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A Review on Open Source Solution for Cloud Computing

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Abstract

Cloud Computing is the latest evolution of internet based computing which assures to provide more flexibility, less expense, and more efficiency in IT services to end users. It is believed that governments, businesses and researchers all can benefit from the adoption of cloud computing services. The aim of this paper is to study four main open source cloud computing platforms available in the market. This paper also highlights their features and limitations which will definitely help service providers and enterprises for selecting best open source cloud computing solutions for their organization according to their needs.

Keywords: Open Source Solution, Cloud Computing

INTRODUCTION

Background and Motivation

In the recent times, “Cloud Computing” has been one of the most discussed terms in the world of Information Technology. The standard definition from the National Institute of Standards and Technology (NIST) is: “Cloud Computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction”. This model is composed of five essential features, three service models and four deployment models [1].

According to US NIST, five essential characteristics, three service models and four deployment models are as follows:

- Five characteristics: on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service.
- Three service models: Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS).
- Four deployment models: private clouds, community clouds, public clouds, and hybrid clouds.
Cloud computing has been enabled by the developments in virtualization, distributed computing, utility computing, web and software services technologies. It is considered as the next natural step in the evolution of on-demand information technology services and products. Because of its various advantages like: lower cost, high scalability, fast processing, and convenience (i.e. anytime and anywhere), cloud computing is gaining its popularity in business and academic environment. [2]

While big companies such as Amazon, Google and Microsoft are offering public cloud infrastructures like Amazon Elastic Compute Cloud (EC2), Google AppEngine, Microsoft Azure, etc commercially in the market. Many other organizations are trying to set up “private clouds”. Private clouds are internal to the organization providing more security, privacy, and better control on data usage and cost.

There are number of cloud platforms available in the market both commercial and open source softwares. Nowadays, an open source solutions for cloud computing are becoming more popular for organizations willing not to use commercially provided cloud. However, there are many open cloud platforms having their own characteristics and advantages making difficult for service providers and enterprises to choose between these platforms. And this difficulty in choosing appropriate cloud platform motivated me to do the study of open source cloud computing solutions available in the market.

Problem Statement

With the advancement in Information Technology, numbers of open source solutions are being developed with several features and purposes. However, for the successful utilization of cloud services it is very important to select appropriate cloud computing solutions according to one’s needs and business requirements. There are various options for open source cloud computing platforms but the real problem lies in the selection of best open source cloud computing solutions which differ from individual to individual and organizations to organizations. Thus, this study is a step towards understanding several aspects of open source cloud computing platform which will help users to make a correct decision.

Objective of Study

The main objective of this study is to give a brief introduction of open source cloud computing platforms available in the market. The most popular open source platforms available in the market are: Eucalyptus, OpenStack, CloudStack and OpenNebula. The study also aims to highlight its features and limitations which will definitely help users for selecting best open source cloud solutions according to their requirement.

RESEARCH METHODOLOGY

To fulfill the above objectives of study, this research is based upon the secondary data. The paper is written based on data collected from:

- Open source cloud computing websites
- Research articles
- Online journal papers

LITERATURE REVIEW

Open Source Cloud Platforms

Open source solutions provide flexibility to users not only to choose the product but also allow users to change source code for their own need. This ability of freedom and openness is
encouraging more programmers to migrate towards the work on open source cloud packages as do not need to pay and look over proprietary issues. An open source cloud is growing and becoming more effective for the IT Industries and organizations who wanted to use the cloud facilities for hosting and other services. There are several open source cloud computing platforms available in the market. Among them the most popular are: Eucalyptus, OpenStack, CloudStack and OpenNebula. [3]

**Eucalyptus:**

EUCALYPTUS [4] is the full form for Elastic Utility Computing Architecture for Linking Your Program to Useful System, which is an open source private cloud software for building private or hybrid cloud resources for compute, network, and storage that are compatible with Amazon Web Service (AWS) APIs. It was developed by University of California-Santa Barbara for Cloud Computing to implement Infrastructure as a Service (IaaS). Eucalyptus provides an Elastic Compute Cloud (EC2) -compatible cloud Computing Platform and Simple Storage Service (S3)-compatible Cloud Storage. Eucalyptus incorporates high-level components such as Cloud Controller (CLC), Cluster Controller (CC), Storage Controller (SC), and Node Controller (NC). The main benefit to use this open source software is for private clouds as it provides highly efficient scalability and organization agility. Main features [6] are:

- Images-Image is a group of software modules.
- Instances- If an image is using then it is called instance.
- IP addressing- Instances will get both public and private IP addresses when it is created.
- Security is provided by firewall.
- Networking- Three network modes: Managed mode, System mode and Static mode. In Managed mode, local network of instances are controlled where as physical LAN and cloud connection is established in System mode and in static mode DHCP server management and assigning IP addresses to the instances are possible.

**OpenStack:**

OpenStack [3, 5] was announced in July 2010 and its initial contributors were NASA and Rackspace. It is one of the fastest growing free open source software available in the market. In the beginning, Rackspace contributed their "Cloud Files" platform (code) while NASA contributed their "Nebula" platform (code). OpenStack open source software is a collection of open source software project that any organization can use to setup and run their cloud compute and storage infrastructure. An OpenStack consist of several components- Compute (Nova), Object storage (Swift), Block storage (Cinder), Networking (Neutron), Dashboard (Horizon), Identity service (Keystone), Image service (Glance), Telemetry (Ceilometer), Orchestration (Heat), Database (Trove). Main properties of OpenStack are [6]:

- Component based architecture- One can easily add new components
- High availability
- Fault Tolerant
- Recoverable- Failures can be easily removed
- Open Standards
- API Compatibility
Nova follows shared nothing architecture and message passing for communication. Nova is a good interface with hypervisor.

VM management and caching are the two functions of Nova.

**CloudStack:**

CloudStack [7] was initially developed by Cloud.com and purchased by Citrix then later released into the Apache Incubator program. The first stable version of CloudStack was released in 2013 and this time governed by the Apache Software Foundation and supported by Citrix. CloudStack have commendable features such as:

- Storage independent compute
- New security features
- Smooth Deployment
- Scalability
- Multi Hypervisor support
- Detailed Documentation
- Interactive Web UI i.e. users can manage their cloud with an easy to use Web interface, command line tools, and/or a full-featured RESTful API.
- Access Control – Eucalyptus has an identity. This identity is grouped together for access control

**OpenNebula:**

OpenNebula [4] was first established as a research project back in 2005 by Ignacio M. Liorente and Ruben S. Montero. It is used by many enterprises as an open, flexible alternative to vCloud on their VMware-based data center. OpenNebula is primarily used as a virtualization tool to manage virtualized infrastructure in the data center, which is usually referred as private cloud and also supports hybrid cloud to combine local infrastructure with public cloud-based infrastructure, enabling highly scalable hosting environments. OpenNebula cloud infrastructure provides users with an elastic platform for fast delivery and scalability of services to meet the dynamic demand of service end-users. OpenNebula cloud computing toolkit is used by hosting providers, telecom operators, IT services providers, supercomputing centers, research labs, and international research projects.

**Comparative Study of Cloud Solutions**

The following table [8] shows a comparative study of four main open source cloud computing platform based on their characteristics.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Eucalyptus</th>
<th>OpenStack</th>
<th>CloudStack</th>
<th>OpenNebula</th>
</tr>
</thead>
<tbody>
<tr>
<td>License</td>
<td>Proprietary, GPL v3</td>
<td>Apache license</td>
<td>Apache license</td>
<td>Apache license</td>
</tr>
<tr>
<td>Cloud Implementation</td>
<td>Private &amp; Hybrid</td>
<td>Private &amp; Hybrid</td>
<td>Public &amp; Private</td>
<td>Public, Private &amp; Hybrid</td>
</tr>
<tr>
<td>Service Type</td>
<td>Compute, Storage</td>
<td>Compute (Nova), Storage (Swift)</td>
<td>Service, Disk, Network Offerings and Templates</td>
<td>Compute, Storage</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------</td>
<td>---------------------------------</td>
<td>-----------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Compatibility</td>
<td>Support EC2, S3</td>
<td>Supports multiple platforms</td>
<td>Support Amazon EC2 and S3 APIs</td>
<td>Open, multiplatform</td>
</tr>
<tr>
<td>Hypervisors</td>
<td>Xen, KVM (VMWare in nonopen source)</td>
<td>Open Virtualization Format (OVF)</td>
<td>VMware, KVM, XenServer, Xen Cloud Platform (XCP) and Hyper-V</td>
<td>Xen, KVM, VMware</td>
</tr>
<tr>
<td>Programming Framework</td>
<td>C, Java</td>
<td>Python</td>
<td>Java, Python</td>
<td>C++, C, Ruby, Java, Shell script, lex, yacc</td>
</tr>
<tr>
<td>Disk Image Options</td>
<td>Options set by admin</td>
<td>Glance has RESTful API</td>
<td>Users can manage their cloud with Web interface, command line tools, RESTful API</td>
<td>In private cloud, most libvirt options left open</td>
</tr>
<tr>
<td>Disk Image Storage</td>
<td>Walrus, which imitates Amazon S3</td>
<td>Nova</td>
<td>iSCSI or NFS</td>
<td>A shared file system, by default NFS, or SCP</td>
</tr>
<tr>
<td>Characteristics</td>
<td>Eucalyptus</td>
<td>OpenStack</td>
<td>CloudStack</td>
<td>OpenNebula</td>
</tr>
<tr>
<td>Unique Features</td>
<td>User management web interface</td>
<td>Unified Authentication System</td>
<td>Clustered LVM, NetScaler Support &amp; LDAP Integration</td>
<td>VM migration supported</td>
</tr>
</tbody>
</table>
CONCLUSION

Cloud Computing is the latest evolution of technology that has transformed the way hardware and software is now designed and delivered in the IT industry. Open source cloud platform provides an alternative to end-users for improved flexibility, scalability, portability and on demand services. The main advantage of open source solution is that they are customizable according to one’s need and desire. This paper gave a brief introduction of four most popular and commonly used open source cloud solutions: Eucalyptus, OpenStack, CloudStack and OpenNebula. The paper also shows a comparative study which would help the users to understand the characteristics and limitations of above popular open source solutions making them able to choose better services according to their requirements.

Since cloud computing is an evolving technology and many features are being added day-to-day, here the comparison is based on the current features and technology available in these open source platform. However, there is need for incorporating many more features to improve the framework of available open source cloud solutions.

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Impact of Fiscal Policy on Agricultural Productivity in Nigeria: An Empirical Analysis

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Abstract

This study is designed to empirically examine the impact of fiscal policy on agricultural productivity in Nigeria between 199-0-2016. The research made use of secondary data obtained from the Central Bank of Nigeria statistical bulletin, Food and Agricultural Organisation (FAO) and the World Bank database. The study adopted econometric tools of analysis to empirically test the objectives outlined in the study. Empirical evidence revealed that all things being equal a rise in gross fix capital formation, agricultural credit and gross domestic product will lead to a corresponding increase in agricultural productivity respectively. Conclusively, the research holds that government total expenditure on agriculture and agricultural credit to the sector has no significant impact on agricultural productivity in Nigeria, while gross domestic product (economic growth) and investment by government in the area of roads, dams, irrigation and preservation have positive influence on productivity in the sector within the period under reference. In line with the foregoing conclusion, the following policy recommendations were made: government should put in place policy and modalities that will encourage existing banks (both commercial and agricultural banks) to make credit facility readily available to farmers to boost production in the sector; government should provide funds to acquire sophisticated farm tools (harvesters, tractors, herbicides, fertilizer etc) and as well build irrigation, dams, storage facilities and establish food processing industries across the country to enable farmers increase productivity, process and preserve their food stuff; government spending on agricultural sector must of a necessity be increased in line with global best practices as advocated by the United Nations agencies and other global organizations.

Keywords: Fiscal policy, economic growth; agricultural credit; cointegration
INTRODUCTION

Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity and feed a projected 9.7 billion people by 2050. Growth in the agriculture sector is two to four times more effective in raising incomes among the poorest compared to other sectors. Agriculture is also crucial to economic growth. Similarly, in the words of Benjamin Franklin (1964), "There seems to be three ways for a nation to acquire wealth. The first is by war, as the Romans did plundering their neighbors. This is robbery. The second is by commerce which is generally cheating, the third is by agriculture, the only honest way, whereby a man receives real increase of the seed sown and grown from God. Agriculture entails the use of various inputs considered as resources to cultivate the land; produce crops like yam, rice, groundnut, beans, cocoa; forestry, livestock, including fishery, process and store, and distribute same.

According to Izuchukwu (2011), agriculture has been an important sector in the Nigerian economy in the past decades, and is still a major sector despite the oil boom. Basically, it provides employment opportunities for the teeming population, eradicate poverty and contributes to the growth of the economy. The oil boom of the 1970s led Nigeria to neglect its strong agricultural sector in favour of an unhealthy dependence on crude oil (Asoegwu and Asoegwu, 2007).

Fiscal policy means a policy pursued by a government to influence spending and economic activities in an economy by changing the size and content of taxation, expenditure and public debt. It is also a means or combination of revenue and expenditure, spending and saving and production and distribution (Ariyo, 1997). In the post oil boom era (1977 to 2002), the price of crude oil started falling and/or fluctuating and there has been a growing concern to revitalize the agricultural sector as well as diversify the economy. In order to revamp the agricultural sector, the federal government had embarked on and implemented several agricultural policies and programmes some of which are defunct or abandoned, and some restructured while others are still in place. These include the farm settlement scheme, national Accelerated Food Production (NAFPP), Agricultural Development Projects (ADPs), River Basin Development Authorities (RBDAs), National Seed Service (NSS), National Centre for Agriculture Mechanism (NCAM), Agricultural and Rural Management Training Institutes (ARMTI) and Agricultural Credit Guarantee Scheme Fund (ACGSF). Others were the Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB) or Bank of Agricultural, Operation Feed the Nation (OFN), Green Revolution Programme, Directorate of Foods, Roads and Rural Infrastructure (DFFRI), Nigerian Agricultural Insurance Company (NAIC), National Agricultural Land Development Authority (NALDA), specialized Universities for Agriculture, Root and Tuber Expansion Programme (RTEP) and Rural Banking Scheme, etc. (Ugwu and Kanu, 2012). Furthermore, the Federal Government in 2004 launched another economic reform called National Economic Empowerment and Development Strategy (NEEDS) programme to encourage private sector participation in the development of the economy. It was also aimed at promoting growth and poverty reduction through a participatory process involving civil society and development partners. In the agricultural sector, NEEDS were directed to influence improvement in the production, processing and distribution of agricultural commodities.

Problem Statement

Despite the laudable programmes of the federal government, budget allocation to the agricultural sector remained poor until the coming in of former President Olusegun Obasanjo who made concerted efforts to revamp the sector. Productivity dropped
significantly from 42 percent in 1990 to 34.6 percent in 2000, before rising to 56.5 percent and also falling to 52.4 percent in 2010 and the real per capital income is also in the decline while the contribution of agriculture to the total GDP has also declined from 40.33 percent in 1986 to 35.18 percent in 2010. Consequently, the country took the only easy way out, that is, borrowing to feed her populace. In short, the deplorable performance of agricultural sector in Nigeria for many years has rendered the country both a net importer of agricultural products and a debtor nation.

Besides oil, the major strength of the Nigerian economy is its agricultural resource base, its human resource base and its huge market. However, these agricultural resources have not been effectively mobilized so as to diversify the economy’s revenue base and reduce dependence on oil. The economy remains vulnerable to external shocks emanating from fluctuation in the price of crude oil and the rising price of imports. The resulting external and internal imbalances are manifest in the adverse balance of payment position. Unemployment and low capacity utilization in virtually all sectors as well as deteriorating purchasing power of the populace (Bukar, Aliyu, Bakshi 1997). Moreso, the attitude of the banks in terms of making credit available to the farmers and the poor implementation of agricultural policies by the government which has led to the underdevelopment of the agricultural sector. On the basis of the above identified problems, this study attempts to critically examine the impact of Fiscal Policy on Agricultural Productivity in Nigeria. The broad objective of the study is to examine the impact of fiscal policy on agricultural productivity in Nigeria, with specific objectives to determine the impact of government expenditure on agriculture on agricultural productivity in Nigeria; ascertain the impact of agricultural credit on agricultural output in Nigeria and examine the effect of gross domestic product on agricultural productivity in Nigeria.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

According to Ahmed (1993), agriculture is been defined as the production of food and livestock and the purposeful tendering of plants and animals. He stated further that agriculture is the mainstay of many economies and it is fundamental to the socio-economic development of a nation because it is a major element and factor in national development. In the same vein, Okolo (2004) described agricultural sector as the most important sector of the Nigeria economy which holds a lot of potentials for the future economic development of the nation as it had done in the past. In the view of Fulginiti and Perrin (1998), agricultural productivity refers to the output produced by a given level of input(s) in the agricultural sector of a given economy. More formally, it can be defined as “the ratio of the value of total farm outputs to the value of total inputs used in farm production” (Olayide and Heady 1982). Notwithstanding the enviable position of the oil sector in the Nigerian economy over the past three decades, the agricultural sector is arguably the most important sector of the economy. Agriculture’s contribution to the Gross Domestic product (GDP) has remained stable at between 30 and 42 percent, and employs 65 per cent, of the labour force in Nigeria (Emeka 2007).

Agricultural sector in Nigeria and its performance

Agriculture constitutes one of the most important sectors of the Nigerian economy. It is also a veritable tool in combating poverty in third world countries and achieving long-term economic development. Although Nigeria depends heavily on the oil industry for its budgetary revenues, the country is predominantly still an agricultural society with approximately 70% of the population engaging in agricultural production at a subsistence level. Based on the varying climatic conditions of regions and the vast and rich soil, the
country produces varieties of crops while a significant portion of the agricultural sector in Nigeria involves livestock production, fishing, poultry, and lumbering, hence, agricultural products were major export product in the 1960s and early 1970s with the sector contribution to the GDP standing at 35% in 2013 (CBN 2013).

Due to the sector’s importance successive government has propounded policy programmes and strategies both monetarily and otherwise to revitalize agriculture in Nigeria from 1960 with all programmes aimed at increasing agricultural output for consumption and export, provide inputs and subsidies to small scale farmers, make credit facilities accessible to a large segment of rural farmers, eradicate poverty, create employment and raise the standard of living. These programmes included the Farm Settlement Scheme policy of 1959, the National Accelerated Food Production Programme (NAFPP) launched in 1972, the Agricultural Development Programme (ADP) of 1974 and 1989, Operation Feed the Nation (OFN) in 1976, the River Basin Development Authorities (RBDAs) was launched in 1976, and the Green Revolution (GR) launched in 1980. The Directorate for Food Roads and Rural Women introduced in 1987, the National Agricultural Land Development Authority (NALDA), launched in 1992, the Family Support Programme (FSP) Family Economic Advancement Programme Strategy (NEEDE) launched in 1999, the National, Special Programme on Food Security (NSPFS) launched in 2002, the Root and Tuber expansion Programme (RTEP) launched in 2003, Seven Point Agenda of 2007 and Transformation Agenda of 2011.

According to the National Bureau of Statistics (2012), agriculture provided 41% of the country’s GDP, with its contribution to the GDP dropping to 35% in 2013 (CBN 2013). Today, less than 50 percent of the country’s cultivable agricultural land is being cultivated with smallholder and traditional farmers who use crude agricultural tools cultivating most of this land. This has not been helped by the discovery of oil in the country. (Manyong et al 2003. The sector is bedeviled by problems such as organizational and weak policy, limited access to improved technologies in the form of improved seeds and the use of mainly crude farm tools such as hoes and cutlasses. Also, there are infrastructural inadequacies as the sector suffers from poor road network lack of storage/processing facilities and underfunding leading to the problem of high food importation.

Government has played a more dynamic role in agricultural production by ensuring stability of the financial system as well as guarantee sources of credit to the farmers through the manipulation of interest rate. Concessionary interest rate was given to the sector between 1970 and 1985. However, the SAP programme led to the deregulation of interest rates in 1990 and indirect monetary policy control was put in place. Hence agricultural sector has to compete for funding with the other sectors of the economy leading to the stoppage sectoral credit allocation policy (Gbosi 2005). This led to increased food import bills and hike in prices with food import increasing from 6.36% in 1991 to 27.02% and 30.56% in 1999 and 2011 respectively (NBS 2012). Due to the above negative impact of SAP and to safeguard the sector from competition as well as enhance flow of credit, the Agricultural Credit Guarantee Scheme (ACGS) was established in 1977 with the share capital of the ACGS increased from N199 million in 1977 to N3 million in 2001, in 2000, the Nigerian Agricultural Commerce and Rural Development Bank (NACRDB) was formed. The National Micro Finance Policy was also launched in 2006 with the aim of creating accessible and easy credit facilities to rural Nigerians. Also Agricultural Credit Support Scheme (ACSS) was established to provide credit facilities to farmer at single digit interest rate with a view to
reduce the cost of agricultural production and increase output on a sustainable basis (Heineken & Akorh 2013).

The effectiveness of these policies remained questionable as the interest rate remained high as well as inflation rate throughout the period. The average interest rate stood at 12.47% in 2010 and 2012 respectively (CBN 2012). Also, food inflation rose from 3.9% in 2006 to 8.2% in 2007 and 18.0% in 2008. It fell 15.5% in 2009 and 12.7% in 2010 (2012).

The Concept of Fiscal Policy

Fiscal policy refer to the part of government policy concerning the raising of revenue through taxation and other means and deciding on the level and pattern of expenditure for the purpose of influencing economic activities or attaining some desirable macroeconomic goals (Anyanwu, 1997:249). Fiscal policy simply defined is the manipulation of government revenue through tax system, government expenditure and debt management to achieve predetermined macro-economic objectives. Such fiscal policy can be used for allocation, stabilization and distribution. In essence, a primary objective of fiscal policy is to balance the use of resources of the public and private sectors and by so doing avoid inflation, unemployment, balance of payments pressures and income inequality. Fiscal policy is traditionally administered by the Executive arm through the Ministry of Finance.

According to Wise Geek (2013) the effectiveness of fiscal policy depends on a wide range of factors which cannot be reliably predicted or understood in advance. Behavioural changes caused by changes in government spending and taxation and among the most significant determinants of effective fiscal policy. Other factors affecting the effectiveness of fiscal policy as identified by Wise Greek include, time lag between the implementation of a new policy and the realization effects of that policy; the effects policy changes have on interest rates and other economic concerns; and the actual quality of the policy change. The goal of macro economy policy is to achieve target levels of inflation, unemployment and economic growth. Fiscal policy defines the scope and structure of services to be financed by the government, adjust the distribution of income through taxes and maintained stability of the economy so that these goals can be achieved if aggregate demand grows in pace with productive capacity. If aggregate demands does not expand more rapidly than productive capacity, inflationary pressures will increase.

On the other hand, if aggregate demand does not expand as much as growth of productive capacity in the economy, there will be rising unemployment. Although many analysts have argued that an important issue is the conduct of macroeconomic policy is the optimal policy mix-a combination of monetary and fiscal policies to achieve the objectives of macroeconomic policy. To them, the question of monetary-fiscal policy mix arises because both policies are interrelated and mutually reinforcing thus suggesting that they are complementary. Furthermore, the effectiveness of one depends on the other. The policy instrument for controlling demand is monetary policy which influences the supply of money and availability of credit and fiscal policy which affects the aggregate flow of purchasing power. Thus, aggregate demand can be influenced through the use of either fiscal or monetary policy. In fact, it is possible to achieve the same level of aggregate demand with different combinations of fiscal or monetary policies.

Monetary policy operates by changing money supply to affect indirectly the level of aggregate demand by changing the income available to spending units in the economy and its impact will depend on the nature of government spending i.e what goods government decides to by, what taxes it decides to charge and what amount decides to transfer. Any of these polices could affect the level of demand and cause an increase in consumption
spending. Investment subsidy could also increase investment spending. The appropriate impact of fiscal policy depends very much on the state of the economy. Fiscal policy is expected to be expansionary, if expected level of demand is low and restrictive, if expected pressure and demand is high in the light of government objectives. An expansionary fiscal policy involving higher government spending can crowd out some interest sensitive private sector spending. In a recession, an expansionary monetary policy complemented by fiscal stimulus is required to stimulate growth, output and unemployment.

On the other hand, when an economy is over heated, tightening of fiscal and monetary policies is required. This assertion is in line with the Keynesian views of fiscal policy that expansionary and contracting fiscal policy can be used to influence macroeconomic performance. Musgrave and Musgrave (1989:6) identify the following as the objectives of fiscal policy; i. the provision of social goods, or the process by which total resource use is divided between private and social goods and by which the mix of social goods is chosen. They referred to this as allocation function ii. Adjustment of the distribution of income and wealth to ensure conformance with what society considers as “fair” or “just” state of distribution. This referred to as distribution function. iii. The use of budget policy as a tool for maintaining high employment, a reasonable degree of price level stability, and an appropriate rate of economic growth, with allowances for effects on trade and on the balance of payment. This is referred to as the stabilization function. From the above assertions it implies that the budgetary policy of a nation greatly determines the extent to which its macro-economic objectives are achieved. Thus, it can be postulate the there is a relationship between the budgetary policy of a nation an its economic growth and poverty reduction efforts.

**Fiscal Policy in Nigeria: Problems and Prospects**

Over the years, the fiscal policy has been the most important instrument influencing macroeconomic performance in Nigeria. The importance of having virile fiscal policies in Nigeria has continued to be the major focus of successive governments in Nigeria including the Obasanjo administration. In his 2001 independence day anniversary speech, President Obasanjo re-emphasis that the government in pursuance of a virile fiscal policy is sending a Bill (Fiscal Responsibility Bill) for an Act that would seek to strength the fiscal and monetary management at the national level. According to him, while all levels of government- local, state and federal have a joint responsibility for managing the nation’s economy, the federal government must play a pivotal role in this regard for the benefit of all Nigerians, no matter where they reside. To him, the modest achievements have been eroded by what remains to be done despite government determined effort in the area of poverty eradication; too many of our citizens still remain poor.

Our industries are being revived and government has taken many measures to support them, but industrial capacity is still far below the level we will like to see. Inflation is still high with us, though today, it is not alarming as it used to be. All of us need to apply our collective will and resources so that every day, every year, we can look back and see how much more value we have added to our circumstances (Vanguard, 2002). Other problems include inefficient use of resources, waste and misplaced priorities in government expenditure, high fiscal deficits at all tiers of government, weak institutional structure among others. These problems have led to a heavy debt burden, huge recurrent expenditure, inefficient public service delivery etc. Also, government spent a huge proportion of current revenue in debt-servicing and interest payment. The Fiscal Responsibility Act is currently been implemented at the federal level with little result to show for it. The rate of corruption is still high and pervasive at the federal level and the virtue of transparency and
accountability is been grossly abused and undermined by public officers. Furthermore, the budget process reached the point of near collapse before the democratic government came to power. The problem has to do with lack of political will and commitment to abide by stipulated rules and budget guidelines. As, such, it was difficult for the government to achieved their major fiscal objectives. Fiscal objectives are macroeconomic goals that the government intends to achieve using the various fiscal policies within a time period.

Agriculture Sector and Economic Growth

Several studies have focused on understanding the association between agriculture and economic growth, yet there is some disagreement. While some researchers have argued that agriculture should be the foundation of economic growth (Gollin, Parent & Rogerson, 2002; Thirtle, Lin & Piesse, 2003), others claimed that the linkages agriculture has with other sectors are too weak and its innovative structures inadequate for promoting economic growth (Ranis and Fei, 1961; Jorgenson, 1961).

However, the relationship between the agriculture sector and other sectors should not be a competition but rather be viewed as interdependent where supply and demand in sectors can be accommodated through strengthened linkages (Lewise, 1954). Nonetheless, the position of agriculture in the strive for industrialization should not be ignored as the case had been in Nigeria. As argued by advocates of agriculture-led growth (ALG), development of the agriculture sector is a prerequisite for industrialization through increase in rural incomes and provision of industrial raw materials, provision of a domestic market for industry and above all the release of resources to support the industry (Schultz, 1964; Timmer, 2004). Neglect of the agriculture sector in favour of the industrial sector will only lead to slow economic growth and inequality income distribution. Therefore, despite the fact that agriculture may be unable to singlehandedly transform an economy, it is necessary and sufficient condition in kick-starting industrialization in the early stages of development (Byerlee, Diao, & Jackson, 2005).

The contributions of agriculture to economic growth can be examined through the roles of the sector in the economy. Johnston and Mellor (1961) summarized these roles in five inter-sector linkages; food, labour, market, domestic savings and foreign exchange. The most basic of these roles is, perhaps the supply of food for both domestic consumption and export. Direct contributions of food production can be through income generated from sales of farm produce and returns from economic activities related to production; or indirectly from increased capacity to partake in any form of economic activity through improved diet. Anyawu, Ibekwe and Adesope (2010) using correlation matrix find that production of major staples in Nigeria contributed significantly to GDP growth (except wheat) between 1990 and 2001. Also, as observed by Timmer (1995), the agriculture sector contributes to economic growth through provision of better caloric intake and food availability. The attainment of global food security and reduction of hunger hinges largely on this singular role. According to FAO (2005), the agriculture sector contributes to economic growth through provision of better caloric intake and food availability.

The attainment of global food security and reduction of hunger hinges largely on this singular role. According to FAO (2005), agriculture can facilitate the attainment of all 8 MDGs through the direct or indirect linkages to food availability and poverty reduction. In 2008, UNDP reported that the 12.6% reduction recorded in the proportion of underweight
children between 1990 and 2008 can be attributed largely to growth in the agriculture sector in Nigeria (NUDP, 2008). Furthermore, as population increases, failure to increase food supply in proportion to increased demand has negative effects on industrial profits, investment and economic growth (Johns & Mellor, 1961).

Hazel and Roell (1983) assert that in the early stages of development, rising incomes of rural/farming households is essential to providing market for domestically produced goods and services via strengthened purchasing power. The most direct contribution of agriculture to economic growth, according to Irz et al. (2001), is increase in incomes of farmers and therefore their purchasing power. Results of several studies, including Gallup et al. (1997), Irz et al. (2001), show that an increase in agriculture growth results in an increase in the income level of the poorest of the population. Also results from cross-country regressions among developing countries show that $1 increase in GDP results in significantly more poverty reduction when the growth is in agriculture rather than other sectors (Lipton, 2012). This sectoral growth increases the incomes and therefore purchasing power of farmers resulting in a vibrant domestic market for other sectors, hence growth in the economy.

An offshoot of income growth is increased domestic savings, both at micro and macro levels as observed in developed economies like Japan, Taiwan, south Korea, Hong Kong and recently, China (Harbaugh, 2004). Agriculture therefore contributes to economic growth by increasing the incomes of majority of the population thereby strengthening their saving capacity. Results from and IFPRI publication on Ethiopia’s growth and transformation plan shows that increased domestic savings is imperative to the achievement of higher Total Productivity (GTP) (Engida et al., 2011) finds that domestic saving is low among rural dwellers/farmers in Nigeria. He highlights the effect of high expenditure on food, which is a consequence of low income due to low productivity, on saving capacities of the farming households in study. This implies that domestic savings largely influences the growth path of the economy.

The sector is also in a position of making surplus labour available to industries. As productivity in the agriculture sector increase, surplus labour and capital is created and diverted to investment in industrial sector resulting in economic growth (Ike, 1982). This facilitates the industrialization process and eventually the transformation of the economy as postulated by the structural development advocates (Awokuse, 2008).

Having argued that economic growth in Nigeria depends to a large extent on growth in the agriculture sector, empirically investigating the sector’s contributions to growth is important both to assess past efforts and justify future investment. Our empirical analysis in the next sections will be aimed at providing evidence on the sources of growth in the Nigerian economy. To further do justice to this, we will evaluate the agriculture sector by investigating the sources of its growth and the subsectors that require further attention based on already highlighted potentials relative to their past contributions.

**Theoretical Framework**

**Dependency Theory**

Dependency Theory has been presented as a theory of development that improves Modernisation Theory (Reyes, 2001a). It combines elements from a neo-Marxist theory and adopts a “revolution of under developed nations model”. The focus of this theory is the totality of society and social system periphery, which highlights the differences between imperialistic countries in the first world and underdeveloped countries. Dependency theory explains these differences by focusing on regions and structural conditions in
different nation states. Although the radical dependency outlooks of Andre Gunder Frank, Ruy Mauro Marinin, Thetono Dos Santos, and Immanuel Wallerstein, cited in Haque (1999), have the hue and revolutionary aspect of social change, they do not demonstrate the exact result of classical Moarxism or Leninism in their evaluation and consideration of historical development underdevelopment. For example, although Wallerstein applies Marxist terms like production mode, and challenges classes and state, he changes the order of the cause and effect relationship that originally was believed to exist among them form a Marxist viewpoint (Haque 1999, p. 111).

Empirical Review on Agricultural Development in Nigeria

There have been a number of valuable studies on the relationship between agriculture and economic growth. Oji-Okoro (2011) is of the opinion that agriculture agricultural production in the country. This implies that the more the public spending on agricultural sector, the more the improvements in the performance of the agricultural sector. Also, a large degree of change in agricultural output is accounted for by change in budgetary allocation to agricultural sector. Thus, budgetary allocation to agriculture has a large impact on agriculture output.

International Food Policy Research Institute (2008) wrote on public spending on agriculture in Nigeria (2001-2005). An empirical analysis was employed. Findings revealed that spending on agriculture was allotted to agriculture during 2001 to 2005, far lower than spending in other key sectors such as education, health, and water. This spending contrasts dramatically with the sector’s importance in the Nigerian economy and the policy emphasis on diversifying away from oil, and falls well below the 10 percent goal set by African leaders in the 2003 Maputo agreement.

Nigeria also falls far behind in agricultural expenditure by international standard, even when accounting for the relationship between agricultural expenditure by international and national income. The spending that is an urgent need to improve internal systems for tracking, recording, and disseminating information about public spending in the agriculture sector.

Ariyo (1993) carried out an evaluation study on the desirability of Nigerian’s fiscal profile between 1970 and 1990. The findings from this study suggest that the structures of government expenditure are inherently unsustainable by the country’s resources profile. The major cause attribute to this was the phenomenal increase in government expenditure financed through debt raised from both internal and external sources. This has consequently led to persistent and unsustainable annual deficits. The result also suggested that the structural adjustment programme (SAP) implemented in 1986 has so far not been of much assistance in addressing the problem.

METHODOLOGY

This study relied essentially on annual times series data of secondary nature sourced from the publications of the Central Bank of Nigeria (CBN) statistical bulletins, Food and Agricultural Organisation (FAO) and World Bank Development Indicators (WBDI) database. Furthermore, the study is econometric based, hence multiple regression techniques such as Augmented Dickey Fuller Unit Root test for stationarity of variables, Johansen cointegration analysis for longrun relationship and Ordinary Least Squares regression for estimation of impact of the independent variables on the dependent variable. These econometric techniques through the use of Eviews version 8.0 shall be used in testing the hypotheses formulated for this study.
Variables in the Model

Variables for this study are Agricultural Output (proxy for agricultural productivity) used as dependent variable with government expenditure on agriculture, investment proxied by gross fix capital formation, agricultural credit to farmers and gross domestic product as independent variables respectively. The time series data cover a 26-years period ranging from 1990-2016. Agricultural / commercial credit, though not a fiscal instrument but is included in the model as a control variable to avoid the incidence of variable omission.

Estimation Procedure

The model of the study would be estimated with the aid of the E-view version 9.0 Econometrics package with Ordinary Least Squares (OLS) technique.

Specification of the Model

To examine the impact of fiscal policy on agricultural productivity in Nigeria using the Ordinary Least Squares (OLS) technique the following model is specified.

The functional form of the model is specified hereunder

\[
\text{Ag-output} = f(\text{G-Exp-Agric}, \text{INVT}, \text{Ag-Credit}, \text{Gdp}) \\
\text{Eqtn 1}
\]

The mathematical form of the model is specified below

\[
\text{Ag-output} = f(\text{G-Exp-Agric} + \text{INVT} + \text{Ag-Credit} + \text{Gdp}) \\
\text{Eqtn 2}
\]

The statistical form of the model is

\[
\text{Ag-output} = \beta_0 + \beta_1(\text{G-Exp-Agric}) + \beta_2(\text{INVT}) + \beta_3(\text{Ag-Credit}) + \beta_4(\text{Gdp}) \\
\text{Eqtn 3}
\]

In order to capture the stochastic term \(\mu_i\) of the variables, the explicit form of the models is given in econometric form below: 

\[
\text{Ag-output} = \beta_0 + \beta_1(\text{G-Exp-Agric}) + \beta_2(\text{INVT}) + \beta_3(\text{Ag-Credit}) + \beta_4(\text{Gdp}) + \mu_i \\
\text{Eqtn 4}
\]

The estimated models are further transformed into log-linear form. This is aimed at reducing the problem of multi-collinearity among the variables in the models. Thus the log-linear models are specified as shown below:

\[
\text{LnAg-output} = \beta_0 + \beta_1(\text{LnG-Exp-Agric}) + \beta_2(\text{INVT}) + \beta_3(\text{LnAg-Credit}) + \beta_4(\text{LnGdp}) + \mu_i \\
\text{Eqtn 5}
\]

\(\beta_1 > 0, \beta_2 < 0, \beta_3 > 0, \beta_4 < 0\)

Where,

- Ag-output = Agricultural Productivity
- G-Exp-Agric = Government Expenditure on Agriculture
- INVT = Proxy for Gross fix capital formation
- Ag-Credit = Agric credit (proxied by credit to the private sector)
- Gdp = Gross Domestic Product
- \(\mu_i\) = Stochastic or error term
- Ln = Natural logarithms
- \(\beta_0\) = Intercept parameter
- \(\beta_1 - \beta_3\) = Coefficients / parameters
A priori Expectation

(a) Agricultural Output (AG-output) and Government expenditure on agriculture: In $\beta_1$ above, the relationship is expected to be positive since the more government expenditure (funding) received by the Federal Ministry of Agriculture, the more capital projects like dam, harvesters, ploughs, irrigation and herbicides etc it can purchase towards strengthening the sector and ultimately leads to greater productivity/output.

(b) Gross fix capital formation is expected a priori to be positively related agricultural output. As government employs the fiscal policy instrument of investment in the agricultural sector, it is expected that roads, irrigation and dams etc built will increase the output from the sector.

(c) The relationship between Agricultural output and Agricultural Credit ($\beta_3$) is equally expected to be positive. For the sake of clarity, agricultural credit refers to commercial bank loans / facility major from the Bank of Agricultural (BOA) extended to farmers to assist them engage in large scale farming / agricultural activities that has the potential of contributing to the economy.

(d) Gross Domestic Product implies the market value of all officially recognized final goods and services produced within a country in a given period. It is defined to include all final goods and services, that is, those that are produced by economic resources located in that nation regardless of their. The relationship between the dependent and independent variable (AG-output and GDP), i.e. $\beta_0$ and $\beta_1$ is expected to be positive as well; since aggregate growth in national income contributes to growth in other sectors of the economy which agriculture is one.

RESULTS AND DISCUSSION

Data Presentation

Data used for this study were essentially sourced from the Central Bank of Nigeria (CBN) statistical bulletin and World Bank Development Indicators (WBDI). The data is presented for the Agricultural output (proxy for agricultural productivity) as dependent variable against G-Exp-Agric, GFCF, Ag_credit and GDP) as independent variables respectively.

<table>
<thead>
<tr>
<th>Year</th>
<th>AG_OUTPUT</th>
<th>G_EXP_AGRIC</th>
<th>GFCF</th>
<th>AG_CREDIT</th>
<th>GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>9.21E+09</td>
<td>0.258000</td>
<td>14.42773</td>
<td>8.692986</td>
<td>2.82E+11</td>
</tr>
<tr>
<td>1991</td>
<td>8.11E+09</td>
<td>0.208700</td>
<td>13.79346</td>
<td>8.951905</td>
<td>3.29E+11</td>
</tr>
<tr>
<td>1992</td>
<td>7.66E+09</td>
<td>0.455975</td>
<td>12.80218</td>
<td>13.32934</td>
<td>5.55E+11</td>
</tr>
<tr>
<td>1993</td>
<td>5.12E+09</td>
<td>1.803806</td>
<td>13.61295</td>
<td>12.19857</td>
<td>7.15E+11</td>
</tr>
<tr>
<td>1995</td>
<td>8.81E+09</td>
<td>1.510400</td>
<td>7.083232</td>
<td>10.01618</td>
<td>2.01E+12</td>
</tr>
<tr>
<td>1996</td>
<td>1.05E+10</td>
<td>1.592562</td>
<td>7.303718</td>
<td>8.978995</td>
<td>2.80E+12</td>
</tr>
<tr>
<td>1997</td>
<td>1.18E+10</td>
<td>2.058885</td>
<td>8.372144</td>
<td>10.66127</td>
<td>2.91E+12</td>
</tr>
<tr>
<td>1998</td>
<td>1.20E+10</td>
<td>2.891705</td>
<td>8.619863</td>
<td>12.98141</td>
<td>2.82E+12</td>
</tr>
<tr>
<td>1999</td>
<td>1.22E+10</td>
<td>59.31617</td>
<td>7.011568</td>
<td>13.49416</td>
<td>3.31E+12</td>
</tr>
<tr>
<td>2000</td>
<td>1.17E+10</td>
<td>6.335779</td>
<td>7.031060</td>
<td>12.30446</td>
<td>4.72E+12</td>
</tr>
<tr>
<td>2001</td>
<td>1.43E+10</td>
<td>7.064546</td>
<td>7.593798</td>
<td>16.50936</td>
<td>4.91E+12</td>
</tr>
<tr>
<td>2003</td>
<td>2.80E+10</td>
<td>7.537355</td>
<td>9.13518</td>
<td>13.79619</td>
<td>8.74E+12</td>
</tr>
<tr>
<td>2004</td>
<td>2.94E+10</td>
<td>11.25663</td>
<td>7.401317</td>
<td>13.12077</td>
<td>1.17E+13</td>
</tr>
</tbody>
</table>
### Table 4.2 Time Series Properties

**ADF Test Result for Log(AG-OUTPUT)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Log(AG-OUTPUT)</th>
<th>Log(OUTPUT)</th>
<th>Augmented Dickey-Fuller test statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>3.64E+10</td>
<td>16.32596</td>
<td>-4.603170</td>
<td>0.0013</td>
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<tr>
<td>2006</td>
<td>4.62E+10</td>
<td>17.91903</td>
<td>-3.724070</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>5.37E+10</td>
<td>32.48423</td>
<td>-2.986225</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>6.73E+10</td>
<td>65.39901</td>
<td>-2.632604</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>6.17E+10</td>
<td>22.43520</td>
<td>-2.986225</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>8.68E+10</td>
<td>28.21795</td>
<td>-2.632604</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>9.07E+10</td>
<td>41.20000</td>
<td>-2.986225</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>1.00E+11</td>
<td>33.30000</td>
<td>-2.986225</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>1.07E+11</td>
<td>39.43101</td>
<td>-2.632604</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>1.14E+11</td>
<td>36.70000</td>
<td>-2.986225</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>9.93E+10</td>
<td>41.27000</td>
<td>-2.986225</td>
<td></td>
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<tr>
<td>2016</td>
<td>9.99E+10</td>
<td>76.75000</td>
<td>-2.632604</td>
<td></td>
</tr>
</tbody>
</table>

Test critical values:
- 1% level
- 5% level
- 10% level


**ADF Test Result for Log(G-EXP-AGRIC)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Log(G-EXP-AGRIC)</th>
<th>Augmented Dickey-Fuller test statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>13.22053</td>
<td>-7.229830</td>
<td>0.0000</td>
</tr>
<tr>
<td>2006</td>
<td>13.16818</td>
<td>-3.724070</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>13.16818</td>
<td>-2.986225</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>13.16818</td>
<td>-2.632604</td>
<td></td>
</tr>
</tbody>
</table>

Test critical values:
- 1% level
- 5% level
- 10% level


**ADF Test Result for Log(GFCF)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Log(GFCF)</th>
<th>Augmented Dickey-Fuller test statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>1.47E+13</td>
<td>-4.925794</td>
<td>0.0006</td>
</tr>
<tr>
<td>2006</td>
<td>1.87E+13</td>
<td>-3.724070</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>2.09E+13</td>
<td>-2.986225</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>2.47E+13</td>
<td>-2.632604</td>
<td></td>
</tr>
</tbody>
</table>

Source: CBN, FAO and World Bank Database
Test critical values:

<table>
<thead>
<tr>
<th>Level</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>-3.724070</td>
</tr>
<tr>
<td>5%</td>
<td>-2.986225</td>
</tr>
<tr>
<td>10%</td>
<td>-2.632604</td>
</tr>
</tbody>
</table>


**ADF Test Result for Log(AG_CREDIT)**
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>0.0017</td>
</tr>
<tr>
<td>Test critical values:</td>
<td></td>
</tr>
<tr>
<td>1% level</td>
<td>-3.724070</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.986225</td>
</tr>
<tr>
<td>10% level</td>
<td>-2.632604</td>
</tr>
</tbody>
</table>


**ADF Test Result for Log(GDP)**
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>0.0008</td>
</tr>
<tr>
<td>Test critical values:</td>
<td></td>
</tr>
<tr>
<td>1% level</td>
<td>-3.724070</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.986225</td>
</tr>
<tr>
<td>10% level</td>
<td>-2.632604</td>
</tr>
</tbody>
</table>


Source: Author’s Computation from Eviews 8.0

**Interpretation of ADF Unit Root Result:**

The result of the stationarity (Unit Root) test indicates that Agricultural output (proxy for agricultural productivity), government total expenditure on agriculture, gross fix capital formation (proxy for investment), agricultural credit and gross domestic product (GDP) respectively are stationary at first difference. None of the variables is stationary at level. Therefore, the null hypothesis of non stationarity of the variables in the model is rejected after differencing at the 1 percent and 5 percent level of significance. Having established the stationarity of the variables in the model, the next step is to conduct the Johansen cointegration test.

**Co-Integration Test:**

Co-integration test is conducted to determine if a long run relationship exist between the variables specified in the model in other to avoid the generation of spurious regression result. The result of the co-integration test is presented below:

**Table 4.2.2(a): Cointegration Rank Test (Trace)**

Unrestricted Cointegration Rank Test (Trace)
### Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.883781</td>
<td>103.2645</td>
<td>69.81889</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.567006</td>
<td>49.45758</td>
<td>47.85613</td>
<td>0.0351</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.427166</td>
<td>28.53180</td>
<td>29.79707</td>
<td>0.0694</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.296527</td>
<td>14.60280</td>
<td>15.49471</td>
<td>0.0678</td>
</tr>
<tr>
<td>At most 4 *</td>
<td>0.207360</td>
<td>5.809647</td>
<td>3.841466</td>
<td>0.0159</td>
</tr>
</tbody>
</table>

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Author’s computation from Eviews 8.0

In the two tables above, the result of the trace statistics (table 2a) and maximum Eigenvalue statistics (table 2b) revealed the rejection of the null hypotheses at 5% level of significance based on our decision rule. The result shows that there are at least two and one cointegrating equations or vectors among the variables of interest, meaning that there is a unique long run relationship between the variables within the period of study.

From the normalized equation \((Ag\text{-output}) = (G-Exp-Agric + Ag-Credit, GFCE + GDP)\), the Ag-output coefficient of 1.00000 indicates that the level of agricultural productivity (Ag-output) in Nigeria is 1 when other variables are zero. This shows that all things being equal, gross fix capital formation, agricultural credit and gross domestic product will lead to a corresponding increase in agricultural productivity respectively. However, the coefficient of government total expenditure on agriculture revealed a negative and insignificant relationship with the dependent variable (agricultural productivity), showing that government expenditure in the agric sector has not yielded the desired outcome.
OLS Estimation Result
The Ordinary Least Square (OLS) i.e. regression result is as presented below:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>5.614868</td>
<td>2.223298</td>
<td>2.525468</td>
<td>0.0193</td>
</tr>
<tr>
<td>LOG(AG,EXP)</td>
<td>-0.067776</td>
<td>0.088397</td>
<td>-0.766719</td>
<td>0.4514</td>
</tr>
<tr>
<td>LOG(GFCF)</td>
<td>0.415370</td>
<td>0.175816</td>
<td>2.362536</td>
<td>0.0274</td>
</tr>
<tr>
<td>LOG(AG,CREDIT)</td>
<td>0.247882</td>
<td>0.184401</td>
<td>1.344253</td>
<td>0.1926</td>
</tr>
<tr>
<td>LOG(GDP)</td>
<td>0.568947</td>
<td>0.081180</td>
<td>7.008419</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared     0.945881 Mean dependent var 24.01802
Adjusted R-squared 0.936041 S.D. dependent var 1.045506
S.E. of regression 0.264410 Akaike info criterion 0.342945
Sum squared resid 1.538079 Schwarz criterion 0.582914
Log likelihood 0.370248 Hannan-Quinn criter. 0.414300
F-statistic 96.12730 Durbin-Watson stat 0.824996
Prob(F-statistic) 0.000000

Source: Author’s computation from Eviews 8.0

The regression result above shows the impact of fiscal policy on Agricultural Productivity in Nigeria between 1990-2016. The goodness of fit of the model as indicated by an R-squared of 94 percent showed a good fit of the model. An adjusted R-Squared value of 94 percent indicated that the model fits the data well, the total variation in the observed behaviour of Agricultural output is jointly explained by variation in the explanatory variables. The remaining 6% is accounted for by the stochastic error term, i.e. from variables and other factors not captured in the model.

To test for the overall significance of the model, the ANOVA of the F-statistics is used. To test for the individual statistical significance of the parameters, the t-statistics of the respective variables were considered. The statistical test of significance of the model estimates is conducted by employing the student’s t-test statistical analysis at five per cent significance level. The critical t-test value from the table is 2.021. The decision therefore requires that the tabulated value be compared with the calculated value. If the critical value of the t-test is greater than the t-test calculated at five per cent significance level, the parameter estimated is statistically insignificant and vice versa.

From the analysis of this study, the variables (government agricultural expenditure and agric credit) which are the core variables meant to impact positively on the dependent variable were found to be statistically insignificant judging from their calculated t-test values of -0.766719 and 1.344253 respectively. The conclusion was reached because these values were all less than the threshold 2.021 critical value at 5% significance level set by theory. Only the coefficient of gross fix capital formation and gross domestic product was statistically significant in relation to the dependent variable in the model. It has a t-statistic value of higher than the table value of 2.021.

The implication is that, only the coefficient of gross fix capital formation and gross domestic product was capable of bringing significant changes to agricultural productivity in Nigeria during the referenced period. The a priori expectations about the signs of the parameter estimates were also considered. Here, the coefficient of gross fix capital formation and GDP entered the model with a positive sign. Contrariwise, the coefficients of government total
expenditure on agriculture and agricultural credit was inversely related to the dependent variable. By implication, a unit increase in investment and gross domestic product will increase agricultural productivity in Nigeria, while government expenditure on agriculture and agricultural credit coefficients variously indicated a lack of positive impact on productivity levels in Nigeria within the study period.

CONCLUDING REMARKS

This study focuses on the impact of fiscal policy on agricultural productivity in Nigeria between 1990-2016. The research made use of secondary data obtained from the Central Bank of Nigeria statistical bulletin, Food and Agricultural Organisation (FAO) and the World Bank database. The study adopted Augmented Dickey Fuller unit root test, Johansen cointegration test and Ordinary Least Squares Regression to empirically test the objectives outlined in the study. The output from the Augmented Dickey Fuller (ADF) unit root test revealed that all variables were found to be stationary at first difference. The Johansen Cointegration technique reveals the presence of two and one cointegrating equations respectively indicating the existence of a long-run equilibrium relationship among the series.

Empirical evidence revealed that all things being equal a rise in gross fix capital formation, agricultural credit and gross domestic product will lead to a corresponding increase in agricultural productivity respectively. However, the coefficient of government total expenditure on agriculture revealed a negative and insignificant relationship with the dependent variable (agricultural productivity), showing that government expenditure in the agric sector has not yielded the desired outcome.

Conclusively, the research holds that government total expenditure on agriculture and agricultural credit to the sector has no significant impact on agricultural productivity in Nigeria. On the other hand, gross domestic product (economic growth) and investment by government in the area of roads, dams, irrigation and preservation have positive influence on productivity in the sector within the period under reference.

The following is therefore recommended for policy implementation:

(a) The government should put in place policy and modalities that will encourage existing banks (both commercial and agricultural banks) to make credit facilities readily available to farmers to boost production in the sector.

(b) Government should provide funds to acquire sophisticated farm tools (harvesters, tractors, herbicides, fertilizer etc) and as well build irrigation, dams, storage facilities and establish food processing industries across the country to enable farmers increase productivity, process and preserve their food stuff.

(c) Government spending on agricultural sector must of a necessity be increased in line with global best practices as advocated by the United Nations agencies and other global organizations.

(d) Corrupt civil servants, contractors and bureaucrats who divert and misappropriate allocated funds for the growth of the sector must be punished to serve as deterrent to other would-be treasury looters. The various financial crimes commissions such as EFCC and ICPC should be strengthened to do this.
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The Role of Institutions in Affecting the Course of International Trade in The Neighboring Countries of Ghana

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Abstract

A recent dilemma and a discourse among international trade economist is whether political and economic institutions really have an impact in promoting the course of international trade in contemporary epochs. Among this relationship, does these institutions helps developing countries to achieve economic salvation? This study empirically investigates the role of institutions in affecting the course of international trade in the neighboring countries of Ghana (Togo, Burkina Faso, and Cote d’ivoire). The study uses panel data from 1995-2017. The fixed effect model was employed for the econometric analysis. The output from the model revealed that exchange rate, freedom from corruption, property rights and trade freedom are statistically significant in explaining the role of institutions in promoting the course of international trade in the neighboring countries of Ghana.

Keywords: International trade, institutions, mixed effect, neighboring, Ghana.

1. Introduction

According to an American economist, Douglass Cecil North (1991), an institution is a “humanly devised constraints that structure political, economic and social interactions”. This implies that a well-structured political and economic characteristic are fundamental to trade facilitations and economic progress.

Most economic growth theories have led emphasis on key economic development indicators that pathed the way to most resilient and strong economics in contemporary times, such as UK, USA, China, Germany, Japan etc, The Solow economic growth model for instance, has outlined that, a well mixer of technology and labor-augmenting technological progress are logic key
instruments to not only reaching the steady state of developing economies but also as a means of economic advancement (Robert Solow, 1956). This implies that a well-structured institution leads to economic development, which in turn improves institutional quality. The direction of causation however differs between the developed and developing economies. In developed countries, resilient institutional quality foments economic development, whereas the reverse is rather true in developing countries (Law et al., 2013).

In the last one and half centuries, wages in the less developed countries have fallen far behind those in the developed countries, both in absolute, relative and proportionate terms, between 1870 to 1990, the ratio of per capita incomes between the developed and the developing countries increased by roughly a factor of five and that the disparities in incomes between the richest country and all others has increased by an order of magnitude (Lant Pritchett, 1997). In 1870, these set of countries (developed and developing) Has been different from each other with “high income OECD” countries being identified as the European countries and their offshoots not leaving Japan out. The growth rate of these countries has been remarkably by historical standards and has left a wide gap among the less develop lower income countries to catch up. Apparently, its seems in any case that this growth sample started changing from 1980, after that few of the fastest developing countries on the planet have equally been low-income countries. Consider isolates economies along with wage quintile in the light of 1980 for per head GDP, and setups consequent populace weighted growth rates (Najaf Ali, 2018). This may probably or largely attribute to the different institutional setups in those economists.

Lant Pritchett (1997), further noted that between 1870-1989 the annual GDP per capita average growth rate of most industrialized economies were awkwardly lower than their offshoots countries. As of 1870-1960, USA, Great Britain, Germany and Japan annual GDP per capita were 1.7%, 1.08%, 1.66% and 1.86% per annum respectively. Lant Pritchett strongly believed that convergence will make poorer nations to growth faster and probably overtake richer nations. These predictions are being materialized with the recent economic advancement in the Asian continent, countries such as China, Hongkong, India, Vietnam and others which were considered heavenly poor countries in the 1980s are now growing at galloping pace. These magnificent economic transformations have increased the world economic output considerably, this may be associated with two basic reasons; firstly, international trade has strengthened between and amongst their trading patterners, these economists have realized the vital role of trade and perhaps expanded their economist to the rest of the world. This economic circumvention has led to a considerably rise in their international inflows. Secondly, the role of institutions has also exacted some kind of efficiency in income and assets distributions amongst the business economic agents. A stable, trustworthy and workable institutions significantly affect a country economic progress positively.

According to the World Bank 2018 Africa report, most of 2018’s top economy performers are non-commodity intensive economies, and Africa has six of the world’s ten fastest growing economies. The list is led by Ghana (8.3%), which is boosted by oil & gas expansion, Ethiopia (8.2%), Côte d’Ivoire (7.2%), Djibouti (7%), Senegal (6.9%) and Tanzania (6.8%).

A couple of studies has been carried out on the role of institutions in economic development and integrations, some has found a bi-directional cause and effects relationships between institutions, economic growth and development (see Bates et al., 2013; Chong and Calderon 2000). A more recent studies of Ignatius Abasimi et al 2018 and Najaf Ali, 2018 reveals quite a robust and perverse effects of institutions on international trade. Most of these studies however focused on only the role of institutions in productivity growth, investment and economic growth to the neglect of the impact of these institutions on international trade (see Easterly et al., 2004; Bates et al., 2013, Robinson, 2001; Acemoglu et al., 2001.). Nevertheless, the
aforementioned studies engrossed and limited their research to a single and distinct countries. Ergo, the none effectuating economic growth in most and almost some West African countries, including Togo Burkina Faso and Cote d’Ivoire, is largely due to or contributing to the weak institutional quality in promoting international trade and economic development.

Due to this fallibility and deficiency in the existing literature, this study seeks to fill the research gap and contribute to the existing literature by proffering an integration and empirical results to elaborate the dynamics and causal relationship of facets that de facto and affects multilateral trade flows of these countries, nevertheless, by estimating and examining how the role of institutions affects the course of international trade in the neighboring countries of Ghana (Togo, Burkina Faso, and Cote d’Ivoire).

Institutions, Economic Freedom, and Trade

An institution as defined by Douglas (1991) is any humanly formulated restraints that structure political, economic and social interactions.

Economic Freedom can be explained as "An aspect of human liberty that is concerned with the material autonomy of the individual in relation to the state and other organized groups. The highest form of economic freedom provides an absolute right of property ownership, fully realized freedoms of movement for labor, capital, and goods, and an absolute absence of coercion or constraint of economic liberty beyond the extent necessary for citizens to protect and maintain liberty itself" (Najaf Ali, 2018). This can be further strengthened to imply that; a transparent institution promotes a conducive economic freedom. The apex of an economic freedom is associated with a resilient economy, perfect interactions of the market forces of demand and supply, human development, healthy environment, higher per capita income or wealth, eradication of poverty, international trade facilitations Ignatius Abasimi (2018).

The smattering research interlinking economic freedom, trade and institutions does not displays a clear spectrograph of the underlining phenomena (see Rose 2000; Acemoglu et al., 2001; Anderson & Marcouiller 2002; Depken II & Sonora 2005; Wisdom Akpalu et al, 2017).

2. Literature Review

The focused of every government in recent periods is how to increased its economic GDP and perhaps its per capita income of its citizenry. In an itching to accomplished these objectives, several development economists often asked questions such as; What institutional measures promotes innovations and human capital development albeit all the economic turmoil’s? (P. Aghion and P. Howitt,1992). why in some societal settings, institutional roles exhibit some positive impacts in technological and innovation advancement, while in some societies they do not? (Parente and Prescott 2005).

Ignatius Abasimi et al (2018) noted in their studies “the impacts of institutions on international trade in Ghana economic perspective” that political and economic institutions exhibit a great and perverse properties on international trade. The study employed the ordinary least square as its econometric tool and the results revealed that business freedom and freedom from corruption has no significant effects on Ghana’s trade, however, property rights, monetary freedom, trade freedom and exchange rate exhibit great robust influence on trade in Ghana’s economic perspective. Their study empirically refute corruption as an obdurate and a canker that compromise international trade.

A recent study; “role of institutions in affecting the course of international trade in Pakistan” by Najaf Ali (2018), stretched that, institutions like, Trade Freedom, Freedom from Corruption, Property Rights, Monetary Freedom, and Business Freedom, greatly possess some perverse
effects on Pakistan trade. The study obtains data from the heritage foundation index for the analysis. The results from the multiple linear regression reveals that exchange rate, monetary freedom and some dummy variable has a negative effect on Pakistan trade while other key institutions such as Trade Freedom, Freedom from Corruption, Property Rights, and Business Freedom had a positive relationship with Pakistan trade flows. The study further carried out some diagnostics test (CUSUM stability test and Breusch-Godfrey Serial Correlation LM Test) to determine the variability and perhaps the stability of the parameters considered. The study recommends that, the property rights enforcement agents in Pakistan should be fused along with the business freedom to magnify the prospects of gains from international trade. Nevertheless, exchange rate oscillations should be controlled in order to have stability and long-term trade patterns.

Mohammad D et al (2009) also studied the long run relationship between private investment and government expenditure in Pakistan. The study employed time series data of the Pakistan economy from 1975-2008 period. The Johansen-Juselius co-integration test used in the study shows the existence of long run relationship among the parameters considered. The results refute the existence of short run causality between the studied variables, however, the long run results show that non-government expenditure such as debt service, defense etc. leads to crowding out in private investment sectors and perhaps possess pervasive effects on social and economic development in Pakistan.

Acemoglu et al (2003) shows the effects of institutional quality on economic growth after the world war 2. The results from the two stage least square reveals that institutional mismanagement and oscillations in macroeconomic policies where the major causes of some economic crisis after the war.

David Dollar & Aart Kraay (2003) in their working paper, “Institutions, Trade, and Growth: Revisiting the Evidence” noted a very crucial interrelationship between Institutions, Trade, and economic Growth. The study employed a mixer of methods (IV regressions, first-stage least square and ordinary least squares) to analyze the interdependence of these economic parameters. The study found out that when institutional quality is used as an exogenous variable, then there is a significant partial association between trade and growth which survives the inclusion of a variety of proxies for institutional quality. Nevertheless, when institutional quality was proxied as an endogenous parameter, they found that the model was relatively weak and unable to estimate the variables in question. Another intriguing finding of the study was that initial income were found to have effects on growth and changes on trade. Conversely, initial institutions once again, predicts the endogenous change in initial income, while initial levels of per capita income that were supposed to be instrumented for the change in initial income were also however, found to explain changes in trade and changes in institutions. The study highlighted in their conclusions that, simple cross-country linear IV regressions, be it or whether at levels or in decadal differences will only result in answering a partial and insignificant portion of the complex interactions roles of institutions and trade on economic growth.

Daniel Kaufmann et al (2004) have noted that a resilient economic development and higher per capita income really depends on the quality of good governance. They further pinpointed in their 2009 report that, they have been a positive robust improvement on voice and accountability by countries such as Ghana, Indonesia, Kenya, Nigeria, and Peru on their governance (institutions) but also declines in that component in countries such as Belarus, Zimbabwe and Venezuela.
Rohini and Christopher (2005) in their study “Institutions and Development: A View from Below” stressed that institutional development and observed growth in cross-country data possess a robust indications of higher, fast, long-term growth in countries with quality contracting institutions, increased protection of private property rights, improved central government bureaucracy, better law enforcement, increased levels of democracy, higher levels of trust, and smoother operating formal sector financial markets. The study again reveals that index of country openness to trade has apparently reduced poverty to a minimal level in in India, Brazil, and Colombia.

Lant Pritchett (1997), in his paper “divergence, big time” portrays how incomes in the less developing countries has fallen behind those in the developed countries. He again shows how the per capita incomes of these two economists (richest and poorest countries) increased by a factor and the difference only changes by an order of magnitude from 1870 to 1990. The study further regressed the relative incomes across the 17 countries or nations considered in the study against their GDP per capita and trend (1 if >1960 and 0 if otherwise). GDP per capita were found to have negative effect on relative incomes of these countries (-0.59), the two-trend considered in his study has coefficients of 0.13 and 0.002. one intriguing fact about this study is that the author was pretty convinced that the developing countries will be converged to meet the developed countries. The most tantalizing and intuition question behind this study is how does the various institutions interlined to pushed these economies forward? One could probably give a theoretical answer; perhaps, they had well-established institutions.

Weingast & Milgrom (1990) examined expansion of international trade in the medieval times as in the case of Champaign fair, and noted that trade was made possible largely by private order courts, whereby the judiciary were private and serves as a documentations ground for the records of traders. This exuberated to the habit that the merchants used to ask the private judges regarding the reputation of the trader to which they are going to trade. Private judges caution the merchants to take precautions when conducting business transactions with traders whose credibility is questionable, the judiciary or judges were also expected to impose fines and penalties to the traders for misconduct, and any breach of business contracts and perhaps if a trader would not pay the fines, he or she were to lose all the future possible contracts or opportunities of trade thereafter. Amongst the absence of enforcement of security or property rights and contracts by the State, private judges combined with the private order institutional arrangements, lead traders and merchants to fulfill the contracts.

Wisdom Akpalu et al, (2017) noted in their studies “Evolution of Institutions in Ghana and Implications for Economic Growth” that, GDP growth rate in Ghana was quite intriguing under quality and better institutions and through out her recent two decades of democracy. The econometric method employed in the study was the ordinary least square (OLS) estimations procedure. This was used to determine whether democratic regimes deliver better growth outcomes (GDP growth rates) than the military regimes, it was also employed to empirically verify whether the indicators of the two institutions (Political and civil liberties and Property rights) vary significantly across the three regimes/eras (precolonial, military and democratic regimes). The results show a mixer of relationships. Their studies again revealed that, out of the three formal institutions employed in the study, Civil and Political liberties and Property Rights are better indemnified under democratic regimes, compared to the colonial era and the military regimes. However, the reported indicators of Political instability from the empirical results revealed on the average less favorable outcomes under democratic regimes.

Ahmet Faruk Aysan et al (2006) elongate in their working paper “Governance and Private Investment in the Middle East and North Africa” that structural reforms such as trade openness and financial development, human capital, economic policies and governance institutions
appears to play a significant role in private investment decisions. The study uses the three stages least squares (3SLS) method or procedure to analyze a panel of 31 countries from 1980-20002. The study further reveals that low level of corruption, a good quality of bureaucracy, a clear security of property rights, a reasonable risk to operations, a sound taxation and regulation as well as better law and order are of priorities for entrepreneurs’ decisions to invest in these economies. Their study also confirms some of the theoretical literature on economic growth and investment, more specifically, the study confirms the user cost of capital theory and the natural curse hypothesis. However, the model fails to verify the Solow hypothesis of decreasing return to scale of physical capital accumulation. The study concludes that improved governance institutions and economic reforms will create an inducive environment for private investment decisions.

3. Methodology and Data Sources

To analyze the role of institutions in affecting the course of international trade in the neighboring countries of Ghana, the study employed panel data (1995-2017) which is sourced from the website of the Index of Economic Freedom -Heritage Foundation and world Bank database. The variables applied in the study includes; exchange rate, which is measured as the official exchange rate of 1 unit of the selected countries’ currencies per US dollars, total exports of goods and services, freedom from corruption, which is interpreted as the integrity of government institutions in decision making processes, business freedom, monetary freedom, property rights, which is the extent to which a country’s legal framework allows individuals to accumulate private property freely, and trade freedom. The first two variables were obtained from the World Bank development indicators database, whiles the rest of the variables were extracted from the Index of Economic Freedom -Heritage Foundation database.

Panel data technique were adopted because it has advantage over cross-sectional and time series regressions especially when it comes to heterogeneity bias. The results from panel data technique are less spurious and more generalized than the aforementioned methods. Since the data is a panel data, the study employed the mixed effect method model which comprise of the random and the fixed effect technique. Theoretically, the mixed effect model can be express as follows;

For each observation i:

\[ Y_i = \beta_1 X_{1i} + \ldots + \beta_p X_{pi} + b_1 Z_{1i} + \ldots + b_q Z_{qi} + \varepsilon_i \] (1)

where \( \beta_1, \ldots, \beta_p \) are the unknown parameters of the fixed effects, \( X_i \) are the known regressors or the design variables and \( Y_i \)'s are the regressands or observations. Moreover, \( b_i \)'s are the random coefficients and \( Z_i \) are the random effect design variables, the \( \varepsilon_i \)'s are the error terms which are expected to be independent and normally distributed with zero mean and variances.

The mixed effects model mixes random effects with the fixed effects of a typical regression model. Winter (2013) describes random effects as something that is commonly nonsystematic and impulsive, hence random influence on the data. Fixed effects however, are predictable and systematic.

The standard regression model for the study is given as:

\[ \ln EXP_{it} = \beta_0 + ln\beta_1 EXR_{it} + ln\beta_2 FRC_{it} + ln\beta_3 BSR_{it} + ln\beta_4 MOF_{it} + ln\beta_5 PRR_{it} + ln\beta_6 TRF_{it} + \varepsilon_{it} \] (2)

Where,
$\beta_0 \ldots \beta_6$ are unknown parameters and constants to be estimated.

EXP represent exports of goods and services,

EXR is exchange rate,

FRC is freedom from corruption,

BSF is business freedom,

MOF is monetary freedom

PRR is property rights

TRF is trade freedom.

i is for country

t is for year

Ln represent natural log.

and $\varepsilon$ is unobserved error term.

**Procedure for data analysis**

The study initially performed pooled OLS estimations and on that bases applied the Chow test to ascertained whether the pooled OLS is preferred to the fixed effect or not. The Hausman test was also carried out to investigate whether the fixed effect or the random effect is appropriate for the data. After the preliminary test, the Chow test and the Hausman test refuted pooled OLS and random effects techniques. The fixed effect model therefore was used for the empirical analysis.

**4. Results and Discussion**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXR</td>
<td>69</td>
<td>4.39e+08</td>
<td>9.45e+08</td>
<td>447.8053</td>
<td>3.66e+09</td>
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<tr>
<td>TRF</td>
<td>69</td>
<td>23.7942</td>
<td>9.076146</td>
<td>10</td>
<td>38</td>
</tr>
<tr>
<td>BSF</td>
<td>69</td>
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<td>8.365043</td>
<td>34.8</td>
<td>65.4</td>
</tr>
<tr>
<td>MOF</td>
<td>69</td>
<td>77.6942</td>
<td>5.853176</td>
<td>59.1</td>
<td>89.4</td>
</tr>
<tr>
<td>PRR</td>
<td>69</td>
<td>31.93913</td>
<td>5.938464</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>TRF</td>
<td>69</td>
<td>62.37246</td>
<td>10.81593</td>
<td>12.6</td>
<td>76.2</td>
</tr>
<tr>
<td>EXP</td>
<td>69</td>
<td>3.76e+09</td>
<td>4.22e+09</td>
<td>2.51e+08</td>
<td>1.37e+10</td>
</tr>
</tbody>
</table>

From table 1.0 above, it’s clear that the highest mean is 77.6942 and the smallest is 3.76e+09 which corresponds to monetary freedom and exports respectively. The minimum and maximum values which are 2.51e+08 and 89.4 again, is traced to monetary freedom and exports respectively. We are motivated that; these two variables will have a great impact on trade in the respective countries.

<table>
<thead>
<tr>
<th>Variables</th>
<th>EXP</th>
<th>BSF</th>
<th>EXR</th>
<th>FRC</th>
<th>MOF</th>
<th>PRR</th>
<th>TRF</th>
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</thead>
<tbody>
<tr>
<td>EXP</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSF</td>
<td>0.3019</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXR</td>
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<td>1.0000</td>
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<tr>
<td>FRC</td>
<td>0.0207</td>
<td>0.4613</td>
<td>-0.3002</td>
<td>1.0000</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>MOF</td>
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<td>-0.0576</td>
<td>-0.2344</td>
<td>0.2096</td>
<td>1.0000</td>
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</tr>
<tr>
<td>PRR</td>
<td>0.0301</td>
<td>0.3143</td>
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</tr>
<tr>
<td>TRF</td>
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<td>-0.1360</td>
<td>0.1461</td>
<td>0.4026</td>
<td>-0.3004</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

The results of the correlation matrix of the role of institutions in affecting the course of international trade in the neighboring countries of Ghana is showed in table 4.2, from the table, trade freedom, monetary freedom and exchange rate has negative correlation with export trade,
while business freedom, freedom from corruption and property rights has positive correlation with international export trade.

Figure 4.1. Residual analysis of the studied parameters

Figures 4.1. Shows the residuals of the variables. This was carried out to ascertain how the data fits the model. The difference between the fitted value and the actual is the residuals. It’s worth to note that the residual, actual and the fitted changes in the same direction. The variables therefore have the same properties for the analysis.

Table 4.3 Breusch and Pagan Lagrangian Multiplier Test for Random Effects versus OLS

<table>
<thead>
<tr>
<th></th>
<th>Var</th>
<th>SD = Sqrt (var)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP</td>
<td>1.78e+19</td>
<td>4.22e+09</td>
</tr>
<tr>
<td>E</td>
<td>2.38e+18</td>
<td>1.54e+09</td>
</tr>
<tr>
<td>U</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Test: Var(u)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Chibar² (01)</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Prob&gt;chibar²</td>
<td>1.0000</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.3 displays the Breusch and Pagan Lagrangian multiplier test for random effects vs pooled OLS technique. The standard deviation and variance of export trade in the studied countries are 4.22e+09 and 1.78e+19 respectively. Based on the p-value, the study rejects the null hypothesis (pooled OLS is better than random effect) and concludes that the random effect is quite efficient.

The study went further to perform Hausman test of random and fixed effect to determine and ascertained which model to use for the empirical results. The results from table 4.4 below shows that the fixed effect model is more efficient than the random effect model largely because, the P-value of the Chi²< 5%. We therefore fail to accept the null hypothesis and conclude that the fixed effect model is effective than random model.
Table 4.4 Hausman Test for Fixed versus Random Effect Models

<table>
<thead>
<tr>
<th>Variables</th>
<th>(b)</th>
<th>(B)</th>
<th>(b-B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnBSF</td>
<td>.4484365</td>
<td>4.200792</td>
<td>-3.752356</td>
</tr>
<tr>
<td>lnEXR</td>
<td>.5554779</td>
<td>-.0938257</td>
<td>.6493036</td>
</tr>
<tr>
<td>lnFRC</td>
<td>-.8486306</td>
<td>-1.058633</td>
<td>.2100023</td>
</tr>
<tr>
<td>lnMOF</td>
<td>.2364668</td>
<td>-.7367713</td>
<td>.9732381</td>
</tr>
<tr>
<td>lnPRR</td>
<td>-.3978483</td>
<td>-1.099708</td>
<td>.7018598</td>
</tr>
<tr>
<td>lnTRF</td>
<td>-.7538183</td>
<td>-1.599996</td>
<td>.8461781</td>
</tr>
</tbody>
</table>

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 68.1
P>chi2=0.0000

Table 4.5 Fixed Effect Model Estimates

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-ratio</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnBSF</td>
<td>.4484365</td>
<td>.3892516</td>
<td>1.15</td>
<td>0.254</td>
</tr>
<tr>
<td>lnEXR</td>
<td>-.5554779</td>
<td>.0899488</td>
<td>6.18</td>
<td>0.000***</td>
</tr>
<tr>
<td>lnFRC</td>
<td>.8486306</td>
<td>.1205688</td>
<td>7.04</td>
<td>0.000***</td>
</tr>
<tr>
<td>lnMOF</td>
<td>.2364668</td>
<td>.6531337</td>
<td>0.36</td>
<td>0.719</td>
</tr>
<tr>
<td>lnPRR</td>
<td>.7538183</td>
<td>.2002333</td>
<td>3.76</td>
<td>0.064*</td>
</tr>
<tr>
<td>lnTRF</td>
<td>.7538183</td>
<td>.1964394</td>
<td>3.84</td>
<td>0.000***</td>
</tr>
<tr>
<td>C</td>
<td>22.89128</td>
<td>8.524096</td>
<td>2.69</td>
<td>0.007***</td>
</tr>
</tbody>
</table>

Note, asterisk ***, * means significance at 1% and 5% levels
R-Square = 0.7843, F Statistic (6,60) = 36.35, Prob > F = 0.0000

Table 4.5 displays the empirical results of the fixed effect model. The outputs from the model reveals that exchange rate, freedom from corruption, property rights and trade freedom are statistically significant in explaining the role of institutions in promoting or affecting the course of international trade in the countries considered. The R-square also depicts the goodness of fit of the model as evidenced with a value of 0.7843 or 78%. This shows that the regressors has been explained by the regressand by 78%.

The results show that a “significant” (not total depreciation) percentage increase in the exchange rate depreciation of the respective countries currencies to the US dollar will lead to an increased in trade (as measured by the export of goods and services) by 56%. Depreciation of the considered country currencies makes the export of goods and services cheaper to the rest of the world, hence promoting trade. The study statistics further reveals that freedom from corruption has a positive and a great impact on international export trade, it has 85% effect on trade for every percentage increased in freedom of corruption in the respective countries. Property rights has a positive and significant effect on export trade, its increases trade by 75% for every percentage increased or improvement in property rights. Lastly, is trade freedom.
Trade freedom also possesses a positive and a significant relationship with trade. It has a coefficient of 0.75, which implies that a significant percentage increased in trade freedom will increase the volume of trade by 75%.


**Conclusion and Recommendation**

An institution is a humanly devised constraints that structure political, economic and social interactions (Douglass Cecil North, 1991). This study combines both political and economic institutions to access their impact on international trade. More specially, the study observed the role of institutions in affecting the course of international trade in the neighboring countries of Ghana; including Togo, Burkina Faso, and Cote d’Ivoire. The empirical results from the econometric analysis reveals quite a robust and significant relationship of parameters such as exchange rate, freedom from corruption, property rights and trade freedom on international trade in the particular countries. One intriguing findings of the study is that all the significant variables except exchange rate are associated with the political institutions in the respective countries. Therefore, its recommended that the government and necessary agencies should conceive and hatch suitable and relevant policies to strengthen the political institutions and all the supplementary sectors in supporting and promoting the course of international export trade. Again, the ministries in charge of trade should be fortified and focused so as to enhanced and maximize the potentials gains from international trade. This will attract and motivate investors who want and have the passion to engage in international transactions to do so with little frustrations. When government impose and implement appropriate policies, it will move along way to boost, intensify and enlarge its economic salvation in the long run.

This study makes a profound contribution to the theoretical and empirical literature in the following direction; from the word go, it’s the first study to incorporate and investigates the role of institutions in promoting the course of international trade in the neighboring countries of Ghana. Contextually, the study offers an integration and theoretical characteristics that intricated the dynamics and causal relationship of facets that de facto multilateral trade flows in the studied countries.
References


Women’s Voice in Business Policy Shaping Spaces in Bangladesh

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Abstract

The current research emphasizes on development of women entrepreneurs in suburban areas of Bangladesh and their scope in participation in policy formulation to achieve economic independence and empowerment. Women entrepreneurship has been playing a pivotal role in terms of economic growth employment generation and industrialization. In urban area nearly 15.4% of the 36.7% self-employed people are women. In rural area, it is only 7.4% (Statistical Pocketbook, Bangladesh ’99). A general observation says that the participation women in business entrepreneurship have developed over last decade. This report is an endeavor to find major challenges that obstruct smooth development of women entrepreneurs and socio-demographic profile of women entrepreneurs. Mostly primary data has been used to find out the major objective. Literature has been reviewed from different perceptions. The research specially focused to the extent of the participation of women entrepreneurs in policy formulation. The study was done on the districts as well-known as greater Mymensingh. Overall perception of women entrepreneurs about existing business environment were also tried to discover through this study. The study concludes with the massage that still in present age women, although doing businesses, are getting little chance to contribute in policy formulation regarding their business which are still done through male dominated bodies like chambers of commerce, other formal and informal associations etc. The research feels necessity to have further study to make the way out and suggest the nation the better solutions in this regard.

Keywords: Empowerment, Participation, Sustainable, Arena, Sensitivity.

I. Introduction

Women are an effective monetary force. For a nation’s development, they make essential commitments as entrepreneurs and employees. The advancement of ladies in associations, Decision making, Political investment and sex mainstreaming is presently seen as the overwhelming theoretical model for advancing social equity and ladies correspondence. Women’s economic empowerment is an inevitable part of development discourse. Without women from the conventional development program, institutionalization of a sustainable
development process is just ridiculous. People’s long lasting thrust for a participatory democracy in Bangladesh also requires a sustainable economic growth. Until now, this growth would always be untouchable without active and meaningful contribution of the country’s women folks. They give a key chance to monetary and social improvement and advance. Existing sex proportion in demographic structure of Bangladesh shows that ladies include right around half of the aggregate populace. They are vital piece of country’s HR. Because of this demographic structure, the issue of the interest of ladies in the standard economy is basic. Without a meaningful and active participation of women, half of the total population, in regular economic activities, a dynamic and sustainable economy is impossible. A feasible economy is a prerequisite for national growth and prosperity including institutionalization of a democratic system. It is not possible to achieve the target of a poverty-free society without incorporation of women in the mainstream economy. However, Women’s role in decision-making is one of the most significant questions for contemplation in the movement for their empowerment. Women’s contribution in the workplace, leadership role in the political and social arenas and access to credit may be viewed as empowerment of women. It is a process that allows women to gain access to and control over the physical resources as well as in the power structure. It is an instrument of awareness and capacity building leading to greater participation in the decision making process. But the process of women’s empowerment is hindered by various difficulties. Mainly Most of the society of our country is male commanding society as a result women are in helpless situation. Each stride towards ladies uniformity is a battle against of social standards. It is a traditional belief that generally males make all major decisions and at the same time they contribute to business arenas more than females, and thus, our society is highly male dominated, which is popularly known as gender bias against female. However the present study is conducted to examine how the gender sensitivity of policy processes in the national economy can be enhanced in greater Mymensingh (especially in business and trade spheres) in order to improve the benefits of policy formulation for women. The study is also designed to portrait real scenery of women entrepreneurs’ participation in decision making and policy formulation in various business spheres. 230 respondents from six district of greater Mymensingh i.e., Mymensingh, Jamalpur, Sherpur, Netrokona, Tangail and Kishoregonj are taken as sample for conducting this research study. It has been found that women are in susceptible situation in case of policy formulation and decision making in business arenas. The study also attempts to give some suggestion to improve this condition. The government as well as all the concerned authority should come forward with considerable efforts to ensure proper participation of women entrepreneurs’ in decision making and policy formulation for smooth running and sustainable development in this sector which will result in overall economic development of Bangladesh.

II. Objectives of the Study

The study is focused:

1. to examine how the gender sensitivity of policy processes in the national economy can be enhanced in greater Mymensingh (especially in business and trade spheres) in order to improve the benefits of policy formulation for women;

2. to conceptualize the positives and negatives of national economic processes for women;

3. to examine how awareness can be raised amongst key policy actors of implications of their interventions for women;

4. to explore how women’s voice and perspectives of greater Mymensingh area can be better articulated in national economic policy spaces by policy and civil society actors able to influence the process; and
5. to support conceptualization of the existing and potential trade and policy leader of the geographical area with a final expectation of enhancement of the beneficial impacts and reduction of the negative impacts of interventions by national trade and policy actors on women.

III. Methodology of the Study

The subject matters related to methodological aspects of this report are the following:

3.1 Sources of data:

<table>
<thead>
<tr>
<th>Primary sources</th>
<th>Secondary sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct interview by using structured questionnaire</td>
<td>Different books, publications and journals</td>
</tr>
<tr>
<td>Field survey</td>
<td>Different magazines and newspapers</td>
</tr>
<tr>
<td>Business academics opinion</td>
<td>Internet and websites</td>
</tr>
</tbody>
</table>

3.2 Data collection:

Primary data is collected from different district areas under greater Mymensingh specifically Mymensingh, Jamalpur, Sherpur, Netrokona, Tangail and Kishoregonj on the current involvements of women in business and trade policy with a standard questionnaire survey. Secondary data is collected through analytical works based on a review of the literature. Critical analytical approaches will provide a base to advance conceptual thinking on women’s engagement with global economic policy processes of national and greater Mymensingh area.

3.3 Sample selection technique:

For our research purpose sample is selected randomly. Our targeted sample was 360 (for Women Entrepreneurs 120, Representatives of Chamber of Commerce and Industry/Association 120 and Business Students and Academics 120). Actual response obtained from targeted sample was 230 (from Women Entrepreneurs 67, Representatives of Chamber of Commerce and Industry/Acassociation 43 and Business Students and Academics 120).

3.4 Sample size:

The total sample size for this research is 230. The targeted respondents are categorized into three categories that are Women Entrepreneurs, representatives of Chamber of Commerce and Industry/Association and Business Students and Academics. Data from 67 Women Entrepreneurs, 43 members of Chamber of Commerce and Industry/Association and 120 Business Academics are collected through a structured questionnaire for the research purpose.

3.5 Types of information:

A structured questionnaire has been served as a data collecting instrument. The questionnaire contains 17 specific questions. In order to take answer of the questions from the respondents there is used a 05 point Likert scale ranging from 01 to 05. In which 05 indicates “strongly agree”, 04 indicates “agree”, 03 indicates “Neutral”, 02 indicates “disagree”, 01 indicates “strongly disagree”.

3.6 Scope of the Study:

The study was conducted in different district areas under greater Mymensingh specifically Mymensingh, Jamalpur, Sherpur, Netrokona, Tangail and Kishoregonj. A short summary of selected areas are portrayed below:
<table>
<thead>
<tr>
<th>District Name</th>
<th>Area (Sq. Killo)</th>
<th>Establishing Year</th>
<th>Number of Upazilla</th>
<th>Population (Census 2011)</th>
<th>Education rate</th>
<th>Presence of Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mymensingh</td>
<td>4363.48</td>
<td>1787</td>
<td>13</td>
<td>5313163</td>
<td>30.10%</td>
<td>Present</td>
</tr>
<tr>
<td>Jamalpur</td>
<td>2031.98</td>
<td>1978</td>
<td>07</td>
<td>2382810</td>
<td>38.50%</td>
<td>Present</td>
</tr>
<tr>
<td>Sherpur</td>
<td>1363.76</td>
<td>1984</td>
<td>05</td>
<td>1407468</td>
<td>38.04%</td>
<td>Present</td>
</tr>
<tr>
<td>Netrokona</td>
<td>2810.40</td>
<td>1882</td>
<td>10</td>
<td>2229464</td>
<td>42.55%</td>
<td>Present</td>
</tr>
<tr>
<td>Tangail</td>
<td>3424.39</td>
<td>1969</td>
<td>11</td>
<td>3605083</td>
<td>46.80%</td>
<td>Present</td>
</tr>
<tr>
<td>Kishoregonj</td>
<td>2688.62</td>
<td>1984</td>
<td>13</td>
<td>3028706</td>
<td>40.30%</td>
<td>Present</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

3.7 Data analyzing process:

Collected information is processed by the use of computer system. Various statistical tools such as Z test, weighted average, standard deviation, arithmetic means, percentage etc. are used for processing the data.

For Z test the following formula is used:

\[
\text{Value of } Z = \frac{\text{Weighted Average} - \mu}{\frac{\delta}{\sqrt{N}}}
\]

IV. Literature Review

Khan (2006) and Mason and Smith(2003) defines empowerment as a process which enables women to meet both their practical and strategic needs and increases women’s political power, consciousness about them and strengthens women’s self-confidence.

Hossain and Jaim(2011) said in another study, women empowerment means the participation of women in household decision making process and contribution to the family income.

Women empowerment consists of greater access to knowledge and resources, greater autonomy in decision making to enable them to have greater ability to plan their lives, or to have greater control over the circumstances that influence their lives and free from shocks imposed on them by custom, belief and practice (GU, 2005).

Lovely Parvin, JiaJinrong and M. WakilurRahman (2012) has conducted a study on women’s participation in business and they argued in their study that, women have poor command over economic resources and policy space in comparison to men. The fact restricts the women especially in developing country like ours to have the intellectual inputs, employment of women labor. In many cases the employment area and career development are dominated by men. This hinders women’s potentials to contribute in economic developments. According to World Bank in no developing country women enjoy equal economic, social, or legal rights compared to those of men. Nearly half of the population is women (sex ratio 10:6). The enormous potentiality of the population has been unutilized as few women participate in the mainstream of economic activities. For instance, only 16% of women are self-employed out of 66% self-employed citizen (based on entrepreneurship status).

In another study, Rozana Majumdar (2012) find out that, in a country like Bangladesh, with a patriarchal social structure reinforced by religious, economic and political norms, it is
challenging to advance the cause of women. The primary role of women is associated with the family – as biological reproducers and nurturers. In addition, women are responsible for all the domestic household work but lack decision-making power within the household. Because of the strong patriarchal structure, political positions for women are a privilege rather than a right. In order for women to mobilize and empower women, according to Srilatha Batliwala, they need to go through a “the process of challenging existing power relations, and of gaining greater control over the sources of power.”

Parveen and Leonhäuser (2005) have said that education, skill acquisition training and exposure to information media help women to be empowered. The women who are engaged in any self-earning activities are more empowered because they have a great role in decision making, access to assets and their control over the self-earnings in Bangladesh.

Laizu et al., (2010) has conducted a research study on women’s empowerment and suggests that, women have full and equal access to ICT based economic and educational activities supports their contribution in business and home-based activities and helps them become more empowered.

Nawaz (2009) analyzes a variety of critical factors of women entrepreneurship development in rural Bangladesh. She depicts an analytical framework based on institutional theory, which focuses on three kinds of factors: regulative, normative, and cognitive. Regulative factors refer to different rules and regulations of the Government that facilitate women entrepreneurship development in rural Bangladesh. Normative and cognitive factors include norms, rules, regulation, and values of society. Based on the analysis of these factors, Nawaz provides various policy implications on how to improve women entrepreneurship development in rural Bangladesh.

ILO Area Office, (2009) said that, women are under-represented in executive bodies. This is evident not only by the number of women members and its attendant percentage of total executive body embers, but also in comparison with the percentage of women members in the respective trade union federations.

The Beijing Platform for Action considered the inequality between men and women in the sharing of power and decision-making at all levels as one of the critical areas of concern for the empowerment of women. It stated “Women’s equal participation in decision-making is not only a demand for simple justice or democracy but can also be seen as a necessary condition for women’s interests to be taken into account. Without the active participation of women and the incorporation of women’s perspective at all levels of decision-making, the goals of equality, development and peace cannot be achieved”.

Rahman, Mostafizur & Fardausara (2006) in another study pointed out that, women’s role in decision-making is one of the most important questions for consideration in the movement for their empowerment. Keeping in mind, the importance of women’s participation in decision-making, like the other government in the world, the government of Bangladesh has initiated efforts to widen the scope of women for participation in the development process. The Local Government (Union Parishad) Second Amendment Act 1997 of Bangladesh is a mile stone towards ensuring women’s equal access and increased participation in political power structures. This amendment provided for direct elections to reserved seats for women in local level elections. As a strategy of affirmative action for providing the structural framework for women’s participation in political decision-making and provided an opportunity to bring women to the center of local development and develop new grass-roots level leadership.
V. Data analysis and Findings

Factor #01: Female entrepreneurs’ involvement in their business operation is satisfactory.

Table: 01

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>230</td>
<td>230</td>
<td>2.53</td>
<td>-6.03</td>
</tr>
<tr>
<td>Percentage</td>
<td>100</td>
<td>100</td>
<td>-</td>
<td>1.96</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀ = Female entrepreneurs’ involvement in their business operation is not satisfactory.
H₁ = Female entrepreneurs’ involvement in their business operation is satisfactory.

From the total of our respondents it is found that, 20.43% respondents strongly disagreed, 40.00% respondents disagreed, 07.83% respondents are neutral, 29.56% respondents agreed and 02.18% respondents strongly agreed that female entrepreneurs’ involvement in their business operation is satisfactory. Here, the calculated value of Z is -6.03 and the critical value of Z is 1.96. As the critical value of Z is greater than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

Comment: Female entrepreneurs’ involvement in their business operation is not satisfactory. It is not a positive sign for women development in Bangladesh. Without the effective participation of women in business arena women’s empowerment can’t be imagined which the perquisite of socio economic development of Bangladesh is. So, concerned authority should come forward to increase women’s involvement in their business.

Factor #02: Female entrepreneurs have opportunity to express their views about important matters.

Table: 02

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>230</td>
<td>230</td>
<td>2.53</td>
<td>-6.53</td>
</tr>
<tr>
<td>Percentage</td>
<td>100</td>
<td>100</td>
<td>-</td>
<td>1.96</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀ = Female entrepreneurs have no opportunity to express their views about important matters.
H₁ = Female entrepreneurs have opportunity to express their views about important matters.

From the above table it has been seen that, 16.09% respondents strongly disagreed, 44.35% respondents disagreed, 11.30% respondents are neutral, 26.96% respondents agreed and 01.30% respondents strongly agreed that female entrepreneurs have opportunity to express their views about important matters. Here, the calculated value of Z is -6.53 and the critical value of Z is 1.96. Since, the critical value of Z is higher than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

Comment: Mathematical analysis reveals that, female entrepreneurs’ opportunity to express their views about important matters is very poor. They can’t express their views freely. As a result they are deprived of expressing their views about any important topic. Such type of neglect acts as obstacles for women’s empowerment. So opportunity should be created to enhance expressing power of women about important matters.
Factor #03: Female entrepreneurs can get enough opportunity in case of policy formulation and decision making.

Table: 03

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium D</td>
<td>61</td>
<td>116</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>20</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td>26.52</td>
<td>50.43</td>
<td>8.70</td>
<td>11.74</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀ = Female entrepreneurs can’t get enough opportunity in case of policy formulation and decision making.

H₁ = Female entrepreneurs can get enough opportunity in case of policy formulation and decision making.

Field survey portraits that, from the total of our respondents 26.52% respondents strongly disagreed, 50.43% respondents disagreed, 08.70% respondents are neutral, 11.74% respondents agreed and 02.61% respondents strongly agreed that female entrepreneurs have enough opportunity in case of policy formulation and decision making. Here, the calculated value of Z is -12.99 and the critical value of Z is 1.96. As the critical value of Z is greater than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

Comment: Opportunity of policy formulation and decision making is a great indicator of women’s empowerment. The present study highlights that woman entrepreneurs are also deprived of this opportunity. In case of policy formulation and decision making process women entrepreneurs are neglected. But efficient policy formulation and wise decision making is possible by women entrepreneurs. So, concerned authority should initiate proper steps to ensure women’s active participation in policy formulation and decision making process.

Factor #04: Female entrepreneurs get equal opportunity as like as male entrepreneurs in case of policy formulation and decision making.

Table: 04

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium D</td>
<td>86</td>
<td>95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>22</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td>37.39</td>
<td>41.30</td>
<td>9.57</td>
<td>8.26</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀ = Female entrepreneurs can’t get equal opportunity as like as male entrepreneurs in case of policy formulation and decision making.

H₁ = Female entrepreneurs get equal opportunity as like as male entrepreneurs in case of policy formulation and decision making.

From the total of our respondents it has been found that, 37.39% respondents strongly disagreed, 41.30% respondents disagreed, 09.57% respondents are neutral, 08.26% respondents agreed and 03.48% respondents strongly agreed that female entrepreneurs get equal opportunity as like as male entrepreneurs in case of policy formulation and decision making. Here, the calculated value of Z is -15.30 and the critical value of Z is 1.96. Since the critical value
of Z is greater than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

**Comment:** The mathematical analysis shows the result that, female entrepreneurs can’t get equal opportunity as like as male entrepreneurs in case of policy formulation and decision making process. Naturally, male entrepreneurs get priority in case of policy formulation and decision making. Such type of discrimination hampers women’s empowerment in case of business arena.

**Factor#05: Female entrepreneurs’ decision is fully accepted by the top authority.**

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD</td>
<td>D</td>
<td>N</td>
<td>A</td>
<td>SA</td>
</tr>
<tr>
<td>Number</td>
<td>35</td>
<td>73</td>
<td>46</td>
<td>70</td>
</tr>
<tr>
<td>Percentage</td>
<td>15.22</td>
<td>31.74</td>
<td>20.00</td>
<td>30.43</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀= Female entrepreneurs’ decision is not fully accepted by the top authority.  
H₁= Female entrepreneurs’ decision is fully accepted by the top authority.

From 100% of our respondents about 15.22% respondents strongly disagreed, 31.74% respondents disagreed, 20.00% respondents are neutral, 30.43% respondents agreed and 02.61% respondents strongly agreed that female entrepreneurs’ decision is fully accepted by the top authority. Here, the calculated value of Z is -3.64 and the critical value of Z is 1.96. As the critical value of Z is greater than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

**Comment:** Mathematical analysis reveals that acceptance of female entrepreneurs’ decision by top authority is very poor. As a result they become frustrated and are discouraged to formulate policy and take decision.

**Factor#06: Female entrepreneurs’ decision is fully implemented and practiced by the top authority.**

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD</td>
<td>D</td>
<td>N</td>
<td>A</td>
<td>SA</td>
</tr>
<tr>
<td>Number</td>
<td>37</td>
<td>73</td>
<td>75</td>
<td>40</td>
</tr>
<tr>
<td>Percentage</td>
<td>16.09</td>
<td>31.74</td>
<td>32.61</td>
<td>17.39</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀= Female entrepreneurs’ decision is not fully implemented and practiced by the top authority.  
H₁= Female entrepreneurs’ decision is fully implemented and practiced by the top authority.

From data analysis it has been found that, 16.09% respondents strongly disagreed, 31.74% respondents disagreed, 32.61% respondents are neutral, 17.39% respondents agreed and 02.17% respondents strongly agreed that women entrepreneurs’ decision is fully implemented and practiced by the top authority. Here, the calculated value of Z is -6.27 and the critical value of Z is 1.96. So the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.
Comment: As female entrepreneurs' decision is not fully accepted by the top authority so it is clear that their decisions are not properly implemented and practiced by the concerned authority. Mathematical analysis portraits that female entrepreneurs’ decision is not fully implemented and practiced by the top authority. So, social acceptance of female entrepreneurs’ is disrupted

Factor#07: Female entrepreneurs can utilize their skills fully.

Table: 07

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>33</td>
<td>49</td>
<td>1.22</td>
<td>1.96</td>
</tr>
<tr>
<td>Percentage</td>
<td>14.35</td>
<td>21.30</td>
<td>85</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀ = Female entrepreneurs can’t utilize their skills fully.
H₁ = Female entrepreneurs can utilize their skills fully.

From the above table it is clear to us that about 14.35% respondents strongly disagreed, 21.30% respondents disagreed, 18.70% respondents are neutral, 36.96% respondents agreed and 08.69% respondents strongly agreed that female entrepreneurs can utilize their skills fully. Here, the calculated value of Z is 0.50 and the critical value of Z is 1.96. As the critical value of Z is greater than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

Comment: From the above mathematical analysis it has been seen that female entrepreneurs can’t utilize their skills fully. Due to insufficient opportunity female entrepreneurs can’t utilize their skills fully. It is a great obstacle for women’s empowerment.

Factor#08: Female entrepreneurs can express their opinion at any time without any complexity.

Table: 08

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>51</td>
<td>110</td>
<td>31</td>
<td>10</td>
</tr>
<tr>
<td>Percentage</td>
<td>22.17</td>
<td>47.83</td>
<td>13.48</td>
<td>4.35</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀ = Female entrepreneurs can’t express their opinion at any time without any complexity.
H₁ = Female entrepreneurs can express their opinion at any time without any complexity.

From the total of our respondents it is found that, 22.17% respondents strongly disagreed, 47.83% respondents disagreed, 12.17% respondents are neutral, 13.48% respondents agreed and 04.35% respondents strongly agreed that female entrepreneurs can express their opinion at any time without any complexity. Here, the calculated value of Z is -9.72 and the critical value of Z is 1.96. As the critical value of Z is greater than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.
**Comment:** Mathematical analysis reveals that, female entrepreneurs’ opportunity to express their opinion at any time is not sufficient. They can’t express their opinion without complexity. Such type of discrimination acts as obstacles for women’s empowerment. So opportunity should be created to enhance expressing power of women about important matters.

**Factor#09:** Traditional values and attitudes of general people regarding social mobility of women to go for decision making are good.

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>39</td>
<td>94</td>
<td>56</td>
<td>34</td>
</tr>
<tr>
<td>Percentage</td>
<td>16.96</td>
<td>40.87</td>
<td>24.35</td>
<td>14.78</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

\( H_0 = \) Traditional values and attitudes of general people regarding social mobility of women to go for decision making is not good.

\( H_1 = \) Traditional values and attitudes of general people regarding social mobility of women to go for decision making is good.

From data collection process it has been found that, 16.96% respondents strongly disagreed, 40.87% respondents disagreed, 24.35% respondents are neutral, 14.78% respondents agreed and 3.04% respondents strongly agreed that traditional values and attitudes of general people regarding social mobility of women to go for decision making is good. Here, the calculated value of Z is 4.65 and the critical value of Z is 1.96. As the critical value of Z is smaller than the calculated value of Z so the null hypothesis \((H_0)\) is rejected and alternative hypothesis \((H_1)\) is accepted.

**Comment:** In our society attitudes of general people regarding social mobility of women to go for decision making is not good. It is a serious obstacle for women empowerment. Women are discouraged to involve in economic activities from his family and society. So, proper steps should be taken to change attitude of general people towards women.

**Factor#10:** Biasness exists between male and female entrepreneurs.

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>20</td>
<td>39</td>
<td>33</td>
<td>98</td>
</tr>
<tr>
<td>Percentage</td>
<td>8.70</td>
<td>16.96</td>
<td>14.35</td>
<td>42.61</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

\( H_0 = \) There exists no biasness between male and female entrepreneurs.

\( H_1 = \) There exists biasness between male and female entrepreneurs.

08.70% respondents strongly disagreed, 16.96% respondents disagreed, 14.35% respondents are neutral, 42.61% respondents agreed and 17.38% respondents strongly agreed that there exists biasness between male and female entrepreneurs. As the calculated value of Z is 6.17 and the critical value of Z is 1.96, so the null hypothesis \((H_0)\) is rejected and alternative hypothesis \((H_1)\) is accepted.
Comment: The above mathematical analysis shows that serious biasness and discrimination exists between male and female entrepreneurs. In most of the cases male entrepreneurs give priority over female entrepreneurs. In case of decision making also female entrepreneurs get less opportunity than male entrepreneurs. It is a serious matter of concern. So, concerned authority should take proper steps to remove this kind of biasness.

Factor#11: Proper training and development facilities are available to make women as an efficient decision maker.

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>32</td>
<td>84</td>
<td>230</td>
<td>2.27</td>
</tr>
<tr>
<td>Percentage</td>
<td>13.91</td>
<td>36.52</td>
<td>27.83</td>
<td>6.96</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀ = Proper training and development facilities are not available to make women as an efficient decision maker.
H₁ = Proper training and development facilities are available to make women as an efficient decision maker.

From the total of our respondents it is found that, 13.91% respondents strongly disagreed, 36.52% respondents disagreed, 14.78% respondents are neutral, 27.83% respondents agreed and 06.96% respondents strongly agreed that proper training and development facilities are available to make women as an efficient decision maker. Here, the calculated value of Z is -2.95 and the critical value of Z is 1.96. As the critical value of Z is greater than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

Comment: Most of the respondents argued that, proper training and development facilities are not available to make women as efficient decision maker. Maximum woman who are presently involved in business arena is not properly trained up. Due to insufficient training female entrepreneurs can’t handle their operations effectively. To accelerate the women empowerment process proper training and development facilities for women should be enhanced.

Factor#12: Women entrepreneurs get expected supports and assistance from government and business regulated agencies when necessary.

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>54</td>
<td>112</td>
<td>230</td>
<td>2.21</td>
</tr>
<tr>
<td>Percentage</td>
<td>23.48</td>
<td>48.70</td>
<td>12.61</td>
<td>13.48</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀ = Female entrepreneurs can’t get expected supports and assistance from government and business regulated agencies when necessary.
H₁ = Female entrepreneurs get expected supports and assistance from government and business regulated agencies when necessary.
From the above table it is clear to us that, about 23.48% respondents strongly disagreed, 48.70% respondents disagreed, 12.61% respondents are neutral, 13.48% respondents agreed and 01.73% respondents strongly agreed that female entrepreneurs get expected supports and assistance from government and business regulated agencies when necessary. Here, the calculated value of Z is -3.38 and the critical value of Z is 1.96. As the critical value of Z is greater than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

Comment: Female entrepreneurs strongly argued that they can't get expected supports and assistance from government and business regulated agencies when necessary. As a result they can't run their business operation smoothly. Without proper support it is really very difficult to carry on business operations. So it is a burning need for female entrepreneurs to get enough supports and assistance from government and business regulated agencies when necessary.

Factor#13: Female entrepreneurs are fully aware about their rights.

Table: 13

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>230</td>
<td>230</td>
<td>3.05</td>
<td>-0.68</td>
</tr>
<tr>
<td>Percentage</td>
<td>100</td>
<td>100</td>
<td>1.11</td>
<td>1.96</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀= Female entrepreneurs are not fully aware about their rights.
H₁= Female entrepreneurs are fully aware about their rights.

From the above table it has been found that, 04.78% respondents strongly disagreed, 36.52% respondents disagreed, 16.52% respondents are neutral, 33.04% respondents agreed and 09.14% respondents strongly agreed that female entrepreneurs are fully aware about their rights. Since the calculated value of Z is 0.68 and the critical value of Z is 1.96, so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

Comment: One of the most crucial causes for slow women empowerment is that female entrepreneurs are not fully aware about their rights. They are not fully conscious about their legal rights. This kind of unconsciousness creates due to lack of proper education. So, concerned authority should initiate proper steps to raise awareness among woman.

Factor#14: Women have full freedom in participating of local and national politics.

Table: 14

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>230</td>
<td>230</td>
<td>2.93</td>
<td>-0.91</td>
</tr>
<tr>
<td>Percentage</td>
<td>100</td>
<td>100</td>
<td>1.17</td>
<td>1.96</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀= Female have no full freedom in participating of local and national politics.
H₁= Female have full freedom in participating of local and national politics.
From the survey it has been seen that, 12.17% respondents strongly disagreed, 30.43% respondents disagreed, 14.78% respondents are neutral, 37.39% respondents agreed and 05.23% respondents strongly agreed that women have full freedom in participating of local and national politics. Here, the calculated value of Z is -0.91 and the critical value of Z is 1.96. As the critical value of Z is greater than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

**Comment:** Mathematical analysis have proved that, women can't get full freedom in participating of local and national politics. They are hindered by his family and society. As female entrepreneurs consist of half of total population, so their participation in local and national politics is very necessary.

**Factor#15: Roles regarding promotion of women entrepreneurs to make them as decision makers of mainstream chambers are sufficient.**

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>28</td>
<td>108</td>
<td>35</td>
<td>56</td>
</tr>
<tr>
<td>Percentage</td>
<td>12.17</td>
<td>46.96</td>
<td>15.22</td>
<td>24.35</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀ = Roles regarding promotion of female entrepreneurs to make them as decisionmakers of mainstream chambers are not sufficient.

H₁ = Roles regarding promotion of female entrepreneurs to make them as decisionmakers of mainstream chambers are sufficient.

From the total of our respondents it has been found that, about 12.17% respondents strongly disagreed, 46.96% respondents disagreed, 15.22% respondents are neutral, 24.35% respondents agreed and 01.30% respondents strongly agreed that organization practices office utility management. As the calculated value of Z is -6.56 is smaller than the critical value of Z is 1.96, so the null hypothesis (H₀) is rejected and alternative hypothesis (H₁) is accepted.

**Comment:** From the above mathematical analysis it is very much clear to us that, roles regarding promotion of women entrepreneurs to make them as decision makers of mainstream chambers are not sufficient. So, mainstream chambers should concern to develop female entrepreneurs.

**Factor#16: Coordination between and among different institutions working for women entrepreneurs development is sufficient.**

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>WA</th>
<th>SD</th>
<th>Z-test Cal. Value</th>
<th>Z-test Cri. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>25</td>
<td>77</td>
<td>55</td>
<td>69</td>
</tr>
<tr>
<td>Percentage</td>
<td>10.87</td>
<td>33.43</td>
<td>23.91</td>
<td>30.00</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

H₀ = There is no coordination between and among different institutions working for female entrepreneurs development.
H₁: There is coordination between and among different institutions working for female entrepreneurs development.

From the total of our respondents it is found that, 10.87% respondents strongly disagreed, 33.48% respondents disagreed, 23.91% respondents are neutral, 30.00% respondents agreed and 01.74% respondents strongly agreed that there is availability of transport facilities. Here, the calculated value of Z is -2.31 and the critical value of Z is 1.96. As the critical value of Z is greater than the calculated value of Z so the null hypothesis (H₀) is accepted and alternative hypothesis (H₁) is rejected.

Comment: Coordination among different institutions working for female entrepreneurs’ development is very poor. So, proper steps should be taken to increase coordination among different institutions working for female entrepreneurs’ development.

VI. Recommendations

Women empowerment is one of the most important issues in the present day of the world. Though women have a great involvement in the development process, they have low status as compared to men, specifically in the developing world. The situation is almost same in Bangladesh. Bangladesh development process will not get pace without the further involvement of the women. However some recommendations and suggestions are designed bellow for improving decision making capacity of women entrepreneurs in business arena:

- Bangladesh Women Chamber of Commerce and Industry (BWCCI) and other women organizations together with male counterpart have to continue their voices to influence the government to undertake policy measures and implement them properly for developing female entrepreneurs’ decision making capability.
- People from all walks of life should work together to remove existing social barriers and create an enabling environment for women entrepreneurs in Bangladesh.
- National Women Development Policy 2008 should be properly implemented.
- Government and business regulated agencies should ensure equal opportunity to male and female entrepreneurs in case of policy formulation and decision making.
- Decisions taken by women entrepreneurs should be honored, accepted and properly implemented by the concerned authority and attitudes of general people towards women entrepreneurs should be changed.
- Govt. should ensure that women entrepreneurs can utilize their skills fully.
- Concerned authority should take proper steps to eradicate discrimination between male and female entrepreneurs and raise awareness among women entrepreneurs.
- Maintain a quota for women entrepreneurs in the project undertaken by respective ministries and make sure that this quota is maintained properly. Besides this coordination can be increased between and among different ministries and institutions that are involved in women entrepreneurship development activities.
- Establish women entrepreneurship development academy for the capacity development of the women entrepreneurs and introduce a holistic program for capacity building of women entrepreneurs.
- Extend social network for women entrepreneurs to make them as efficient decision maker.
- Education system should have some mechanism to change social attitudes towards women entrepreneurs and harmony and coordination between and among policy institutions to improve women entrepreneur can be ensured.
- Improve law and order situation in order to ensure fear free environment for business community, especially for women entrepreneurs.
VII. Conclusion

One of the reports of (UNIFEM, 2004) indicates 7 Principles to make women empower in the corporate world: Equality should be created among man and women. Top business leadership must promote the gender equality through their policies and should promote healthy and safety measure to feel the women secure at workplace. Government should also establish the programs and training plans that increase the education and awareness level among women. Moreover concerned authority should promote the women owned businesses by expanding the relationships with their companies and should recognize the women leadership in communities and in public. In addition companies must be held accountable for their women empowerment and gender equality policies.

We conclude our discussion on the points that the present condition of women empowerment and participation in policy formulation and decision making process is not so good in Bangladesh’s corporate sector. Although now a days women are engaged in various but women’s’ participation in policy formulation and decision making process is very poor due to the number of reasons indicated in the research. But these issues can be overcome through the measures suggested in this research paper especially the principles suggested by the (UNIFEM, 2004). The dream of empowering the women in the corporate sector can be come true by increasing their participation in the economic activities. And it can be hoped that in future women empowerment condition will be better than the past.

References:


ILO Area Office (2009), Women’s Participation in Trade Unions in Bangladesh: Status, Barriers and Overcoming Strategies,

Big Data Management in Transport & Logistics Industry: A Literature Review

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Abstract
Nowadays, the amount of data produced from transport & logistics industry appears significant increase. Meanwhile, under the worldwide competition, professionals are struggling in dealing with the huge data. Thus, the adoption of new information technologies has become essential for most of transport & logistics businesses to improve their activities with the investigation of how to produce, capture and analyse data. Big Data Management is one of the best techniques which can help them in overcoming their problems (Tiwari, et al., 2018). Realizing its benefits, this paper will provide a literature review of big data in the transport & logistics industry to demonstrate its knowledge and understanding of related research in recent five years, especially the application cases. During the analysis, this paper will discuss the strength, weakness, opportunities and threats of adopting big data, to identify the research directions for future study in transport & logistics domains.

Keywords: Big Data Management, Transport, Logistics

1. Introduction
The widespread using of information technologies in transport & logistics industry leads to the fast increase of data sources (Nguyen, et al., 2017). And, this increasingly massive amount of data also provides logistics companies with lots of opportunities for exploring new values and the challenges, which could raise powerful competitive advantages in terms of management and analysis. In academic area, researchers have given a new concept as Big Data in this practice, which also has been a new trend of application in the field of transport & logistics (Tiwari, et al., 2018). Thus, this paper will perform a comprehensive literature review for the
related articles in recent five years to investigate and critically analyse the knowledge and application cases of big data in transport & logistics industry.

The structure of this paper is organized as follows. Firstly, in section II, the overall background of transport & logistics industry will be given. Then, in section III, this paper will analyse the strength, weakness, opportunities and threats of Big Data in transport & logistics, with relevant cases to support. At last, a brief review of some prospects of Big Data in transport & logistics and limitations of this paper will be concluded in section IV.

2. Background

Generally, the logistics operations include freight transport, supply chain management, e-commerce, inventory, delivery, handling, reverse logistics and so on. According to Tan (2015), the methodological advancements and analytical capabilities of Big Data technologies play a vital role in new business models and the improvement of customer experience, when applied in transport & logistics chains. For example, new data-driven businesses and opportunities appear across global forwarding networks based on the development of analytics capabilities in Big Data (Govindan, et al., 2018). The data captured along the forwarding networks including cargo, size, weight, location and destination by professionals from millions of shipments around the world every day, promotes to the optimization of operation efficiency and business models. Besides, now, transport & logistics industry has been considered as an important data source, which can develop these Big Data applications to a new level as well.

3. Literature Analysis

The adoption of Big Data in transport & logistics industry can usually refer to three dimensions: operational efficiency, customer experience and new business models (Nguyen, et al., 2017). In this section, the strength, weakness, opportunities and threats of Big Data are discussed in detail referring to transport & logistics issues.

3.1 Strength Analysis

A. Big Data Technology

The Big Data technology generally involve commercial and open-source platforms and services for storage, security, access and processing of data (Hopkins & Hawking, 2018). Cloud computing is one of the widely used Big Data technologies and internet-based. With the cloud computing, users can access files to share or process data from any device that can access the Internet. Besides, cloud computing is also a good tool that support the processing of this huge amount of unstructured data and turn it into actionable business intelligence (Misbahuddin, et al., 2015). In another word, Cloud offers everything as a service business model for IoT (Internet of Things) and big data. And, the investigation of cloud computing, big data and IoT has been well adopted in the Intelligent Transport Systems applications.
Application Case: Take the Agent Vehicle Tracking solution from DHL as an example (shown in figure 1). In 2011, DHL has adopted cloud computing throughout their organization and believe that Big Data would improve their logistics operational performance, such as efficiency and service quality (Hopkins & Hawking, 2018). To achieve the goals of ‘Plan Zero’ (Zero Vehicle Accidents, Zero Environmental Impacts and so on), DHL implemented a range of truck telematics and established cloud computing platforms to collect and process sensor data from trucks, including speed, distance travelled, location, engine data and so on, with control rooms which monitor and change driver behaviors. According to the annual report from DHL, by 2016, DHL had reduced their GHG emissions by 42 percent. Specially, 32 percent of this reduction was due to Agent Vehicle Tracking (Hopkins & Hawking, 2018).

Analysis: Cloud-based service has four key strong supports to big data: Scalability, Flexibility, collaborated and Security (Tiwari, et al., 2018). Firstly, from the view of scalability and flexibility, Cloud-based services are ideal for businesses with growing or fluctuating demands. Logistics companies always meet seasonal demand fluctuations on delivery, especially affected by the commercial promotions, for example, ‘Black Friday’ in the UK or ‘Double Eleven Day’ in China. In the case of DHL, the fluctuation of logistics demands may lead to the data change on its type and amount, which requires the big data platform in the capability of scalable and flexible. And, Cloud Computing can allow this growth or fluctuation, and the steadily process a huge amount of unstructured data.

Besides, the cloud computing can increase the collaboration of a business team. The members of Agent Vehicle Tracking team in DHL can access, edit and share documents anytime from anywhere, which enables them to do more together and better.

At last, cloud-based services improve the security of data storage. Cloud-based services can enable the data storage, computing and memory resources in an elastic and “transparent” way, which can avoid the data loss as far as possible (Hopkins & Hawking, 2018).

B. Big Data Analytics

Data Analytics includes descriptive analytics, diagnostic analytics, predictive analytics, prescriptive analytics and so on (Nguyen, et al., 2017). In transport & logistics operations, the Big Data analytics can support the dynamic routes design by processing real-time information from sensor data or external customer information.

Application Case: As an example, Routific is a commercial route optimisation software developed...
for most delivery businesses to improve the performance of last-mile delivery.

In figure 2, it exposes the user interface of ‘Routific’ for on-demand logistics management, where the freight fleet can be tracked for last-mile delivery optimisation.

![User Interface of 'Routific' for Last-Mile Optimization](image)

**Figure 2.** The user interface of last-mile optimization tool (Tiwari, et al., 2018)

*Analysis:* In the case of last-mile optimization tool, the software – ‘Routific’ provides a flexible solution to the Vehicle Routing Problem, based on the factors in terms of time windows, delivery types, vehicle capacities, driver speeds, priority stops, driver shift times, driver breaks, traffic, and more (Tiwari, et al., 2018). According to the statistics on its website, the software – ‘Routific’ can help its customers save time and fuel with 40% shorter routes (Routific, 2018).

As for the operational level, Big Data analytics applied in the ‘Routific’ can dynamically analyse and optimise the distribution network in consider of the coordination between transport routes and transit points, by processing real-time sensor data from vehicles (Govindan, et al., 2018). However, in previous, the route plan was based the past inefficient resources such as historical averages or even personal experience, which was hard to reflect the reality.

### 3.2 Weakness Analysis

#### A. Big Data Technology

Firstly, Cloud computing platforms need lots of investment for its development and maintains. Most of the Small & Medium-sized Enterprises (SMES) relies on the Third-Party service, such as Amazon, Microsoft and iCloud, which may meet more risks on information leakages, especially for the information related to market strategy. In addition, since cloud computing needs a constant internet connection, if the Third-Party services has any failure, the daily operations of SMES will also be significantly impacted.

#### B. Big Data Analytics

At first, it is not all companies can afford the cost on the building of analytical capabilities.
Generally, the Big Data analytics are always developed by high-level professionals who are named as ‘Data Analytics’ in many cases. Recently, some large firms are beginning to create “Chief Analytics Officer” roles to oversee the building of analytical capabilities, such as UPS. But, both the cost of human resources and technologies development are very expensive. Only few large logistics companies could afford its costs. Thus, if some SMEs want to improve their transport or logistics performance by the Big Data analytics, they must rely on the Third-Party services.

Besides, while cost is often a limiting factor in many technology decisions, ease of use appears to be a more pressing issue than cost (Gasova, et al., 2017). Because, the implementation of a complex big data system throughout the organisation always needs staff training and professionals to support, which would cost a lot of time on it.

3.3 Opportunities Analysis

A. Big Data Technologies

The application of Big Data technologies is still a new trend in transport & logistics field, which promotes to a fast growth of new technologies, such as Artificial Intelligence (AI) and Data Science. Meanwhile, the investigation of new technologies is also leading to the development of fully auto-decision processes, known as Smart Logistics in the transport & logistics industry (Gasova, et al., 2017). Under this context, transport & logistics industry and Big Data are in together development.

In Smart Logistics, the research and development of new intelligent self-driving vehicles in a Big Data and IoT-based traffic infrastructure has been popular in recent years (Wang, et al., 2016). The new intelligent self-driving vehicles would be a key trend in transport & logistics area during the following years and bring more flexible and automated logistics solutions as well. Because, the shared sensor data provides more great deal of information on weather and traffic for the optimisation of efficiency and self-management on the flow of logistics and goods. For example, Mercedes is leading to the design of “future Truck 2025” that presents a self-driving truck would change the future of shipping methods (Borgi, et al., 2017).

B. Big Data Analytics

Based on Big Data predictive analytics, the Predictive Analytics allows logistics providers to improve their process efficiency and service quality by forecasting demands before any request or order will be placed, to short its delivery time (Tiwari, et al., 2018). Take the concept of Internet of Trains as an example. The Internet of Trains is a new trend of maintenance services proposed by Siemens in past few years, which could reduce the train failures by analysing the sensor data, to achieve a data-driven predictive maintenance of trains fleet (Teradata, 2015).

3.4 Threats Analysis

A. Big Data Technologies

Firstly, the development of Big Data technologies may meet a threat on the data monopoly. Even though transport & logistics industry can create huge amounts of data due to the adoption of new technologies, such as IoT, all these data may meet a forbidden challenge on share from
several large firms in the transport & logistics industry, which may affect the development of Big Data technologies in logistics domains (Hopkins & Hawking, 2018).

In addition, the privacy and security issues are still a serious challenge for the storage and transmission of enormous quantity of sensor data (Tiwari, et al., 2018). For example, in 2016, over 50 million of Facebook users suffered their data exploited by a political consultancy. There’re no detail regulations for professionals or businesses on the development of the crowd-sourced data and application platforms. However, those multi-platforms, such as Google, adopted big data technologies are becoming more and more easy to locate or track objects, including vehicles and people, which may lead to new threats in terms of privacy and security. If misunderstood and misconfigured, it may pose risk to our data, privacy, and safety.

B. Big Data Analytics

One of the important challenges maybe from the predictive analytics limitations. On one hand, predictive models cannot offer a reliable answer for future during the self-learning and self-regulating processes. Because, history data cannot always predict the future, which means the data fitting is unable to resolve all the issues. On the other hand, data that are inaccurate, incomplete, or inconsistent can also noise the results of prescriptive analytics and create serious operational problems for businesses. For example, the self-driven car may meet traffic accidents, due to inaccurate decisions under the inaccuracies in transport data and road conditions information. Besides, the inaccurate decisions caused by predicative analytics limitations may lead to a threat on legal insight. For example, the self-driven car from Uber caused a casualty accident in America at the beginning of 2018. How to determine its legal responsibility was a difficult.

4. Conclusion & Limitation

This paper explored a literature overview of Big Data, and analysed the main strength, weakness, opportunities and threats in the transport & logistics industry. The application of Big Data technology and analytics in transport and logistics fields is still in development. Firstly, this paper proposed that the Big Data technology and new knowledge explored from the vast of sensor data along the logistics chains are in together development, which could offer valuable opportunities. Besides, the technical limitations and risks of Big Data in transport & logistics industry also needs to concerned by scientists and researchers, such as the raising challenges of privacy and safety. In addition, since the analysis of this literature review is based on materials just collected from academic journals, in future researches, it shall collect more information from practice. At last, this review just reflects the recent views of scholars who research on Big Data in the field of transport & logistics. Therefore, the analysis proposed in this review needs to be further enhanced based on much more academic journals and practical cases.
Reference


Teradata, 2015. The Internet of Trains: Analysing sensor data helps simens keep operators on track by reducing train failures.


Application and implications of Maslow’s Hierarchy of Needs Theory: The Zimbabwean experience

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Abstract

This study was carried out to evaluate the relevance of Maslow’s Hierarchy of Needs Theory in satisfying the needs of teachers in a rural setup. A qualitative approach was taken focusing on Mazowe District. It was found that even though, Maslow’s theory forms the basis for motivation strategies in organisations, it was inconsistent with the local and best human capital practices. The findings pointed to the fact that there were violations of basic, safety, esteem and self-actualisation needs by the employer. It also emerged that the District was politically charged during and soon after harmonised general elections and the most affected were teachers due to their freedom of expression and as disseminators of information and knowledge in communities they serve. Self-actualisation was found to be a myth since the employer failed to meet basic needs. The study recommended that motivation should be localised considering the factors that have impact on motivation of employees. Theories of motivation can therefore be not viewed as a universal construct as obtained in this study.

Keywords: motivation productivity, needs, retention

1. Introduction

The Public Service Commission (PSC) which is the employer of all civil servants teachers included, has tried a number of motivation and retention strategies since independence in 1980. Payment of a bonus, rural and transport allowances among others have been tried and failed to yield the desired results. A number of studies have been carried out on teacher motivation but few studies have been conducted in Zimbabwe, especially looking at rural teachers (Belle, 2007; Chindanya, 2002). Paramount to the survival of institutions or organisations is the motivation and job satisfaction of its workforce. According to Cole (2009), organisations have the responsibility of creating enabling environments for their employees to be productive and motivated. Employees should be given the opportunity to exercise self-control and be responsible for their actions. Giving employees autonomous in their jobs is great motivation in itself (Ployhart and Moliterno, 2011). Organisations need to recognise individual efforts and
offer appropriate rewards. It is also critical for organisations to nurture and retain hard working and committed pools of employees. The intellect of human is the most important resource and an organisation depends on people for its existence and profitability (Chin and Sofian, 2011). The Public Service Commission has failed to motivate and retain qualified and experienced personnel leading to poor service delivery (Zvavahera, 2015). This study sought to evaluate the applications and implications of Maslow’s Hierarchy of Needs Theory from the Zimbabwean perspective.

2. Literature

Motivation and retention are topical issues in modern organisations around the globe. Motivation is defined as the force that prompts action in a positive direction with the view of achieving agreed objectives (Maicibi, 2004). Motivation also refers to all forms of forces that are positive and shown in employees through the achievement of organisational and individual goals concurrently (Cole, 2009). On the other hand, employee retention is defined as the ability by an organisation to retain its staff in the face of competition (Ongori, 2007). Management through modern management practices can motivate and retain employees. Employees who are engaged in organisations come from different backgrounds such as the old and the young, male and female married and unmarried. This is how complex the environment is. Gannon (1985) states that it is the responsibility of management to make sure that motivation strategies cover a wide spectrum of employees in order for them to be effective and acceptable. Mukokoma (2008) feels that there are no motivation strategies that can be effectively applied throughout all organisations due to the external environment that is difficult to control.

Factors that motivate employees in certain environments cannot be overemphasized as these might fail in other areas. According to Lumley, Coetzee, Tladinyane and Ferreira (2011), retention and motivation are becoming a challenge since employees and labour laws are increasingly becoming demanding and more complex on a daily basis. Job satisfaction is influenced by working conditions (Hosseini, 2013). Lumley et al. (2011) acknowledge that job satisfaction leads to improved productivity and profitability for the organisation. Motivated and committed employees are crucial for the success and survival of organisations (Maicibi, 2004). According to Cole (2009), Taylor had an assumption that employees were motivated by high salaries and this notion was however, refuted by Herzberg (1959) in his “Two Factor Motivation Theory”. Maicibi (2004) further discovered that management should be concerned with the creation, development and maintenance of an environment to which individuals work together in groups towards the accomplishment of common organisational goals and objectives. To this end, an organisation cannot effectively and efficiently achieve its mission without motivating and retaining its personnel to work together towards the achievement of set goals and objectives (Cole, 2004).

Organisations aim to create productive workforces, reduce absenteeism and labour turnover (Wright and McMahan, 2011). Self-actualisation is critical for sustenance and growth of organisations and individual employees. Blunt and Jones (1992) aver that satisfaction of workers is central to the proper management of employees which translates to improved motivation and productivity. Cole (2004) found out that employees come to work for various reasons. Some come to work as a means of survival, whilst others seek growth, self-esteem and satisfaction in their careers. However, individuals in organisations are motivated by various things such as the job itself or challenging tasks (Chin and Sofian, 2011). The above issues bring us to the understanding that the management of employees at the workplace is complex since there are many variables that affect their performance. Wright and McMahan (2011) argued that organisations should consider their employees as a source of competitive
advantage since it is the only resource which cannot be imitated by competition. As submitted by Lumley et al. (2011) most rural schools’ teachers are affected by a variety of challenges emanating from political, socio-economic, legal, and technological environments. According to a study carried out in Rawalpindi City in 2004, in the United States of America by the US Government, teachers were found to be the role models of their school children in shaping their future careers. This means that if teachers are not happy, this is likely to affect the performance of the children leading to poor results. Teachers therefore, play a critical role in their learning and in shaping the children’s future careers.

It is critical to understand that motivation leads to acceptable behaviours which are likely to produce the desired outcome. When a person is motivated, he/she tries to achieve both individual and organisational goals. For an individual to perform to the satisfactory level, environmental factors (political, economic, social, technological and legal) have to be considered and these are external to the organisation. Campbell, McAllister and Eley (2012) are of the view that both intrinsic and extrinsic factors of motivation can go a long way in motivating and retaining employees in organisations.

Peresuh and Nhundu (1999) feel that for individual employees to achieve the desired outcomes they should have the ability and an enabling environment, which perhaps could be lacking in rural schools. Organisations should create environments which allow for innovativeness and team building. Such organisations can lead to great satisfaction of employees. Freedom to exercise self-control is also critical for organisations to be successful. Motivation is not manipulation or management through fear or coercion but a conscious effort in which individuals choose to behave in certain ways towards achieving both personal and organisational goals (Wright and McMahan, 2011). Cole (2009) avers that motivation is linked to satisfaction, commitment and loyalty to the organisation. As mentioned earlier on, motivation and retention are key to this study. Theories on motivation and retention are going to be discussed in this section. Most theories of motivation imply aspects of retention as well and therefore double as models of motivation and retention. There are many theories of motivation and most of these theories were developed in the Western World and these have been transferred to Africa and other continents without adjusting them to local jurisdictions. This could be one of the reasons for their failure.

2.1 Theories of Motivation

The basic theory of motivation to be reviewed first is that of Urcdziková and Kiss (2009) which is referred to only as the simple model of motivation as illustrated in Figure 1.1. According to this theory, people always have needs and these stimulate certain behaviours towards achieving satisfaction. These needs could be both at an individual and organisational levels. Individual and organisational needs have to be satisfied at the same time in order to realise improved productivity in organisations. As its name implies, this theory is very simple and offers the very basic skeleton of every model of motivation including the one below. Because of its simplicity, it does not elaborate on what should be designated as a need, behaviour and satisfaction. Thus, it is very difficult for any given group of researchers to come up with the same categories of data to measure and use as a theoretical framework.
2.1.1 Maslow’s Hierarchy of Needs Theory

Maslow in 1950, proposed the Hierarchy of Needs Theory (McLeod, 2007). Maslow arranged employees’ needs in order of importance and indicated that these are satisfied following the prescribed order. According to Maslow, these needs start from the bottom (physiological to self-actualisation needs) and that these are fulfilled systematically as shown by Figure 1.2. However, this theory has its weaknesses. Even though shelter is regarded a basic need according to Maslow, what was pertaining on the ground was that accommodation that was available in most rural schools was either inadequate or dilapidated. For motivation strategies to be effective, management should consider employees’ motivation at an individual level and the context in which they are operating (Baron and Greenberg 2003; Werner (2007).

Maslow’s theory did not address motivational needs at an individual level. It should be noted that employees are not the same and that they react differently to different motivational strategies. In the real work environment, Maslow’s needs cannot be satisfied in an orderly manner as portrayed since some of them can be fulfilled simultaneously. This theory was not comprehensive in its approach as other variables that make employees stay in their jobs were not considered. The external environment which affects directly or indirectly on both employees and organisations were not considered. For instance, the global economic meltdown is external to the organisation but can end up affecting organisations, employees and the society in general. This theory fails to address the basic needs of an employee from a Zimbabwean perspective. Employees’ needs are not uniform and cannot therefore be applied holistically. Maslow’s Hierarchy of Needs Theory is viewed from the aspects discussed below.

- **Physiological/basic needs**
  With reference to this study, when teachers graduate from colleges and universities their desire will be to get employment in order to meet their basic needs such as food, shelter, sex and others. This is when people starting building their future on the basis of their current employment. At this stage of their lives, they are not worried about where they are deployed and how much they get, their desire is to get a job and get going. As time passes employees aspire to achieve more and grow in their careers.

- **Safety**
  As they get more experience, they start acquiring property in the form of furniture, electrical gadgets such as smart phones, television sets, computers and many others. They also want to be protected from physical and emotional harm in their endeavours to serve communities around them. They start aiming higher and looking for better opportunities beyond the rural communities that are obviously urban communities. As they get more and more experience, they would want to improve themselves in all spheres of life.
When the lower needs are met, employees would want to get friends, fill affectionate about others. Since most teachers are perceived to be enemies of the ruling party, the Zimbabwe African National Union-Patriotic Front (ZANU PF), they do not have freedom of association even though freedom of movement and expression is enshrined in our Constitution. It is perceived that parents who send their children to these schools are the same people who perpetrate violence on teachers.

**Esteem needs**

At the fourth level in Maslow’s hierarchy is the need for appreciation and respect. Teachers who work in rural areas need to be respected as transformers of society. Since most of the needs would have been fulfilled, the esteem needs begin to play a more prominent role in motivating behavior. When teachers produce good results, their efforts need recognition. Prestige at this level plays a critical role. At this level, monetary rewards are not as important as recognition. It seems teachers’ efforts have not be recognised in any way. By the end of the day, they feel that they are not important and that their work is not important as well. They end up wanting to move to urban areas where there are better opportunities in every sphere of their lives. It seems as if it is at this point, that most teachers seek transfers to better schools.

**Self-actualization**

Even though this level is difficulty to achieve, it is the desire of everyone in life to reach their fullest potential in their careers and life beyond the careers. For teachers, this level has been difficulty to achieve because the environment they are operating in, rural schools does not permit that. Promotions are difficulty to come by. To this end, teachers will continue to make efforts in trying to fulfill this need by placing themselves strategically. In urban areas, there are opportunities of consulting, getting better opportunities and advancing themselves professionally. So this why it is important to understand how motivation functions at various levels. It also critical to come up with what teachers perceive to be motivation. It seems there is lack of engagement and consultations when it comes to the conditions of service for teachers. What is interesting is that what is called motivation, could not be viewed the same by teaching
practitioners. What is also clear from the above discussion is that motivation is a function of management. It is against this background that the researcher seeks to develop a model that can assist management in motivating and retaining experienced and qualified employees.

3. Objective

The objectives of this study were to:

- Evaluate the application and implications of Maslow’s Hierarchy of Needs Theory from rural teachers’ perspective; and
- Synthesise the analysis into a model of motivation of human capital

4. Methodology

This section gives an account of the methodologies, procedures and analytical tools used in carrying out the study. The study used the qualitative research design and the case study approach. The factors considered for selecting the case were:

1. The case provided fresh insight to a previously generalised problem through an in-depth analysis.

2. The case was thus, considered to have the ability to provide a basis for pursuing remedial action on the problem of motivation;

3. The case challenged the existing models of motivation and offered a counter-theory to prevailing theoretical frameworks that are largely euro-centric and assumed that human needs considered as basic human rights in the West were the same as basic human needs everywhere; and

4. Analysis of data from the case was deemed appropriate and sufficient to generate an indigenous theory and thus offered a fresh direction for future research where the theory may be tested to further ground it in other alternative contexts.

Mazowe District has three mission-boarding secondary schools and one Government primary boarding school. Some teachers from the four boarding schools formed part of the purposive sample of this study. The other six-day schools were also purposively selected and some teachers from these schools participated in the study. The respondents were chosen considering the accessibility of the respondents, their willingness to participate in the study and their experiences and knowledge as teaching practitioners in Mazowe District. Patton (2002) submits that the selection procedures are dependent on the variables being considered by the researcher.

4.1 Considerations for choosing Mazowe district as the study area

The study focused on rural schools in Zimbabwe. Zimbabwe has a total of 60 districts situated in ten the provinces of the country. Eight of the provinces have districts that are largely situated in rural areas. The rural areas have the following characteristics:

- Low household income often inadequate to cover school fees;
- Poor infrastructure and facilities such as road networks, communication, service centres and many others; and
- Poor pass rates
Ordinarily, the choice of the study site is premised on the need to select a district that is representative and typical of any rural district in Zimbabwe. In this study, however, the choice of the study area was informed by the results of the preliminary desk study on the state of rural education in Zimbabwe. The desk study revealed that Mashonaland Central province had the lowest number of trained primary and secondary school teachers at 24.1% and 57.4% respectively. The Zimbabwe Vulnerability Assessment Committee Report (2017) and the Medium Term Plan Education in Zimbabwe (Coltart, 2013) were used to provide this basic information. Out of the eight districts in Mashonaland Central Province, Mazowe district was purposively selected considering its proximity to urban centres notably Harare, Chinhoyi and Bindura. Findings from such a district would therefore imply that other rural districts cannot have better conditions. The researcher was cognisant of the fact that although districts may share common characteristics, every district presents a unique set of issues.

A case study is a qualitative methodology which studies a phenomenon in its natural setting (Sunders, Lewis and Thornhill, 2012). A much more detailed and preferred definition for this study comes from Mills, Durepos and Wiebe (2010). This school of thought argues that the term case study refers to a methodology for examining a problem, associated with a person, place, event, phenomenon, or other type of subject of analysis in order to extrapolate key themes and results that help predict future trends, illuminate previously hidden issues that can be applied to practice, and/or provide a means for understanding an important research problem with greater clarity. Thus, this study sought to evaluate applications and implications of Maslow’s Hierarchy of needs in motivating and retaining rural teachers.

4.2 Population
Mazowe District has an establishment of 2 090 teachers (including Headmasters) for both primary and secondary schools and 10 District Officials. The current staff strength of 1520, 10 District Officials, 10 schools development chairpersons, 10 teachers who had left teaching and the Provincial Education Director formed the population of the study. The population for this study was therefore 1551. While numbers are mentioned here, it does not mean the numbers are significant as far as drawing meaning from the data is concerned. Their significance lies in the fact that the population was large enough for data collection until saturation point.

4.3 Sample size
The criteria for coming up with the sample were:

- Individuals with five years or more as teaching practitioners;
- Type of school-boarding/day;
- Location of a school in terms of accessibility; and
- Willingness of the respondents to participate

4.4 Sampling techniques
This study employed a number of non-probability sampling methods based on an appreciation of the nature of the population under study namely the purposive, expert and snowballing non-probability sampling methods. The goal of the qualitative study was to provide an in-depth understanding as to why teachers in Mazowe district shun rural schools from Maslow’s point of view. To accomplish this goal, the qualitative research focused on criterion-based sampling techniques to reach the target group. Purposive sampling, expert sampling and snowballing sampling were used in the study. The reasons for choosing these sampling techniques are discussed below.
4.4.1 Purposive Sampling or Judgemental Sampling

Purposive non-probability sampling is a sampling method that produces a purposive non-probability sample. Sources are not uniform regarding the nomenclature. This study follows Kumar (2011) and Cooper and Greenaway (2015) who use the term purposive sampling to refer to this method and a purposive sample to refer to the sample that comes out of this method. The researcher only approached people who met certain criteria based on the researcher’s consideration of whether the data provided would meet the objectives of the study. In this case, experienced teachers, heads of schools and senior district officials were purposefully chosen to participate in the study.

4.4.2 Expert sampling

Expert sampling is a non-probability sampling method and it occurs when elements selected for the sample are chosen by the judgment of the researcher in this case expertise and experience of education practitioners in rural schools. This study follows Kumar (2011) and Cooper and Greenaway (2015) who use the term expert sampling to refer to the sample that comes out of this method. The researcher approached people who met the criteria based on the researcher’s consideration of whether the data provided would meet the objectives of the study. The Provincial Education Director, the District Schools Inspector (DSI), the District Inspector (DI) the Human Resources Officer (HRO), ten teachers who had left teaching and ten heads of schools formed the experts of this study. Therefore, the expert sample for this study was thirty three (33) including twenty heads from the twenty schools visited.

4.4.3 Snowball Sampling

The snowball non-probability sampling method is used to collect data from a group or organisation that the researcher has very little or no knowledge about (Kumar, 2011). The method arrives at a sample by utilising networks. In this study, the researcher began with one person who met the researcher’s criteria. Information was collected from the respondents and then the researcher used the respondents to identify others from whom information was collected. The latter became part of the sample and the researcher requested these respondents to identify others from where data were collected and these too became part of the sample and the process recurred until the researcher had the desired data. The researcher was referred by other respondents to senior officials or individuals who had valuable information. In terms of infrastructure, the researcher was also referred from one school to another. This helped the researcher to make some comparisons and draw conclusions from what he had gathered from the respondents and had observed. Some pieces of data were not easily accessible especially those that officers and, or, teachers either felt they were protected by the official secrecy act or divulging such data would get them into trouble for political reasons or otherwise. The snowball sampling technique became useful.

4.5 Data collection methods

Data collection offers the opportunity for assessing research design within each tradition of inquiry. The researcher needed to have determinant data collection instruments (Creswell, 2007; Locke, Silverman, and Spirduso, 2010; Marshall and Rossman, 1999). The instruments used for data collection in the study were interviews, observations and review of documents at the district offices. The researcher pilot-tested the data collection instruments on a different group before carrying out the full-fledged research. The idea was to improve on the instruments.
4.5.1 In-depth interviews with key informants

Even though the interviews were time-consuming, they became the researcher’s main data-gathering method. The researcher used unstructured interviews with key informants and semi-structured interviews were done with teachers. In-depth face-to-face interviews were done with the PED, DSI, DS and the Human Resources officer to get an in-depth understanding of why teachers shun rural schools. Interviews were done with selected teachers, SDC chairpersons and heads of schools. This helped the researcher to get actual reasons as to why teachers wished to transfer to urban and boarding schools. As way of validating responses from other categories, the researcher managed to track down ten teachers who had left the service and interviewed them as well. This provided balanced views on the issues affecting teachers in rural areas.

4.5.2 Focus group discussions

In order to get an in-depth understanding and appreciation of what motivate rural teachers, ten (10) focus groups with ten members each were formed. All the four boarding schools became part of the four focus groups and the remaining six focus groups were formed out of the rural day schools. An interview guide was used and the researcher directed the discussions. The purpose of the focus group discussions was twofold: first, the focus discussion group sessions were meant to generate as much data and knowledge as possible that would allow the data generation to reach saturation point. It was also a way of authenticating the submissions by the respondents; second, the sessions were meant to assist the study to arrive at trustworthiness through peer reviewing and debriefing, member checking and thick descriptions.

4.5.3 Direct observations

In qualitative research, observation as a method of collecting research data involves observing behaviour and systematically recording the results of those observations. Besides observing the behaviour of teachers, the researcher also observed the state of infrastructure and facilities in the schools visited. The observation guide which was developed by the researcher informed the observations. A checklist was used to assess the suitability of infrastructure and other facilities in the visited schools.

The researcher took detailed descriptive notes of the observations. The observations offered the researcher with a flavour of what was happening in the schools visited. This also gave an insight into the bigger picture of what could be happening in other rural schools around the country. Classrooms, roads, laboratories, teachers’ accommodation were observed. This was done in order to link the behaviours and attitudes to the motivational levels of the teachers and how this prompted rural-urban migration. The observations provided useful data to the researcher and opened new avenues for future researches.

4.5.4 Document analysis

The researcher further analysed documents from the District offices, as these were a rich source of valuable secondary data. Documentary analysis complemented data gathered through interviews and observations. The researcher reviewed the following three documents: Public Service Act Chapter (16:04); Public Service Regulations Number 1 of 2000 as amended in 2001; and the Principal Procedures. The reasons for choosing these key documents are that, the SI 1 of 200 is the code of conduct for all civil servants, teachers included. The Principal Procedures cover appointments, promotions and regradings of teachers. Further to the review of the above documents, various registers were also analysed and they provided vital information on the
movement of teachers within and outside the district. The idea was to assess the effectiveness of the three primary documents in the efficient management of teachers in rural schools.

Key

- DSH: Day school head
- BSH: Boarding school head
- PED: Provincial Education Director
- DSI: District Schools Inspector
- DI: District Inspector
- HRO: Human Resources Officer
- T: Teacher who had left the district
- DSFGD: Day school focus group discussion
- BSFGD: Boarding school focus group discussion.

Note
- DSH and BSH: range of 1-10
- T: range of 1-10
- FGDs: range of 1-10
- HRO, PED, DSI and DI were interviewed as individuals.

5. Findings

The study found that the employer was failing to meet all the needs as portrayed by Maslow’s Hierarchy of Needs Theory. The findings are presented in the sections that follow. The responses from all the categories of the respondents are nested in Figure 3.

5.1 Violation of physiological needs

The nesting of the Maslow’s Hierarchy of Needs Theory shows that the basic needs of the employees were not being adequately addressed. The fact that salaries were too low to meet the respondents’ basic needs was a ‘violation’ of the respondents’ basic rights. There was consensus that rural schools had failed to provide basic services such as clean water and health facilities. Poor working conditions in terms of infrastructure, amenities, teaching and learning resources were cited. Accommodation and salaries were cited as the main reasons why teachers were failing to meet their basic needs. Even though most schools provided accommodation, it was dilapidated and inadequate. T5 had this to say: “I decided to pack my bags and leave. Currently, I am teaching at a private college and my salary is two times more than what I was getting when I was in Government. I now lead a better life than before.” Figure 3 show responses pertaining to the levels of salaries.

![Figure 3: Responses on the levels of salaries](Source: Field data)
The responses were indicating that accommodation was a problem in most schools in the district.

"Accommodation was a problem at my former school, most of us were sharing thereby making privacy seem as a luxury and not the right that it should be. Our properties could not be accommodated and to add insult to injury, some of us had big families. With respect to their condition and ambience, these houses were not habitable at all."

(T 3).

As T8 observes: "I had one small room to share with my wife and my two siblings thereby negating on privacy". The situation is worse in satellite schools where tobacco barns were housing teachers despite not providing proper ventilation and not being fit for that purpose. The houses available were ancient and parents could afford to construct new houses for teachers due to their poor economic status. DSH1 bemoaned his housing plight: "Even I as Head, share with two teachers. Is there any element of respect that I can expect from the society and my staff? At one of my satellite schools, farm shades are used as makeshift teachers' houses." Figure 4 populates the responses on the state of accommodation in the district.

![Figure 4: Responses on the state of accommodation](image)

Source: Field data
Figure 5: Responses on Maslow’s Hierarchy Needs of Theory

Source: Field data

5.2 Violation of Safety needs

There was consensus that there was serious violation of safety needs of the respondents by political parties. The PED had this to say, “Some teachers in Mazowe District are being protected by the courts. Court orders have been issued against the perpetrators of political violence. Reports which have been coming to my office are that, ZANU (PF) supporters are the main perpetrators of political violence.” All the respondents concurred that security was a cause for major concern.
5.2.1 Boredom

The study established that civic facilities were lacking yet critical for development of social life. There is lack of entertainment in rural schools leading to boredom which is counter-productive.

We need to have light moments after the day’s hard work. The only entertainment is in the form of beer drinking, going to church (African Independent Churches of the apostolic type) listening to radio or watching television. However, the Zimbabwe Broadcasting Cooperation transmission is very poor. This forces some few teachers who can afford to buy satellite decoders and dishes but still subscriptions are a big challenge for two reasons, namely affordability in terms of monthly subscriptions and travel to and from the surrounding towns were DSTV agents are found. [T8].

For some of us who take alcohol, spend our social lifetime patronizing the beer halls in our area and where these are not available some teachers are forced into taking illegal staff like kachasu (some home brewed clear beer)” [T1]. Most of the respondents concurred that there was limited entertainment in rural areas.

5.2.2 Preying on the weak

The respondents were victims of circumstances due to their desperate situations. Greedy officials were found to be taking advantage of the desperate situation of teachers.

Since teachers will be desperate to transfer, they end up being victims of circumstances. Senior officers have been preying on the weak to the extent that some female teachers are full of regrets and embarrassments. Reports have been made to higher offices and nothing has been done. Senior officers are taking advantage of the situation to sexually abuse female employees and asking for bribes from male teachers [BSFGD7].” Most of the respondents agreed that they were being taken advantage of.

5.3 Violation of love, belonging needs, and social exclusion

The fact that there is no freedom of movement and association in the district was found to be a violation of love and belonging needs. Teachers were called names such as traitors, saboteurs, sellouts for supporting opposition politics and they were also blamed for being critics of some of the government policies. They became social and political outcasts in the district and such teachers were left out in developmental and social programmes and projects. They felt that they
that they were no longer part of the communities they were serving. The only places they could find solace were churches and beerhalls but still negative labeling was there.

5.3.1 Sexual frustration and strained marriages

The responses given indicate that there was loneliness and sexual frustration among the respondents who were not living with their families due to different workstations, professions or inadequate accommodation at their workstations. There was also consensus that sexual frustration was leading to prostitution that was likely to lead to high prevalence of HIV and AIDS in rural schools. This led to strained marriages and relationships and high rates of separations and divorces.

5.3.2 Violation of esteem needs/ Lack of recognition

The respondents revealed that there was serious violation of esteem needs. There was lack of recognition and appreciation for the work done by teachers. DSFGD1 had this to say, “There are no prospects for promotion since there are limited vacancies in our schools.” DSFGD1 added, “We feel that our work is not appreciated by our superiors.”

5.3.3 Retrogressive movement and downward social mobility

The situation on the ground showed that there were acts of retrogressive movement on the part of the respondents. There was backward movement because the status of the respondents was said to be depreciated to the lowest levels since the year 2000. The respondents had the desire to move up the social ladder, which is theoretically possible by working hard, applying oneself, and making connections with others. In this case, it was found that rural teachers were moving down the social ladder social due to political violence and limited freedom of movement and association in the communities they worked.

5.4 A myth of self-actualisation

The findings of the study pointed to the fact that rural schools were failing to meet the basic needs of teachers let alone the esteem needs. The question which remains unanswered is ‘Can it then be possible for teachers in rural schools to self-actualise, when the lower and middle level needs are not met? This is why the respondents indicated that it was myth and will remain a dream.

6. Conclusion and Discussion

This section concludes and discuss the findings in relation to the findings and literature.

6.1 Violation of physiological needs

This study established that there were serious violations of basic needs for teachers in Mazowe district, which also is a violation of Article 25 of the Universal Declaration on Human Rights. The Article states that everyone is entitled to the right to adequate food, water housing, clothing and medical care. The right to medical care implies the right to live a healthy life, or at least healthy to the best of ability of a particular individual. All these were found to be lacking and then it becomes difficult to talk about a reasonable working and living environment. From the finding of this study, it is very clear that rural teachers were leaving in very poor conditions. What is also not clear about Maslow is the type and nature of accommodation. He should have at least talked about decent accommodation, proposing standards not just shelter. Teachers are an elite group in our society and they should be treated as such. The findings of this study are contrary to Hosseini (2013) who avers that motivation of employees is influenced by working conditions (Hosseini, 2013).
This right to medical care as a universal right of all human beings can be interpreted to mean many things. For the purposes of the comparison to the Maslow’s Hierarchy of Needs Theory, it could be interpreted as a physiological need. The fact that teachers were living in dusty conditions means that this could also affect their health that means that their lives will be in danger since some of them were said to have allergies and some were asthmatic. Accordingly, the employer was found to be violating the industrial and labour laws as well as failing to observe the article on The Universal Declaration of Human Rights. This is contrary to Maslow’s Hierarchy of Needs Theory.

6.2 Undignified activities

Respondents who had left the district indicated that most teachers were involved in undignified activities in order to make ends meet. Undignified activities are actions which are embarrassing to the one who is performing them. In this study, most teachers were found to be engaging in vending, minerals panning and cross border trading which was not befitting to their once esteemed profession. From a human resources point of view, it is extremely undignified and unacceptable for a professional to become a vendor. In Zimbabwe, vending used to be and is still trade for the poor in our communities. This is a sign of extreme violation of employees’ rights, and violating Maslow’s esteem and self-actualisation needs. Such situations are embarrassing to the employer, the employee and the family of the employee. This is the current position in the Zimbabwean rural schools. The fact that employees engage in undignified activities to raise money means that the employer has failed to meet basic needs.

6.3 Violation of safety needs

Political intimidation and physical assault of teachers was a major security concern and violation of Maslow’s Hierarchy of Needs, level 2 (Safety needs). Issues covered at this level include protection form physical harm, order, law security and freedom from fear. It is very difficult for anyone to engage and work effectively and successfully when they are constantly stuck in fights and being singled out for abuse. Common sense tells us that it is not possible. When a person is victimised that person is clearly not safe in that particular environment. When people are victimised, they often become vigilant and their time and energy, which should and would, under normal circumstances, be spent focused on job performance and other priorities in life, is instead spent focusing on ways to be and stay safe. There is no stability on the part of victims and obviously, schoolchildren bear the consequences. From the findings of this study, it was clear that teachers were under siege from ZANU (PF) supporters.

6.4 Violation of love, belonging needs and social exclusion

Teachers were found to be deprived of love and belonging needs and there was also serious social exclusion. Teachers were outcasts and their socialisation was limited to family members only and close friends. Their social exclusion emanated from the perception that they were agents of political change. It was also felt that they were decoding information with political connotations in the communities they were working. Anyone associated with teachers was also socially excluded.

Politicians and senior officials were causing havoc on teachers. Staffing officers were taking advantage of the desperate teachers to solicit for bribes and sexual favours. On the hand, politicians know that there is no observation of the rule of law and they take it upon themselves to abuse teachers. The situation was found to be bad and not helping the situation at all. They took advantage of the teachers’ weak status. Teachers who were not living with their families were being sexually starved and could end up engaging in prostitution leading to strained marriages and relationships. The theories of motivation, management and retention
discussed in the literature section do not adequately address the modern day human capital issues in organisations as evidenced by the issues raised by the respondents in this study. In order to address the challenges highlighted by the respondents, a localised model of motivation was proposed and is presented in the section that follows.

7. Model of motivation of human capital

Accordingly, using the data that were collected through in-depth interviews, observations and the review of documents, this chapter focuses on the development of a suitable model for use in addressing the concerns raised by teachers in Mazowe district, the country in general and beyond. The development of the model is consistent with objective number 2 which intended to synthesise the findings of the study into a model of motivation of human capital with the view of motivating employees in a local environment. The model which will henceforth be referred to as the ‘Motivation theory of Human Capital’ (see Figure 4) was developed taking into cognisance the weaknesses identified in Maslow’s Hierarchy of Needs Theory in addressing issues raised by employees at the workplace and issues raised by the respondents in this study. As a way forward, the model proposes a review of all current policies by looking at the identified critical motivational factors and the suggested strategies. The components of the model are closely linked to the recommendations.

The model seeks to addresses the following key areas:

- Critical motivational issues;
- Mitigatory strategies;
- Review of current policies; and
- Decentralised decision making

It is believed from the research findings that, a holistic application of the model could go a long way in addressing most of the issues raised by the respondents. The employer needs to critically analyse what is motivation from the respondents’ perspectives considering their local environments. Further more, coming up with appropriate mitigatory strategies will go a long way in motivating and retaining rural teachers. Further to that, the review of current policies by decentralizing decision-making will improve motivation of teachers in rural schools and beyond.
7. Recommendations

At this stage, coming up with relevant action or interactional strategies directed at managing the phenomenon, is the major goal of this study. It is particularly because of this goal that the researcher developed a model of motivation of human capital grounded in the findings of the study. This study aimed at coming up with relevant action or interactional strategies directed at motivating and retaining teachers in rural schools.

The government should provide decent accommodation for all the teachers that match those of either urban or boarding schools or even better. It is critical to build standard classrooms and related infrastructure, especially proper administrative blocks that match the classrooms and related infrastructure in either urban or boarding schools or even better. It is critical to reach out at the communities from where learners come using both traditional leaders and political structures so as to improve the teachers’ relationships with parents in a bid to make parents appreciate and value teachers as vehicles of socio-economic development in their communities and the nation at large.

Since health is a basic need, there is need to improve health facilities and make them relatively accessible and affordable. There is need for liaison among the responsible Ministries of Transport and Infrastructure Development, Health and Child Care, the District Development Fund and local authorities to upgrade the roads and make health facilities available and accessible. The Government also should introduce community halls and sporting facilities in the rural areas and to encourage the Zimbabwe Broadcasting Cooperation to improve coverage in rural areas so as to improve the teachers’ entertainment options. That way, it may also restrain teachers from abusing alcohol and this may improve teacher attendance and attention in class.

It is critical for SDCs to enhance involvement including strengthening home-school ties, equipping schools with the necessary resources to enable them to involve parents in more
meaningful ways, exploring other avenues of communicating with parents and sensitising them on the need to be actively involved in the education of their children. It is also plausible that development partners such as the United Nations International Children’s Emergency Fund (UNICEF) donated some textbooks in most schools around the country. The development partners should go an extra mile by improving infrastructure in rural schools to the same levels with urban areas. They should continue to assist in areas where the government is having challenges such as in the improvement of infrastructure, the provision clean water, provision of information and communication technology and other basic services in the areas of health.

The PSC should pay a reasonable salary that commensurate with qualifications and experience. The introduction of a hardship allowance for rural teachers may go a long way in mitigating the rural-urban migration of human capital in Zimbabwean rural schools. The introduction of money and non-monetary incentives such as residential stands/houses may go a long in addressing the plight of teachers on accommodation. The employer should also allow after work entrepreneurship so that teachers can supplement their basic salaries which have become inadequate. The recruitment and selection processes need to be decentralised so as to wade off corruption and issues of sexual harassment. The PSC should move away from the bureaucratic tendencies in order to make speed decision making.

Unfreezing of performance related salary increments and study leave so that teachers may improve their skills through the conventional system and studying through ODL may become optional for those in favourable conditions is critical. The PSC should allow teachers to proceed on manpower development leave on full salary in line with what is prevailing in the security sector. The employer should also offer financial assistance to those who wish to develop themselves professionally. It is critical to introduce workers’ committees at school level so that issues affecting teachers can be addressed at the shop floor level and this leads to timeous decision-making. It is desirable to involve teachers in critical decisions and other engagements.

There is need to improve the Ministry of Primary and Secondary Education internal systems especially to wade off corruption, and adopt affirmative action in the deployment processes, for instance, in the deployment of university graduates and couples. Reviewing the Public Service Act (16:04) and other related statutes will allow teachers’ representative bodies at grassroots level that feed into the national representative bodies so that collective bargaining starts at a local level. Creating a legal framework and conditions of service for rural teachers and other civil servants in rural areas may go a long way in addressing the problem of rural-urban migration of human capital in Zimbabwean rural schools.

Exercising political tolerance and respecting the teachers’ basic human rights, especially discouraging political violence against the teachers will ensure their safety. Political parties need to be reminded that teachers like any other citizens have a right to choose political parties to support. The harassment of teachers need to stop if the quality of education is to improve in rural areas.

8. Implications for practice

Many researchers and scholars have come up with many theories of motivation which have failed to stand the trial of time. Retention strategies proposed in Zimbabwe, and elsewhere have also failed to address the problem of motivation. Teachers in rural schools operate in unique environments which are highly challenging. Rural schools continue to produce poor results due to a number of challenges some of them mentioned in this study. The Motivation Theory of Human Capital in this study, if applied holistically, could go a long way in mitigating the rural-urban migration of human capital in Zimbabwe and other countries facing similar challenges. There is need to recognise and appreciate that motivation has become complicated and personal
to the extent that global motivational strategies may not be applicable in modern day organisations. Schools are organisations which are critical for developing and nurturing talent that is critical for the future development of our communities and the nation at large. Managers need to identify needs which are peculiar to groups of employees so that targeted strategies can be applied. There is also need to appreciate that rural teachers operate from different environments from their urban counterparts. This will assist managers in coming up with appropriate strategies in addressing issues raised by a particular group, in this case rural teachers.

9. Conclusions

A myriad of management practices, political, economic, social, technological and legal factors were identified as the reasons why teachers were not motivated. The researcher understood what constitutes motivation from the rural teachers’ point of view. Teachers were not comfortable to work in rural schools due to the poor working and living conditions, lack of teaching and learning materials and lack of incentives. In this case, the quality of education was compromised due to these and other challenges. Accommodation for teachers in rural schools was found to be inadequate and dilapidated and sharing was negating teachers’ privacy. It is therefore, critical for the employer to provide decent and adequate accommodation for rural teachers. This could go a long way in addressing accommodation issues raised by teachers. It was also sad to note that basic services and infrastructure were lacking and it was serious in satellite schools. The unavailability of health facilities and clean water were a challenge since this exposed teachers and school children to diseases. The study therefore concluded that the employer was failing to meet the basic needs of rural teachers. Their physiological, safety, social self-actualisation and esteems needs were being seriously violated. Deployment was not fair since sexual harassment and corruption were reported to be rampant in the district. The performance management system was found to be ineffective and not adhering to its tenets. The issues of inadequate salaries and lack of incentives were also raised.

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Relationship Between Exchange Rate and the Nigerian Economy

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Abstract
This study examined the relationship between exchange rate and the Nigerian economy from 1986 to 2016. Secondary data obtained from the Central Bank of Nigeria statistical bulletin and the World Bank database was used. Econometric tools of analysis were employed to estimate the model. The output from the Augmented Dickey Fuller (ADF) unit root test revealed that all variables except inflation rate and interest rate were found to be stationary at first difference. The Johansen Cointegration technique reveals the presence of two and one cointegrating equations respectively indicating the existence of a long-run equilibrium relationship among Gross. The normalized cointegration equation revealed that exchange rate had positive relationship with economic growth (GDP). The slope of EXR (exchange rate) though insignificant is positive. The coefficient of INTR was observed to be negative and insignificant, while INFR was negative and statistically significant. Deriving from empirical findings, the study thus concludes that exchange rate has a positive long run relationship with economic growth. Based on the foregoing findings, the study has favoured the implementation of the following recommendations: government should encourage export promotion strategies in order to maintain a surplus balance of trade, conducive environment, adequate security, effective fiscal and monetary policies, as well as infrastructural facilities be provided so that foreign investors will be attracted to invest in Nigeria. The apex bank (Central Bank of Nigeria) should design and develop strategies that will stem the tide of rising inflation in the economy as persistent rise in prices has the tendency of adversely affecting consumers’ purchasing power. Finally, monetary policy measures to reduce the present high interest rate adopted for borrowers should be initiated as fast as possible. It is only an affordable interest rate (cost of borrowing) that can motivate would-be investors to borrow and invest for the growth of the national economy.

Keywords: Exchange Rate, Economy, Nigerian
I: INTRODUCTION

1.1 Background of the Study

Foreign exchange is the means of payment for international transaction. It is made up of convertible currencies that are generally accepted for the settlement of international trade and other external obligation. Just like every other commodity, a market is established which works more like any other market having a supply curve, a demand curve and an equilibrium price and quantity. There are also conditions which are held constant (ceteris paribus). When these conditions changes, the curve shift and there is a change in the equilibrium price quantity. This market for currencies is known as the foreign exchange market.

The foreign exchange market according to the Central Bank of Nigeria is the medium of interaction between the sellers and buyers of foreign exchange. The seller of foreign exchange constitutes the supply while the buyers of foreign exchange constitute its demand. The supply of foreign exchange is derived from oil exports, non-oil export, expenditure of foreign tourist in Nigeria, capital repatriation by Nigerians resident abroad etc. Exchange rate is an important economy metric as it reflects underlying strength and competitiveness with world economies (Asinya and Takon, 2014; Akonji, 2013). Whether fixed or floating, exchange rate affects macroeconomic variables such as import, export, output, interest rate, inflation rate etc. Chong and Tan (2008) empirical analysis revealed that exchange rate is responsible for changes in macroeconomic fundamentals for the developing economies.

Mehdi (2014) stated that the effect of exchange rate fluctuations on economic growth varies in different countries, asserting that one of the factors determining the way exchange rate fluctuations affect economic growth is the development level of each country’s financial markets revealing that new theories emphasize the high correlation between economic growth and innovation. Exchange rate fluctuations influence domestic prices through their effects on aggregate supply and demand. In general, when a currency depreciates it will result in higher import prices if the country is an international price taker, while lower import prices result from appreciation. The potentially higher cost of imported inputs associated with an exchange rate depreciation increases marginal costs and leads to higher price of domestically produced goods (Kandil, 2004). However, the extent of such price adjustment depends on a variety of factors such as market structure, the relative number of domestic and foreign firms in the market, the nature of government exchange rate policy and product substitutability (Fouquin, 2001).

In the bid to achieve macroeconomic stability, Nigeria’s monetary authorities have adopted various exchange rate arrangements over the years. It shifted from a fixed regime in the 1960s to a pegged arrangement between the 1970s and the mid-1980s, and finally, to the various types of the floating regime since 1986 (Eze and Okpala, 2014; Dada and Oyeranti, 2012), following the adoption of the Structural Adjustment Programme (SAP). The fixed exchange rate regime induced an overvaluation of the naira and was supported by exchange control regulations that engendered significant distortions in the economy. That gave vent to massive importation of finished goods with the adverse consequences for domestic production, balance of payments position and the nation’s external reserves level (Akonji, 2013). Moreover, the period was bedeviled by sharp practices perpetrated by dealers and end-users of foreign exchange (Adelowokan, 2012). These and many other problems informed the adoption of a more flexible exchange rate regime in the context of the SAP, adopted in 1986. A regime of managed float has been the predominant characteristic of the floating regime in Nigeria since 1986. Although the Naira exchange rate has witnessed some period of relative stability since the implementation of the Structural Adjustment Programme (SAP) in 1986, its continued depreciation, however, mars the economic performance of the country. The challenge of the combined effect of hikes in oil
prices and exchange rate instabilities on macroeconomic economic stability and economic growth for oil producing nations like Nigeria is really enormous.

1.2 Problem Statement, Objectives / Research Questions

In recent times, the Nigerian economy has been experiencing concurrent and unstable volatility in inflation rate as well as exchange rates. Ojo and Alege (2014) have argued that the current high variability of exchange rate fluctuations in Nigeria may generate adverse effects in the form of higher price inflation and larger output contraction. The theoretical assertion came through in Nigeria in the recent times with Nigeria witnessing incessant fall in the value of Naira to US dollar which is followed by high and persistent rise in general prices of commodities.

Since September 1986, when the market determined exchange rate system was introduced via the second tier foreign exchange market, the naira exchange rate has exhibited the features of continuous depreciation and instability. This instability and continued depreciation of the naira in the foreign exchange market has resulted in declines in the standard of living of the populace, increased cost of production which also leads to cost push inflation. It has also tended to undermine the international competitiveness of non-oil exports and make planning and projections difficult at both micro and macro levels of the economy. A good number of small and medium scale enterprises have been strangulated as a result of low Dollar-Naira exchange rate and so many other problems resulting from fluctuations in exchange rates can also be identified. This movement of the exchange rate along the path of depreciation since 1986 has raised a lot of questions on the impact of exchange rate policies on the Nigerian economy, hence this study seeks to examine the relationship between exchange rate and economic growth in Nigeria. The specific objectives of the study however includes among others, to determine if exchange rate contributes significantly to Nigeria’s economic growth and to examine the impact of interest rate on gross domestic product (economic growth) in Nigeria. Deriving from the objectives, the following research questions will elicit answers in the process of study:

(i) Does exchange rate have any significant positive relationship on the economic growth of Nigeria?
(ii) What is the contribution of exchange rate to economic growth in Nigeria?
(iii) What is the impact of interest rate on gross domestic product in Nigeria?

1.3 Hypotheses of the study

Based on the objectives of the study, the following hypotheses were formulated:

\( H_0: \) Exchange rate has no long-run relationship with the Nigerian economy

\( H_0: \) Exchange rate has no significant impact on economic growth in Nigeria

\( H_1: \) Interest rate has no significant impact on Nigeria economic growth

II: LITERATURE REVIEW

2.1 Conceptual Framework

Exchange rate has been defined as the price of one currency in terms of another (Mordi, 2006). Exchange rate is the price at which one country exchanges its currency for other currencies. The increase or decrease of real exchange rate indicates strength and weakness of currency in relation to foreign currency and it is a standard for illustrating the competitiveness of domestic industries in the world market (Razazadeh karsalari, Haghiri & Behrooznia, 2011). Azeez, Kolapo and Ajayi, (2012) noted that When there is deviation of this rate over a period of time
from the benchmark or equilibrium, exchange rate is called exchange rate volatility. It also indicates the misalignment of exchange rate as occurred where there is multiplicity of markets parallel with the official market.

Jhingan (2010) defined exchange rate as the rate at which one currency exchanges for another. Exchange rate is said to depreciate if the amount of domestic currency required for buying a foreign currency increases, while exchange rate appreciates if the amount of domestic currency required for buying a foreign currency reduces. An appreciation in the real exchange rate may create current account problems because it leads to overvaluation. Overvaluation in turn makes imports artificially cheaper while exports relatively expensive, thus reducing the international competitiveness of a country (Takaendesa, 2006). Movements in the exchange rate have ripple effects on other economic variables such as interest rate, inflation rate, unemployment, money supply; etc. These facts underscore the importance of exchange rate to the economic wellbeing of every country that opens its doors to international trade in goods and services.

Dada and Oyeranti (2012) noted that the objectives of an exchange rate policy include determining an appropriate exchange rate and ensuring its stability. Over the years, efforts have been made to achieve these objectives through the applications of various techniques and options to attain efficiency in the foreign exchange market. Exchange rate arrangements in Nigeria have transited from a fixed regime in the 1960s to a pegged regime between the 1970s and the mid-1980s and finally, to the various variants of the floating regime from 1986 with the deregulation and adoption of the structural adjustment programme (SAP). A managed floating exchange rate regime, without any strong commitment to defending any particular parity, has been the most predominant of the floating system in Nigeria since the SAP era (Obadan, 2008). Following the failures of the variants of the flexible exchange rate mechanism (the AFEM introduced in 1995 and the IFEM in 1999) to ensure exchange rate stability, the Dutch Auction System (DAS) was re-introduced on July 22, 2002. The DAS was to serve the triple purposes of reducing the parallel market premium, conserve the dwindling external reserves and achieve a realistic exchange rate for the naira. The DAS helped to stabilize the naira exchange rate, reduce the widening premium, conserve external reserves, and minimize speculative tendencies of authorized dealers. According to Chowdhury (1999), the role of exchange rate and its effects on macroeconomic performance has continued to generate interest among economists. Many economists argue that exchange rate stability facilitates production activities and economic growth. They are also of the view that misalignment in real exchange rate could distort production activities and consequently hinders exports growth and generate macroeconomic instability.

2.2 Effect of Exchange Rate on the Growth of Nigeria’s Economy

According to Danjuma (2013), the following have been adduced as the effect of exchange rate on economic growth of many developing nations.

(a) Increase in foreign exchange earnings: The foreign exchange reserve of a country is responsive to its exchange rate which has a multiplier effect on the economic growth of a country. When there is more export due to increase in value of a country’s currency, this would increase the foreign exchange reserve of the country at the Central Bank. There is a possibility of the increase in export enhancing economic growth of the country. However, in Nigeria, the foreign exchange reserve has not translated to enhanced economic growth due to low exports and more imports.
(b) Improvement in Technology: There is empirical evidence that most of the countries having high external reserves are countries with advanced technology. The increase in currency reserves would lead to advanced countries investing their capital in Nigeria.

(c) Appreciation of National Currency: Increase in foreign exchange according to Doyle, (2001), would strengthen the value of national currency in relation to the other currencies being traded in the foreign exchange market. This would also lead to increase in the confidence of investors to trade in the national currency. However, this has not worked out for Nigeria as the naira is being weakened day in day out due to high level of corruption and capital flight ravaging the economy.

(d) Increase in the standard of living: In economies like China, Japan, USA and Switzerland with favourable external reserves, there is usually the positive effect on the people living or carrying on business in such countries. This was manifested in the Nigerian economy in the 1960s before the discovery of oil which though has resulted in higher national income but has paradoxically reduced living standards over the years.

(e) Inflation: Increase in external reserve was supposed to dampen the inflationary effect in the economy. Unfortunately, the reverse has been the case in Nigeria as more Nigerian naira is being spent on imported goods.

(f) High cost of maintenance: Foreign exchange rate management usually leads to a country procuring high debt through loans from the International Monetary Fund (IMF) or the World Bank to finance it projects. In Nigeria for example, when the naira becomes weak compared to other currencies like Dollar or Pound and there is the need to transact foreign trade with USA or any of the European countries, Nigeria would require extra cost in floating these other currencies for effective trade deals. This has also led to exposure to transaction risk, commercial risk end political risk.

2.3 Theoretical Framework

This study is guided by two theories viz the Purchasing Power Parity Theory and the Balance of Payment Theory. These theories are adopted due to their relevance to the study.

2.3.1 The Purchasing Power Parity Theory:

This Theory states that spot exchange rate between currencies will change to the differential in inflation rate between countries. The theory states that the equilibrium exchange rate between two inconvertible paper currencies is determined by the equality of their purchasing power. That is, the exchange rate between two countries is determined by their relative price levels. The purchasing power parity (PPP) theory originated from the writings of the Swedish economist Gustav (Menon & Viswanathan, 2005). The theory states that homogeneous goods in different countries cost the same in the very same countries when measured in terms of the same currency. This implies that exchange rates between currencies are in equilibrium when their purchasing power is the same in each of the two countries. The willingness to pay a certain amount for foreign money must ultimately and essentially be due to the fact that this money possesses a purchasing power against goods and services in that country (Reid & Joshua, 2004). Any deviation from this statement implies that a country’s currency is incorrectly valued.

The theory is linked to the arbitrage hypothesis that states that if two homogeneous goods are traded at different prices in different countries, this arbitrage opportunity would be utilized, which leads to convergence of the deviations from Purchasing Power Parity towards equilibrium in the absence of arbitrage costs. There are two forms of PPP, absolute and relative.
The absolute PPP, also known as the Law of One Price, states that a commodity costs the same regardless of what currency is used to purchase it or where it is selling (Reid & Joshua, 2004). This theory is based on the assumptions that there are no transaction costs, no barriers to trade and the commodities being traded are homogeneous. If the trading currency is exchanged at the spot exchange rate, the price of a homogenous commodity should be identical across borders. The theory suggested use of price indexes to determine the exact price of a homogenous commodity between countries. The main challenge of this belief is in measuring Purchasing Power Parity constructed from price indexes given that different countries use different goods to determine their price level (Reid, 2005).

2.3.2 The Balance of Payment Theory:

This theory stipulates that under free exchange rates, the exchange rate of the currency of a country depends upon its balance of payment. According to (Brooks 2014), a favourable balance of payments raises the exchange rate, while an unfavourable balance of payments reduces the exchange rate. Thus the theory implies that the exchange rate is determined by the demand for and supply of foreign exchange.

2.4 Empirical Review

Adeniran, Yusuf and Adeyemi (2014) examined the impact of exchange rate on Nigeria economic growth from 1986 to 2013 using correlation and Ordinary Least Squares regression analysis to analyze the data. The result revealed that exchange rate had positive but insignificant impact on Nigeria economic growth. It was recommended that government should encourage the export promotion strategies in order to maintain a surplus balance of trade and also conducive environment, adequate security, effective fiscal and monetary, as well as infrastructural facilities should be provided so that foreign investors will be attracted to invest in Nigeria.

Attah-Obeng, Enu, Osei-Gyimah and Opoku (2013) examined the relationship between GDP growth rate and exchange rate in Ghana from the period 1980 to 2012. The study employed the graphing of the scatter diagram for the two variables which are GDP growth rate and exchange rate to establish the correlation between GDP growth rate and exchange rate using the Pearson’s Product Moment Correlation Coefficient (PPMC) and finally estimated the simple linear regression using OLS. It was confirmed that undervaluation (high exchange rate) stimulates economic growth in the short run. Therefore, policy makers should stabilise monetary and fiscal policies in the long run.

Oriavwote and Oyovwi (2012) investigated the determinants of the real exchange rate in Nigeria. The objective of the study was to present a dynamic model of real exchange rate determination and empirically test the implications of changes in possible determinants of the real exchange in Nigeria. With data covering 1970-2010, the parsimonious ECM result showed amongst others that the ratio of government spending to GDP, terms of trade and technological progress are not important determinants of the real effective exchange rate in Nigeria. The result showed that capital flow, price level and nominal effective exchange rate are important determinants of the real effective exchange rate in Nigeria and recommended that the Dutch Disease syndrome holds in Nigeria and recommended amongst others that policies have to be put in place to stabilize the problem of inflation.

Mori, Asid, Lily, Mulok and Loganathan (2012) investigated the effects of exchange rate on economic growth in Malaysia using time series data spanning 1971 to 2009. The results of ARDL bounds test suggested that long-run cointegration existed between both nominal and real exchange rates and economic growth with a significant positive coefficient recorded for real
exchange rate and concluded that both exchange rates have a similar causal effect towards economic growth and suggested that a systematic exchange rate via monetary policy be properly developed to promote the stability and sustainability of economic growth in Malaysia.

Furthermore, Using the Vector Error Correction Model (VECM) Akinlo and Lawal (2012) examined the impact of exchange rate on industrial production in Nigeria over the period 1986-2010. The findings confirmed the existence of long run relationship between industrial production index and exchange rate, money supply and inflation rate. Moreover, exchange rate depreciation had no perceptible impact on industrial production in the short run but had positive impact in the long run. Output, inflation and exchange rate in Nigeria was the focus of the work by Odusola and Akinola (2001). Employing a structural VAR model, evidence from the estimations demonstrated the existence of mixed results on the impact of exchange rate depreciation on output. Inflation was found to generate substantial destabilizing impact on output, suggesting that monetary authorities should play a critical role in providing enabling environment for growth. The authors concluded that prices, parallel exchange rate and lending rate were important sources of fluctuations in the official foreign exchange rate. In conclusion, most of the econometric analyses indicated that devaluations (either increases in the level of the real exchange rate or in the rate of depreciation) were associated with a reduction in output and increase in inflation.

Rasaq (2012) analysed the impact of exchange rate volatility on Macroeconomic variables. employing Correlation Matrix, Ordinary Least Square (OLS) and Granger Causality test, The findings showed that exchange rate volatility had a positive influence on Gross Domestic Product and suggested that there is need for Nigeria to improve their revenue base in term of increasing number of items meant for export, reduce over reliance on petroleum sector, reduce the importation of non essential items and increased domestic production will reduce the problem caused by exchange rate volatility.

On the effect of exchange rate on the economic sector output, Ehinomen and Oladipo (2012) examined the impact of exchange rate management on the growth of the manufacturing sector in Nigeria. Ordinary Least Square (OLS) multiple regression analysis was employed to analyse the time-series data which spanned 1986 to 2010. The empirical result of the study showed that depreciation which forms part of the structural adjustment policy (SAP) 1986, and which dominated the period under review has no significant relationship with the manufacturing sector productivity. It was found that in Nigeria, exchange rate appreciation has a significant relationship with domestic output and recommended that government should direct its exchange rate management policy towards exchange rate appreciation in order to reduce the cost of production in the manufacturing sector that depends heavily on foreign inputs while there should be total ban of importation on consumer and intermediate goods that can be produced locally.

III: STUDY METHODOLOGY

3.1 Variables used in the Model

The models used in this study are estimated using annual Nigeria data on some macro-economic indicators, which includes: Gross Domestic Product (GDP); Exchange Rate (EXR); Interest Rate (INTR) and Inflation Rate (INFR) for the period 1986 – 2016. The correlation and multiple regression analysis of the ordinary least square (OLS) is the estimation technique that is being employed in this study to determine the relationship between Exchange Rate and economic growth in Nigeria.
3.2 Method and Sources of Data Collection

The study employs secondary annual time series data covering the period 1986-2016. This period is chosen as it corresponds to the period when the Nigerian economy was deregulated and exchange rate was liberalized during the Structural Adjustment Programme (SAP). Data for the study was obtained from Central Bank of Nigeria (CBN) statistical Bulletin and World Bank Development Indicators (WBDI).

3.3 Method of Data Analysis

The method of data analysis employed in this study is analytical. The analytical tool used is the Ordinary Least Square (OLS) regression technique. These econometric techniques include: unit root test, co-integration test and Error Correction modeling (ECM) respectively. The emphasis would be to note whether the variables are well behaved or not. The aim is to provide answers to research questions/objectives earlier formulated.

3.4 Model Specification

The model which specifies the relationship between exchange and economic growth in Nigeria is significantly influenced by exchange rate as the main variable with interest rate and rate of Inflation as supporting variables respectively.

The functional form of the model is formulated below:

\[ \text{GDP} = f(\text{Excr, Intr, Infr}) \]  
(3.4.1)

The model is restated in an econometric form as follows:

\[ \text{GDP} = \alpha_0 + \alpha_1(\text{Excr}) + \alpha_2(\text{Intr}) + \alpha_3(\text{Infr}) + \epsilon \]  
(3.4.2)

The model is specified of its log-linear form:

\[ \ln(\text{GDP}) = \alpha_0 + \alpha_1\ln(\text{Excr}) + \alpha_2\ln(\text{Intr}) + \alpha_3\ln(\text{Infr}) + \epsilon \]  
(3.4.3)

Where:

- GDP = Gross Domestic Product
- Excr = Exchange Rate
- Intr = Interest Rate
- Infr = Inflation Rate
- Ln = Natural Logarithm
- \( \beta_0 \) = Constant
- \( \alpha_0, \alpha_2, \) and \( \alpha_3 \) = Coefficients of the respective variables
- \( e \) = Stochastic error term

In this study, exchange rate (Excr), interest rate (Intr) and inflation rate (Infr) are considered to be explanatory (independent variables) which is used to explain Gross Domestic Product (GDP), proxy for economic growth in Nigeria. In essence, GDP is the dependent variable.

3.5 Economic a Priori Expectation

In consonance with economic theory, an increase in exchange rate is expected to produce a positive change in output and hence economic growth in Nigeria. However, increase in interest rate and inflation rate is expected to have negative relationships with economic growth in the Nigerian economy. Hence, from the model, the a-priori expectation may be held as follows: (exchange rate = +; interest rate = -; inflation rate = -).

Based on the a-priori expectation stated above, the signs of parameters in the model are as follows: “Exchange rate” coefficient is expected to be positive because an increase in exchange rate will lead to increase in gross domestic product (GDP) in Nigeria while, “interest rate” and “inflation rate” are expected to be negative because increases in interest rate and inflation rate is
expected to lead to a decrease in GDP, ceteri-paribus. This is because an increase in INTR will discourage investors from accessing credit thereby limiting investment and general output growth in the economy. Similarly, persistent increase in the general prices of goods and services have the tendency to impact negatively on GDP and hence the Nigerian economy over time.

IV: DATA ANALYSIS AND INTERPRETATION

4.1 Data Presentation

Data used for this study were essentially sourced from the Central Bank of Nigeria (CBN) statistical bulletin and World Bank Development Indicators (WBDI). The data is presented for the variables GDP, Excr, Intr and Infr rate respectively.

Table 4.1 Data Presentation

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP</th>
<th>EXCR</th>
<th>INFR</th>
<th>INTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>23.75444</td>
<td>0.562197</td>
<td>1.743471</td>
<td>0.000000</td>
</tr>
<tr>
<td>1987</td>
<td>23.90520</td>
<td>1.390296</td>
<td>3.998407</td>
<td>0.000000</td>
</tr>
<tr>
<td>1988</td>
<td>23.87052</td>
<td>1.512259</td>
<td>3.921313</td>
<td>0.000000</td>
</tr>
<tr>
<td>1989</td>
<td>23.91091</td>
<td>1.996703</td>
<td>1.996658</td>
<td>2.684318</td>
</tr>
<tr>
<td>1990</td>
<td>24.14939</td>
<td>2.084216</td>
<td>2.565486</td>
<td>0.728565</td>
</tr>
<tr>
<td>1991</td>
<td>24.03355</td>
<td>2.293493</td>
<td>2.643607</td>
<td>0.000000</td>
</tr>
<tr>
<td>1992</td>
<td>24.10088</td>
<td>2.850615</td>
<td>3.797484</td>
<td>0.000000</td>
</tr>
<tr>
<td>1993</td>
<td>23.48258</td>
<td>3.094011</td>
<td>4.045946</td>
<td>1.475781</td>
</tr>
<tr>
<td>1994</td>
<td>23.61843</td>
<td>3.090861</td>
<td>4.046307</td>
<td>0.000000</td>
</tr>
<tr>
<td>1995</td>
<td>24.07482</td>
<td>3.086270</td>
<td>4.288204</td>
<td>0.000000</td>
</tr>
<tr>
<td>1996</td>
<td>24.27827</td>
<td>3.085775</td>
<td>3.76505</td>
<td>0.000000</td>
</tr>
<tr>
<td>1997</td>
<td>24.30184</td>
<td>3.085849</td>
<td>2.143575</td>
<td>2.810219</td>
</tr>
<tr>
<td>1998</td>
<td>24.18915</td>
<td>3.085847</td>
<td>2.302223</td>
<td>3.230103</td>
</tr>
<tr>
<td>1999</td>
<td>24.30319</td>
<td>4.525457</td>
<td>1.889850</td>
<td>1.018099</td>
</tr>
<tr>
<td>2000</td>
<td>24.56026</td>
<td>4.622001</td>
<td>1.936335</td>
<td>0.000000</td>
</tr>
<tr>
<td>2001</td>
<td>24.51059</td>
<td>4.711611</td>
<td>2.937767</td>
<td>3.171275</td>
</tr>
<tr>
<td>2002</td>
<td>24.80278</td>
<td>4.792298</td>
<td>2.555410</td>
<td>0.000000</td>
</tr>
<tr>
<td>2003</td>
<td>24.93770</td>
<td>4.861535</td>
<td>2.641325</td>
<td>2.153342</td>
</tr>
<tr>
<td>2004</td>
<td>25.19884</td>
<td>4.889507</td>
<td>2.707919</td>
<td>2.963681</td>
</tr>
<tr>
<td>2005</td>
<td>25.44398</td>
<td>4.877289</td>
<td>2.882759</td>
<td>0.000000</td>
</tr>
<tr>
<td>2006</td>
<td>25.70296</td>
<td>4.857108</td>
<td>2.108943</td>
<td>0.000000</td>
</tr>
<tr>
<td>2007</td>
<td>25.83797</td>
<td>4.834758</td>
<td>1.683102</td>
<td>2.452240</td>
</tr>
<tr>
<td>2008</td>
<td>26.06112</td>
<td>4.775301</td>
<td>2.449105</td>
<td>1.432816</td>
</tr>
<tr>
<td>2009</td>
<td>25.85601</td>
<td>5.003287</td>
<td>2.445618</td>
<td>3.165749</td>
</tr>
<tr>
<td>2010</td>
<td>26.36423</td>
<td>5.012620</td>
<td>2.618869</td>
<td>0.000000</td>
</tr>
<tr>
<td>2011</td>
<td>26.74367</td>
<td>5.036054</td>
<td>2.383316</td>
<td>1.781966</td>
</tr>
<tr>
<td>2012</td>
<td>26.85656</td>
<td>5.059422</td>
<td>2.508289</td>
<td>1.929070</td>
</tr>
<tr>
<td>2013</td>
<td>26.96737</td>
<td>5.058226</td>
<td>2.137218</td>
<td>2.327019</td>
</tr>
<tr>
<td>2014</td>
<td>27.06627</td>
<td>5.066087</td>
<td>2.086589</td>
<td>2.429765</td>
</tr>
<tr>
<td>2015</td>
<td>26.89927</td>
<td>5.259787</td>
<td>2.199188</td>
<td>2.609763</td>
</tr>
<tr>
<td>2016</td>
<td>26.72630</td>
<td>5.535333</td>
<td>2.736661</td>
<td>2.825852</td>
</tr>
</tbody>
</table>

Source: CBN and World Bank Development Indicators
4.2 Unit Root Test

This is the first test carried out in the cointegration analysis and is known as the pre-cointegration test. This test tries to examine the property of the variables. It is used to check for the presence of a unit root i.e. none stationarity of the variables. It is carried out using the Augmented Dickey Fuller (ADF) test for unit root. The time series properties of the variables as evaluated are presented below:

**Table 4.2.1 Time Series Properties**

<table>
<thead>
<tr>
<th>ADF Test Result for Log(GDP)</th>
<th>Lag Length: 0 (Automatic - based on SIC, maxlag=7)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t-Statistic</td>
</tr>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-5.486109</td>
</tr>
<tr>
<td>Test critical values:</td>
<td></td>
</tr>
<tr>
<td>1% level</td>
<td>-3.679322</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.967767</td>
</tr>
<tr>
<td>10% level</td>
<td>-2.622989</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>ADF Test Result for Log(EXCR)</th>
<th>Lag Length: 0 (Automatic - based on SIC, maxlag=7)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t-Statistic</td>
</tr>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-5.644484</td>
</tr>
<tr>
<td>Test critical values:</td>
<td></td>
</tr>
<tr>
<td>1% level</td>
<td>-3.679322</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.967767</td>
</tr>
<tr>
<td>10% level</td>
<td>-2.622989</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>ADF Test Result for Log(INFR)</th>
<th>Lag Length: 0 (Automatic - based on SIC, maxlag=7)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t-Statistic</td>
</tr>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-2.966899</td>
</tr>
<tr>
<td>Test critical values:</td>
<td></td>
</tr>
<tr>
<td>1% level</td>
<td>-3.670170</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.963972</td>
</tr>
<tr>
<td>10% level</td>
<td>-2.621007</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>ADF Test Result for Log(INTR)</th>
<th>Lag Length: 0 (Automatic - based on SIC, maxlag=7)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t-Statistic</td>
</tr>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-4.896880</td>
</tr>
<tr>
<td>Test critical values:</td>
<td></td>
</tr>
<tr>
<td>1% level</td>
<td>-3.670170</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.963972</td>
</tr>
<tr>
<td>10% level</td>
<td>-2.621007</td>
</tr>
</tbody>
</table>
Table 1(a-d) above shows the stationarity test statistics for all the variables using ADF technique. From our results, the result shows that we cannot reject the null hypothesis of unit roots for all the variables in level form except for interest rate and inflation rate which attained stationarity under I(0) order of integration. However, GDP and Excr became stationary after applying first difference for each of the variables. From the tables presented above, evidence indicated that we can reject the null hypothesis for each variable. Base on the fact that all the variables are stationary either at I(0) or I(1), the study proceeded to testing whether or not the variables are co-integrated.

### 4.3 Johansen Co-integration test
The co-integration test is used to check for long run relationship between the dependent and independent variables (Ogundipe and Amaghionyeodiwe, 2013). The co-integration test was carried out using the Johansen technique and it produced the following results:

#### Table 4.3: Johansen Cointegration Test

**Unrestricted Cointegration Rank Test (Trace)**

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.795303</td>
<td>80.31799</td>
<td>47.85613</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.599912</td>
<td>34.31754</td>
<td>29.79707</td>
<td>0.0141</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.155452</td>
<td>7.751457</td>
<td>15.49471</td>
<td>0.4924</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.093657</td>
<td>2.851792</td>
<td>3.841466</td>
<td>0.0913</td>
</tr>
</tbody>
</table>

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

**Unrestricted Cointegration Rank Test (Maximum Eigenvalue)**

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Max-Eigen Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.795303</td>
<td>46.00045</td>
<td>27.58434</td>
<td>0.0001</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.599912</td>
<td>26.56608</td>
<td>21.13162</td>
<td>0.0078</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.155452</td>
<td>4.899666</td>
<td>14.26460</td>
<td>0.7545</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.093657</td>
<td>2.851792</td>
<td>3.841466</td>
<td>0.0913</td>
</tr>
</tbody>
</table>

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author’s computation E-views

The results on the examination of the stable long run relationship between exchange rate and economic growth in Nigeria as reported above indicates that there is significant long run relationship between exchange rate and the Nigerian economy since both the trace test and the maximum Eigen value test passed the test of stability. There is at least two cointegration rank at 1% and 5% level of significance respectively. In other words, they possess the features that would cause them to converge in the long-run. Since there is at least one co-integrating vector,
an economic interpretation of the relationship between gross domestic product and the independent variables (exchange rate, interest rate and inflation rate) can be obtained by normalizing the estimates of the unconstrained co-integrating vector.

### Panel 1: Normalizing the Estimates of the Unconstrained Co-integrating Vector.

1 Cointegrating Equation(s): Log likelihood -1073.462

Normalized cointegrating coefficients (standard error in parentheses)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>1.000000</td>
<td>1.00E+09</td>
</tr>
<tr>
<td>EXCR</td>
<td>2.92E+09</td>
<td>3.90E+09</td>
</tr>
<tr>
<td>INFR</td>
<td>-5.38E+09</td>
<td>1.10E+10</td>
</tr>
<tr>
<td>INTR</td>
<td>1.03E+11</td>
<td>1.10E+10</td>
</tr>
</tbody>
</table>

Note: Standard errors are in parenthesis
Source: Author’s computation from E-views 8.0

The parameters (i.e., long-run estimates) of the cointegrating vector for the long-run equation are presented in Panel 1. In terms of the signs and magnitude of the coefficients which signify the effect of exchange rate policy variables on economic growth, it was observed from the model that EXCR had positive relationship with economic growth (GDP). The slope of EXR (exchange rate) though insignificant is positive, thus confirming the *a priori* expectation in line with economic theory of a positive relationship between exchange rate and economic growth. The coefficient of INTR was observed to be negative and insignificant, while INFR was negative and statistically significant. To determine the relationship between exchange rate policy and economic growth of Nigeria, it was observed that, a percentage change in exchange rate brings about 2.92 percentage increase in economic growth, indicating a positive impact on the Nigerian economy. Interest Rate is negative and statistically insignificant, as a unit change in Interest Rate leads to -1.03E+11 percentage decrease in economic growth. In the same vein, inflation rate (INFR) coefficient appeared inversely related to economic growth, revealing that a percentage change in inflation rate, holding all other factors constant leads to 5.38E+09 decrease in economic growth in Nigeria within the study period.

### 4.4 Error Correction Mechanism

In the short-run, deviations from the long-run relationship established in table 4.3 could occur due to shocks to any of the variables. In addition, the dynamics governing the short-run behavior of the model are different from those in the long-run. Due to this difference, the short-run interactions and the adjustments to long-run equilibrium are important because of the policy implications. The error-correction model arises from the long-run co-integration relationship. To check for the speed of adjustment of the model from the short run to the long run equilibrium state, then, we consider the error correcting term (ECM). The greater the coefficient of the error correction term, the faster the speed of adjustment of the model from the short run to the long run. Below is an extract of the ECM from the VECM output.

Table 4.4: Error Correction Mechanism (ECM) output

<table>
<thead>
<tr>
<th>Error Correction:</th>
<th>D(LOG(GDP))</th>
<th>D(LOG(EXCR))</th>
<th>D(LOG(INTR))</th>
<th>D(LOG(INFR))</th>
</tr>
</thead>
<tbody>
<tr>
<td>CointEq1</td>
<td>0.009679</td>
<td>-0.073622</td>
<td>0.216369</td>
<td>-3.18E-05</td>
</tr>
<tr>
<td></td>
<td>(0.02670)</td>
<td>(0.01874)</td>
<td>(0.13364)</td>
<td>(0.05501)</td>
</tr>
<tr>
<td></td>
<td>[0.36253]</td>
<td>[-3.92858]</td>
<td>[1.61900]</td>
<td>[-0.00058]</td>
</tr>
</tbody>
</table>

Source: Author’s computation using E-views 8.0
The estimated coefficient of the ECM term which is also the speed of adjustment to equilibrium is negative as required by economic theory. Judging from the table above, the ECM coefficient -0.073622 is rightly signed and statistically significant at 5% level of significance. It was revealed that about 7% of the disequilibrium or distortion in the Nigerian economy is yearly being corrected for. Theoretically speaking, the estimated coefficient of the error correction term should be negative and lie within an interval of zero and one. Thus, the larger the magnitude of this coefficient, the faster the speed of adjustment toward the long-run equilibrium. It is instructive to note, however, that the adjustment speed of 7% is very low, and thus will act as a slow down on convergence to the equilibrium path.

The hypotheses formulated for this study are tested in line with empirical findings thus:

\[ H_0: \text{Exchange rate has no long-run relationship with the Nigerian economy} \]

\[ H_0: \text{Exchange rate has no significant impact on economic growth in Nigeria} \]

\[ H_0: \text{Interest rate has no significant impact on economic growth in Nigeria} \]

To test hypothesis one above, the result from Johansen cointegration analysis is used. Judging from the cointegration outcome, a unique equilibrium longrun relationship existed between exchange rate and gross domestic product (the Nigerian economy). In line with this finding, the null hypothesis of no long run relationship between the variables in question is rejected, hence it is concluded that exchange rate has a positive long run relationship with economic growth between the study periods (1986-2016).

On hypothesis two, based on the normalized estimates of the unconstrained cointegrating vector on GDP, it was revealed that the coefficient of exchange rate though positively related to economic growth is not statistically significant in the model, thus we accept the formulated null hypothesis and conclude that exchange rate has no significant impact on economic growth in Nigeria. A similar conclusion is held for interest rate because of the low t-statistic value which revealed that interest rate is both inversely related and insignificant in explaining the model on the relationship between exchange rate and economic growth in Nigeria during the study period.

4.6 Post-Estimation Test

(a) Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

<table>
<thead>
<tr>
<th>F-statistic</th>
<th>7.283001</th>
<th>Prob. F(2,12)</th>
<th>0.0085</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obs*R-squared</td>
<td>9.869307</td>
<td>Prob. Chi-Square(2)</td>
<td>0.0072</td>
</tr>
</tbody>
</table>

Source: Author’s computation using E-views 8.0

From the test results presented above, the probabilities of both the F-statistic (0.0000) and the observed Rsquared (0.0001) are less than 0.05. Therefore, \( H_0 \) is not accepted, meaning autocorrelation is present.

(b) Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

| F-statistic | 1.897055 | Prob. F(3,14) | 0.1765 |

95
From the test results presented in the table above, both the probabilities of F-statistic (0.1765) and the observed R-squared (0.1576) are higher than 0.05 indicating the absence of heteroscedasticity. Implying that the errors are homoscedastic and therefore useful for analysis and forecasting.

(c) Normality Test

The Jarque-Bera test result of normality is as shown below. The result revealed that the residuals of the data are normally distributed. The null hypothesis of normality of the residuals of the data is accepted at 34 per cent confidence level as indicated by the probability value of 0.64 and Jarque-Bera value of 2.160825 is greater than zero.

V: SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between exchange rate and the Nigerian economy from 1986 to 2016. Secondary data obtained from the Central Bank of Nigeria statistical bulletin and the World Bank database was used. Augmented Dickey Fuller unit root test, Johansen cointegration test and Error correction mechanism (ECM) approach to empirically test the objectives outlined in section I of the study.

The output from the Augmented Dickey Fuller (ADF) unit root test revealed that all variables except inflation rate and interest rate were found to be stationary at first difference. The Johansen Cointegration technique reveals the presence of two and one cointegrating equations respectively indicating the existence of a long-run equilibrium relationship among Gross. Evidence from shortrun analysis (Error correction mechanism) revealed that the coefficient value of -0.073622 is rightly signed and statistically significant at 5% level of significance. The coefficient indicated that about 7% of the disequilibrium or distortion in the Nigerian economy was yearly being corrected for. It is instructive to note however that the adjustment speed of 7% is very low, sluggish and unpalatable.
Furthermore, the normalized cointegration equation revealed that exchange rate had positive relationship with economic growth (GDP). The slope of EXR (exchange rate) though insignificant is positive. The coefficient of INTR was observed to be negative and insignificant, while INFR was negative and statistically significant.

Deriving from empirical findings, the study thus concludes that exchange rate has a positive long run relationship with economic growth. Similarly, exchange rate appeared positively related to economic growth but it is statistically insignificant in the model, thus it was concluded that exchange rate has no significant impact on economic growth in Nigeria. A similar conclusion is held for interest rate because of the low t-statistic value which revealed that interest rate is both inversely related and insignificant in explaining the model on the relationship between exchange rate and economic growth in Nigeria during the study period.

Based on the findings in the foregoing paragraph, the study has favoured the implementation of the following recommendations:

Government should encourage export promotion strategies in order to maintain a surplus balance of trade, conducive environment, adequate security, effective fiscal and monetary policies, as well as infrastructural facilities be provided so that foreign investors will be attracted to invest in Nigeria.

The apex bank (Central Bank of Nigeria) should design and develop strategies that will stem the tide of rising inflation in the economy as persistent rise in prices has the tendency of adversely affecting consumers’ purchasing power.

Finally, monetary policy measures to reduce the present high interest rate adopted for borrowers should be initiated as fast as possible. It is only an affordable interest rate (cost of borrowing) that can motivate would-be investors to borrow and invest for the growth of the national economy.

BIBLIOGRAPHY


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