Others, 6.4% and 0.7% of respondents disagreed and strongly disagreed respectively. The findings generally shows that, majority confirmed that, there is good leadership supervision towards implementation do strategic plans in surveyed LGAs.

**Coordination**

Another question needed respondents to know whether there is control of subordinates. The results in Table 4.7 show that out 140 of respondents 32.1% of respondents strongly agreed and 33.6% agreed while 22.1% were neutral. Others, 6.4% and 5.7% of respondents disagreed and strongly disagreed respectively. Another question needed respondents to know whether there are enough skills of leaders to control. The results in Table 4.7 revealed out 140 of respondents 30.7% of respondents strongly agreed and 39.3% agreed while 17.1% were neutral. Others, 7.1% and 5.7% of respondents disagreed and strongly disagreed respectively. Another question needed respondents to know whether there is enough time to control. The results in Table 4.7 revealed that out 140 of respondents 30.2% of respondents strongly agreed and 40.3% agreed while 19.4% neutral. Others, 5.8% and 4.3% of respondents disagreed and strongly disagreed respectively. The findings correlates with other scholars who argues that, leader must have and possess superior skills needed and necessary to effectuate performance by sensing, transforming and seizing available opportunities, capability of employees and other resources within the organisation (Kihara et al., 2016; Kabetu & Iravo, 2018; Kirigi, 2020). Therefore, the findings revealed good coordination of leaders towards implementation of strategic plans in LGAs

**Staffing**

Another question needed respondents to know whether there is availability of skilled labour for technical job. The results in Table (4.7) revealed that out 140 of respondents 27.9% of respondents strongly agreed and 41.4% agreed while 24.3% neutral others, 3.6% disagreed and 2.9% strongly disagreed respectively. The further question needed respondents to know whether there is a sufficient supply of labour in the area. The results in Table (4.7) revealed that out 140 of respondents 34.3% of respondents strongly agreed and 30.7% agreed while 19.3% were neutral. Others, 12.1% and 3.6% of respondents disagreed and strongly disagreed respectively. Therefore, the findings shows that, in the five surveyed LGAs there is availability of enough skilled employees for technical jobs, this influence successful implementation of strategic plans.
Table 4.7: Influence of organisational Leadership on Implementation strategic plans

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to direct subordinates</td>
<td>7</td>
<td>5.0</td>
<td>28</td>
<td>20.0</td>
<td>40</td>
</tr>
<tr>
<td>Capabilities towards organization direction</td>
<td>3</td>
<td>2.1</td>
<td>8</td>
<td>5.7</td>
<td>45</td>
</tr>
<tr>
<td>Multiple’s skills in organization direction</td>
<td>3</td>
<td>2.1</td>
<td>8</td>
<td>5.7</td>
<td>30</td>
</tr>
<tr>
<td>Close supervision to subordinates</td>
<td>2</td>
<td>1.4</td>
<td>12</td>
<td>8.6</td>
<td>34</td>
</tr>
<tr>
<td>Efficiency of supervision to subordinate</td>
<td>0</td>
<td>0.0</td>
<td>8</td>
<td>5.7</td>
<td>31</td>
</tr>
<tr>
<td>Enough time in supervision of subordinates</td>
<td>1</td>
<td>0.7</td>
<td>9</td>
<td>6.4</td>
<td>29</td>
</tr>
<tr>
<td>Control of subordinates in the organization</td>
<td>8</td>
<td>5.7</td>
<td>9</td>
<td>6.4</td>
<td>31</td>
</tr>
<tr>
<td>Enough skills of leaders in controlling subordinates</td>
<td>8</td>
<td>5.7</td>
<td>10</td>
<td>7.1</td>
<td>24</td>
</tr>
<tr>
<td>Enough time in controlling subordinates</td>
<td>6</td>
<td>4.3</td>
<td>8</td>
<td>5.8</td>
<td>27</td>
</tr>
<tr>
<td>Availability of skilled labour force technical jobs</td>
<td>4</td>
<td>2.9</td>
<td>5</td>
<td>3.6</td>
<td>34</td>
</tr>
<tr>
<td>Availability of cheap casual labors</td>
<td>6</td>
<td>4.3</td>
<td>16</td>
<td>11.4</td>
<td>31</td>
</tr>
<tr>
<td>Sufficient supply of labour in the area</td>
<td>5</td>
<td>3.6</td>
<td>17</td>
<td>12.1</td>
<td>27</td>
</tr>
</tbody>
</table>

N= 140

4.2. Inferential analysis

The study used inferential statistical analysis of collected data to generalize the relationship of the variables in this study. The major interest was to explain which percentage is influenced by organisational leadership on implementation of strategic plans in Tanzania’s LGAs.

4.2.1. Regression analysis of organisational leadership

The study needed to establish the relationship between organisational leadership and implementation strategies in LGA. The outcome revealed that Pearson correlation (R)=0.525 at significant level of 0.05 implies that there is moderate correlation between organisational leadership and the implementation strategies in LGA as shown in Table (4.16). The findings correlate with other scholars who revealed that there is a positive and a significant relationship between leadership and organisation performance(Kihara et al., 2016; Michira & Anyieni, 2018; Ikiara & Kariuki, 2018).
**Table 4.16:** Correlations of Organisational Leadership

<table>
<thead>
<tr>
<th></th>
<th>Implementation of Strategies in LGAs</th>
<th>Organisational Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Implementation of Strategic plans in LGAs</strong></td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>140</td>
</tr>
<tr>
<td><strong>Organisational Leadership</strong></td>
<td>Pearson Correlation</td>
<td>.525**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>139</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.01 level (2-tailed).

Furthermore, the finding in Table 4.17 show the coefficient determinant (R Square) of 0.275 at the significant level 0.05. This implies that 27.5 % of the implementation strategic plans in LGA are influenced by organisational leadership. This shows that, only 27.5% is contributed leadership while 72.5% is contributed by other factors as far as implemenetation of strategic plans in Tanzania’s Local government Aauthorities. The results agrees with other scholars who argues that, organisational leadership and comprehended with superior and strong leadership skill are very crucial dynamic capability that are required to drive performance in organizations that are implimentaing their statgies(Kihara et al., 2016; Michira & Anyieni, 2018; Kirigi, 2020).

**Table 4.17:** Model of Summary for Organisational Leadership

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.525**</td>
<td>.275</td>
<td>.270</td>
<td>.59917</td>
</tr>
</tbody>
</table>

*a. Predictors: (Constant), Organisational Leadership*

Also, the results in Table 4.18 show that organisational leadership has a positive significant influence on the implementation of strategies in LGA. The model of the goodness of fits was ISP= 1.625+0.562+e, where by ISP = implantation strategic plans in LGA. This model indicates that change of element in organisational leadership increased the implementation of strategic plans in LGA by the rate of 0.562, if LGA will not concentrate on organisational leadership, still its implementation strategies will be positive at the rate of 1. 625. This shows that there are factors that can influence the implementation strategies in LGA.
Table 4.18 Coefficients

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>1.625</td>
<td>.302</td>
<td>5.374</td>
<td>.000</td>
</tr>
<tr>
<td>Organisational Leadership</td>
<td>.562</td>
<td>.078</td>
<td>7.215</td>
<td>.000</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Implementation of Strategic Plans in LGAs

Moreover, the analysis of variance (ANOVA) in Table 4.19 confirmed that the model of fit was suitable for the data where by F=52.052 and P-value=0.00 which is less than significant level of 0.05 with df=137. This shows that, there is a significant relationship between organisational leadership and implementation strategic plans in LGA.

Table 4.19. ANOVAa

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>18.687</td>
<td>1</td>
<td>18.687</td>
<td>52.052</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>49.183</td>
<td>137</td>
<td>.359</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>67.870</td>
<td>138</td>
<td>.359</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Implementation of Strategic plans in LGAs
b. Predictors: (Constant), Organisational Leadership

6. Conclusion and Policy Implication

The study concludes that organisational leadership influence the implementation of strategic plans in LGAs. Therefore, proper leadership led to the effectiveness of the implementation of strategic plans in LGAs triggered by leaders who are able to direct their subordinates, supervise subordinates, and adequate skilled labour force for a technical job. Hence, the study suggested that LGAs should consider organisational leadership as a key for effective implementation of strategies by imparting skills on supervising and coordinating subordinates in their organization. The study informs policymakers or the government to rectify some of the regulations and guidelines that seem to restrict the implementation of strategies and make sure LGAs are having leaders who can real deliver value to their organisations.

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Disclosure

The authors declare that they have no competing interests in this study.
Reference


Effect of Local Governments’ Finances on Economic Growth of Nigeria: An Empirical Exploration

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Abstract
It is expected that local government as the closest tier of government to the people should promote grassroots development while at the same time contribute to national economic growth and development. The extent to which this is realized particularly in a developing country like Nigeria has not been given the empirical attention it deserves in past studies. Therefore, in this study, we examined the effect of local government finances (comprising total revenue, capital and recurrent expenditure) on economic growth in Nigeria for the period, 1993 to 2021. Dynamic Least Squares, Fully Modified Least Squares, Canonical Cointegrating Regression, and Granger causality techniques were applied to the annual time series data sourced from Central Bank of Nigeria’s statistical bulletin. Empirical findings of this study confirm the existence of a long-run relationship between local government finances and economic growth in Nigeria. Furthermore, local governments’ recurrent and capital expenditures were found to have positive but non-significant effect on economic growth unlike local governments’ total revenue which has negative and non-significant effect on economic growth of Nigeria. This study found no causal relationship between local government finances and economic growth. However, there is a unidirectional causality running from revenue to recurrent expenditure at the local government level. Likewise, capital expenditure has a unidirectional causality with recurrent expenditure. It can therefore be concluded that local government finances have no significant effect on economic growth of Nigeria in the study period. This study recommends that local government finances should be re-engineered towards growth-inducing projects, programmes and investments.

Keywords: Local government finances, capital expenditure, recurrent expenditure, government revenue, economic growth.
1. Introduction

Government at any level exists to provide services to the people for the enhancement of their living standard and therefore local governments that are created to bring government closer to the people at the grassroots are also expected to ensure transformation of rural lives (Musa & Ajibade, 2016). Local governments have the duty to provide services to the people at the grassroots level which should translate into sustainable development (Abioro & Adefeso, 2014).

Nigeria is a Federation of 36 states and Federal Capital Territory (FCT) with three tiers of government composed of the federal, state and local governments. Nigeria operates a democratically elected local government system and currently, there are 774 local government areas in Nigeria (Section 7(1) of the 1999 constitution of the Federal Republic of Nigeria). The local government as the third tier of government in Nigeria has constitutional duties and responsibilities to perform but chiefly, all these local government areas are created to ensure development at the grassroots level through services delivery to the local populace. Other important roles of local government according to Abugu (2014) include serving as the engine room of rural development and mobilization as well as national development considering the different roles in the provision of basic social amenities, mass mobilization, and ensuring social and economic justice. Furthermore, local government provides a secure and stable environment in which enterprises can flourish and are responsible for physical infrastructure necessary prerequisites to economic activity (UCLG Policy Paper, 2016). The author notes further that local government provides other public goods needed for human capital development; in addition to job creation and leadership training at the grassroots level. Moreover, Agbodike et al. (2014) reiterated that local government administration serves as a vehicle for political education and mobilization among others. According to the authors, local government administration also raises revenue to finance development programmes at the grassroots, in addition to promoting democratic rule in the society.

The aim of any government is to utilize the available scarce resources to ensure the growth and development of the country (Babarinde et al., 2021), but despite these roles, local governments in Nigeria have been bedeviled by myriads of problems which have undermined their capacity to properly and significantly influence the national economic fortune. Some of these problems include lack of autonomy and financial power; high employee turnover; excessive interference by state government, poverty of leadership, lack of true autonomy, and financial paucity (Agbodike et al., 2014; Ibietan & Ndukwe, 2014). Other problems of local government enunciated by Okafor et al. (2015) include abuse of constitutional provisions by the State governments; low level of commitment to the people; lack of monitoring and evaluation; rural poverty; rural unemployment; and inadequate resources in the rural areas.

Developments in the local government system is germane to national development in Nigeria (Idike, 2014) and it is expected that local government as the closest tier of government to the people should promote grassroots development while at the same contribute to national economic growth and development. The extent to which this is realized particularly in a developing country like Nigeria is a subject worthy of empirical

In Nigeria, Eyitayo and Alani (2019) attempted to empirically examined the role of local government fiscal autonomy on rural development and Aruwa (2012) though, examined public finances and economic growth in Nigeria but the real thrust of the study was to empirically determine the relationship between government revenues and expenditures, as well as the link between expenditures and economic growth in Nigeria. The focus of the duo empirics still focused on the federal government. Likewise, some past studies (such as Ekori and Adeniyi (2014), Abdulmajeed et al (2019), Aluthge et al (2021), Azubike and Onukwube (2019), Joseph and Omoduro (2020), Odinakachi et al. (2021), Rotimi et al (2021), Maikano (2022)) which examined the impact of government finances (revenue, expenditure) on economic growth still used the federal/central government as a case study without considering either the state or local governments.

Considering the dearth of empirical study on the role of local government finances in the economy of Nigeria, this study therefore, aims to carry out an empirical exploration on the study matter by examining the effect of local governments’ finances on economic growth in Nigeria. Specifically, the objectives of this study are to: assess the effect of local government revenue on economic growth in Nigeria; evaluate the effect of local government recurrent expenditure on economic growth in Nigeria; and examine the effect of local government capital expenditure on economic growth in Nigeria.

The three hypotheses of the study expressed in their null forms are stated hereunder:

**H01:** Local government revenue does not have significant effect on economic growth in Nigeria;

**H02:** Local government recurrent expenditure does not exert significant effect on economic growth in Nigeria;

**H03:** Local government capital expenditure does not significantly affect economic growth in Nigeria.

This study is limited to Nigeria as a case study of developing economy and only the third tier of government in Nigeria, that is, local government is examined. Local
government as the closest tier of government to the people, is expected to improve the country’s economic fortune and this study therefore focuses on testing this assumption.

The rest part of this study is structured into six other sections, comprising in the following order of: literature review, methodology, results and discussion, summary of findings, and finally, conclusion and recommendations.

2. Literature Review

The 1976 Local Government Reforms in Nigeria defines local government as government at local level exercise through representative council established by law to exercise specific powers within defined areas. To Sierak (2016), local government is an internal organization of the local society, with a distinct legal personality, structures and decision-making bodies. Local government can also be described as the level of government nearest to the people and considered to be the cornerstone of the government system in any country (Abdulkarim & Adeiza, 2019). Local government has also been conceptualised as the government established for the sole purpose of directly governing the local populace (Ibietan & Ndukwe, 2014). According to Tiku et al. (2019), local government is a semi-autonomous territorial unit created by the constitution or general laws of a state to undertake certain functions within specified or limited geographical location.

Local government finances relate to the fiscal operations of the local government through measures like revenue, expenditure, debt, budgeting and financial administration. Government revenue is the various income sourced by government from sources like taxes, fines, investment income, business, donations, grants, aids, etc., which are used in financing its operations, activities and expenditures (Babarinde, 2022). Section 162 (10) of Nigeria’s 1999 Constitution defines revenue as any income or return accruing to or derived by the Government from any source and including any receipt however described arising from the operation of the law, receipt from or in respect of any property held by the government, and any return by way of interest or loans and dividends in respect of shares or interest held by the Government in any company or statutory body. To Azubike and Onukwube (2019), government revenue is money received by a government. Income from federation account, state allocation, Value Added Tax, internally generated revenue, excess crude, budget augmentation and Subsidy Reinvestment and Empowerment Program (SURE-P), exchange gain and non-oil excess revenue, and grants are the main sources of local government revenue in Nigeria (Central Bank of Nigeria, 2021).

Government expenditure are the various costs, expenses and utilization of financial resources (funds) by the public sector for the proper functioning of government machineries and for the provision of public goods and services. In other words, the amount of money spent by government to provide public goods and ensure public governance is called government expenditure (Abdulmajeed et al., 2019). Government expenditure also called public expenditure could either be capital expenditure or recurrent expenditures. Government expenditure is capital in nature when the expenditure involves the procurement of long-lived and highly valued assets and properties that are capable of producing other assets. Construction of roads and bridges,
building of hospitals, acquisition of plants and machineries are examples of capital expenditure of government while expenditures in the forms of payment of workers’ wages and salaries, expenses of printing and stationary, debt servicing, regular repairs and maintenance, and other expenditure necessary for the day-to-day administration of government affairs, constitute the recurrent expenditures of government.

Economic growth as one of the macroeconomic goals of most public financial policies (Abdulmajeed et al., 2019), can be defined as the continuous expansion of the productive capacity of an economy which reflects increased capacity utilization to produce goods and services, and is normally represented by gross national product or gross domestic product (Abdulmajeed et al., 2019; Obaka et al., 2021). Economic growth is the increase of per capita gross domestic product as driven by improvements in productivity, which involves producing more goods and services with the same inputs of labour, capital, energy and materials (Diejomaoh & Eboh, 2010). Economic growth is the aggregate performance of the economy emanating from the contributions of different sectors of the economy. The public sector, through its various agencies at the different tiers of government is expected to contribute to the pool. A case in point in this study is the local government, which through its various functions and activities, is expected to contribute in economic aspect to the national fortunes. According to Diejomaoh and Eboh (2010), local governments have a role to play in the economic development of any nation; and their responsibilities and services have impact on the livelihoods of individuals and by extension the national economy is also affected.

Empirically, past studies have attempted relating local government activities with different aspects of national and human lives. For instance, Oduro-Ofori (2011) investigated the role of local government in local economic development in Ghana. The study revealed that, though the local government played several roles in local economic development, these were mainly traditional and not directly effective to rapidly address the local economic development needs of the municipality.

Renny an et al (2012) analysed the effects of fiscal autonomy and economic growth on local financial performance in Papua Province, Indonesia. From Partial Least Square (PLS) analysis, the study concludes that fiscal autonomy and economic growth have positive impact on local financial performance. In another study, Aruwa (2012) examined the relationship between government revenues and expenditures, expenditures and economic growth in Nigeria based on e Vector Error Correction modeling technique. The study found that real gross domestic and government revenue have positive impact on government expenditure. Further evidence from the study shows that economic growth and revenue causes the growth of public expenditure.

In another study, Ekor and Adeniyi (2014) investigated the impact of federal government expenditure on economic growth in Nigeria. From the modified Autoregressive Distributed Lag (ARDL) model, the study shows that government total and recurrent expenditures have non-significant effects on economic growth unlike capital expenditure which has significant positive effect in the second lagged period. The study also indicates that in the long run real GDP growth is slowed by the negative government expenditure multiplier.
Faisol (2017) studied the correlation between the public expenditure efficiency and the economic growth in East Java and Central Java, Indonesia using Stochastic Frontier Analysis (SFA) method and regression analysis. The study shows that public expenditure efficiency scores have positive and significant correlation with the economic growth in the region.

Siregar and Pratiwi (2017) analyzed the effect of local government characteristics (size, age, status, population, number of work units, employee expenditure and leverage) on local financial independence as well as its impact on economic growth and the Human Development Index in Indonesia using Partial Least Squares technique. The study shows among others, that size, age, status, population, number of work units, and have leverage positive and significant effect on the local financial independence. According to the study, local financial independence has negative and significant effect on economic growth.

Omodero et al (2018) investigated the impact of total internally generated revenue, internally generated revenue of the federal, state and local governments on economic development of Nigeria. From the multiple regression, the study reveals that total internally generated revenue, state internally generated revenue, and local government internally generated revenue have significant positive impacts on economic development unlike federal government internally generated revenue which has positive and significant influence on economic growth in the country.

Furthermore, Tiku et al (2019) examined the effect of local government autonomy on socio-economic development in Nigeria using descriptive method of analysis. The finding of the study reveals that autonomy of local councils has a fundamental role to play in the socio-economic development of rural areas in Nigeria.

Eyitayo and Alani (2019) analysed the link between local government fiscal autonomy and rural development in Yewa South and IFO local government areas of Ogun State, Nigeria. From the ordinary least squares regression, the study finds the existence of a negative effect of poor capital funding on the lives of the local people.

Azubike and Onukwube (2019) investigated the effect of the government revenue on the economic growth of Nigeria. The study shows that oil and non-oil revenues have positive effect on the economic growth of Nigeria. The study concludes that oil revenue does not have significant impact on the economic growth of Nigeria but a significant relationship between government non-oil revenue and economic growth of Nigeria was confirmed by the study.

Abdulmajeed et al (2019) examined the relationship between government expenditure and economic growth in Nigerian using vector error correction model (VECM). The study indicates that in the short run, capital expenditure has a positive and significant effect on economic growth while recurrent expenditure has negative but significant link with economic growth. In the long-run, recurrent expenditure has a positive and significant relationship with economic growth.

Sawitri et al (2020) analysed the changes in regional income and financial independence of regional economic growth with capital expenditure as a variable intervention in
Denpasar City. The study shows among others, that that the regional revenue has a positive effect on regional economic growth.

Joseph and Omodero (2020) investigated the relationship between government revenues and the economic growth of Nigeria using OLS regression method. The study reveals that federally collected revenue and Value Added Tax have a moderate positive relationship with the economic growth in Nigeria in the study period.

Odinakachi et al (2021) carried out a study on the effect of federal government revenue and expenditure on the economic growth of Nigeria using ARDL approach. The study concludes that federal government retained revenue; non-oil revenue and recurrent expenditure have statistically significant effect on economic growth in Nigeria.

In their study, Rotimi et al (2021) focused on the relationship between revenue generation and economic growth in Nigeria. From the multiple regression, the study indicates that domestic debts and non-oil revenue have positive and significant impact on economic growth, unlike external debts and oil revenue which were inversely related to economic growth in Nigeria.

Aluthge et al (2021) investigated the impact of Nigerian government capital and recurrent expenditure on economic growth using ARDL model. Capital expenditure was established by the study to have positive and significant impact on economic growth while recurrent expenditure does not have significant impact on economic growth in Nigeria.

In a recent study, Maikano (2022) analysed the correlation between government revenue and economic performance of the Nigerian economy. From the OLS multiple regression technique, the study reveals that significant positive relationship exists between government revenue and economic performance in Nigeria.

3. Methodology

The study is based on ex-post facto research design, a design that allows the use of past data in evaluating the relationship between variables of interest. Thus, the data for the study is from secondary source and it is annual in frequency. The secondary data is necessary in order to align with the research design of the after-event approach (ex-post facto) employed in this study to determine the effect of local governments’ finances on economic growth in Nigeria.

The description of variables of study in the form name, notation, measurement and type are summarized in Table 1.
Table 1: Description of Variables

<table>
<thead>
<tr>
<th>Name</th>
<th>Notation</th>
<th>Measurement</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth</td>
<td>RGDP</td>
<td>GDP at Current Basic Prices and it represents Economic growth measured in Billion Naira</td>
<td>Dependent</td>
</tr>
<tr>
<td>Local governments’ finances:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recurrent expenditure</td>
<td>LGRECEXP</td>
<td>Recurrent expenditure of the Local Government measured in Billion Naira</td>
<td>Independent</td>
</tr>
<tr>
<td>Capital expenditure</td>
<td>LGCAPEX</td>
<td>Capital expenditure of the Local Government measured in Billion Naira</td>
<td>Independent</td>
</tr>
<tr>
<td>Total expenditure</td>
<td>LGTGEX</td>
<td>Total expenditure of the Local Government measured in Billion Naira</td>
<td>Independent</td>
</tr>
<tr>
<td>Total revenue</td>
<td>LGTREV</td>
<td>Total current revenue of the Local Government measured in Billion Naira</td>
<td>Independent</td>
</tr>
</tbody>
</table>

Source: Authors’ design (2022).

Data analytical tools of this study are econometric. Hence, Dynamic Least Squares (DOLS), Fully Modified Least Squares (FMOLS) and Canonical Cointegrating Regression (CCR) and pairwise Granger causality test constitute the model estimation techniques used in this study. The three cointegrating regression techniques were employed to determine the effect of local governments’ finances on economic growth while the direction of impact was further explored using the pairwise Granger causality approach. However, before the model estimation proper, some preliminary tests like descriptive statistics, unit root test and cointegration test were conducted.

The basic descriptive statistics like mean, maximum, minimum, standard deviation, and Jarque-Bera are reported of the variables in order to have a feel of the statistical behavior of the data. The mean as a measure of central tendency, gives the average value of each series over the study period. The minimum and maximum gives an idea of the range of the series thus providing the upper and lower limit of the variables over the study period. The standard deviation is a measure of variability and thus providing details of how each variable varies from its mean value. The standard deviation vis-à-vis the mean value provides an idea of the degree of dispersion exhibited by each variable from its average value. Jarque-Bera test is a formal test of normality of variables. The null hypothesis of normality is rejected when the probability value of the Jarque-Bera is less than 0.01, or 0.05 or 0.10 and vice versa, there is a conclusion of normality when the p-value of the test is higher than any of the three ideal levels of significance.
Unit root test is necessary in time series analysis in order to avoid spurious regression result as a result of using non-stationary variables in the regression model. In empirical research, time series are assumed to be stationary but this assumption is not always true. A variable is said to be stationary if its mean and co-variances are time-invariant. Therefore, the Augmented Dickey Fuller (ADF) unit root test approach was employed in testing the stationarity assumption in the variables of study in this research. The null hypothesis of the ADF test is that there is unit root in the series, that is, the series is non-stationary. The alternative hypothesis is there is no unit root in the series. The null hypothesis is rejected when the p-value of the ADF test is less than 0.01, or 0.05 or 0.10. Similarly, using the critical value approach for decision making on unit root, once the ADF test statistic is more than the critical value at any of the three ideal levels of significance (1%, 5% and 10%) the null hypothesis is rejected and it is thus concluded that that the particular variable is stationary.

The Johansen cointegration test is a test of long-run equilibrium among variables of interest. Conventionally, both the Trace and Max-eigenvalue statistics are produced by the test. The test requires that all the series to be integrated of the same level of one, that is, I(1) series. The null hypothesis of the test is that there is no cointegration among the set of variables while the alternative is there is cointegration among the variables. The rejection of the hypothesis at the 0.05 level when MacKinnon-Haug-Michelis’s p-values is less than 0.05 and the conclusion will be that the variables are cointegrated, that is, there is a long-run equilibrium relationship among the variables.

Dynamic Least Squares (DOLS), Fully Modified Least Squares (FMOLS) and Canonical Cointegrating Regression (CCR) are the three comparative cointegrating regression techniques employed in the analysis of the effect of local governments’ finances on economic growth in Nigeria. The p-value approach was used in this study to determine whether or not the three explanatory variables (LGREV, LGRECEX and LGCAPEX) have significant impact on the explained variable which is RGDP. Thus, if the p-value of the coefficient of variable does not exceed any of 0.01, 0.05 and 0.10, such variable is said to have statistically significant effect of the dependent variable but size and sign are revealed by the value and sign (plus or minus) of the coefficient of the series respectively. The implication of significant variable in model estimated is in its ability to be employed in policy recommendation.

4.0 Results and Discussion

4.1 Data Presentation

The summary of local governments’ finances (consisting of local government total revenue, recurrent expenditure and capital expenditure as well as economic growth in Nigeria for the study period, 1993 to 2021 are presented in Table 2.
Table 2: Summary of Local Governments’ Finances (Local Government total revenue (LGTREV), Local Government recurrent expenditure (LGRECEX), Local Government capital expenditure (LGCAPEX) and Economic Growth (GDP at Current Basic Prices) in Nigeria (₦ Billion) for the Period 1993 to 2021

<table>
<thead>
<tr>
<th>Years</th>
<th>RGDP (₦ Billion)</th>
<th>LGTREV (₦ Billion)</th>
<th>LGRECEX (₦ Billion)</th>
<th>LGCAPEX (₦ Billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>1,244.80</td>
<td>19.87</td>
<td>13.97</td>
<td>5.51</td>
</tr>
<tr>
<td>1994</td>
<td>1,751.28</td>
<td>19.22</td>
<td>14.88</td>
<td>4.08</td>
</tr>
<tr>
<td>1995</td>
<td>3,069.43</td>
<td>24.41</td>
<td>16.32</td>
<td>6.13</td>
</tr>
<tr>
<td>1996</td>
<td>4,045.32</td>
<td>23.79</td>
<td>16.62</td>
<td>6.05</td>
</tr>
<tr>
<td>1997</td>
<td>4,374.50</td>
<td>32.80</td>
<td>22.66</td>
<td>8.62</td>
</tr>
<tr>
<td>1998</td>
<td>4,756.71</td>
<td>44.95</td>
<td>27.95</td>
<td>18.54</td>
</tr>
<tr>
<td>1999</td>
<td>5,426.47</td>
<td>60.80</td>
<td>41.61</td>
<td>18.83</td>
</tr>
<tr>
<td>2000</td>
<td>6,990.62</td>
<td>151.88</td>
<td>93.90</td>
<td>59.96</td>
</tr>
<tr>
<td>2001</td>
<td>8,150.02</td>
<td>171.52</td>
<td>122.71</td>
<td>48.66</td>
</tr>
<tr>
<td>2002</td>
<td>11,383.66</td>
<td>172.15</td>
<td>124.70</td>
<td>45.12</td>
</tr>
<tr>
<td>2003</td>
<td>13,418.01</td>
<td>370.17</td>
<td>211.63</td>
<td>150.08</td>
</tr>
<tr>
<td>2004</td>
<td>17,938.38</td>
<td>468.30</td>
<td>295.65</td>
<td>165.40</td>
</tr>
<tr>
<td>2005</td>
<td>22,884.90</td>
<td>597.22</td>
<td>374.51</td>
<td>213.46</td>
</tr>
<tr>
<td>2006</td>
<td>30,063.96</td>
<td>674.26</td>
<td>398.18</td>
<td>267.66</td>
</tr>
<tr>
<td>2007</td>
<td>34,318.67</td>
<td>832.27</td>
<td>683.60</td>
<td>143.80</td>
</tr>
<tr>
<td>2008</td>
<td>39,542.43</td>
<td>1,378.97</td>
<td>819.40</td>
<td>562.57</td>
</tr>
<tr>
<td>2009</td>
<td>43,012.51</td>
<td>1,069.36</td>
<td>704.60</td>
<td>363.00</td>
</tr>
<tr>
<td>2010</td>
<td>54,612.26</td>
<td>1,359.20</td>
<td>823.70</td>
<td>533.00</td>
</tr>
<tr>
<td>2011</td>
<td>62,980.40</td>
<td>1,636.15</td>
<td>1,279.77</td>
<td>352.15</td>
</tr>
<tr>
<td>2012</td>
<td>71,713.94</td>
<td>1,648.25</td>
<td>1,345.42</td>
<td>299.39</td>
</tr>
<tr>
<td>2013</td>
<td>80,092.56</td>
<td>1,810.05</td>
<td>1,413.97</td>
<td>392.95</td>
</tr>
<tr>
<td>2014</td>
<td>89,043.62</td>
<td>1,614.80</td>
<td>1,432.60</td>
<td>181.23</td>
</tr>
<tr>
<td>2015</td>
<td>94,144.96</td>
<td>1,245.64</td>
<td>1,150.43</td>
<td>95.90</td>
</tr>
<tr>
<td>2016</td>
<td>101,489.49</td>
<td>1,083.55</td>
<td>994.05</td>
<td>90.80</td>
</tr>
<tr>
<td>2017</td>
<td>113,711.63</td>
<td>1,337.98</td>
<td>1,194.53</td>
<td>144.07</td>
</tr>
<tr>
<td>2018</td>
<td>127,736.83</td>
<td>1,724.72</td>
<td>1,405.20</td>
<td>319.77</td>
</tr>
<tr>
<td>2019</td>
<td>144,210.49</td>
<td>1,722.26</td>
<td>1,405.84</td>
<td>316.69</td>
</tr>
<tr>
<td>2020</td>
<td>152,324.07</td>
<td>1,636.26</td>
<td>1,347.57</td>
<td>289.18</td>
</tr>
<tr>
<td>2021</td>
<td>173,527.66</td>
<td>1,837.32</td>
<td>1,523.91</td>
<td>314.02</td>
</tr>
</tbody>
</table>

Source: Central Bank of Nigeria (2021)’s Statistical Bulletin
4.2 Preliminary Analyses

4.2.1 Descriptive Statistics

The descriptive statistics of the variables of study (real gross domestic product (RGDP), local government total revenue (LGTREV), local government recurrent expenditure (LGRECEX), and local government capital expenditure (LGCAPEX)) are presented in Table 3.

**Table 3: Descriptive Statistics**

<table>
<thead>
<tr>
<th></th>
<th>RGDP</th>
<th>LGTREV</th>
<th>LGRECEX</th>
<th>LGCAPEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>52343.43</td>
<td>854.0731</td>
<td>665.5131</td>
<td>186.7800</td>
</tr>
<tr>
<td>Maximum</td>
<td>173527.7</td>
<td>1837.320</td>
<td>1523.910</td>
<td>562.5700</td>
</tr>
<tr>
<td>Minimum</td>
<td>1244.800</td>
<td>19.22000</td>
<td>13.97000</td>
<td>4.080000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>52225.19</td>
<td>693.7802</td>
<td>575.4229</td>
<td>162.6961</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.835682</td>
<td>0.048112</td>
<td>0.176066</td>
<td>0.629650</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.488296</td>
<td>1.369146</td>
<td>1.375232</td>
<td>2.487639</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>3.691818</td>
<td>3.224976</td>
<td>3.339673</td>
<td>2.233422</td>
</tr>
</tbody>
</table>

Source: Authors’ computation (2022).

According to the descriptive statistics in Table 3, the average total revenue of local government in Nigeria between 1993 and 2021 stood at ₦854.0731 Billion while the mean value of local government recurrent expenditure (₦665.5131) exceeds its counterpart capital expenditure (₦186.7800). Nigeria’s economy grows at an average of ₦52343.43b in the study period (1993-2021) while its minimum and maximum value was ₦1244.800b and ₦173527.7b respectively. While local government total revenue ranges between ₦19.22000b and ₦1837.320b; local government recurrent expenditure ranges between ₦13.97000b and ₦1523.910b. Furthermore, ₦4.080000b and ₦562.5700b are the respective minimum and maximum values of local government capital expenditure in the period under review. By the Jarque-Bera statistics, all the variables of study (RGDP, LGTREV, LGRECEX and LGCAPEX) are normally distributed.

4.2.2 Unit Root Test Results

After the descriptive statistics, then the unit root test was conducted and the results are reported in Table 4.

**Table 4: Augmented Dickey Fuller (ADF) Unit Root Tests**

<table>
<thead>
<tr>
<th></th>
<th>Level</th>
<th>First</th>
<th>Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADF stat</td>
<td>p-value</td>
<td>Difference</td>
</tr>
<tr>
<td>RGDP</td>
<td>8.650929</td>
<td>1.0000</td>
<td>RGDP</td>
</tr>
<tr>
<td>LGCAPEX</td>
<td>-1.431475</td>
<td>0.5520</td>
<td>LGCAPEX</td>
</tr>
<tr>
<td>LGRECEX</td>
<td>-0.230064</td>
<td>0.9234</td>
<td>LGRECEX</td>
</tr>
<tr>
<td>LGTEXP</td>
<td>-0.534408</td>
<td>0.8698</td>
<td>LGTEXP</td>
</tr>
<tr>
<td>LGTREV</td>
<td>-0.536948</td>
<td>0.8693</td>
<td>LGTREV</td>
</tr>
</tbody>
</table>

Source: Authors’ computation (2022). Note: * rejection of null hypothesis of unit root at 1% level of significance.
The ADF unit root test’s results in Table 4 attest to the fact that all the variables of study (economic growth, local government capital expenditure, local government recurrent expenditure, local government total revenue) are stationary at first difference, that is, they are integrated of order one.

4.2.3 Cointegration Test

Furthermore, cointegration test of long-run relationship among variables of study are conducted and the results are presented in Table 5.

| Unrestricted Cointegration Rank Test (Trace) | | | | |
|---|---|---|---|
| Hypothesized | Trace | 0.05 | |
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob. |
| None * | 0.853524 | 72.19764 | 47.85613 | 0.0001 |
| At most 1 | 0.266759 | 20.33354 | 29.79707 | 0.4005 |
| At most 2 | 0.246228 | 11.95595 | 15.49471 | 0.1591 |
| At most 3 * | 0.147983 | 4.324003 | 3.841466 | 0.0376 |

| Unrestricted Cointegration Rank Test (Maximum Eigenvalue) | | | | |
|---|---|---|---|
| Hypothesized | Max-Eigen | 0.05 | |
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob. |
| None * | 0.853524 | 51.86410 | 27.58434 | 0.0000 |
| At most 1 | 0.266759 | 8.377591 | 21.13162 | 0.8792 |
| At most 2 | 0.246228 | 7.631948 | 14.26460 | 0.4173 |
| At most 3 * | 0.147983 | 4.324003 | 3.841466 | 0.0376 |

Source: Authors’ computation (2022). Note: * denotes rejection of the hypothesis at the 0.05 level;

The cointegration test by way of Johansen unrestricted cointegration rank test (where both Trace and Max-eigenvalue statistics) indicate one cointegrating equation at the 0.05 level. This implies the existence of a long-run relationship between local governments’ finances and economic growth in Nigeria in the study period.

4.3 Estimation Results

4.3.1 Results of Dynamic Least Squares (DOLS), Fully Modified Least Squares (FMOLS) and Canonical Cointegrating Regression (CCR) Models

In order to determine the effect of local governments’ finances on economic growth in Nigeria, three regression models (Dynamic Least Squares (DOLS), Fully Modified Least Squares (FMOLS) and Method: Canonical Cointegrating Regression (CCR)) were estimated and the results are summarized in Table 6.
Table 6: Results of Dynamic Least Squares (DOLS), Fully Modified Least Squares (FMOLS) and Canonical Cointegrating Regression (CCR)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP</td>
<td>FMOLS</td>
<td>LGTREV</td>
<td>-2458.775</td>
<td>0.1256</td>
<td>-2212.239</td>
<td>0.1690</td>
<td>-2473.703</td>
<td>0.1563</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LGRECEX</td>
<td>2560.929</td>
<td>0.1106</td>
<td>2314.299</td>
<td>0.1501</td>
<td>2575.946</td>
<td>0.1396</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LGCAPEX</td>
<td>2391.121</td>
<td>0.1384</td>
<td>2124.988</td>
<td>0.1929</td>
<td>2407.695</td>
<td>0.1712</td>
</tr>
<tr>
<td></td>
<td>DOLS</td>
<td>Constant</td>
<td>2239.637</td>
<td>0.7977</td>
<td>2631.852</td>
<td>0.6434</td>
<td>2127.769</td>
<td>0.7956</td>
</tr>
<tr>
<td></td>
<td>CCR</td>
<td>R-squared (R²)</td>
<td>0.846272</td>
<td></td>
<td>0.959916</td>
<td></td>
<td>0.845479</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjusted R²</td>
<td>0.827056</td>
<td></td>
<td>0.922916</td>
<td></td>
<td>0.826163</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ computation (2022).

Evidence from the three cointegrating regression models (DOLS, FMOLS and CCR) in Table 6 shows that there is negative non-significant effect, positive non-significant effect, and positive non-significant effect of local government total revenue, local government recurrent expenditure, and local government capital expenditure respectively on economic growth in Nigeria. In other words, local governments’ finances, as represented by local government total revenue, capital expenditure and recurrent expenditure, do not have significant effect on economic growth in Nigeria in the study period.

4.3.2 Pairwise Granger Causality Tests

In order to investigate the direction of causality between local governments’ finances and economic growth in Nigeria, the pairwise Granger causality test was applied to the data and the results reported in Table 7.

Table 7: Pairwise Granger Causality Tests

<table>
<thead>
<tr>
<th>Lags: 1</th>
<th>Null Hypothesis:</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LGTREV does not Granger Cause RGDP</td>
<td>28</td>
<td>0.14474</td>
<td>0.7068</td>
</tr>
<tr>
<td></td>
<td>RGDP does not Granger Cause LGTREV</td>
<td></td>
<td>0.64234</td>
<td>0.4304</td>
</tr>
<tr>
<td></td>
<td>LGRECEX does not Granger Cause RGDP</td>
<td>28</td>
<td>0.04778</td>
<td>0.8287</td>
</tr>
<tr>
<td></td>
<td>RGDP does not Granger Cause LGRECEX</td>
<td></td>
<td>0.70374</td>
<td>0.4095</td>
</tr>
<tr>
<td></td>
<td>LGCAPEX does not Granger Cause RGDP</td>
<td>28</td>
<td>1.50477</td>
<td>0.2314</td>
</tr>
<tr>
<td></td>
<td>RGDP does not Granger Cause LGCAPEX</td>
<td></td>
<td>0.79839</td>
<td>0.3801</td>
</tr>
<tr>
<td></td>
<td>LGRECEX does not Granger Cause LGTREV</td>
<td>28</td>
<td>0.01064</td>
<td>0.9187</td>
</tr>
<tr>
<td></td>
<td>LGTREV does not Granger Cause LGRECEX</td>
<td></td>
<td>3.79080</td>
<td>0.0629***</td>
</tr>
<tr>
<td></td>
<td>LGCAPEX does not Granger Cause LGTREV</td>
<td>28</td>
<td>0.00369</td>
<td>0.9520</td>
</tr>
<tr>
<td></td>
<td>LGTREV does not Granger Cause LGCAPEX</td>
<td></td>
<td>1.06526</td>
<td>0.3119</td>
</tr>
<tr>
<td></td>
<td>LGCAPEX does not Granger Cause LGRECEX</td>
<td>28</td>
<td>3.67070</td>
<td>0.0669***</td>
</tr>
<tr>
<td></td>
<td>LGRECEX does not Granger Cause LGCAPEX</td>
<td></td>
<td>1.04596</td>
<td>0.3162</td>
</tr>
</tbody>
</table>

Source: Authors’ computation (2022). Note: *** rejection of null hypothesis at 10% level.
The results of the pairwise Granger causality tests (in Table 7) reveal that, except local government revenue which Granger-caused local government recurrent expenditure and also local government capital expenditure which Granger-caused local government recurrent expenditure, both in a unidirectional manner; this study found no causal relationship between any other pairs of variables of study. This further corroborates the evidence of lack of significant effect of local governments’ finances (local government total revenue, capital expenditure, and recurrent expenditure) on economic growth in Nigeria as reported in the regression analysis in Table 6. In other words, there is no causality between local governments’ finances and economic growth in Nigeria but there is unidirectional causality flow from local governments revenue to local government recurrent expenditure and also local government capital expenditure Granger-caused local government recurrent expenditure with a path of causality running from the former to the latter.

5. Summary of Findings

The findings of this study are summarized as in under:

i. All the variables of study (economic growth, local government capital expenditure, local government recurrent expenditure, and local government total revenue) are integrated of order.

ii. There is a long-run relationship between local governments’ finances and economic growth in Nigeria.

iii. There is a negative and non-significant effect of local government total revenue on economic growth in Nigeria.

iv. There is a positive but non-significant effect of local government recurrent expenditure on economic growth in Nigeria.

v. There is a positive but non-significant effect of local government capital expenditure on economic growth in Nigeria.

vi. Local government revenue has a unidirectional causal relationship with local government recurrent expenditure in Nigeria.

vii. Local government capital expenditure Granger-caused local government recurrent expenditure in a unidirectional manner.

viii. There is no causality between local governments’ finances and economic growth in Nigeria.

6. Conclusion and Recommendations

In this study, we empirically explored the effect of local governments’ finances on economic growth in Nigeria between 1993 and 2020 using Dynamic Ordinary Least Squares, Fully Modified Least Squares, Canonical Cointegrating Regression and Granger causality techniques. From the empirical evidence established in this study, it can be concluded that while there is a long-run relationship between local governments’ finances and economic growth in Nigeria; local government recurrent and capital expenditures have positive but non-significant effects on economic growth unlike local
government total revenue which has negative and non-significant effect on the country’s economic growth. It is therefore argued that local governments’ finances do not have significant effect on economic growth in Nigeria in the study period. Likewise, there is no causality between local government finances and economic growth in Nigeria.

In the light of the foregoing, this study recommends that:

i. Local governments’ financial finances should be re-engineered towards growth-inducing projects, programmes and investments;

ii. In the same vein, Nigerian local governments should also be re-considered as an investment centre and not merely as a cost-centre;

iii. Considering the causality between local government revenue and expenditure, Nigerian local governments should embrace a fiscal synchronization policy of discounting both its revenue and expenditure while making its fiscal decisions;

iv. Nigerian local government s should focus on growth-inducing and life-enhancing capital expenditure while making its capital budgeting decision so as to ensure its recurrent expenditures are not out of proportion of its capital expenditure carrying capacity.

References


Performance Implications of Manpower Development in Nigeria Public Sector: A Case of Non-Academic Staff of Universities in Ekiti State

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Abstract
The study focused on the relationship between manpower development and performance with special reference to non academic staff of universities in Ekiti State. A descriptive survey research design was adopted for the study. The population of the study comprised non academic staff of the three public universities (Ekiti State University, Ado-Ekiti, Bamidele Olumilua University of Education, Science and Technology Ikere-Ekiti, Federal University, Oye-Ekiti) in Ekiti State. The sample size was 363. Primary data used for the study were gathered through the administration of structured questionnaire to the respondents. The data retrieved were analysed using Pearson Product Moment Correlation. The study found that there is significant relationship between coaching, job rotation, workshop and seminar, committee or work group method, in service training, vestibule training method and performance at 0.05 level of significance. The study concluded that there is significant relationship between manpower development and performance of non academic staff in Ekiti State.

Keyword: Development, Manpower, Performance

INTRODUCTION
Manpower development has become increasingly crucial to the success of contemporary organizations particularly in the public sector as a result of rapid changes in technology which required that employees acquire the knowledge and skills necessary to survive with the new processes being established (Broadhurst, 2012; Dukakis, 2002). The growth of organizations into big and complex operations whose structured are continually changing requires employees to be prepared for new assignments. The survival of these
organisations therefore, depends on how well they acknowledge and understand the crisis. Organizations are the frameworks through which individual seek to satisfy most of their needs (Letam, 2013). Manpower is the crucial factor in the development of any organisation. Manpower refers to human power supplied by physical and or mental work of people rather than machines. Also, it refers to power in terms of number of people needed in a particular organisation (Microsoft Encarta, 2009). All other resources like money, machine and material resources are controlled by manpower in order to develop the organisation. Capital alone cannot move itself except with the involvement of manpower, to manage men, money, materials and machines, labour force requires continual study, high performance and righteous self discipline. In view of this, managers must be in a continual state of education and training throughout their working lives. A man who ceases to embrace new knowledge begins to be a wasting asset to himself or herself, his or her employer and the community. Therefore, Onasanya (2005) perceives manpower development as a form of specialized education designed at giving the trainee a particular or specialized knowledge, skill and attitude which employee must possess to effectively perform in a given position. Beardwell and Helen (2001) described manpower development as the process of becoming increasingly complex, more elaborate and differentiated by virtue of learning. Being successful in the knowledge economy requires mastering a new set of knowledge and competencies. These include basic academic skills and the ability to use these skills effectively (Hassan, 2011).

In Nigeria, there is a shortage of skilled manpower as well as a surplus of semi-skilled labour and the major challenge facing the public sector employees. One important way to do this is to develop subordinates so that they can cope with future challenges and demands. Organisations have the responsibility of providing development opportunity for their subordinates so as to enable them exercise their full potentials. Public sector is weighed down by the problem of inefficiency, low capacity utilization and other symptoms of poor job performance (Nnamani, 2011). These problems can be avoided and slowed by early identification of adequate training techniques and programmes for different levels of directors, supervisors and operatives. It is recently discovered that many organisations are not making enough effort to develop their employees. Also, lack of interest in manpower development on the fact that some of the beneficiaries do not always work towards increasing their productivity and poor funding for planning and executing development programme for staff are enough reason for manpower development challenges in the public sector. Therefore, this study becomes so imperative due to tertiary institution is an organisation that has to do with supply of labour with high employee diversity. To this end, this study will explicitly evaluate the relationship between manpower development and performance particularly among non academic staff of universities in Ekiti State.

**Research Objectives**

The specific objectives are to:

i. determine the relationship between coaching and the performance of non academic staff of universities in Ekiti State;
investigate the relationship between job rotation and the performance of non academic staff of universities in Ekiti Stats;

ascertain the relationship between seminar and workshop and the performance of non academic staff of universities in Ekiti Stat;

examine the relationship between in service training and the performance of non academic staff of universities in Ekiti Stat;

evaluate the relationship between committee or work group method and the performance of non academic staff of universities in Ekiti Stat;

assess the relationship between vestibule training method and the performance of non academic staff of universities in Ekiti State.

LITERATURE

There is a need for proper understanding of manpower before robust discussion of manpower development. Manpower indicates the power of human physical strength. Moreso, manpower refers to power in terms of the workers available to a particular group or required for a particular task in any organization. Development according to Okotoni and Erero (2005) is centred on building the knowledge and skills of organisational members so that they will be prepared to take on new responsibilities and challenges. Development patterns to any learning activity which is directed toward organisation’s future needs rather than present needs. This is concerned more with career growth than immediate performance. More often than not, staffs in higher cadre benefit from development programmes. For this reason, Olaniyan and Ojo (2008) refer to development as the process of teaching managers and professionals the skills needed for both the present and future jobs.

Hamlin (2004) posited that it implies any activity which deliberately attempts to improve a person’s skill in a job. It also creates learning in the areas of knowledge, skill, experience and attitudes. This tends to suggest that the essence of manpower development goes beyond job skills but extends to personal development in terms of knowledge acquisition. In fact, it can be interpreted to mean a transformation of men. Furthermore, Conroy (2000) defined manpower development as a purposive effort intended to strengthen the library’s capability to fulfil its mission effectively and efficiently by encouraging and providing for the growth of its own human resources. The researcher furthermore described manpower development as a factor that improves the competence of personnel through opportunities for learning on the job. This implies that manpower development can be achieved through training and education of staff (Madubueze, Ananti, Onyekwelu & Okpalibekwe, 2015).

Meanwhile, manpower development or human resources development refers to the improvement in knowledge, skill, attitude and endowment of labour force so as to bring about organisational growth. Previously, much emphasis was laid on capital and material resources development. However, it has now been recognized that access to capital and material resources can only be achieved if manpower is adequately developed. In addition, it has also been realized that human beings are the active driving forces used in accumulating capital, tapping natural resources, building social, economic
and political organization (Hassan, 2011). According to Dutta (2005) staff development refers to the processes, programs and activities through which every organization develops, enhances and improves the skills, competencies and overall performance of its employees and workers.

Manpower development therefore is the continuous process of impacting new information, skills, attitude and ideas to employees dictated by the requirement of job change (Modupe, 2008). This means that manpower development is the process of preparing the total quantitative and qualitative human asset in an organisation so that they can move with the organisation as they develop, change and grow. Manpower development benefits the employee, the organisation and the society at large. It is worthy to note that skill acquisition enriches the quality of human knowledge, preparing employees to undertake specific task and employment functions which help to transform the environment. Learning organisations understand that any fund spent on capacity development has both immediate and long term impact on the organisation and the community it operates (Dode & Bassey, 2014).

**Dimensions of Manpower Development**

The dimension of manpower development involves the following:

**Coaching:** This is a method of on the job training and development in which a young employee is attached to a senior employee with the purpose of acquiring knowledge and experience needed for the performance of tasks (Yalokwu 2000). This enable employee to understudy their senior colleagues to broaden their knowledge.

**Job Rotation:** This method either involve the movement of an employee from one official assignment or department to the other, in order for the employee to be acquainted with the different aspects of the work process or through job enlargement, that is given additional responsibility to an employee who has been uplifted as a result of the acquisition of additional skill or knowledge (Yalokwu 2000; Lawal 2006). This will ensure such employee have prior knowledge about the entire unit of the organisation.

**Seminar and Workshop:** This involve a formal method of on the job training in which skills and knowledge are acquired by employees through internally organized seminars and workshops geared toward updating the workers with new techniques or skills associated with the performance of their jobs (Lawal, 2006).

**In Service Training:** This method involves training outside the organization or workplace in higher institution of learning or vocational centres under the sponsorship of the organization or on terms that may be agreed upon between the organization and the worker (Lawal 2006).

**Committee/Work Group Method:** This method entails manpower development through the involvement of employees in meetings, committees and work group discussion geared towards injecting inputs in form of decision making as regard solving organizational problem. This method is quite indispensible, especially in the aspect of training employees for managerial functions or heading organizational units.
Vestibule Training Method: This is a method of manpower development through the acquisition of skills in a related working environment (Nongo 2005). Under this method the trainees practice their skill with identical equipment that they use or they are expected to use in their actual place of work. This method is most suitable for sensitive operations where maximal perfection is expected. The purpose is therefore to enable perfection at work place.

Performance

Performance according to Agbaeze, Nkechi and Chineolo (2019) is the degree of an achievement to which an employee fulfils the organizational mission at workplace. Employee performance refers to the effective discharge of one’s duty for good results. It is how well an employees fulfils their job requirements (Mitchel, 2013). Cascio (2006) define performance as working effectiveness, that is, the way in which employee does a job, judged by its effectiveness. Performance can be referred to as the degree of achievement of the mission at workplace that builds up an employee’s job and it is used to express the range of measurements of transactional efficiency, input and output efficiency.

Theoretical Framework

This study will be underpinned by operant conditioning theory. Operant conditioning was first described by American psychologist Edward Thorndike (1874-1949). This is an example of stimulus response that goes along with reinforcement unlike classical conditioning without reinforcement. This theory believe that to a great extent the frequency with which people do things increases or decreases depending on the consequence of their actions. Learning from the consequence of our behaviour is called operant conditioning (Adedayo, 2010). The term is derive from the word operate, when our behaviour operates on the outside world, it produce consequence for us and those consequence determine whether we will continue to engage in that behaviour. We can define operant conditioning then as a form of learning in which the consequence of behaviour leads to changes in the probability of its occurrence. Therefore, the relationship between manpower development and performance is best described by operant conditioning theory since manpower development seen as a learning programme.

METHODOLOGY

The study was carried out in Ekiti State. This study adopted descriptive research design while data used for this for this study was gathered through the primary source mainly structured questionnaire.

The population of this study was made up of non academic staff of public universities in Ekiti State, Nigeria. There are three universities in Ekiti which are: Ekiti State University, Ado-Ekiti, Federal University of Oye and Bamidele Olumilua University of Education, Science and Technology. The three universities were covered bringing the population total to three thousand nine hundred and sixty three (3,963) staff as revealed on the population distribution table.
Table 1: Population Distribution

<table>
<thead>
<tr>
<th>S/N</th>
<th>Faculty</th>
<th>Non Academic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ekiti State University</td>
<td>1650</td>
</tr>
<tr>
<td>2.</td>
<td>Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti</td>
<td>492</td>
</tr>
<tr>
<td>3.</td>
<td>Federal University, Oye-Ekiti</td>
<td>1821</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>3,963</strong></td>
</tr>
</tbody>
</table>

**Source:** Personnel Record of each Institution as at 2021

For the purpose of this study, three hundred and sixty three (363) respondents were sampled using Yamane (1967) sampling model from the three public Universities which are Ekiti State University, Ado-Ekiti, Federal University of Oye and Bamidele Olumilua University of Education, Science and Technology, Ikere Ekiti. The formula is stated below:

\[ n = \frac{N}{1+N(e)^2} \]

\[ n = \text{anticipated sample size}; N = \text{population size}; e = \text{sampling error (0.05)}. \]

Therefore the total sample size was computed as:

\[ n = \frac{3,963}{1+3,963(0.05)^2} \quad n = 363. \]

The selected universities were proportionately sampled respectively due to the differential number of non academic staff in each sampled university. To calculate each size of the stratum, Kumaran (1976) Model was employed. The model is stated as follows:

\[ n = \frac{n_iN_i}{N} \]

Where, \( n = \text{number of respondent from each university}; n_i = \text{total number of sample size Ni=number of stakeholders in each university}; N = \text{population of the study}. \)

Table 2 Summary of Stratified Sample Size of each University

<table>
<thead>
<tr>
<th>University</th>
<th>Sample Size</th>
<th>Number of Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>EKSU</td>
<td>(363)(1650)</td>
<td>151</td>
</tr>
<tr>
<td></td>
<td>3,963</td>
<td></td>
</tr>
<tr>
<td>BOUESTI</td>
<td>(363)(492)</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>3,963</td>
<td></td>
</tr>
<tr>
<td>FUOYE</td>
<td>(363)(1821)</td>
<td>167</td>
</tr>
<tr>
<td></td>
<td>3,963</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>363</strong></td>
</tr>
</tbody>
</table>

**Source:** Author’s Computation, 2022
The measurement construct included manpower development and dependent variable (employee Performance). Manpower development was measured by coaching, job rotation, workshop and seminar, in service training, committee or work group method and vestibule training method on employee performance. The measures were adapted by Agunyai (2015).

The descriptive statistics to be used include percentage and frequency counts while the inferential statistics that would be used is Pearson Product Moment Correlation model for the objectives. The Pearson Product Moment Correlation formula is given as:

\[ r_{xy} = \frac{n\Sigma xi yi - \Sigma xi \Sigma yi}{\sqrt{n\Sigma x^2} - (\Sigma xi)^2 / n \Sigma y^2 - (\Sigma yi)^2} \]

Where \( r_{xy} \) = correlation coefficient showing the linear relationship between dependent and independent variables

\( X \) = Independent Variable (Manpower Development)

\( Y \) = Dependent Variable (Performance)

**DATA ANALYSIS AND PRESENTATION**

This section presents the analysis of data, the data interpretation and discussion of the findings with regards to the objective of the study. The analysis of the respondent's demographic information is presented in table 3.
Table 3: Respondents Demographic Distribution

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>156</td>
<td>52.2</td>
</tr>
<tr>
<td>Female</td>
<td>143</td>
<td>47.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>299</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>110</td>
<td>36.8</td>
</tr>
<tr>
<td>Married</td>
<td>189</td>
<td>63.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>299</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Educational Qualification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.Sc</td>
<td>148</td>
<td>55.9</td>
</tr>
<tr>
<td>M.Sc</td>
<td>94</td>
<td>31.4</td>
</tr>
<tr>
<td>Ph.D</td>
<td>38</td>
<td>12.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>299</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Working Experience</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 10</td>
<td>60</td>
<td>20.0</td>
</tr>
<tr>
<td>11-20</td>
<td>147</td>
<td>49.2</td>
</tr>
<tr>
<td>21 Above</td>
<td>92</td>
<td>30.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>299</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Field Survey, (2022)

Table 3 indicated that the male distribution was 156 (52.2%), while the female were 143 (47.8%). This implied that we have more male non academic staff than female in the surveyed universities in Ekiti State. Considering the marital status, 110 (36.8%) of the total respondents were single while 189 (63.2%) were married. The summary of response gathered here implied that larger populations of respondents are married. It was also shown that 148 (55.9%) of the respondents were B.Sc degree holders, 94 (31.4%) respondents were M.Sc degree holders while 38 (12.7%) were Ph.D degree holders, which indicated that majority of the respondents were B.Sc degree holders. Responses also showed that 60 (20%) of the respondents have below 10 years work experience, 147 (49.2%) o the respondents have between 11-20 years of experience while 92 (30.8%) of the respondents have above 20 years of experience. This implied that a larger percentage of surveyed staff have between 11-20 years of experience.
Relationship between Manpower Development and Performance

Relationship between manpower development (coaching, job rotation, workshop and seminar, in service training, committee or work group method and vestibule training method) and performance was subjected to Pearson product moment correlation.

Table 4: Relationship between Manpower Development and Performance

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correlation Value</th>
<th>Sig (2-tailed)</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coaching</td>
<td>.532</td>
<td>.000</td>
<td>6th</td>
</tr>
<tr>
<td>Job Rotation</td>
<td>.682</td>
<td>.000</td>
<td>1st</td>
</tr>
<tr>
<td>Workshop and Seminar</td>
<td>.607</td>
<td>.000</td>
<td>3rd</td>
</tr>
<tr>
<td>In Service Training</td>
<td>.590</td>
<td>.000</td>
<td>4th</td>
</tr>
<tr>
<td>Committee or Work Group</td>
<td>.623</td>
<td>.000</td>
<td>2nd</td>
</tr>
<tr>
<td>Vestibule Training</td>
<td>.554</td>
<td>.000</td>
<td>5th</td>
</tr>
</tbody>
</table>

Source: Author’s Field Survey, (2022)

Manpower Development and Performance

Table 4 depicts the relationship that exists between coaching and performance. The correlation coefficient value of coaching (0.532) showed that there is a strong positive relationship between coaching and performance thus implied that there is significant relationship between coaching and performance of non academic staff in Ekiti State. Moreso, the correlation coefficient value of job rotation (0.682) showed that there is a strong positive relationship between job rotation and performance thus implied that there is significant relationship between job rotation and performance of non academic staff in Ekiti State. Furthermore, the correlation coefficient value of workshop and seminar (0.607) showed that there is a strong positive relationship between workshop and seminar and performance thus implied that there is significant relationship between workshop and seminar and performance of non academic staff in Ekiti State.

The correlation coefficient value of in service training (0.590) showed that there is a strong positive relationship between in service training and performance thus implied that there is significant relationship between in service training and performance of non academic staff in Ekiti State. Furthermore, the correlation coefficient value of committee or work group method (0.623) showed that there is a strong positive relationship between committee or work group method and performance thus implied that there is significant relationship between committee or work group method and performance of non academic staff in Ekiti State. Finally, correlation coefficient value of vestibule training method (0.554) showed that there is a strong positive relationship between vestibule training method and performance thus implied that there is significant relationship between vestibule training method and performance of non academic staff in Ekiti State. The relationship has been found to be significant at 0.000 p< 0.05 for manpower development as the p-value which is shown in the sig (2-tailed) row as
revealed on the Table. Therefore, alternate hypothesis was accepted while the study rejected otherwise.

Discussion of Findings

Based on the outcome of the analysis, it was deduce that male and married status covers the larger part of the survey and considering the educational background, respondents with first (B.Sc) degree covers the larger part and that most of the respondents have 11-20 years of working experience. However, the study found that there is positive and significant relationship between manpower development and performance in the surveyed institution in Ekiti State at 0.05 level of significance. Moreso, it was found that alternate hypothesis was accepted while the study rejected otherwise thus implied that there is significant relationship between manpower development and performance. The findings contradict the study of Agunyal (2015) who assessed manpower development, capacity building and service delivery in Ife-East Local Government Area, Osun State, Nigeria. The study revealed that staff training or their capacity building does not at all times translate to efficient service delivery in Ife East Local Government Area.

Conclusion

Based on the study, the study found that there is strong positive relationship between coaching and performance. Also, there is strong positive relationship between job rotation and performance. Moreso, there is strong positive relationship between workshop and seminar and performance. Furthermore, there is strong positive relationship between in service training and performance. It was also found that there is strong positive relationship between committee or work group and performance and that there is strong positive relationship between vestibule training and performance. Therefore, the study accept alternate hypothesis and reject otherwise thus concluded that there is positive and significant relationship between manpower development and performance of non academic staff of universities in Ekiti State.

Recommendations

Based on the findings, public sector organization is seen to be effective and efficient if there is demonstrable increase in productivity, therefore, it is recommended that university management should base manpower development on proper analysis of its contribution to the effectiveness and efficiency of the organization. University management should note that manpower programmes for employees should be done on regular basis because it involves systematic, professional and development of skills, knowledge and attitude necessary for performing specific schedule of duties. Employees should be exposed to these dimensions of manpower development (job rotation, workshops and seminars, Committee or work group, coaching, vestibule training and in service training) to enable them keep abreast with the challenges posed by modern business offices.

Policy Implications

This study evaluated the performance implication of manpower development particularly among non academic staff of public universities in Ekiti State. From the outcome and conclusion of the study, manpower proxies were found positive and
significant. However, effective adoption of manpower development has a long term positive implications on organisations especially in discovering employee talents and enhancing skilful employee. This will help broaden employee’s knowledge on their daily operation, improve their productivity and boost their level of confidence in solving organisational problem.

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