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International Journal of Social Sciences and Economic Review, 2(2), 2020 | PP: 34– 43
https://doi.org/10.36923/ijsser.V2i2.63

Effect of Substance Abuse On Nigeria's Economic Performance

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Article History:

Received: 01-04-2020
Accepted: 26-05-2020
Publication: 27-06-2020

Cite this article as:

Ikhayere, J., Babalola, A., & Yelwa, M. (2020). A. Effect of Substance Abuse on Nigeria's Economic Performance. *International Journal of Social Sciences and Economic Review*, 2(2), 34-43. doi.org/10.36923/ijsser.v2i2.63

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Abstract: The purpose of this study is to investigate the effect of substance abuse on the real growth rate in Nigeria between 1993 and 2017. Specifically, it examines the period-based impact of substance abuse prevalence and the rehabilitation of individual drug addicts on the actual growth rate of the Nigerian economy. To achieve this, the study employs autoregressive distributed lag (ARDL) and co-integration/bound test techniques to analyze the data obtained from secondary sources, including the National Drug Law Enforcement Agency (NDLEA), National Bureau of Statistics (NBS), and Federal Ministry of Finance. Preliminary tests and correlation analysis were also conducted. The findings reveal that substance abuse has a significant negative impact on economic performance, whereas the rehabilitation of individual drug addicts has a significant positive impact. However, in the long run, there was no significant impact on the Nigerian economy. These results suggest that while immediate efforts to curb substance abuse and rehabilitate addicts can yield positive economic outcomes, long-term strategies need to be reassessed for sustained economic growth. In conclusion, this study underscores the importance of addressing substance abuse not only as a public health issue but also as a critical factor affecting economic performance. The findings provide valuable insights for policymakers, drug control agencies, and economic planners, highlighting the need for comprehensive and integrated approaches to combat substance abuse and support rehabilitation efforts. This work contributes to the limited literature on the economic impact of substance abuse and serves as a reference for future research in health economics and macroeconomic analysis.

Keywords: Drug Abuse, Narcotic, Rehabilitated-individual, Substance Abuse, Nigeria

1. Introduction

Current evidence from around the world reveals a continuing upward trend in the abuse and trafficking of narcotic and psychotropic substances. Drug abuse and trafficking among adolescents and young adults have existed for decades. However, the proportion has grown at a disturbing rate over the past two decades, crossing all socio-economic, political, and national boundaries.

The World Drug Report shows that around 210 million people aged 15-64 years consume illicit drugs annually. Out of this number, problem drug users account for 27 million, and millions die from illicit drugs and alcohol abuse annually (UNODC, 2011). One indicator of the extent of drug abuse and trafficking in economic terms is the estimates of the international illicit drug industry. According to the Global Financial Index (GFI), the global market in drug trafficking has a projected annual global worth of between $426 billion and $652 billion (USD), making this market the most lucrative illicit market next to counterfeit and pirated goods. It is expected to generate as much as $1.13 trillion annually (GFI, 2017). There continues to be an unsatisfied and huge demand for drug abuse prevention, treatment, care, and support, particularly in developing countries. Drug use affects not only the individual user but also their families, friends, coworkers, and communities. The abuse of these drugs cuts across culture, social, and political background, sex, age, and religion. In some quarters, it is not only seen as a health or social problem but a threat to human existence.

Africa is significantly involved in the illicit drug trade. For instance, illegal drug consumption in South Africa doubles the world norms, with the largest illegal drug market in Sub-Saharan Africa. Figures from the South African Police Service show that drug abuse accounts for about 60% of all crimes, and 15% of South Africans abuse drugs (South African Depression / Anxiety Groups, 2013). In 1996, an estimated 3.6 million Nigerians had drug abuse problems (NDCMP, 1999). In 2018, a study conducted by the National Bureau of Statistics (NBS) established the massive scale of Nigeria's drug challenge. The survey indicates that, in 2017, approximately 15 % of the adult population in Nigeria (around 14.3 million people) reported a significant level of use of psychotropic substances. This report is alarming because it doubles the global 2016 average of 5.6% among adults (Yomi, 2019). Despite various measures undertaken by law enforcement agencies, the relative ease with which youths are able to obtain all forms of illicit drugs is disturbing. This appears to be a fallout effect of

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drug trafficking in Nigeria, which is used as a conduit in the international narcotic drug trade. Local markets for narcotic drugs are being created in the major cities of Nigeria. Youths exposed to drug abuse often develop social, physical, psychological, and economic problems. Lives are lost daily through addiction and the activities of drug traffickers. A significant number of violent crimes and countless deaths from accidents have been traced to the activities of persons influenced by drugs. The increase in the number of international conferences, symposia, and seminars on drug problems reflects the concern over the widespread abuse of drugs in many countries of the world, including Nigeria.

1.1. Stylized Facts About Substance Abuse In Nigeria.

The Government of Nigeria has been sincerely worried about the extent of and the rising tendency in the demand for and traffic in narcotic drugs and psychotropic substances, which unfavourably affect the international image of the country and the well-being of its citizenry. Distinguishing the relationship between illicit traffic in drugs and psychotropic substances and other related organized crimes that destabilize and demoralize the real economy and threaten the stability and security of the country within the sub-region is a matter of great concern. Nigeria has been at the forefront of international efforts to reduce the drug menace in support of regional and global peace and security.

The problem of drug abuse started to take on a very worrisome dimension in the late forties, following the return of some Nigerian soldiers from Burma and India, where they participated in World War II. Among the spoils of war the soldiers were said to have returned with were seeds of cannabis sativa, also known as India Hemp. They discovered that the illicit plant would thrive in some parts of the country. Over time, the cultivation of cannabis began to develop exponentially, alongside the trafficking and abuse of the plant, which many drug analysts describe as the “wicked weed.” By the early 1990s, those engaged in the nefarious illicit drug business rapidly realized that the geographical location of Nigeria, its dense population, bustling business, and active air transport activities provided a conducive environment for a thriving drug trade involving “Category A” drugs such as cocaine, heroin, and other psychotropic substances.

The drug data statement of the National Drug Law Enforcement Agency (NDLEA) shows that all categories of illicit drugs are widely abused in all states of the federation, including the Federal Capital Territory (FCT). The 1999 rapid situation assessment of the drug problem in Nigeria, undertaken by NDLEA/United Nations Development Program (UNDP) in 22 states of the federation covering the six geopolitical zones, revealed that cannabis is the drug most abused by all categories/classes of people in society (NDLEA, 2017). These groups include secondary and tertiary students, commercial sex workers, artisans, professionals, unemployed youths, journalists, religious leaders, law enforcement personnel, and prison inmates, among others.

These drugs are not produced in Nigeria but are brought in from Asia and South American countries. Thus, Nigeria serves not only as a consuming nation but also as an international transit point for illicit trafficking to Europe and America. The fallout of this illicit trade in Nigeria is the creation of local markets for the sale and consumption of cocaine and heroin. There is also a rising trend in the consumption of various chemicals that produce psychoactive vapours, which are readily abused, mostly in the northern part of the country. Examples of these chemicals include aerosols, gasoline, glue, nail polish remover, and insecticides. NDLEA annual reports indicated that drug abuse and illicit cannabis cultivation and trafficking have, over the years, followed observable social parameters such as gender, age, ethnicity, and social class. The report shows that between 2000 and 2010, a total of 48,728 males and 3,226 females were arrested and prosecuted. The report also indicated that most of the people arrested for cross-border illicit drug trafficking come from the South-East, South-South, and South-West, with occasional arrests of persons from other parts of the country. Meanwhile, the North-West and South-East are categorized as the highest in drug abuse, followed by South-South, North-Central, North-East, and South-West in that order (NDLEA, 2017). The same report indicated that 8,826 suspected drug offenders, consisting of 8,332 males and 494 females, were apprehended in 2014 alone. The total quantity of drugs seized stood at 166,677.18 kg. As usual, cannabis maintained the lead in total drug seizures with 158,852.20 kg, followed by psychotropic substances at 7,407.20 kg, cocaine at 222.04 kg, heroin at 56.449 kg, methamphetamine with 119.2 kg, and ephedrine with 35.8 kg. It is particularly concerning that over ten clandestine illicit drug laboratories were discovered in Anambra and other parts of the country in 2015 and 2016 alone, earning the country the opprobrium to be a drug-producing nation (Mitchel, 2015).

Drug abuse in Nigeria is not predominantly a male affair; women are also largely involved. Between 2000-2010, a total of 48,728 males and 3,226 females were arrested (NDLEA seizure report, 2015). This represents a significant drain on the labour force and human capital resources because when traffickers are incarcerated, they are unable to participate in labour supply, thereby crowding out productivity.

The social and economic costs related to drug abuse in Nigeria are high. These include the financial losses and distress suffered by drug-related crime victims, increased burden for the support of the addicts, and greater demand for medical and other treatment services. There is also a significant loss of potential manpower, leading to poor economic performance and the creation of a volatile environment for investors, all contributing to a lowered GDP in the country. Botvin decried the involvement of Nigerian youths in drug trafficking and crimes, which impair Nigeria’s image both at home and abroad. Such individuals constitute a menace to society, become social deviants, and are economically dependent, rendering the labour market vacant (Botvin, 1995).

The drug data report of the NDLEA showed that all categories of illicit drugs are widely abused in all states of the federation. The data revealed that cannabis is the most commonly abused drug by all classes of people in society—artisans, professionals, civil servants, journalists, religious leaders, health workers, traders, and law enforcement agents who constitute the labour force. High productivity in an economy is a function of a healthy labour force (NDLEA, 2017).

The unsavoury phenomenon of illicit drug use and abuse calls for the societal dedication of resources to evidence-based prevention strategies and interventions, which include treatment, rehabilitation, and public enlightenment programs. The Nigerian government expended #500 million in 2008 alone on drug abuse enlightenment in all six geopolitical zones of the country (Mitchel, 2015). Although such preventive measures can be expensive, studies have shown that for every $1 spent, an effective prevention program can save the government up to $10 in subsequent costs (INCB, 2012). In 2012, about 1,404 hectares of farmlands used for the cultivation of cannabis were discovered and destroyed by the drug law enforcement agency in Nigeria, while illicit drugs seized weighed 33,968 kg, with a projected street value of #34 billion naira, which was roughly half the national budget for agriculture that year. When these illicit drugs are seized by law enforcement and destroyed through public burning, investments in them by farmers are nullified. Despite ever-increasing budgetary allocations and expertise in drug abuse control in the country, there is still a sporadic increase in the drug problem in both demand and supply..

2. Literature Review

2.1. Conceptual Review

Most definitions of substance abuse available in the literature are not usually expressed in economic terms but in public health, medical, and criminal justice contexts. For example, the National Institute on Drug Abuse (NIDA) defines drug addiction as a prolonged, relapsing malady characterized by habitual drug-seeking and consumption despite adverse implications (NIDA, 2018). A definition expressed in epidemiological terms considers drug abuse to occur when a relevant etiological division is greater than zero, meaning that drug abuse harmfully affects the health of the consumer (Eric et al., 2000).

A more all-inclusive definition within the realms of economics and sociology, which encompasses non-medical costs such as accidents and policing, is that abuse exists when drug use, most often of illicit drugs, involves a net social cost in addition to the resource cost of the provision of that drug. That is, substance abuse arises if society incurs a net cost as a result of drug use.

Specifically, substances are abused by individuals when they are consumed in ways different from medically recommended or socially acceptable forms within society. Simply put, a drug is said to be abused when its use is not medically necessary, it is used for non-medical purposes, its use is legally prohibited, or it is excessively used, as in the case of a socially acceptable drug like alcohol.

2.2. Theoretical Review

National governments and business communities are increasingly and continuously recognizing the undesirable consequences of substance abuse on their economies and national labour force. The impact of illicit drug use on our national economies and the health of people who use drugs is notorious. The preventive measures undertaken by the government, the production and preparation of illicit drugs by traffickers, and the care, rehabilitation, and social reintegration process by addict families are serious financial and economic drains (Ijie, 2016). It is generally accepted that substance use and abuse by workers can harmfully affect their performance and the productivity of workplaces and invariably cut down the national output of that society (Eric et al., 2000).

Drug abuse occurs most often among people in the 15-55 years age cluster (UNODC, 2017). In essence, it includes those within the labour force. Given the high unemployment rate in most developing countries like Nigeria, gainful employment is often a major problem. Abuse of illicit drugs edges the probability of entering or remaining in the employment sector while thwarting initiated by the inability to find a job favours drug intake, thus creating a vicious circle (Ijie, 2019). Alcohol and drug abuse by employees cause many expensive problems for businesses and industries, ranging from low productivity, workplace accidents, and injuries to an increase in health care and insurance claims, to mention a few.

The extrapolated economic cost (externalities) of drug abuse in the U.S. was put at $195 billion in 2007. This cost includes $120 billion in lost productivity, mainly due to labour involvement costs, care for drug abuse victims, detention, and premature death; $11 billion in health care costs; and $61 billion in criminal justice costs, which included criminal investigation, prosecution, and incarceration (UNDCP, 2009). These costs incurred have an opportunity cost, which is the next best sector the government would have spent on if not spent on the management and control of drug abuse-related issues.

Drug abuse in the workplace imposes a substantial extra cost on the trade industry, thus decreasing its competitiveness. Despite its current level of development, society will find it extremely difficult to advance if it has to depend on a workforce weakened by large-scale drug use and abuse. The consequence of illicit drug use on productivity depends on the type, quality of drugs consumed, and the performance required for the job in question. Responsibilities that involve high-level judgment, persistent attention, instant recollection, and fine motor skills are apparently more easily messed up by drugs than physical labor.

The correlation between low productivity, accidents, and drug-taking habits is also well known in many parts of the world today. Drug and alcohol-related issues in the workplace are not only costing Australian businesses money in absenteeism but also a ponderous $6 billion in lost productivity (Kristin, Synnove & Torleif, 2018). Further to the direct financial cost businesses suffer, there are concerning health issues that provide further stress in the workplace. Drug issues cause a multi-billion rand dent in the South African economy annually. The yearly expenditure to the country's alcohol abuse alone, in the areas of absenteeism, reduced efficiency, health, and welfare costs, as well as alcohol-connected misconduct, are projected at up to 10% of GDP or as much as R37.9 billion annually, according to a 2014 study in the South African Medical Journal (SAMJ). The newest investigation from the Medical Research Council (MRC), issued in the South African Medical Journal, indicates that South Africa lost approximately $23 billion in 2009 as a result of alcohol abuse. It was said that around $3 billion of the said amount was spent on tackling the social ills linked with alcohol-induced challenges, which include road accidents, disabilities, illnesses, deaths, and crimes. Health care services received the second-largest bill, $930 million, followed by social welfare at $30 million, according to the MRC study (Forbes Africa, 2017).

Examining illicit drug use and abuse relating to productivity outcomes is essential for policies and research geared towards checking drug challenges, and ascertaining its correlation with micro and macro levels of labor market outcomes and economic performance as a whole is also apt in our present days (Roldes, 2014). Recent studies indicate that there seems to be a correlation between substance abuse prevalence and labor productivity, and hence economic growth (Ijie, 2019; Roldes 2014; Eric, 2000; Kaestner, 1999). This supports the investigation carried out by The International Labour Organisation (ILO) involving Poland, Sri Lanka, Egypt, Namibia, and Mexico, in which drug abuse has a negative influence on the economic performance of the affected country and its citizens. Buddy (2020) in his study also demonstrated that substance abuse among workers could endanger public safety, diminish job performance, cause loss of productivity, theft, and fatalities, and thus affect the performance of the economy as a whole.

In a similar manner, according to the National Safety Council, the U.S. loses an estimated $74 billion annually in lost work productivity as a result of alcohol intake, from absenteeism, low output, and premature retirement to withdrawal from work, death, or little earning prospects. Since small and medium-sized businesses may not have activities to fight alcohol consumption, they are more likely to employ workers who struggle with alcohol use than larger businesses. In some countries, drug activities make users reduce their thought about their predicaments. This work adopts the (ILO) studies in which drug abuse has a negative impact on national productivity.

2.3. Empirical Review

Far-reaching econometric models have also been developed and employed in establishing the impact of substance abuse on macroeconomic variables such as human capital, productivity, employment status, poverty, labor supply, and wages. For instance, Kaestner (1999) used the two-equation model to evaluate the effect illicit drug use has on the wages of workers. His results are stable and supportive, in line with earlier research, and the study concluded that illicit drug use has a direct consequence on workers' wages. The longitudinal estimates, which control for unobserved heterogeneity in the sample, are mixed among men. However, estimated wage influences of marijuana and cocaine use are indirect. The findings also revealed that the influence of cocaine consumption remains directly significant among women. This finding indicates that the misuse of drugs is gender-sensitive.

Terza and Peter (2007) examined the effects of substance abuse on job quality and productivity, employing the 1992 National Longitudinal Alcohol Epidemiological Survey (NLAES). Their findings established that substance abuse is not exogenous and has a significant negative impact on the likelihood of white-collar employment. However, the findings indicated an opposite influence on part-time jobs, as such individuals only have income intermittently and not on a regular basis. Their results also showed that illicit drug use is income elastic, as it could differentiate between those on regular salaries and those on part-time wages.

Roldes (2014) employed a cost estimation methodology to determine the social cost of drug abuse in Australia. The drugs examined included alcohol, cannabis, opiates, amphetamines, cocaine, and hallucinogens, among others. The study reported that the estimated cost of drug abuse, including licit and illicit substances, was equivalent to 4.8% of total expenditure.

Ijie and Babalola (2020), using the Techniques of Auto-Regressive Distributed Lag (ADRL) Model, investigated Government Expenditure on Substance Abused Persons and Economic Growth in Nigeria from 1993 to 2017. The bound test results indicate that there is a long-run positive effect of government expenditure on substance abuse on the real growth rate..

3. Methodology

3.1. Model Specification

In line with Cuddington's (1993) model, the functional relationship between economic growth and substance abuse effect can be modelled as:

GDPgr= *f*(SAP, RHB)----------(1)

Where:

GDPgr is the growth rate of real GDP.

SAP is the Substance Abuse Prevalence rate.

RHB is Rehabilitated individuals on substance abuse.

Transforming equation 1 into an econometric model, equation 2 was derived as

$GDPgr = b_o+b_1SAP+b_4RHB+Ui$……..…..(2)

Empirically, the regression equation for estimating the impact of substance abuse on economic growth can be modeled in logarithm form as follows

$LogGDPgr = b_o+b_1logSAP+b_2logRHB+Ui$ ……..(3)

All variables are as previously defined, except = b_o, as constant, b_1- b_2 are parameters for estimation and U_i as white noise, the error disturbance variable representing all other factors affecting GDP growth rate not captured in the model respectively.

3.2. Sources Of Data

Secondary data was employed. The data for this study was sourced from the NDLEA Annual Report and Drug Data Collection Research. Other sources included the National Bureau of Statistics (NBS), the Federal Ministry of Finance annual budget, as well as other relevant government agencies in substance abuse data collection. The use of secondary data is due to the need for data over a long period (1993-2017). The year 1993 is chosen as the base year of the study because it was the year when the Federal Government made a concerted effort and legislated on the control of illicit drugs. All the variables in the dataset are first transferred into the natural logarithm for statistical reasons such as standardization, equalization of the variables, and removal of trends. The study spans from 1993-2017 and consists of 25 yearly observations.

3.3 Description Of Variables

- Gross Domestic Product Growth Rate (GDPgr): GDP is the total income that accrues from the production of goods and services in the country over one year. This represents the output of the economy. The GDP growth rate measures how fast the economy is growing. The study employs the real growth rate, which is measured by nominal GDP deflated by the inflation rate and serves as a proxy for economic growth.
- Substance Abuse Prevalence (SAP): Prevalence is the number of cases of a particular disease or disorder occurring in the general population at a given point in time. Substance abuse prevalence is included in the model because it leads to a “crowding out” effect on the real GDP through diminished health status of the labor force, losses in production due to substance abuse mortality and morbidity, and lost labor productivity.
- Treated & Rehabilitated Addicts (RHB): The prevalence of treated and rehabilitated addicts is included in the model because capacities and abilities (skilled and unskilled) that have been diminished or lost due to abuse effects are recovered due to professional medical care and rehabilitation, allowing these individuals to contribute to the real GDP.

4. Results / Analysis

4.1. Summary Of Descriptive Statistics Results

Table 1 presents the descriptive statistics of the dataset with 25 observations. It shows that LRHB has the highest mean value (7.010927), followed by LGDPgr (1.405589) and LSAP (-5.31258). The distribution shows two different forms of normality according to the Kurtosis result. LGDPgr and LSAP show a leptokurtic distribution with values of approximately 4, while LRHB shows a platykurtic distribution. The Jarque-Bera statistics indicate the normality distribution of data. The probabilities show large values, meaning the null hypothesis of the normal distribution of the variables is accepted, except for LSAP, whose value is zero. Thus, all variables are normally distributed except for LSAP. The standard deviation shows the rate of volatility. Since the logarithm of all variables was taken, the volatility is already reduced. Table 1 shows that the highest standard deviation figure is for LRHB (1.334).

Table 1: Descriptive Statistics Results

	LGDP_GR	LRHB	LSAP
Mean	1.405589	7.010927	-5.31258
Median	1.586658	7.282761	-5.27818
Maximum	3.518559	8.884333	-4.60685
Minimum	-0.74605	4.691348	-8.16024
Std. Dev.	0.899243	1.334178	0.835194
Skewness	-0.41576	-0.27341	-1.90473
Kurtosis	3.963945	1.702875	6.995879
Jarque-Bera	1.553075	1.898982	29.20908
Probability	0.459996	0.386938	0
Sum	32.32854	161.2513	-122.189
Sum Sq. Dev.	17.79005	39.16067	15.34607
Observations	23	23	23

Source: Author’s computation from E-Views 9.

4.2. Result Of Correlation Matrix

Table 2 presents the relationship that exists within the variables. The result shows that LGDPgr has a 31.1% positive relationship with LRHB, while LGDPgr has a 29.5 % positive relationship with LSAP. These are both weak, except for the relationship between LSAP and LRHB, which is quite high to positive 80.5 %. Since the relationship does not imply causality, the study went further to make more analysis with econometric tools based on the model of the study.

Table 2: Correlation Matrix Result

	LGDP_GR	LRHB	LSAP
LGDP_GR	1	0.310564	0.295386
LRHB	0.310564	1	0.804988
LSAP	0.295386	0.804988	1

Source: Output from E-Views version 9.

4.3. Unit Root Test Result

The two test statistics used are Augmented Dickey-Fuller (ADF) and Phillip Peron (P.P.). The null hypothesis of both tests is that the variable has a unit root. Unit root test results are presented in Tables 3(A & B).

Table 3A: ADF Test Result

Variables	At Level	Probability	At 1st Diff.	Probability
LGDP_GR	-3.805104**	0.0133	-	-
LRHB	-1.629741	0.4526	-6.542821***	0.0000
LSAP	-5.503084***	0.0002	-	-

***significant at 1%.
**significant at 5%.

Source: Output from E-Views version 9.

The two statistics show that LGDPgr and LSAP are stationary at the level at 5% and 1% level of significance. However, LRHB is nonstationary at level but the first difference.

Table 3B: P.P. Test Result

Variables	At Level	Probability	At 1st Diff.	Probability
LGDP_GR	-2.818859*	0.0735	-	-
LRHB	-1.552378	0.4906	-7.139377***	0.0000
LSAP	-5.503084***	0.0002	-	-

***significant at 1%.
**significant at 5%.

Source: Output from E-Views version 9.

Since these variables were not integrated in the same order, the Autoregressive Distributed Lag (ARDL) model was employed. This technique called for lag selection order before employing it for the analysis. The result is presented below.

4.4. Results Of Selection Order Of Model.

Table 4 presents the findings of model selection criteria of twenty possible models using Akaike Information Criteria (AIC), Breusch Information Criteria (BIC), Hannan Quinn (H.Q.), and adjusted R-square.

Table 4: Model Selection Criteria

Model	LogL	AIC*	BIC	HQ	Adj. R-sq	ARDL Specification
1	-8.757522	2.262621	3.008709	2.424541	0.392943	(4, 4, 4)
2	-10.529452	2.336138	3.032487	2.487264	0.384012	(4, 4, 3)
3	-11.411963	2.324949	2.971558	2.465280	0.413751	(4, 4, 2)
4	-16.348692	2.699875	3.296745	2.829411	0.166090	(4, 4, 1)
5	-17.062589	2.672627	3.219758	2.791369	0.196678	(4, 4, 0)
6	-11.069251	2.387548	3.083896	2.538673	0.351517	(4, 3, 4)
7	-11.454772	2.329026	2.975635	2.469357	0.411356	(4, 3, 3)
8	-12.373631	2.321298	2.918168	2.450834	0.428909	(4, 3, 2)
9	-16.350803	2.604838	3.151969	2.723580	0.249330	(4, 3, 1)
10	-17.122099	2.583057	3.080449	2.691004	0.265557	(4, 3, 0)
11	-11.962322	2.377364	3.023973	2.517695	0.382203	(4, 2, 4)
12	-12.822176	2.364017	2.960887	2.493553	0.403984	(4, 2, 3)
13	-12.845972	2.271045	2.818176	2.389786	0.462369	(4, 2, 2)
14	-16.474946	2.521423	3.018815	2.629370	0.309456	(4, 2, 1)
15	-18.005199	2.571924	3.019576	2.669076	0.267688	(4, 2, 0)
16	-12.325892	2.316752	2.913622	2.446288	0.431500	(4, 1, 4)
17	-12.867811	2.273125	2.820256	2.391866	0.461249	(4, 1, 3)

18	-12.888691	2.179875	2.677267	2.287822	0.509252	(4, 1, 2)
19	-17.933915	2.565135	3.012787	2.662287	0.272643	(4, 1, 1)
20	-18.869338	2.558985	2.956898	2.645342	0.266034	(4, 1, 0)

Source: Author's Extract from E-views 9.

Of all these models, model eighteen with ARDL (4, 1, 2) was selected since it has the lowest values of AIC (2.18), BIC (2.68) and H.Q. (2.29) and the highest Adjusted R-sq (0.51). This model (ARDL, 4, 1, 2) was employed for the whole study.

4.5. Result Of ARDL

Table 5 shows the result of ARDL (4, 1, 2) in the short run. From Table 5, the impact of LGDPgr spread over four lag periods shows that they have a positive effect on the present growth rate. Still, their impacts are not significant as indicated by their standard errors (0.188, 0.194, 0.240), t-statistics (0.59, 1.59, 1.40) and the probability values (0.567, 0.141, 0.18). However, at fourth-lag period, the impact of LGDPgr on itself is significant at 1 % level of significance.

Table 5: Result of ARDL (4, 1, 2) with LGDPgr as the Dependent Variable.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGDP_GR(-1)	0.110759	0.187737	0.589967	0.5671
LGDP_GR(-2)	0.307572	0.193863	1.586543	0.1409
LGDP_GR(-3)	0.336972	0.240332	1.402106	0.1885
LGDP_GR(-4)	0.935405	0.251551	3.718547	0.0034
LSAP	-0.724082	0.960630	-0.753757	0.4668
LSAP(-1)	-2.857455	0.795206	-3.593352	0.0042
LRHB	0.561120	0.320902	1.748569	0.1082
LRHB(-1)	0.935473	0.355260	2.633209	0.0233
LRHB(-2)	-0.692013	0.265655	-2.604931	0.0245
C	-25.25312	6.851493	-3.685783	0.0036
R-squared	0.730088			
Adjusted R-squared	0.509252			
S.E. of regression	0.617623	Akaike info criterion		2.179875
Sum squared resid	4.196034	Schwarz criterion		2.677267
Log-likelihood	-12.88869	Durbin-Watson stat		2.726504
F-statistic	3.306010			
Prob(F-statistic)	0.032859			

Source: Author's Extract from E-views 9.

Substance abuse prevalence (LSAP and LSAP(-1)) shows the correct negative sign (-0.724 and -2.857), which is in line with theory. This means that in the present period (LSAP), a one % increase in LSAP, on average, would lead to a 0.724 % decrease in LGDPgr. However, the impact is not significant, as shown by all three statistics: standard error, t-statistics, and probabilities. At the one-lag period, LSAP(-1), a one % increase in LSAP, on average, leads to a 2.86 % decrease in LGDPgr, and its impact is quite significant with a low standard error (0.8) and high t-statistics (-3.59). Its probability (0.0042) indicates that the impact is significant at the 1 % level of significance.

The coefficients of LRHB show a positive impact on LGDPgr for the present and one-lag periods, which is in line with the a priori expectation, except for the two-lag period, which shows an unexpected negative sign. The lag periods of LRHB are both significant at the 5 % level of significance, as the probabilities show. Since LRHB(-2) is not in line with theory, it is concluded that LRHB(-1) has a significant positive impact on LGDPgr. By implication, a one % increase in LRHB in the previous year, on average, leads to a 0.94 % increase in LGDPgr.

The R-squared (0.73), which shows the %age of variation explained by the independent variables, indicates that about 73 % of variations in LGDPgr are explained in the model. Fisher's statistics show a value of 3.31 with a probability value of 0.03, meaning that the F-statistics is significant at the 5 % level. D.W. statistics (2.7) indicates the presence of serial correlation.

4.6 Result Of ARDL Bound Test

Table 6 showcases the result of the ARDL bound test, whose essence was to see whether there exists a long-run impact of the two explanatory variables (LSAP and LRHB) on LGDPgr. From the table, the F-statistics value

(5.05) does not exceed the I1 bound (6.36) at the 1 % level of significance, meaning that there is no long-run effect of the explanatory variables on the dependent variable. Thus, the study could not go further to analyze the long-run impact of the model. This is similar to the findings of Ijie and Babalola (2020).

Table 6: ARDL Bound Test

Test Statistic	Value	k
F-statistic	5.048940	2
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	3.17	4.14
5%	3.79	4.85
2.5%	4.41	5.52
1%	5.15	6.36

Source: Author's Extract from E-views 9.

4.7. Result Of Wald Test

Table 7 presents the results of the Wald test, which is basically to check for the presence of a redundant variable(s) in the model employed. Using the rule of thumb for standard error that, when it is greater than half the coefficient, the null hypothesis is accepted, among the two variables, broken (through lagging) into the five variables, only LRHB (at present period) shows sign of redundancy since its standard error (0.32) is quite higher than half of its coefficient (0.56). Therefore, other variables are quite relevant in affecting the dependent variable (LGDPgr), though in the short run.

Table 7: Wald Test

Test Statistic	Value	df	Probability
F-statistic	4.719911	(5, 11)	0.0151
Chi-square	23.59956	5	0.0003
Null Hypothesis: C(5)=0,C(6)=0,C(7)=0,C(8)=0,C(9)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
LSAP = C(5)		-0.724082	0.960630
LSAP (-1) = C(6)		-2.857455	0.795206
LRHB = C(7)		0.561120	0.320902
LRHB(-1) = C(8)		0.935473	0.355260
LRHB (-2) = C(9)		-0.692013	0.265655

Source: Author's Extract from E-views 9

4.8, Result Of Residual Diagnosis

Figure 1 presents the normality test of residual diagnosis of the model employed. The standard deviation (0.458) shows approximately close to zero deviation, which is quite good. It shows a mild negative skewness, which is also almost zero. The Kurtosis shows approximately 3.0, a mesokurtic distribution which indicates a normal distribution. Finally, the Jarque-Bera is 0.15 with a probability (0.93), meaning the null hypothesis (of normality) should be accepted.

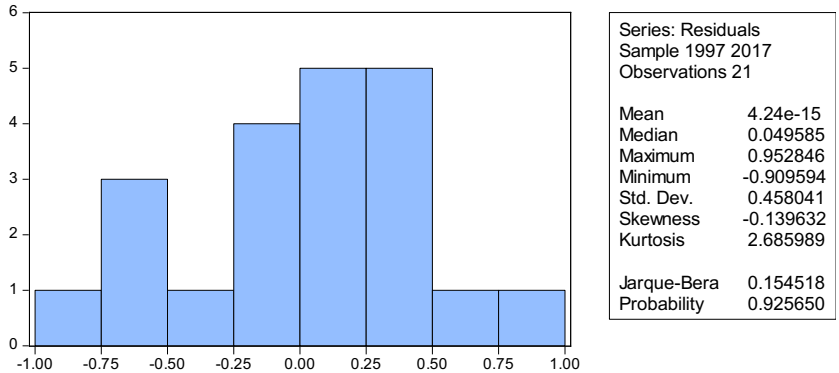

Figure 1: Test of Normality of the Residuals. Source: Author's Extract from E-views 9.

5. Discussion

The study examines the effect of substance abuse on economic performance in Nigeria for the period between 1993 and 2017. It uses substance abuse prevalence (SAP) and rehabilitated individuals (RHB) as the explanatory variables and the real growth rate (GDPgr) as a proxy for economic performance and the dependent variable.

The first objective of this study was to investigate the impact of substance abuse, captured by substance abuse prevalence (SAP), on economic performance proxied by the real growth rate in Nigeria. The result of our correlation matrix showed that substance abuse prevalence (SAP) has a positive relationship with the actual growth rate (GDP_GR). Since correlation does not imply causality, the study further analyzed the effect of substance

abuse prevalence using the ARDL technique. The ARDL cointegration result showed that in the short run, substance abuse prevalence had a significant negative impact on real economic growth. However, the ARDL bound test result indicated that there was no long-run effect of substance abuse prevalence on the actual growth rate. This implies that the more the government spends on curbing (reducing) the act of substance abuse prevalence in Nigeria, the more people are efficient at work, which will improve productivity and economic growth. This finding supports the study carried out by the International Labour Organization (ILO), involving Egypt, Mexico, Namibia, Poland, and Sri Lanka, in which drug abuse has a direct negative influence on the economic performance of the affected country's citizens, including the youths.

Objective two was set to examine the effect of RHB on the real growth of Nigeria's economy. The result of our correlation matrix indicated that RHB had a weak positive relationship with the real growth rate. The ARDL cointegration result indicated that RHB had a positive short-run impact on GDP_GR and was significant at the 5% level. This means that an increase in RHB would also invariably increase the value of the real growth rate of the economy since these people will be more efficient at work, thereby increasing productivity. This is also in line with the a priori expectation of the investigation.

6. Conclusion

The objective of this study was to investigate the effect of substance abuse on the real growth rate in Nigeria between 1993 and 2017. The study specifically examined the short and long-run impact of substance abuse prevalence and rehabilitated individual drug addicts on the real growth rate of the Nigerian economy.

Previous studies on illicit drug abuse were reviewed in their conceptual, theoretical, and empirical forms. The review of various theoretical frameworks guided the formulation of a functional relationship between the variables in line with the objectives developed in the study. Time-series data were sourced from the National Drug Law Enforcement Agency (NDLEA), the National Bureau of Statistics (NBS), the Federal Ministry of Finance, and other relevant agencies. Unit root tests were carried out on the data with all data integrated of order zero (0) except for rehabilitated individual drug addicts, which were of order 1(0). The models were then analyzed using the ARDL co-integration/bound test techniques. In between, correlation analysis was carried out.

The study found that substance abuse and rehabilitated drug individuals have a significant impact on economic growth. While substance abuse had a considerable negative effect, rehabilitated individual drug addicts had significant positive effects. However, in the long run, there was no indication of significant effects on Nigeria's economy.

7. Limitations and Future Recommendations

The primary area for further studies is the methodology used. Researchers could make use of econometric tools like logit and probit models to capture the possibilities involved in the study. Additionally, incorporating more variables such as crime rates and the number of imprisoned individuals due to drug use could enhance the model. Combating the menace of drug abuse prevalence and trafficking requires a cooperative effort from all sectors; thus, both government and non-government organizations at local and international levels must network to ensure effective control. Adequate funding should be provided to government organizations involved in drug demand reduction activities. Moreover, creating employment opportunities is crucial to divert users and traffickers from the illegal drug trade. It is also essential to embark on extensive preventive drug abuse education and enlightenment programs that emphasize a healthy lifestyle, especially given the increasing number of youths involved in drug abuse and illicit drug trafficking.

Acknowledgement Statement: The authors would like to thank all participants and the reviewers for providing comments in helping this manuscript to completion.

Conflicts of interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding statements: This research has not received any funding.

Data availability statement: Data is available at request. Please contact the corresponding author for any additional information on data access or usage.

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