

## Model of Drug Trafficking In Nigeria: A Panel Data Analysis Model

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**Abstract:** This study was carried out to determine important factors that contribute to drug trafficking in Nigeria. The study employed principal component analysis (PCA) as a variable reduction tool in this study. Using all the variables in the model may violate the principle of parsimony; therefore, it was necessary to keep the model as simple as possible. The latent root criterion was employed in variable selection under the PCA approach. The panel data model was also used to fit the relationship between drug trafficking and related factors. The data for this study was collected from Annual Statistical Bulletin/Socio-Economic data, National Bureau of Statistics and National Drug Law Enforcement Agency. It comprises of drug trafficking data from 2000 to 2011. Average Household Size (HHS), Unemployment Rate (UNR), Adult Literacy Education (ALE), total Literacy at Primary (LP), Male/Female Literacy Secondary (LS), were collected together with the Drug Trafficking records (DRT). On the whole, both across the zones and states, unemployment rate was found not to have significant effect on drug trafficking and over the years. This suggests that unemployment was never a significant cause of drug trafficking over the years and across the states in Nigeria. Average household size was significant across the states and zones but without any periodic influence. This also suggests that household sizes have contributed to the rate of drug trafficking in Nigeria. This may be attributable to the fact that members of large households may tend to seek greener pastures outside their state or countries of residents and as such may likely become victims of drug trafficking.

**Keywords:** Drug trafficking, panel data analysis, unemployment rate

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### I. Introduction

One of the major issues tarnishing the image of Nigeria, both home and abroad, is her citizen's involvement in hard drug trafficking. Drug trafficking is a global illicit trade involving the cultivation, manufacture; distribution and sale of substances which have been subject to drug prohibition laws.

A hard drug could be defined as any chemical substance which when introduced into the body affects the functioning and behavior of the individual concerned, making him/her unusually "high". They either stimulate/depress the central nervous system or produce sedative, stimulative, hallucinogenic, exhilarative, brain dysfunctional physical and psychological disorders on individual [1]. Some of the popularly known and most commonly used hard drugs reported by FBI[2] include cocaine, heroin, cannabis, marijuana, methamphetamine and hallucinogens.

NIDA[3] research findings have established that people abuse substances such as drugs, alcohol, and tobacco for varied and complicated reasons and the specific drug (or drugs) used varies from country to country and from region to region. Worldwide, the five main drugs of use are Cannabinoids, Stimulants, Hallucinogens and other compounds, Opioids and Morphine Derivatives and Depressant. Studies have shown that effects of drug addiction manifest physically, physiologically, and socially through the behaviour of drug addicts in society

Nigeria's tarnished image in the global village has become a sign of dishonor, dishonesty, and disrespect, leading to outright humiliation of her citizens abroad. Nigeria has emerged as a major drug trafficking hub over the past few decades. Nigerians are over-represented among Africans arrested for transporting drugs across international borders[4]. Nigeria also topped the list of major transit routes of heroines destined for Europe and a prominent participant among West African countries that produce and export cannabis to countries in Europe. The production of methamphetamine in Nigeria and its export also of growing concern and the cultivation of cannabis is well established in various parts of the country[5].

To effectively involve stakeholders in drug control activities and in line with the then Global Plan Action, the federal government constituted the Inter-Ministerial Committee on drug control (IMC) IN 1994. The committee is being headed by the Chairman and Chief Executive of NDLEA and has members drawn from Government Ministries and Agencies. The IMC produced the first National Drug Control Master Plan

(NDCMP) IN 1999, a second NDCMP 2008-2009 (extended to 2013) and the current NDCMP 2015-2019. The IMC has the responsibility to coordinate implementation of the NDCMP 2015-2019 as well as to monitor and evaluate its outcomes.

In addition, the Money Laundering Decree No 3 was enacted in 1995 to monitor laundering of drug trafficking proceeds through financial institutions. In 2004, the nature, scope and content of this decree were expanded to include the proceeds of other crimes. In the same year, the federal government also enacted the Economic and Financial Crime Act, No 20, leading to the establishment of the Economic and Financial Crimes Commission (EFCC).

In spite of the efforts of these and other collaborating agencies, Nigeria's image continues to be dented through her citizen's participation in hard drug. Statistical records indicated an upswing in drug business due to some challenges (poor logistics including operational vehicles, surveillance equipment, arms and ammunition, drug testing kits, etc., inadequate intelligence gathering capacity, lack of database, capacity gaps in intelligence-led operations, etc.) preventing effective operations.

According to Chiakwelu [6], Nigeria at this point in time is left with only one option: to rebuild her image. The author opined that if Nigeria fails to travel the pathway of revival, reawakening and rebirth, she will end up becoming a sinking ship and diminishing giant of Africa; and that Nigeria must rise to the challenge of self-transformation and revitalization by schooling her citizens to desist from globally detestable acts like terrorism and hard drug trafficking.

This present study attempts to isolate the main causes of drug trafficking in Nigeria, by state and by year, with the hope of opening up more effective ways of stopping drug trafficking in Nigeria.

### **Objective of the Study**

The aim of this study is to model drug trafficking in Nigeria while the objectives are to:

1. Identify the important variables responsible for drug trafficking using the principal component analysis.
2. Fit appropriate model for drug trafficking in Nigeria using the important variables.
3. Investigate if drug trafficking is changing over the years.

## **II. Literature Review**

Some studies related to hard drug trafficking as well as panel data analysis is reviewed below:

Ojebuyi and Salawu[7] argued that Trafficking and use of illicit drugs have become a deadly plague unleashing social and health hazard son the human race. According to the authors, the problem of drug trafficking is more prevalent in the developing nations, while Nigeria is one of the most affected African countries. Despite efforts by the Nigerian anti-drug abuse agencies, the rate of drug-related crimes in the country seems to persist. Their paper suggests that the nation's mass media should be more aggressively involved in fighting trafficking and use of illicit drugs in the country discussed different social change strategies that the Nigerian mass media could adopt to fight drug-related vices. However, the researchers recommend that these media campaigns should be effectively complemented with other communication approaches.

Dorn, Levi and King[8] carried out a review of upper level drug trafficking with Specific objectives of describing criminal organizations active in upper level drug trafficking; constructing a useful typology of them; to comment on changes over time; and to understand impacts of specific types of intervention on specific types of drug trafficking organization. Upper level trafficking is taken to include: source zone traders' relationships and transactions, including wholesale distribution within the source countries; export, international transit. Their interest is particularly on heroin and cocaine because these are of greatest concern in the UK drug strategy. The reviewers concluded that upper level drug markets can be understood as networking (including patterns of avoidance) and transactions between three broad 'types' of traffickers (and variants).

McGuire[9] examines the effect that the surge in narcotics trafficking has had on governance and security in the region, paying particular attention to the experience of Guinea-Bissau and neighboring Republic of Guinea (Guinea-Conakry. The central argument presented is that narcotics trafficking is only one facet of the overall challenge of state weakness and fragility in the region. Thus, simply implementing counter-narcotics initiatives in the region will have a limited impact without a long-term commitment to strengthening state capacity, improving political transparency and accountability and tackling poverty alleviation and underdevelopment. Without addressing the root issues that allowed for the penetration of trafficking groups into the states of the region in the first place, West Africa will remain susceptible to similar situations in the future, undermining the region's nascent progress in the realms of governance, security, and development.

Aning and Pokoo[10] focuses on the nexus between drugs, crime and terrorism. Their work argues that, the financial spin-offs from criminal activities contribute to the development of opportunistic relationships between criminals and extremist groups that threatens West Africa's fragile states. Their analyses were based on evidence from several West African states, but employ the ongoing crisis in the Sahel, particularly Mali, as an

empirical case, to demonstrate how 'profitable collusion' among different actors permits hollow states to become edifices that allows corruption, criminality and impunity to flourish.

Gyong and Tanimu[11] in their study found that there was a steady increase in the number of suspects arrested for drug related offences in Nigeria over the past two decades. For instance, they revealed that the number of suspects arrested rose from 293 persons in 1991, to a maximum of 6,323 persons in 2006, showing an increase of 2,158%. Their study also showed an increase in female involvement in drug related offences with an increase from 61 females in 1994 to 440 in 2006.

Parry and Pithey[12] reviewed the epidemiology of HIV and the changing patterns of drug trafficking and use in South Africa. A review of existing local studies on drug-related HIV risk among drug users revealed that most of the studies focused on drug use as a risk factor for HIV infection among adolescents and female street sex workers, with very few studies conducted among injection drug users (IDUs). Their article also reviewed current prevention strategies for addressing substance use in relation to HIV in South Africa and in the short-term recommends the implementation of risk reduction strategies that focus on reducing the adverse consequences of substance abuse. In the long-term, more integrated HIV and substance prevention programmes that include the biological, cultural, social, spiritual and developmental needs of individuals and groups are required to alleviate the double burden of drug abuse and HIV.

Essien[13] focused on drug use and abuse in tertiary institutions, the case of Federal University of Technology, Minna students. The study investigated the extent to which drugs are being used by students. Harmful drugs, subject to misuse as well as the reasons for use were highlighted. Some drugs commonly abused were also shown. The survey made use of questionnaires to seek students' opinion on the use and abuse of drugs. Descriptive statistics of simple frequencies and percentage were used for analyzing the data in respect of the research questions. The sample frame consists of 100 males and 100 female students. The research findings revealed that certain pre-disposing factors such as sex, age, family background, occupation of parent etc. contributes immensely to drug abuse by the students. The study also probed into reasons why students abuse drugs.

Odejide[14] highlighted the contribution of poverty, political instability, social unrest and refugee problems to the rapid spread of psychoactive substance use/abuse in Africa particularly among the youth. The review also points to a possible linkage between psychoactive drug use and HIV infection. At present in Africa, systematic evidence-based drug information is sparse. Also, drug policies are skewed towards formal control measures that may not encourage community participation. Poor funding, insufficient skilled health personnel, poor laboratory facilities, inadequate treatment facilities, and lack of political will are some of the impediments to controlling substance use/abuse in Africa. The paper argued that well-coordinated civil society participation is necessary in the control of drug problems in Africa in order to achieve a balance between supply and demand reduction efforts.

Nnabuko et al [15] critically analyzed the international image implications of the involvement of some Nigerian youths in hard drug trafficking and the public relations panacea for the problem. The objectives were to determine the effect of use of force and law versus public relations persuasive communications strategy in arresting the involvement of Nigerians in hard-drug trafficking and to examine the use of public relations media, techniques and strategies for the National Drug Law Enforcement Agency (NDLEA) in addressing the hard-drug problem in Nigeria. The study employed integrated qualitative and quantitative situation analysis study (SAS) approach. In the qualitative analysis, focus group discussions were used, while in the quantitative, opinion survey technique was employed in gathering data. The data were analyzed qualitatively and statistically. Results obtained showed that the use of force, law and imprisonment would not significantly discourage Nigerian youths from hard drug trafficking. But the use of public relations persuasive communication strategies and a combination of force and law would do it. The use of oramedia, social media, mass media, interpersonal communications, religious institutions, educational institutions, opinion leaders, town unions/associations were then recommended for the anti-drug campaign.

Obiechina and Isiguzo[16] focused on curbing the menace of drug use among students. They discussed some drugs that are commonly abused by the adolescents under the slangs or common name, route of administration and possible effects in terms of physical, psychological, social and emotional. The health implications of adolescents' drug behaviour were also explored. Their paper concluded that there should be more serious concern, and worried that more students in our secondary schools are fast joining the drug train, drinking and smoking away their future for the pleasure of getting high, hence, poses a threat to the health and safety of the adolescents, family, their community and the country. Recommended among others is that Ministry of Education and Culture in-collaboration with National Drug Law Enforcement Agency (NDLEA) should improve arrangements for sensitizing particularly students on the adverse effects of drugs and alcohol abuse. Also, teachers should be provided with skills on how to handle students with behavioural problems.

According to Ekpenyong[17], Drug abuse is becoming increasingly problematic in Nigeria. A number of recent studies suggest that almost all Nigerian youth experiment with drugs at some point, particularly alcohol and

nicotine. The foremost concern is the number of these youth that will form an addiction to serious substances, jeopardizing their own health and safety and creating difficulties for their families and the public at large. Drug use, it is widely accepted, has negative consequences for the academic, social, psychological and physical development of users. The explored the perceptions of public secondary school students around drugs and substance abuse and how these perceptions influence their behaviours. This study was carried out in four secondary schools in Bayelsa State, Nigeria. The data obtained was analyzed using descriptive and inferential statistics. The findings of the study revealed that the perceptions of the students with regards to drugs and substance abuse contributed considerably to their behaviour on these issues.

Clarke[18] discusses some of those implications, but argues that to better understand the threat faced by the new generation of jihadists in the West, security forces and intelligence services must also look at the micro-level of how lower level trafficking, drug dealing and petty criminal activity, combined with prison radicalization and ties to the black market and illicit underworld, combine to present a new spin on a longstanding threat. To be sure, the micro-level is even more difficult to counter, given already poor community-police cooperation and relations in the marginalized communities throughout the West. Further, the threat from drug trafficking at the micro-level can be equally as nefarious, as smaller cells are given greater autonomy to finance plots, recruit new members and ultimately conduct attacks in developed democracies. The paper concludes with some policy recommendations geared toward helping host-nations build capacity in critical areas, including law enforcement and intelligence, from the local to the state to the federal level.

### III. Research Methods

The study employed principal component analysis (PCA) as a variable reduction tool in this study. Using all the variables in the model may violate the principle of parsimony; therefore, it was necessary to keep the model as simple as possible. The latent root criterion was employed in variable selection under the PCA approach. The panel data model was also used to fit the relationship between drug trafficking and related factors. The data for this study was collected from Annual Statistical Bulletin/Socio-Economic data, National Bureau of Statistics and National Drug Law Enforcement Agency. It comprises of drug trafficking data from 2000 to 2011. Average Household Size (HHS), Unemployment Rate (UNR), Adult Literacy Education (ALE), Male/Female Literacy Primary (LP), Male/Female Literacy Secondary (LS), were collected together with the Drug Traffickers (DRT).

### IV. Results And Discussion Of Findings

#### Principal Component Analysis

Table 1: Communalities

	Initial	Extraction
UNR	1.000	.665
HHS	1.000	.797
LP	1.000	.694
LS	1.000	.665
ALE	1.000	.598

Extraction Method: Principal Component Analysis.

Table 1 presents the communalities statistics. Communalities is the proportion of each variable's variance that can be explained by the factors (independent variables). Initial communalities are, for correlation analyses, the proportion of variance accounted for in each variable by the rest of the variables. This is the square of multiple correlation when one factor is regressed over the rest

The values in this "Extraction" column indicate the proportion of each variable's variance that can be explained by the retained factors. Variables with high values are well represented in the common factor space, while variables with low values are not well represented. From table 1, the variables have high values which suggests that all the variables are well represented.

Table 2: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.259	25.173	25.173	1.259	25.173	25.173
2	1.100	21.996	47.169	1.100	21.996	47.169
3	1.060	21.200	68.369	1.060	21.200	68.369
4	.895	17.898	86.267			
5	.687	13.733	100.000			

Extraction Method: Principal Component Analysis.

From table 2, only three factors will be retained after the principal Component analysis, as there are only three variables that have Eigen values greater than one (1).

Table 2 also shows the percentage of the variances accounted for by each factor (**% of Variance**); cumulative percentage of variance accounted for by current and all preceding variables in the column (**Cumulative %**) and **Extraction Sums of Squared Loadings**—which is the number of rows in this panel of the table corresponding to the number of factors retained.

**Table 3: Component Matrix<sup>a</sup>**

	Component		
	1	2	3
UNR	.118	-.168	<b>.789</b>
HHS	.333	<b>.827</b>	-.053
LP	<b>.810</b>	.185	.058
LS	.636	-.503	.082
ALE	-.269	.318	.651

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

The variable selected (retained) are highlighted in bold in table 3 above. In each column, the highest value in each column of the component matrix is selected as the extracted values. LP is selected in column 2 as the first component with the highest value of 0.810. HHS is the second component extracted with value of 0.827 and the third component is UNR with value of 0.789.

### V. Panel Data Analysis

The redundant variable test in table 4 performs an F-test of the joint significance of variables that are presently included in a panel equation. The test shows that the cross section (states) and the period has significant effect on DRT. Also there is a significant interaction between effect of state and years.

The cross section fix effect test in table 8 presents the effect of state on the relationship between the dependent variable and the independent variables. LP and HHS were found to have a significant effect on DRT across the states but UNR does not. The intercept model was also found to be appropriate for the relationship between DRT and the independent variables. The aptness of the model test shows that the least square approach to the panel data regression is appropriate for fitting the relationship. The R-squared of approximately 0.112 shows that approximately 11.2% of the variation in the dependent variable is attributable to the independent variables. Table 5 presents the effect of years (period) on DRT. None of the independent variables have significant effect over the years, even when the test of model aptness shows that the model is a good fit for the relationship between DRT and the independent variables over time.

Table 6 tests the combine effect of cross section (states) and period (years). The result shows that only LP has significant effect on DRT across the states and over the years.

The redundant variable test in table 7 performs an F-test of the joint significance of variables that are presently included in a panel equation across the zones. The test shows that the cross section (zones) and the period have significant effect on DRT. Also there is a significant interaction between effect of state and years.

Table 8 presents the cross section fixed effect model for the zones. The tests shows that LP and HHS have significant impact on DRT as their p-values are less than 0.05. The intercept model was however not suitable for the relationship between DRT and the independent variables. From the r-square it is seen that 41.73% change in change in DRT across the zones is attributable to the independent variables.

### VI. Conclusion

This study was carried out to determine important factors that contribute to drug trafficking in Nigeria. On the whole, both across the zones and states, unemployment rate was found not to have significant effect on drug trafficking and over the years. This suggests that unemployment was never a significant cause of drug trafficking over the years and across the states in Nigeria. Average household size was significant across the states and zones but without any periodic influence over the years. This also suggests that household sizes have contributed to the rate of drug trafficking in Nigeria. This may be attributable to the fact that members of large households may tend to seek greener pastures outside their state or countries of residents and as such may likely become victims of drug trafficking. It is therefore recommended that government should improve living standards of its citizenry so as to discourage them from illicit trades and behaviours.

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APPENDIX

Table 4:

Redundant Fixed Effects Tests  
Equation: Untitled  
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	27.889379	(36,393)	0.0000
Cross-section Chi-square	563.118706	36	0.0000
Period F	3.901206	(11,393)	0.0000
Period Chi-square	46.013356	11	0.0000
Cross-Section/Period F	22.168847	(47,393)	0.0000
Cross-Section/Period Chi-square	575.009213	47	0.0000

Table 8:

Cross-section fixed effects test equation:  
Dependent Variable: DRT  
Method: Panel Least Squares  
Date: 08/05/16 Time: 18:39  
Sample: 2000 2011  
Periods included: 12  
Cross-sections included: 37  
Total panel (balanced) observations: 444

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	100.2076	25.59105	3.915728	0.0001
HHS	12.29649	5.492116	2.238935	0.0257
LP	8.36E-05	1.54E-05	5.410881	0.0000
UNR	-0.056844	0.072552	-0.783497	0.4338

Effects Specification			
Period fixed (dummy variables)			
R-squared	0.111733	Mean dependent var	202.4842
Adjusted R-squared	0.082745	S.D. dependent var	137.1707
S.E. of regression	131.3730	Akaike info criterion	12.62716
Sum squared resid	7404058.	Schwarz criterion	12.76553
Log likelihood	-2788.229	Hannan-Quinn criter.	12.68173
F-statistic	3.854494	Durbin-Watson stat	0.584158
Prob(F-statistic)	0.000003		

Table 5

Period fixed effects test equation:

Dependent Variable: DRT

Method: Panel Least Squares

Date: 08/05/16 Time: 18:39

Sample: 2000 2011

Periods included: 12

Cross-sections included: 37

Total panel (balanced) observations: 444

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	203.1185	19.34349	10.50062	0.0000
HHS	0.607030	3.917525	0.154952	0.8769
LP	-5.84E-06	1.13E-05	-0.517206	0.6053
UNR	-0.004470	0.043274	-0.103298	0.9178

Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.722833	Mean dependent var	202.4842
Adjusted R-squared	0.696077	S.D. dependent var	137.1707
S.E. of regression	75.62116	Akaike info criterion	11.57512
Sum squared resid	2310298.	Schwarz criterion	11.94411
Log likelihood	-2529.677	Hannan-Quinn criter.	11.72063
F-statistic	27.01550	Durbin-Watson stat	1.836453
Prob(F-statistic)	0.000000		

Table 6

Cross-section and period fixed effects test equation:

Dependent Variable: DRT

Method: Panel Least Squares

Date: 08/05/16 Time: 18:39

Sample: 2000 2011

Periods included: 12

Cross-sections included: 37

Total panel (balanced) observations: 444

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	112.7441	22.27576	5.061290	0.0000
HHS	8.988878	4.627767	1.942379	0.0527
LP	8.76E-05	1.53E-05	5.742488	0.0000

UNR	-0.044284	0.071833	-0.616480	0.5379
R-squared	0.087623	Mean dependent var	202.4842	
Adjusted R-squared	0.081403	S.D. dependent var	137.1707	
S.E. of regression	131.4691	Akaike info criterion	12.60439	
Sum squared resid	7605020.	Schwarz criterion	12.64129	
Log likelihood	-2794.175	Hannan-Quinn criter.	12.61894	
F-statistic	14.08568	Durbin-Watson stat	0.605214	
Prob(F-statistic)	0.000000			

**COEFFICIENT COVARIANCE MATRIX**

	C	LP	HHS	UNR
C	859.8069	-7.12E-05	-176.5158	-0.175888
LP	-7.12E-05	1.22E-10	3.35E-07	2.77E-08
HHS	-176.5158	3.35E-07	38.59029	0.027462
UNR	-0.175888	2.77E-08	0.027462	0.001783

**Panel Data Regression by zones CODING OF ZONES**

The geographic zones are coded as follows: South East =1; South South =2; South West =3; North Central =4; North East = 5 and North West =6.

**Table 7**

Redundant Fixed Effects Tests  
Equation: Untitled  
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	67.980988	(5,52)	0.0000
Cross-section Chi-square	145.423842	5	0.0000
Period F	5.650204	(11,52)	0.0000
Period Chi-square	56.612830	11	0.0000
Cross-Section/Period F	24.718652	(16,52)	0.0000
Cross-Section/Period Chi-square	154.974911	16	0.0000

**Table 8**

Cross-section fixed effects test equation:  
Dependent Variable: DRT  
Method: Panel Least Squares  
Date: 07/28/16 Time: 16:32  
Sample: 2000 2011  
Periods included: 12  
Cross-sections included: 6  
Total panel (balanced) observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	275.0546	182.5194	1.506988	0.1373
LP	0.000127	5.81E-05	2.187134	0.0329
HHS	19.70402	8.643064	2.279750	0.0264
UNR	-0.197884	0.247962	-0.798041	0.4282

Effects Specification

Period fixed (dummy variables)

R-squared	0.417339	Mean dependent var	1248.653
Adjusted R-squared	0.274229	S.D. dependent var	477.9077
S.E. of regression	407.1401	Akaike info criterion	15.03924
Sum squared resid	9448492.	Schwarz criterion	15.51355
Log likelihood	-526.4128	Hannan-Quinn criter.	15.22807
F-statistic	2.916216	Durbin-Watson stat	0.341608
Prob(F-statistic)	0.002195		

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