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VALUE ADDED TAX AND SOCIAL WELFARE IN NIGERIA

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Abstract: Fiscal tool such as value added tax is employed to enable government finance its public activities with a view to minimizing the distortions created by market forces. There is no doubt that value added tax, indeed increases government revenue, but how has the revenue generated from value added tax impacted on economic development of Nigeria is an issue of concern among other factors. This outcome focused on the effect of Value Added tax on social welfare in Nigeria. The outcome utilized vector Error correction model based on pooled data frame work for the period 1993 – 2023. The use of VECM was to determine the short-run dynamics and long-run equilibrium adjustment among the various variables while Philip-Peron Test was conducted to ascertain the stationarity of the variable in the time series. The outcome of the outcome indicate that value added tax had insignificant contribution to social welfare in Nigeria. The outcome conclude that higher value added tax efficiency may coincide with lower levels of economic distress and when well-managed can contribute to reducing unemployment rate over time. Based on the outcome of the outcome, recommendations and conclusion were made.

Keywords: *Value Added Tax, Social Welfare, misery index, unemployment rate.*

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Introduction

In managing the economy of any nation, government employs various policies which have two aspect; goals and instruments. The broad goals of macroeconomics policies are full employment, price stability, top equilibrium and economic growth and development. There are also various policy instruments employed in achieving these goals. One of such instruments is direct and indirect taxes (Emah & Offiong, 2014).

How well a nation discharges its responsibilities of providing essential goods and services such as education securities, electricity, water and health facilities among others depend on the revenue from various sources including taxation (Ogundele, 1996). Achieving economic development is dependent on the financial resource available, value added tax which is a consumer based tax has assumed a high profile since its introduction in Nigeria in the year 1994. The value added tax generated N8.20 billion in 1994 which was over 36% above the projected revenue of 6 billion for the period. The revenue generated from value added tax (VAT) has increase progressively over the years. In 2004. N163. 3billion was realized while N795.60 billion was generated in 2013. value added tax (VAT) amongst all in the table of tax is a major revenue contributor to the Nigeria's economy (Ajakaiye, 2000) valued added tax (VAT) is levied on goods and services of registered businesses in the country.

Tax revenue generated from value added tax (VAT) is capable of influencing economic development. Jhingan (2005) opined that economic development generally refers to the sustained, concerted actions of policy makers and communities that promote the standard of living and economic health of a specific area. Such actions can involves multiple areas including the development of human capital, Critical infrastructure, regional competitiveness, environmental stability, social inclusions, health, safety, literacy and other initiatives (Dwivedi, 2004).

Dwivedi (2004) explained that economic development is the process by which a high degree of self-reliant economic growth is a given economy is sustained for a long period of time which is characterized by greater reduction in poverty, unemployment and inequality Economic growth is seen as characterized by increase in a country's real Gross National product and per capita real Gross National Product. The real Gross National Product is preferred to the nominal Gross National Product in the measurement of economic growth because it will not distort inflation and it will inform us whether or not the country's standard of living is improving on the average. The enabling law backing the establishment of value added tax (VAT) in Nigeria is decree 102 of 1883 which actually became effective in 1994. Value added tax (VAT) in Nigeria is Decree 102 of 1993 which actually became effective in 1994, Value added tax (VAT) is charged at 7% on all VAT table goods and services either domestic or exported. The tax is collected on behalf of the Government by businesses and organizations which have registered with Federal Inland Revenue Service (FIRS) for (VAT) services (Olatuniji, 2009).

The business and organizations can claim credit for this tax (called input tax) when goods are sold or services rendered monthly to the Federal Inland Revenue Services (FIRS) by these registered gents. The 7% value added tax (VAT) is called "the

output tax", therefore, the value added tax (VAT) payable is the output tax less: the input tax and is equivalent to the value added tax VAT paid by the final consumer of the product that will be called by the Government (Olatunji, 2009) The final consumer is also expected to pay VAT on goods and services supplied to him. This constitutes the VAT input. The difference between the output and the input represents the amount is payable where the output tax exceeds the input tax where the input tax exceeds the output tax, this may be claimed from the FIRS. The methods to be used in claiming such refund are; the credit method, direct cash refund method and a combination of the two (Ojo, 2009).

All over the world, tax is one of the veritable tools used by the government to generate revenue which will enhance its responsibilities to the populace. Therefore, tax can be seen as a means by which government appropriate part of the private sector's income. The aggregated revenue is used in meeting both recurrent and capital expenditure. Value added tax (VAT) is a composition every stage of production and distribution on the value they add to their purchases of raw materials and other inputs (Daferigbe et al; 2014).

Therefore, fiscal policy instrument such as value added tax (VAT) is employed to enable government finance its public activities with a view to minimizing the distortions created by the market forces. There is no doubt that value added tax (VAT), indeed increases government revenue, but how has the revenue generated from value added tax (VAT) impacted on the economic development of Nigeria among other factors is he issue of concern (Daferigbe, et al; 2024).

Theoretical Explanation of the Study

This research is based on modernization theory. It originated from the idea of German sociologist Max Webber in 1864 which provided the basis for the modernization paradigm developed by Talcott Parsons in 1902. The theory looks at the internal factors of a country while assuming that with assistance "traditional" countries can be brought to development in the same manner more developed countries have been.

Modernization theory attempts to identify the social variables that contribute to the social progress and development of societies and seek to explain the process of social evolution. The major assumptions of modernization theory of development basically are: modernization is a phase and homogenizing process. Modernization is an irreversible and progressive process which in the long run is not only inevitable but desirable. These assumptions relate to the outcome because tax revenue generation is aimed at achieving development which come in phrases and also homogenizing in nature.

Conceptual Explanation of the Study

The concept of Value Added Tax (VAT)-Value added tax was first introduced by France in 1954. It has been embraced by well over seventy countries all over the world. These include the entire Organization for Economic Co-operationand Development (OECD) countries such as Japan, Canada, the state of Michigain, in the United States of America (USA) and many African countries Daterigbe et al; 2024).

Value added tax (VAT) is a gross product type of tax imposed on destination principle. Nigeria adopts a given percentage (70.0) value added tax charges on all goods and services, either domestic or exported. This is the lowest rates among countries in African continent. The tax collected on behalf of the government by businesses and organizations which have registered with federal Inland Revenue Service (FIRS) for value added tax service (Olaoye, 2009). Akpan (2011) state that the input tax mechanism in value added tax (VAT) makes it self-policing because of the needs to obtain receipt at each stage of transaction. The value added tax (VAT) makes it self-policing because of the needs to obtain receipt at each stage of transaction. The value added tax (VAT) is imposed on the net sales value of non-exempt, qualifying goods and services in Nigeria. It is levied on any individual, corporation, Sole, Group, body corporate or organization, or imports taxable goods or services. During direct sales or open market transaction pays the tax to the seller together with the cost of the goods or services bought. Where the goods or services were supplied to a government ministry, Department and Agency (MDA) or a company engaged in oil operations, the VAT payable by the MDAs or oil company is deducted or withheld at source (at the point of payment).

VAT Administration in Nigeria- All manufactures, distributors' importers and suppliers of goods and services are obliged to register for value added tax (VAT) payment within six months of commencement of such business. The prospective value added tax (VAT) Payer must obtain and complete VAT form 001 and return to the nearest local VAT office. A permanent VAT registration number is to be given to each registered pay (Ojo, 2003). Federal Inland Revenue Service (FIRS) is assigned by law (Section 7G of Decree No. 102 of 1993), the responsibility of administering VAT in Nigeria. The service is empower to do such things as it may deem expedient for the assessment and collection of tax in accordance to section 2 of the Decree (Ojo, 2009).

In accordance with the above provision of Decree, VAT system in Nigeria is administered by RS. Through the VAT directorate which is located at its head office in Abuja with a network of Zonal and local VAT offices throughout the Federation (FIRS, 1993).

The success or failure of any tax depends largely on the extent of how it is properly managed. The extent to which the tax is interpreted and implemented, as well as the publicity brought into it will determine how the particular tax is able to meet its objective. Hence, one of the acid tests in determining the success of a tax is the management of the policy. Value added tax (VAT) may be complicated to administer but it is not complex as personal income tax or company income tax (Unwabuike, 2003). The introduction of VAT in Nigeria through Decree 102 of 1993 marks the phasing out for the sales tax Decree N07 of 1986. The Decree took effect from 1st December, 1993, but by administrative arrangement, invoicing for tax purpose did not commence until 1st January. 1994. Value added tax is a tax on the supply of goods and services which is eventually born by the final consumer but all collected at each stage of production and distribution chain. With VAT; government reasoned; it will be virtually impossible to evade tax.

Social Welfare- As an organized function, social welfare is defined as a set of activities that help individuals, families, groups, and communities to cope with the social problems that arise as a result of changing circumstances. However, in addition to and beyond its responsibility for specific services, social welfare serves a broader purpose within the context of a country's social development (Casimir & Samuel, 2015). Social welfare denotes the full range of organized activities of voluntary and governmental agencies that seek to prevent, alleviate, or contribute to the solution

of social problems, or to improve the well-being of individuals, groups or communities 9National Association of social worker Encyclopedia of social work 1971 in Omokhabi, 2021).

Social welfare is essential given the fact that, it allows for a system where members of the society particularly, the less privileged can enjoy their fundamental rights, and as well, access a good amenities as provided by the government or by other philanthropic organisations) The importance of social welfare services are to alleviate poverty among members of the society, help government in being pruaent and pragmatic in implementing spcial welfare policies to the benefit of its citizenry, assist government in maximizing public funds in the execution of social welfare policies, avail members of the public the opportunity to engage in positive adventure, provision of financial assistance to the needy, provision of health care for the sick or aged, provision of child's health insurance, provision of sex education especially the female child, providing social amenities for the public, and provision of supplementary nutritional assistance (Aldama, 2020).

Social welfare is of the five systems of social services in modern industrial societies philosophically, social welfare is conceived in a broad sense, which is also called social service which includes education, medical and health, housing, income maintenance, and personal welfare.

Social Welfare Services Provision in Nigeria- Social welfare services in Nigeria dates from the missionary era after the Second World War through the colonial times to this present day. Salvation Army, Green Trangle group and the Roman Catholic Church initiated the social welfare services through the missionary groups. These Philanthropist helped in the development of social welfare services by building orphanages for the poor and the disadvantaged. Social welfare activities were Lagos and spread to other regions in Nigeria. At that time, social welfare services and social work were located in the social development division in the Federal ministry of labour and social welfare.

With the creation of new states, social welfare programme were put under the ministry of women Affairs and social development. However, in precolonial times, what existed in Nigeria was traditional social work practice, which solved and still prevents most of the social problems experienced till date. In the 1970s, Social problems escalated in Nigeria with Western civilization which worsens the social problems such as child abandonment, armed robbery, cultism and kidnapping (Ogbonna, 2017).

Omokhabi and Mensah (2021) classified social welfare in Nigeria as child social welfare services, family social welfare services; prisons social welfare services, educational social welfare services; community social welfare.

Misery Index- Misery index otherwise known as the economic discomfort index (EDI) is one of the early attempts at the development of a comprehensive index comprising a range of indicators for tracking macro-economic conditions along the business cycles. The index was created by Okun (1966). It comprises of inflation and unemployment rates for a specific economy. It was made popular in the early part of 1970s, when the United States of America was experiencing stagnation. As a result of the stagnation, a higher level of either inflation or unemployment was a negative impact on the welfare of the citizens, Okun (1966), therefore, suggested that misery index is a measure of economic alistress due to the significant of imposed on the citizenry by negative economic conditions in the United States of the time. In its original form, the index was computed as a combination of unemployment and inflation rates.

Mankiw (2010) Explained that the Index measures the level of economic discomfort as an unweigleted sum of unemployment and inflation which constitutes two important indicators of macroeconomic policy outcomes over the years, other variants of the index have been developed such as the Barro (1999) misery index which includes interest rates and GDP growth rate into the mix. Macroeconomic policy is intended to achieve full employment level. Achievement of full or sustainable employment level. Achievement of full or sustainable employment opportunities is a key dimension to wellbeing of human development. While acknowledging the inestimable importance of macroeconomic policies, it is however worrisome to note that for the past years or decades, there is little or no evidence of a meaningful impact of such macroeconomic policy on unemployment and inflation rates in Nigeria.

Despite huge government occasioned by the implementation of expansionary fiscal policy which has often been accompanied by monetary expansion, there seems to be rising unemployment, inflation and slow growth of gross domestic product (GDP). This situation requires further investigation into the effect of macroeconomic policies and the problem of unemployment, inflation and key indicators of misery index.

Economic misery is measured by misery index (MI). In the 1960s, An American economist named Arthur Melvin Okun, developed misery index as a way to provide President Lyndon Johnson with an easily digestible snapshot of the economy. The Okun's index was a simple sum a country's annual unemployment rate and its inflation rate. It is assumed that both an increase in the rates of unemployment and inflation will create economic and social cost for a country Okun's index was used for quantifying the financial well-being of a country's population. It measures how people are faring economically in a country. Okun indicated that the misery index can be perceived as a crude utility or just discitility function in an economy (Pchine et al; 2014).

The factors contributing to Nigeria's misery include its high unemployment rate, inflation rate and interest rate. For instance, in 1987 the first year of implementing structural adjustment programme (AAP), unemployment stood at 7.0 percent. It was 7.5 percent in 1992, it declined to 7.2, 6.8, and 6.4 percent in 1993, 1994 and 1995. It rose again to 8.5 in 1997. In 1998, it fell to 7.6 percent and rose again to 8.5 and 11 percent in 1999 and 2000 respectively. In 2001, 2002, 2003 and 2004 it was 9.6, 8.8, 10.8 and 10.2 percent. CBN (2003) reported that the reason for this increases in unemployment rate in Nigeria was because of the simultaneous rapid expansion in the educational sector, new entrants into the labour market increased beyond the absorptive capacity of the economy and these developments have worsened the unemployment situation in the country. Also, in 2006, 2007, Nigeria's unemployment rate maintained an increasing trend of 9.4, 9.9 and 10.9 percent respectively. The situation worsened in 2008 (Gbosi, 2015).

Unemployment Rate- Nigeria is a nation endowed with an abundance of material and human resources, Nigeria's citizens continue to struggle for survival, despite the wealth of natural resources that thy have been endowed with, because of economic problems and difficulties in the country (Ekpo, 2008). A major

has impact on country development is unemployment. Nigeria's unemployment rates has risen from 14 – 12% in Q4 2016 to 27% in 2nd quarter of 2020, according to the National Statistical Bureau (MBS), 2020 numerous reasons contribute to the high unemployment rate. These factors include absence of employment opportunities in some sectors, population growth and skill gap between employers' needs and available labour (Lemchi 2020). There are two groups of people in any given country; the economic active and economically inactive. The improvements of human well-being and standard of living is an integral part of economic development. Gross national income and gross domestic product is measured as parameters for measuring the development due to the fact that growth only refers to an increase in the national productivity. Given the need for higher productivity person as a consequence of growth in output and income, economic development is concerned with production per capital. Indeed, improved indicators of human development and living standards are often a result of developments in the economy. By contrast, the improvements in economic well being observed over recent years in Nigeria cannot always be sustained by growth (Daniel 2024).

In Nigeria, studies and insights into the rate of unemployment and growth in the economy have been carried out by several authors.

Empirical Bases of the Study

Lababatu (2014) examined tax revenue and economic growth in Nigeria. The main objective of this outcome is to explore the relationship between taxation and economic growth in Nigeria. The outcome covered the period between 1981- 2010. The outcome used petroleum profit tax, company income tax, custom and excise duty and value added tax, company Income tax, custom and excise duty and value added tax while gross domestic product was employed as the dependent variable. multiple linear regression analysis was used to analyse the data by employing the use of vector Error correction model. The findings revealed that petroleum profit tax, company income tax and value added tax have a positive impact on Nigeria's economic growth while custom and excise duties impacted negatively but overall a significant relationship between tax revenue and the Nigeria economic growth exist. The outcome recommended that only skilled and professionals and trustworthy, hands should be responsible for tax administration.

Okoli, Njoku and Kaka (2014) examined taxation and economic growth in Nigeria, using Granger causality approach. The outcome covered the period 1994 – 2012. Taxation was disaggregated into value added tax, personal income tax, company income and petroleum profit tax. while the gross domestic product was used as a parameter for measuring economic growth in Nigeria. The data collected were analyzed using the Granger causality test and regression analysis. The results of the analysis revealed that significant positive relationship exists between the disaggregated and gross domestic product.

Chigbu and Njoku (2015) examined taxation using series data from 1994 – 2012. The dependent variables used in the model includes gross domestic product (GDP) as a parameter for measuring economic growth, inflation and unemployment. The objective of this outcome is to determine how taxation affects these macroeconomic variables. Ordinary least square analysis was employed to analyze the data. The results of the statistical analsysis revealed that positive relationship exist between the explanatory variables (custom and Excise Duties, company income tax, personal income tax, petroleum profit tax and value added tax) and the dependent. Variables (Gross Domestic Product unemployment) The individual explanatory variables have not significantly contributed to the growth of the economy, also the explanatory variables have not significantly contributed to the reduction of high rate unemployment and inflation in Nigeria for the period under review.

The outcome of Tomijan Ovich (2004) Demonstrates that taxes are imposed with the main objective of reducing the wealth inequalities between the poor and rich who dwell in the same nation, reduced the level of inflation and are tools used by the national fiscal policy. This is completed by the outcome of centry and hubbard (2005) which suggested that tax system is normally used for economic growth and wealth creation in a given economy or country. Azubike (2009) has demonstrated that has demonstrated that tax is a major source of revenue for any country.

Ogbonna and Ebinobowei (2012) have also found that tax reforms had significant effect on the economic growth of Nigeria. Their outcome shows that taxation is a significant tool that is used in Nigeria and helps in the wealth creation manifested in the economic growth in Nigeria.

Lyndon, Etale and paymaster (2016) determined how company any gross domestic product are related. The results of the regression analysis conducted showed that company income tax (CIT) and value (VATX) are positively related to economic growth between 1994 and 2013. The outcome employed Simple Linear ordinary least square regression, and it was statistically revealed that VAT X statistically and positively affects Nigeria economy. In addition, Ogudy, Kingsley and Aki Losotu (2018) statistically tested the relationship between corporate income tax and performance of the manufacturing companies in Nigeria. The results of fixed and random effect model technique revealed that company and significantly related to financial performance. The studied sample. Joseph and Chukwuemeka (2018). assessed the relationship between value added tax and economic growth in Nigeria. The results of regression analysis conducted showed that value added tax is positively and significantly related to economic growth in Nigeria.

Adereti, Adesina and Sanni (2011) examine the relationship between Value Added Tax and economic growth in the Nigerian economy. The outcome employed time series data on both the dependent and independent variables such as Gross Domestic product (GDP), VAT Revenue. Total Tax Revenue and Total Federal Government Revenue over a period of 14 years ranging from 1994 – 2008. The outcome's methodology comprised of a combination of descriptive and inferential statistics. The outcome of the outcome suggested a positive relationship exists between revenue generated from VAT and Gross Domestic Product (GDP).

Adegbie and Fakile (2011) carried out a outcome which aimed at ascertaining the statistical correlation between Company Income Tax (CIT) and the development of the Nigerian economy covering a period of 26 years spanning from 1981 - 2007. The Gross Domestic Product (GDP) was employed in the outcome as a proxy for economic development, and this was estimated against total revenue generated from CIT. primary and secondary data were utilized in the outcome and these data were analyzed using time Chi square and multiple regression analysis. The result of the analysis depicts that Company income Tax has a significant impact of economic development proxy as GDI'. The outcome revealed that tax evasion and lax avoidance are the major Factors responsible for dwindling in the level of revenue generated.

Methodology

Date were obtained from National Bureau of statistics (NBS), Federal Inland Revenue Service (FIRS) and Central Bank of Nigeria (CBN) Statistical Bulletin covering the period of years 1993 – 2023. The outcome used panel data analysis technique. Vector Error Correction Model (VECM), PP Test and Granger Causality were conducted for stationarity and non-stationarity, short run and long run relationship.

Model Specification

Functional

Model: Misery Index (MI) Model

MI = F(VAT)

MI = β1VAT + e

Model: Unemployment rate (UR) model

UR = f(VAT)

UR = α_0 + α_1 + VAT + e

Where:

- MI = Misery Index (Sum of inflation rate and unemployment rate, minus GDP growth rate)
- UR = Unemployment Rate
- VAT = Value Added Tax
- β0 , α_0 = Constant terms
- β1, α_1, = Coefficient of VAT

Econometric Model Specification

Model 1: = Misery index (MI) Model

MI β0 + β1 VAT + e

Model 2: = Unemployment Rate (UR) Model

UR α_0 + α_1VAT + e

Where

- MI = Misery Index
- UR = Unemployment Rate
- VAT = Value Added Tax
- β0, α_0 = Constant terms
- β1, α_1, = Coefficient of VAT
- e = Error term

Results

Univariate Analysis

Descriptive Statistics

Table 1 below is the Presentation the summary of the descriptive statistic of the longitudinal data variables.

Table 1: Descriptive Statistics

	GCF	LFP	IR	MI	TFP	VAT	UR
Mean	1.09E+13	59.81923	23.86191	21.73742	0.874142	606.7241	4.112903
Median	5.36E+12	60.15	22.62250	17.17000	0.907200	481.4000	3.870000
Maximum	3.70E+13	60.6	36.09000	76.88000	1.095900	1886.340	5.710000
Minimum	9.09E+10	58.311	16.50000	9.160000	0.635000	91.80000	3.560000
Std. Dev.	1.23E+13	0.659143	4.539874	15.70353	0.152988	512.9845	0.604980
Skewness	1.002838	-0.701593	0.667890	2.438551	-0.249179	1.101618	1.442398
Kurtosis	2.616164	2.177146	2.946998	8.003594	1.573787	3.382749	3.641526
Jarque-Bera	5.386337	3.417774	2.308359	63.06185	2.948157	6.459296	11.28091
Probability	0.067666	0.181067	0.315316	0.000000	0.228990	0.039571	0.003551
Sum	3.37E+14	1854.396	739.7192	673.8600	27.09840	18808.45	127.5000
Sum Sq. Dev.	4.53E+27	13.0341	618.3136	7398.021	0.702162	7894591.	10.98004
Observations	31	31	31	31	31	31	31

Source: Researchers computation using E-views 10.0

Table 1 presents the descriptive statistics for the macroeconomic and fiscal variables over the outcome period, including Gross Capital Formation (GCF), Labour Force (LF), Interest Rate (IR), Misery Index (MI), Total Factor Productivity (TFP), Value Added Tax (VAT), and Unemployment Rate (UR). The data shows that GCF, and LFP demonstrate substantial absolute numbers along with considerable variability between years 1993 to 2016. An evaluation of data shows that GCF demonstrates the largest standard deviation as well as mean value which indicates a wide distribution of capital investment over the observed period. The skewness values show many variables display positive skewness which points to extraordinary high values occurring within the data. The three variables of MI, VAT and UR display higher than normal values according to the skewness measure with values of 2.44, 1.10 and 1.44 respectively. The skewness value of TFP at -0.25 shows that the productivity measurements have a few cases which fall below typical levels.

Kurtosis values in statistical analysis allow deeper insights into distribution shapes and extreme value frequency patterns. Kurtosis determines how data distribute in tail regions and around the mean values when compared to normal distributions. The distribution of normal data possesses a kurtosis value of 3 but variations from this parameter point to specific distributional features. The Kurtosis measurement of 8.00 for the Misery Index exceeds the normal level. The highly leptokurtic distribution possesses both a sharp peak and thick tails. Practically the Misery Index demonstrates volatile behavior where data values stay close to the mean yet experience occasional strong spikes. Economic

uncertainty becomes particularly intense in specified years because the two elements of the Misery Index experience abrupt deterioration. With kurtosis levels of 3.64 and 3.38, respectively, the Unemployment Rate (UR) and Value Added Tax (VAT) likewise show leptokurtic trends. These numbers suggest that there are more frequent occurrences of values far from the mean than would be expected in a normal context, even though they are not as dramatic as the Misery Index. They nonetheless show fatter tails and higher peaks than a normal distribution. This could be a result of policy changes or economic developments that caused certain indicators to suddenly rise or fall. Kurtosis values for other variables, including Interest Rate (IR), Gross Capital Formation (GCF), and Labor Force Participation (LFP), are close to or slightly below 3 (2.95, 2.62, and 2.17 respectively), suggesting distributions that are roughly somewhat platykurtic. These distributions are less likely to behave like outliers and have a more normal shape. Notably, the kurtosis values of 1.57 for Total Factor Productivity (TFP) correspondingly show flat-topped, platykurtic distributions with slimmer tails. This indicates that over the outcome period, these variables performed more consistently and were less likely to have extreme outcomes.

The Jarque-Bera (JB) test for normality yields statistically significant values for MI ($p = 0.0000$), VAT ($p = 0.0396$), and UR ($p = 0.0036$), indicating that these variables deviate significantly from a normal distribution. Other variables, including GCF, LFP, IR, and TFP, do not show statistically significant JB results, suggesting approximate normality.In conclusion, variables like LFP and GCF exhibit significant levels of variability and large-scale numbers that are typical of macroeconomic aggregates. However, MI, VAT, and UR show leptokurtic traits and high positive skewness, suggesting the presence of extreme observations and outliers. When performing additional inferential analysis, the non-normal distribution of a number of variables, especially MI, justifies the application of strong statistical methods or data modification.

Lag length Selection

Using an unrestricted VAR modelling, the lag length was determined as describe by the table below.

Table 2 Lag Length Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: UR MI IR GCF TFP LF CIT VAT
Exogenous variables: C
Sample: 1993 2023
Included observations: 28

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1959.023	NA	9.08e+49	140.5731	141.0013	140.7040
1	-1668.106	374.0352	3.76e+43	125.5790	129.8611	126.8881
2	-1371.994	190.3577*	8.49e+37*	110.2139	118.3499	112.7011
3	4475.146	0.000000	NA	-301.6533*	-289.6635*	-297.9879*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Source: Researchers computation using E-views 10.0

A number of information criteria, including the Sequential Modified Likelihood Ratio Test (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Criterion (HQ), were used to determine the ideal lag length for the Vector Autoregression (VAR) model. By balancing model fit and parsimony, these criteria help choose a lag length that prevents both underfitting and overfitting.

The above table displayed the results of the lag order selection, which demonstrated varying preferences for each criterion. A lag length of two was chosen by the Final Prediction Error (FPE) and Likelihood Ratio (LR) tests, indicating that adding two delays (lags) reduces information loss and increases the predictive accuracy of the model. In line with its propensity to choose richer models that more accurately reflect dynamic structure, even at the expense of more parameters, the Akaike Information Criterion (AIC) likewise chose lag 2.

Different preferences for each criterion are indicated by the lag order selection results, which are displayed in the above table. Both the Final Prediction Error (FPE) and the Likelihood Ratio (LR) test chose a lag length of 2, indicating that adding two lags reduces information loss and boosts the predictive accuracy of the model. Lag 2 was also chosen by the Akaike Information Criterion (AIC), which is in line with its propensity to favor richer models that more accurately depict dynamic structure, even at the expense of extra parameters.

Lag 2 seems to be the more dependable and theoretically consistent option given the disparity between the criterion and the computational anomaly at lag 3 (such as the undefined FPE and zero LR statistic). It eliminates possible overfitting linked to the higher lag order and is supported by the three main criteria (LR,

FPE, and AIC). Furthermore, using lag 2 guarantees that the model captures the dynamic interactions between the variables while remaining tractable in light of the small sample size. In conclusion, a lag length of 2 was chosen for the VAR model because it is supported by most selection criteria and strikes an ideal balance between explanatory power and model parsimony without causing instability or over-parameterization.

Unit Root Test

Phillips-Perron Test for time series analysis was employed to determine the stationarity of the variables in the time series. The results are showed in Table 3

Table 3: PP Unit Root Test Results Summary

	Level Test Result			**First Difference Test**			**2nd Difference Test**			
Variable	**PP Stat**	**5% T_{cr}**	**Prob**	**ADF Stat**	**5% T_{cr}**	**Prob**	**ADF Stat**	**5% T_{cr}**	**Prob**	**Order**
MI	2.44	3.56	0.35	6.32	3.57	0.00	9.92	3.58	0.00	1(1)
UR	2.41	3.56	0.36	6.22	3.57	0.00	4.80	3.58	0.00	1(1)
IR	4.46	3.56	0.00	8.37	3.57	0.00	13.96	3.58	0.00	1(1)
GCF	1.19	3.56	0.91	4.09	3.57	0.01	4.78	3.58	0.00	1(1)
DTFP	2.83	3.57	0.19	5.06	3.58	0.00	8.35	3.58	0.00	1(1)
LFP	2.03	3.56	0.55	3.92	3.57	0.02	6.51	3.58	0.00	1(1)
CIT	2.88	3.56	0.18	6.28	3.57	0.00	7.86	3.58	0.00	1(1)
LNVAT	8.82	3.56	0.31	4.93	3.57	0.00	8.82	3.58	0.00	1(1)

Source: Researchers computation using E-views 10.0

Table 4.1.3 displays the summary of Phillips-Perron (PP) unit root tests which evaluated the variables in the outcome. The PP test evaluated variables in their level position and first difference state along with secondary differences when required for examination with statistical significance set at 5%. When using standard testing procedures the assumption is that the null hypothesis shows presence of unit root (non-stationarity) and null rejection occurs if the p-value falls below 0.05 indicating first-order stationarity.

The results show that the variables fail to achieve stationarity at level because the p-values exceed 0.05 for each statistical test. The null hypothesis of non-stationarity remains valid because the probability values at the level show results of MI (0.35), UR (0.36), IR (0.00), GCF (0.91), DTFP (0.19), LFP (0.55), CIT (0.18), and VAT (0.44). Most variables achieve stationary properties after first differencing them. The econometric results show that MI (0.00), UR (0.00), IR (0.00), GCF (0.01), and CIT (0.00) demonstrated probability levels below 0.05 thereby declining the null hypothesis to establish first difference stationarity that equates to I(1). Table 3 revealed that the All of variables are I(1), thus, the Johansen Cointegration test will be used in establishing if a long run relationship exist among the variables.

Cointegration Test

The Johansen Cointegration Test results for the models are summarized in Table 4a-4b.

Table 4a: Johansen cointegration Test for Model 1 (MI)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob****
None *	0.9906	256.8684	95.7536	0.0000
At most 1*	0.8891	126.1746	69.8188	0.0000
At most 2*	0.7372	64.5985	47.8561	0.0006
At most 3	0.4733	27.1785	29.7971	0.0973

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the -0.05 level

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

Statistical data from Table 4a provides compelling evidence that the variables incorporated in Model 1 (MI) share long-run equilibrium relationships. The Johansen cointegration procedure applied to this model utilized linear deterministic trends and included 1 to 2 lagged first differences, covering the adjusted sample period from 1996 to 2023. The trace test results indicate the existence of three cointegrating vectors. The null hypothesis of no cointegration ($r = 0$) is strongly rejected, with a trace statistic of 256.8684, far exceeding the 5% critical value of 95.7536, and a p-value of 0.0000. The test continues to reject the null hypotheses for $r \leq 1$ (126.1746) and $r \leq 2$ (64.5985) with highly significant p-values (both < 0.001), confirming the presence of at least three cointegrating relationships. However, the trace statistic for $r \leq 3$ is 27.1785, which does not surpass the 5% critical value of 29.7971, yielding a p-value of 0.0973, and thus fails to reject the null hypothesis at this level. Consequently, the analysis supports the conclusion of three stable long-run cointegrating vectors among the variables in Model 1. The maximum eigenvalue test further substantiates this conclusion. The test statistics for $r = 0$ (130.6938), $r = 1$ (61.5761), and $r = 2$ (37.4200) all exceed their

respective 5% critical values, affirming the rejection of null hypotheses up to r = 2. However, the test statistic for r = 3 (18.0585) is below the critical value threshold, indicating that the fourth cointegrating vector lacks statistical support. As such, the maximum eigenvalue test aligns with the trace test by identifying three cointegrating equations at the 5% significance level.

These results suggest that the included variables: Misery Index (MI), Total factor Productivity (TFP), Gross Capital Formation (GCF), Value Added Tax (VAT), Labour Force Participation (LFP) and Company income tax (CIT) are cointegrated, reflecting synchronous movement over time despite being individually non-stationary in levels. The detected long-run relationships imply that short-term divergences among variables tend to self-correct, thereby maintaining equilibrium over the long run. This empirical evidence justifies the use of a Vector Error Correction Model (VECM) for Model 1. A VECM structure captures both short-run deviations and long-run equilibrium dynamics, offering a more accurate representation of the relationships among the model's variables. Relying solely on a differenced VAR would risk omitting vital long-term information and potentially misrepresent the underlying system dynamics.

Table 4b: Johansen cointegration Test for Model 2 (UR)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob****
None *	0.9500	207.8441	95.7536	0.0000
At most 1*	0.8417	123.9224	69.8188	0.0000
At most 2*	0.7394	72.2975	47.8561	0.0001
At most 3*	0.5015	34.6338	29.7971	0.0128
At most 4	0.3512	15.1433	15.4947	0.0564

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the -0.05 level

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

Statistical data from Table 4b demonstrates strong evidence that variables in Model 2 (UR), LNUR LNTFP LNGCF LNCAT LNLFP LNCIT maintain significant long-run equilibrium relationships. The Johansen cointegration analysis incorporated a linear deterministic trend in the data and was conducted using 1 to 2 lagged first differences across an adjusted sample period from 1996 to 2023. The trace test results confirmed the presence of up to four cointegrating vectors. Specifically, the trace statistic for r = 0 is 207.8441**,** significantly exceeding the 5% critical value of 95.7536 with a p-value of 0.0000, thereby rejecting the null hypothesis of no cointegration. The subsequent test statistics for **r** ≤ 1 (123.9224)**,** r ≤ 2 (72.2975), and r ≤ 3 (34.6338) similarly reject their respective null hypotheses at the 5% significance level, supported by p-values well below 0.05, indicating strong evidence against the null of fewer cointegrating equations. However, for r ≤ 4, the trace statistic (15.1433) does not exceed the critical value (15.4947), and the p-value of 0.0564 suggests that the null hypothesis of at most four cointegrating vectors cannot be rejected. This pattern confirms that four stable long-run relationships exist among the model's variables. The maximum eigenvalue test, which sequentially tests for r vs. r + 1 cointegrating equations, identifies three cointegrating equations at the 5% significance level. The test statistics for r = 0 (83.9217)**,** r = 1 (51.6248), and r = 2 (37.6637) surpass their respective 5% critical values, indicating significance. However, for r = 3, the test statistic (19.4905) falls below the threshold, suggesting no evidence of a fourth cointegrating equation based on this criterion. Hence, while the trace test supports the existence of four cointegrating vectors, the maximum eigenvalue test offers more conservative evidence for three cointegrating relationships.

These results confirm that the model variables exhibit long-term stochastic trends and move together over time, despite being non-stationary in levels. In particular, the presence of cointegrating relationships indicates that any short-term deviations among the variables including labor force participation (LFP), unemployment rate (UR), and other associated macroeconomic indicators(a contained in the model) are expected to self-correct and revert toward long-run equilibrium paths. This statistical evidence supports the implementation of a Vector Error Correction Model (VECM), which accommodates both the short-run dynamics and long-run equilibrium adjustments among the variables. Relying solely on a VAR model in differences would overlook these important equilibrium relationships and likely result in model misspecification and inefficiencies. The identified cointegrating vectors emphasize the interconnected nature of the labor market and broader economic and fiscal indicators within the model.

Multivariate Analysis

Based on the outcome of the Johansen Cointegration Test carried out in the previous section, Vector Error Correction Models (VECM) was used to perform the analysis.

Table 1a: VECM results for Model 1 (MI)

Vector Error Correction Estimates

Date: 05/05/25 Time: 14:05

Sample (adjusted): 1995 2023

Included observations: 29 after adjustments

Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LNMI(-1)	1.000000
LNTFP(-1)	-78.24817
	(7.58363)
	[-10.3180]
LNGCF(-1)	7.360551
	(0.95891)
	[7.67595]
LNVAT(-1)	-15.62755
	(4.23112)
	[-3.69348]
LNLFP(-1)	392.5608
	(92.7684)
	[4.23162]
LNCIT(-1)	15.91844
	(3.43949)
	[4.62814]
C	-1835.337

Error Correction:	D(LNMI)	D(LNTFP)	D(LNGCF)	D(LNVAT)	D(LNLFP)	D(LNCIT)

CointEq1	0.037369	0.001358	-0.005433	-0.031680	-0.000207	-0.058391
	(0.01203)	(0.00086)	(0.01661)	(0.01246)	(0.00018)	(0.01308)
	[3.10647]	[1.57510]	[-0.32700]	[-2.54160]	[-1.18114]	[-4.46256]
D(LNMI(-1))	-0.027171	0.003069	0.104587	-0.030989	0.000154	-0.090482
	(0.21819)	(0.01564)	(0.30134)	(0.22608)	(0.00317)	(0.23733)
	[-0.12453]	[0.19624]	[0.34707]	[-0.13707]	[0.04857]	[-0.38126]
D(LNTFP(-1))	0.601493	0.557232	-1.255789	0.107666	0.028865	1.878365
	(1.92178)	(0.13776)	(2.65425)	(1.99132)	(0.02796)	(2.09037)
	[0.31299]	[4.04500]	[-0.47312]	[0.05407]	[1.03240]	[0.89858]
D(LNGCF(-1))	-0.519728	0.001596	0.041998	0.481855	0.002303	0.856248
	(0.19293)	(0.01383)	(0.26647)	(0.19992)	(0.00281)	(0.20986)
-*+	[-2.69381]	[0.11539]	[0.15761]	[2.41030]	[0.82040]	[4.08010]
D(LNVAT(-1))	0.190591	0.018613	-0.014513	0.130907	0.003939	0.672904
	(0.44279)	(0.03174)	(0.61155)	(0.45881)	(0.00644)	(0.48163)
	[0.43043]	[0.58642]	[-0.02373]	[0.28532]	[0.61144]	[1.39713]
D(LNLFP(-1))	-2.904585	-0.487929	7.679903	-7.497438	0.294703	11.70734
	(15.3577)	(1.10088)	(21.2111)	(15.9134)	(0.22344)	(16.7049)
	[-0.18913]	[-0.44322]	[0.36207]	[-0.47114]	[1.31896]	[0.70083]
D(LNCIT(-1))	0.062419	-0.037618	-0.132542	-0.231241	-0.002713	-0.723500
	(0.35040)	(0.02512)	(0.48396)	(0.36308)	(0.00510)	(0.38114)
	[0.17813]	[-1.49765]	[-0.27387]	[-0.63688]	[-0.53209]	[-1.89823]
C	0.042381	0.008330	0.235368	-0.017029	-0.001347	-0.091904
	(0.07955)	(0.00570)	(0.10986)	(0.08242)	(0.00116)	(0.08652)
	[0.53278]	[1.46078]	[2.14235]	[-0.20660]	[-1.16364]	[-1.06217]
R-squared	0.393403	0.615707	0.065247	0.349851	0.154509	0.597479
Adj. R-squared	0.191204	0.487609	-0.246337	0.133134	-0.127321	0.463305

Sum sq. resids	2.304711	0.011843	4.396347	2.474513	0.000488	2.726807
S.E. equation	0.331283	0.023747	0.457548	0.343270	0.004820	0.360344
F-statistic	1.945621	4.806538	0.209406	1.614325	0.548235	4.453020
Log likelihood	-4.430281	71.99943	-13.79465	-5.461061	118.2469	-6.868834
Akaike AIC	0.857261	-4.413754	1.503079	0.928349	-7.603234	1.025437
Schwarz SC	1.234446	-4.036569	1.880264	1.305534	-7.226049	1.402622
Mean dependent	-0.024512	0.012808	0.204191	0.074982	-0.000750	0.078855
S.D. dependent	0.368366	0.033175	0.409844	0.368688	0.004539	0.491874

Determinant resid covariance (dof adj.)	2.72E-13
Determinant resid covariance	3.91E-14
Log likelihood	200.7399
Akaike information criterion	-10.11999
Schwarz criterion	-7.573995
Number of coefficients	54

Source: Researchers computation using E-views 10.0

The outcomes above looked at the long-term and short0term effects between Misery Index (LNMI) alongside several critical economic variables through Vector Error Correction modeling of macroeconomic data from 1995 to 2023. LNTFP and LNGCF with LNVAT and LNLFP and LNCIT compose the variables this outcome examines. The VECM analysis operates using 29 adjusted observations to identify both equilibrium conditions between variables and their dynamic short-term adjustments which happen when the equilibrium changes. Statistics show significant long-run relationships between Misery Index and the cointegrating equation as the normalized variable. Total factor productivity has a substantial negative effect on the Misery Index because its coefficient equals -78.25 and has a high significance level (7.5832). The results match theoretical predictions because productivity growth steers inflation downward and creates more job opportunities which in turn lowers economic difficulties.

Gross capital formation, on the other hand, shows a positive and significant coefficient (7.36; t = 7.68), indicating that long-term gains in investment are linked to an increase in the Misery Index. This surprising result might be the result of capital-intensive investments made during the outcome period, which might not have immediately increased employment but instead drove up prices. Likewise, the Misery Index has a positive correlation with both labor force participation (392.56; t = 4.23) and corporate income tax (15.92; t = 4.63). The former would suggest that decisions about employment and investment are distorted by higher corporate taxes, while the latter might be the result of labor supply pressures exceeding demand, which would raise unemployment. Value-added tax, on the other hand, has a negative correlation with the Misery Index (-15.63; t = -3.69), indicating that it might have a stabilizing effect on the economy. This may be because indirect taxes help to strengthen fiscal restraint, which can reduce inflation expectations and enhance macroeconomic stability.

The LNMI equation's error correction component (ECT) is positive and statistically significant (0.0374; t = 3.11), suggesting that the Misery Index deviates from its long-term equilibrium path in the short term. Even though this is a little surprising because we usually expect the dependent variable to adapt toward equilibrium, this discovery might point to hidden short-term causes or underlying structural rigidities that are causing the divergence. The fiscal variables D(LNVAT) and D(LNCIT), on the other hand, have negative and statistically significant ECTs (-0.0317 and -0.0584, respectively), suggesting that they actively compensate for disequilibria and support long-term stability. The remaining variables' ECTs are statistically insignificant, suggesting that their short-term reactivity to disequilibrium is either weaker or delayed.

Additional understanding of intervariable connections can be gained from short-run dynamics. D(LNTFP(-1)) has a large effect on its own growth (0.5572; t = 4.05), indicating that productivity gains are persistent. Furthermore, the long-term benefit is reversed in the short term when lagging changes in gross capital creation dramatically lower the Misery Index (-0.5197; t = -2.69). This demonstrates how the impact of investments varies according on the time horizon taken into account. As demonstrated by its strong positive coefficients in the equations for D(LNVAT) and D(LNCIT), short-run investment also has a positive impact on tax collections, indicating that it has a stimulative influence on economic activity. The idea that labor force participation and corporate taxes either adjust slowly or are impacted by structural and policy restrictions not included in the data is supported by the fact that the majority of short-run coefficients involving these variables are statistically insignificant.

Model diagnostics show different explanatory power levels. The R-squared values for D(LNCIT) and D(LNTFP) are 0.60 and 0.62, respectively, indicating acceptable match. That of LNVAT is 0.35 indicating moderate fit. The model does not sufficiently represent their short-term fluctuation, though, as evidenced by the low or even negative adjusted R-squared values of the equations for D(LNGCF), D(LNLFP), and D(LNMI). This implies that in order to improve model performance, future models will need to include more short-run controls or structural dummies.

Table 1b: VECM outcomes for Model 2 (UR)

Vector Error Correction Estimates
Date: 05/05/25 Time: 14:02
Sample (adjusted): 1995 2023
Included observations: 29 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LNUR(-1)	1.000000
LNTFP(-1)	2.488726 (0.24462) [10.1740]
LNGCF(-1)	-0.188993 (0.03008) [-6.28317]
LNVAT(-1)	-0.823040 (0.16941) [-4.85830]
LNLFP(-1)	-12.82681 (2.97606) [-4.30999]
LNCIT(-1)	0.484882 (0.13263) [3.65588]
C	58.94758

Error Correction:	D(LNUR)	D(LNTFP)	D(LNGCF)	D(LNVAT)	D(LNLFP)	D(LNCIT)
CointEq1	0.140945 (0.10737) [1.31269]	-0.090614 (0.02099) [-4.31781]	-0.222397 (0.52551) [-0.42320]	1.250403 (0.35994) [3.47388]	0.001775 (0.00564) [0.31479]	1.579490 (0.48083) [3.28493]
D(LNUR(-1))	-0.751047 (0.35106) [-2.13937]	0.140976 (0.06862) [2.05455]	0.336505 (1.71821) [0.19585]	-1.831077 (1.17687) [-1.55589]	-0.014207 (0.01844) [-0.77055]	-2.840034 (1.57212) [-1.80650]
D(LNTFP(-1))	-0.501151 (0.55608) [-0.90122]	0.489866 (0.10869) [4.50704]	-1.651076 (2.72166) [-0.60664]	0.748004 (1.86418) [0.40125]	0.020907 (0.02920) [0.71590]	1.997941 (2.49025) [0.80231]
D(LNGCF(-1))	0.019865 (0.05469) [0.36322]	-0.011883 (0.01069) [-1.11165]	-0.079632 (0.26767) [-0.29750]	0.550035 (0.18334) [3.00008]	0.001385 (0.00287) [0.48231]	0.808636 (0.24491) [3.30171]
D(LNVAT(-1))	-0.059039 (0.14148) [-0.41728]	-0.041060 (0.02765) [-1.48478]	-0.073483 (0.69247) [-0.10612]	1.009722 (0.47430) [2.12885]	0.007253 (0.00743) [0.97611]	1.902015 (0.63360) [3.00194]
D(LNLFP(-1))	-1.158832	-0.828479	6.044950	-5.157316	0.215138	7.574948

	(4.41862)	(0.86364)	(21.6263)	(14.8127)	(0.23206)	(19.7875)
	[-0.26226]	[-0.95929]	[0.27952]	[-0.34817]	[0.92709]	[0.38281]
D(LNCIT(-1))	0.054119	0.003604	-0.116986	-0.824454	-0.005044	-1.521632
	(0.10549)	(0.02062)	(0.51631)	(0.35364)	(0.00554)	(0.47241)
	[0.51302]	[0.17481]	[-0.22658]	[-2.33132]	[-0.91040]	[-3.22099]
C	0.009968	0.012905	0.262956	-0.059125	-0.001246	-0.122830
	(0.02324)	(0.00454)	(0.11375)	(0.07791)	(0.00122)	(0.10408)
	[0.42888]	[2.84100]	[2.31172]	[-0.75887]	[-1.02097]	[-1.18018]
R-squared	0.291781	0.772491	0.065280	0.458116	0.122719	0.456713
Adj. R-squared	0.055708	0.696654	-0.246293	0.277488	-0.169708	0.275617
Sum sq. resids	0.183522	0.007011	4.396193	2.062448	0.000506	3.680401
S.E. equation	0.093483	0.018272	0.457540	0.313388	0.004910	0.418637
F-statistic	1.235977	10.18627	0.209518	2.536242	0.419658	2.521939
Log likelihood	32.26019	79.60054	-13.79414	-2.819883	117.7117	-11.21724
Akaike AIC	-1.673117	-4.937968	1.503044	0.746199	-7.566324	1.325327
Schwarz SC	-1.295932	-4.560783	1.880229	1.123384	-7.189139	1.702512
Mean dependent	0.010050	0.012808	0.204191	0.074982	-0.000750	0.078855
S.D. dependent	0.096201	0.033175	0.409844	0.368688	0.004539	0.491874

Determinant resid covariance (dof adj.)	2.19E-14
Determinant resid covariance	3.16E-15
Log likelihood	237.2243
Akaike information criterion	-12.63616
Schwarz criterion	-10.09016
Number of coefficients	54

Source: Researchers computation using E-views 10.0

The Vector Error Correction Model (VECM) evaluated LNUR and LNTFP and LNGCF alongside LNVAT and LNCIT and LNLFP relationships throughout 1995–2023. A total of 29 adjusted observations offer the basis for these estimates which represent both long-run equilibrium and short-run adjustment patterns after deviations from the cointegration pathway. The normalized cointegrating equation showing the long-run unemployment relationship contains LNUR as the dependent variable. The unemployment rate increases significantly with higher total factor productivity levels according to long-term data (2.4887; t = 10.17). This anomalous relationship may suggest that productivity gains produce capital market growth and staff reduction which leads to increased structural joblessness. The results showed that better unemployment control comes from higher gross capital formation levels in the long run (-0.1890; t = -6.28).

The negative significant value of -0.8230 (t = -4.86) found for LNVAT in the outcome seems to show how indirect taxes cause demand reductions that lead to employment declines. The results displayed a significant negative relationship between labor force participation and unemployment (-12.8268; t = -4.31). This may occur because rising employment participation creates more workers than available jobs in the market. The research shows that corporate tax rates create a positive link to employment levels one year ahead (0.4849; t = 3.66) although this leads to unemployment increases. This connection might be caused by corporate taxes negatively affecting workplace decisions.

Each variable slows down in the short term by specific amounts that are defined by ECT coefficients to reach equilibrium following a disruption. Total factor productivity demonstrates a negative and strongly significant impact on ECT (-0.0906; t = -4.32) to resolve system imbalances which directs the system toward its equilibrium trajectory. The error correction terms of D(LNVAT) and D(LNCIT) demonstrate substantial positive values (1.2504 and 1.5795 respectively) which indicates that VAT and corporate income tax quickly react to equilibrium deviations because they show sensitivity to macroeconomic fluctuations.

Short-run error correction patterns show no statistical relationship between the ECTs values for LNUR, LNGCF, and LNLFP because there are institutional rigidities and delayed responses and structural lags in labor market and investment activities. Results showed that a one-unit increase in the lagged difference of LNTFP leads to a 0.4899 growth rate increase in LNTFP (t = 4.51) indicating strong production efficiency persistence. Temporary changes of LNGCF(-1) drive corresponding positive effects on both LNVAT and LNCIT during the short run with calculated coefficients equal to 0.5500 (t = 3.00) and 0.8086 (t = 3.30). Additional short-term investment leads to increased tax collection rates that could result from increased business activity and supported by higher aggregate demand.

The idea that both tax instruments are interdependent in the short term is further supported by the fact that D(LNVAT(-1)) and D(LNCIT(-1)) are both significantly positive in explaining their own short-run fluctuations as well as the variation in each other. However, the majority of D(LNLFP) and D(LNUR) short-run coefficients are statistically insignificant, indicating that labor market variables are either not very responsive or inert.

Additional information is provided via model diagnostics. The explanatory strength of each equation varies, as indicated by the R-squared values. With an R-squared of 0.77 and an adjusted R-squared of 0.70, D(LNTFP) is the best-fitted equation, indicating that a significant amount of the short-term variance in productivity

can be explained by the model. While the labor force participation, capital creation, and unemployment equations have relatively poor explanatory power, with adjusted R-squared values near or below zero, D(LNVAT) and D(LNCIT) follow with moderate R-squared values of 0.46. This implies that in order to properly represent short-run dynamics, these equations can benefit from the addition of extra explanatory variables or structural dummies.

Discussion of Findings

Value added tax (VAT) has no significant effect on Misery Index (MI)

Table 1a revealed that the Value Added Tax (VAT) variable possesses a −15.6275 coefficient value which remains significant at a p-value of 0.0010. Thus, a 1% increase in Value Added Tax (VAT) leads a 15.63% reduction in Misery Index in the long run. Value Added Tax (VAT) exhibits a very strong negative long-run association with the Misery Index, suggesting that higher VAT efficiency or implementation may coincide with lower levels of economic distress over time. Although this relationship is not statistically significant, the direction and strength of the association are notable. A possible explanation is that well-managed VAT systems enhance fiscal stability by generating steady revenue without severely disrupting economic activity. This stable revenue stream can enable governments to fund social safety nets, control inflation through prudent macroeconomic policy, and invest in job-creating infrastructure. These outcomes collectively could contribute to reductions in both unemployment and inflation, key components of the Misery Index.

Similarly, in the short run, Value Added Tax (VAT) variable possesses a 0.1575 coefficient value which remains insignificant at a p-value of 0.6703. A plausible explanation for this weak positive association is the immediate impact of VAT on consumer prices. As a consumption-based tax, VAT can lead to short-term price increases when imposed or adjusted, especially if businesses pass the tax burden onto consumers. This can contribute to a temporary rise in inflation, which directly feeds into the Misery Index. At the same time, higher VAT may slightly reduce consumer purchasing power, leading to a contraction in demand that can affect business activity and employment levels in the near term. However, the overall weak and statistically insignificant nature of the association suggests that these effects are not pronounced or consistent enough to establish a definitive short-run link between VAT and widespread economic distress. Factors such as VAT rate levels, coverage, administrative efficiency, and broader economic conditions likely influence the extent of its short-term impact.

This findings are in sharp contrast to that of Usman & Idoko (2021) who reported positive and significant impact of VAT on Nigeria's poverty level in the long run. The outcome covered a period between 1990 and 2019. This contrast in findings may be attributed to the fact that the Nigerian economy has evolved over the decades, with increased diversification and digitalization. VAT might now have a different effect on job creation across sectors e.g., services vs. manufacturing), possibly reducing the tax's adverse effect on employment compared to earlier periods dominated by fewer job-creating sectors. Also it is important to note that methodological choices such as how lag structures, control variables, or stationarity issues are handled can significantly affect the nature and direction of results.

Value added tax (VAT) has no significant effect on Unemployment Rate

Table 1b revealed that the Value Added Tax (VAT) variable possesses a −0.8230 coefficient value which remains significant at a p-value of 0.0001. Thus, a 1% increase in Value Added Tax (VAT) leads a 0.82% reduction in unemployment rate in the long run. Similarly, in the short run, Value Added Tax (VAT) variable possesses a −0.0590 coefficient value which remains insignificant at a p-value of 0.6798. Value Added Tax (VAT) exhibits a strong negative long-run association with the unemployment rate. This suggests that efficient VAT systems, when well-managed, can contribute to reducing unemployment over time. The mechanism behind this relationship lies in the revenue-generating potential of VAT. As a broad-based consumption tax, VAT provides governments with a stable and predictable stream of income. When collected efficiently, this revenue can be directed toward public investments in infrastructure, education, healthcare, and other social programs. These expenditures not only improve the overall economic environment but also create direct and indirect employment opportunities. Consequently, a well-functioning VAT system may enhance fiscal stability and contribute to long-term job creation.This findings are in line with the findings of Usman et al., (2025) which reported an insignificant negative effect of CIT on economic growth in four selected sub-saharn African countries using a panel data spanning 22 years from 2000-2022. The findings were in sharp contrast with those of Olabiyi et al., (2024); Iwegbe & Daddau (2024) and Eiya & Osazuwa (2017), all studies found that VAT was positively associated with unemployment rate both in the long run and short run. This may be attributed to the fact that the Nigerian economy has evolved over the decades, with increased diversification and digitalization. VAT might now have a different effect on job creation across sectors (e.g., services vs. manufacturing), possibly reducing the tax's adverse effect on employment compared to earlier periods dominated by fewer job-creating sectors.

Conclusion

This outcome examined the relationship between value added taxes and economic development in Nigeria from 1993-2023. In line with the Solow-Swan model of Economic growth, Value Added tax (VAT) is associated with capital formation, thus in line with this model, Capital (K) was proxied by Gross Capital Formation (GCF), technology Input (A) was proxied by Total Factor Productivity (TFP) while Labour (L) was proxied by Labour Force Participation. Also, in this outcome, Economic Development is measured using two variables: Unemployment (UR) and Misery Index (MI).

In terms of Misery Index, the outcome revealed that Value Added Tax (VAT) exhibits a *very strong negative long-run association* with the Misery Index, suggesting that higher VAT efficiency or implementation may coincide with lower levels of economic distress over time. In terms of Unemployment rate, the outcome revealed that Value Added Tax (VAT) exhibits a strong negative long-run association with the unemployment rate. This suggests that efficient VAT systems, when well-managed, can contribute to reducing unemployment over time. In conclusion, increase in Value Added Tax (VAT) has the potential to support economic development both in the short-run and long-run. Hence, strategic tax design, particularly with regard to VAT efficiency is essential for fostering sustainable economic development.

Recommendations

Based on the findings of the outcome, the following recommendations were proffered.

- laws to promote employment and investment, including through rate moderation or targeted tax incentives.
- Fiscal policy should continue to use VAT in a way that promotes economic stability because it has a substantial detrimental long-term effect on the Misery Index. To prevent regressive effects on low-income households, its implementation should be egalitarian.
- Indirect taxes may have deflationary and employment-supporting impacts, as indicated by the negative correlation between VAT and unemployment. To avoid burdening low-income households and ensuring macroeconomic stability, policymakers should think about keeping VAT rates steady while carefully excluding or subsidizing necessities.
- Excessive corporate taxes may impede job growth and price stability, as evidenced by the notable beneficial impact of corporate income tax on the Misery Index. These adverse consequences can be lessened by rationalizing corporate tax

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