EUROPEAN ACADEMIC RESEARCH
Vol. IX, Issue 2/ May 2021

Impact Factor: 3.4546 (UIF)
DRJI Value: 5.9 (B+)

ISSN 2286-4822
www.euacademic.org

Analysis of Simulated Crime Rate in Lagos State: The Log-Linear Approach

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Abstract

This research work was carried out to statistically assess the crime rate in Lagos State using simulated data. The study covers ten most prevalent crimes (Assault, Theft, Store breaking, Burglary, Unlawful possession, Rape, Suicide, Murder, Breach of public peace, Armed robbery) during past years. Secondary data collected from the Lagos State Police head quarter was simulated appropriately and analysed for the purpose of the study. The result of the analysis shows that there is no interaction between crimes and years at which they were committed. It also shows that there is strong positive association between some crimes committed.

Keywords: Crime rate, Log-linear, Simulation

INTRODUCTION

A growing concern across the nation is the heightened incidence of criminal and violent behavior. There has been a steadily increasing trend in the crime rate over time until the 1990s, where the trend

begins to fall off. However, the fluctuations have been a historical pattern since 1960, and the causes of them remain unexplained.

Since the publication of Gary Becker (1968), the economics profession has analyzed the determinants of criminal behavior from theoretical and empirical points of view. The growing public awareness is justified because rampant crime and violence may have pernicious effects on economic activity and, more generally, because they directly reduce the quality of life of all citizens who must cope with the reduced sense of personal and proprietary security.

Most urban cities of the world have experienced a remarkable rapid urban growth resulting from industrialization and technological advancement. In Nigeria Industrialization and unplanned urbanization characterizes the economic and social Growth processes. The resultant effect is that the quality of the urban environment is above crisis situation. The spatial expression of these realities and the consequence of spontaneous urbanization with the uncontrolled growth pattern in most of the urban cities are manifested in diverse urban problems such as urban decay where visible forms of drug use, anti–social behavior and criminal damage to public and private properties are the order of the day (Gibbons, 2004). This however, leads to fear and insecurity of lives. Hence, Glaser and Sacerdote (1999); Banister and Fyfe, (2001) noted that the fear of crime is closely related to densely populated and built environment.

Crime and the fear of crime affect many aspect of everyday life in our cities. This promotes insecurity and anxiety in most cases. In Nigeria especially in the urban areas people live in fear.

Burglary, armed robbery, "yahoo-yahoo", kidnapping and other forms of crime are the other of the day. Gibbons (2004) opined that no matter the nature of crime, it will have dynamic effect driven by household location decision which in turn affects the price of properties. Hence the demand for low–crime neighbourhoods is revealed in a property (social exclusion unit, 2001). For instance studies of Los Angeles inner city corridors found that crime was the prominent concern of residence in the area.

Consequently, a potential renter or buyer of house would always be concerned with the crime rate in a neighbourhood before making their choice. Hence in high crime area rental or sales value tend to decline. Social exclusion unit (2001) noted that areas with high crime

and unemployment rates acquire poor reputations as properties in the areas are in bad condition and hence attracts low values.

Crime has become cultural in our civilised world. Breaking-News that used to announce serious and special events to the public has become more common than the ordinary ones, announcing crime instead. It used to be unexpected, few and fiendish, but nowadays, it is commoner than our rampant fashion. There is an unhealthy and serious competition on who is a better criminal in the society. A great percentage of men and women see nothing wrong with doing those things that are socially strange, legally wrong, morally sacrilegious, not to talk of the ones that are abominations, biblically.

Personal reasons, ulterior motives and selfish choices have become the defence mantra for many people. Some people even have the guts to produce well concocted, but flimsy reasons for the crime of murder. To them, the reasons for the dastardly act should be prioritized in the consideration process of the matter. In fact, to show the level of insanity predominantly in existence, many have been bewitched and given reasons to attempt suicide. Of course, we know that suicide missions have become a way of life in some regions of the world. Day after day, there are new cases where people enter into settlement agreements for monetary and what-have-you compensation, while they unperturbed, subject many 'innocent' souls to untimely death.

The looting of the nation's treasury by our political office holders has continued unabated, with the culprits refusing to take full responsibilities when nabbed. The case of the Iboris, the sacked bank chiefs; the past and present federal, state and local government leaders and all others undergoing trials in the hands of our anti-graft agencies, are just a very small fraction of the real offenders. Others must have done theirs incognito or are still under the protection of the power of incumbency.

The continued hostage-taking and harassment of Nigerians and expatriates by ransom-seeking kidnappers is going out of hand. The resurgence of militancy in the oil-rich region of the country has rubbished the little attempt made by the government to restore peace and improve the living standard of people in the area. Yet, those believed to be behind the menace are claiming innocence. No one wants to be blacklisted or labelled 'the scapegoat.'

The arms and ammunitions that were intercepted recently on different occasions at our ports, while on their way to the nation opened

another chapter of the nation's sorry state. There seems to be a higher level of insecurity in our nation as the elections involving our desperate politicians in 2023 are at the corner.

Generally, there is an increased desire in people to commit crime but a well reduced gusto to take full responsibility of the crime committed, nor even receive the commensurate punishment for the said crime, when they are eventually singled-out as the culpable culprits. Unfortunately, people continually indulge in capital offences that should attract capital punishments, while it is not easy for them to take responsibility of offences that are not punishable.

Much work has been done to determine the effect of crime on property values in the developed country (Haurin and Brasington, 1996; Patras and Greebaumt, 2006; Patras, 2007). In Nigeria, little or no effort has been made in this direction. The few known studies that exist focused on the performance of the police in relation to crime and the impact of urban crime on residents' satisfaction and mobility.

It is against this background that this study was undertaken to carry out an assessment of simulated crime rate in Lagos State.

PURPOSE OF THE STUDY

The purpose of this study is to assess the crime rate in Lagos State. Precisely, this research set to do the following:

(i) Ascertain the interaction between crimes and years at which they were committed.

(ii) Investigate any association between pair of crimes committed.

RESEARCH QUESTIONS

(i) Is there interaction between crimes and years at which they were committed?

(ii) To what extent is there an association between pair of crimes?

LITERATURE REVIEW

Crime, according to the Oxford dictionary, is defined as a serious offence committed which is punishable by law, or an illegal act committed as a whole. The fact that crime is on the increase in Nigeria is not new. The rising crime rate or the increase in criminal acts

prevalent in our society today is a symptom of a much more serious, deeply rooted problem. There are so many factors contributing to the rampant increase in crime that have to be addressed before we can think of moving this great country to higher height. One of the major factors contributing to the increase in crime in our society today (and perhaps the most important challenge to be overcome) is unemployment.

Nigerian organized crime, or Nigerian OC, may refer to a number of fraudsters, drug traffickers and racketeers of various sorts originating from Nigeria. Nigerian criminal gangs rose to prominence in the 1980s, owing much to the globalization of the world's economies and the high level of lawlessness already in the country.

Criminal organizations from Nigeria typically do not follow the mafia -type model followed by other groups. They appear to be less formal and more organized along familial and ethnic lines, thus making them less susceptible by infiltration from law enforcement. Police investigations are further hampered by the fact there are at least 250 distinct ethnic languages in Nigeria. Other criminal gangs from Nigeria appear to be smaller-scale freelance operations.

Nigerian criminal groups are heavily involved in drug trafficking, shipping heroin from Asian countries to Europe and America; and cocaine from South America to Europe and South Africa. The large numbers of ethnic Nigerians in India, Pakistan, and Thailand give their gangs ready access to around 90% of the world's heroin. In the United States, Nigerian drug traffickers are important distributors of heroin, from importing it into the country to distribution level and selling it to lower-lever street gangs.

CLEEN Foundation releases a report on crime in Nigeria for 2010 and 2011 and identifies mobile phone handsets, money and food as items holding more attraction to thieves.

Controversy has continued to trail the 2011 national criminal victimisation and safety survey presented by CLEEN Foundation recently. The foundation claimed that in spite of the various crimes control measures adopted by the law enforcement agencies in the Past 11 years, criminals have continued to operate with impunity. CLEEN foundation said it started the conduct of large surveys on crime victimisation in the country since 2004 in an effort to address the missing gap in the nation's crime control measures. The report covered 2010 and first half of 2011.

According to the CLEEN, the most common forms of victimisation were theft of various kinds of property, especially handsets, money and agricultural products. The foundation also noted that domestic violence, robbery and physical assault are also prevalent in the country. Theft of mobile GSM phones was rated 49. 9 percent, theft of money was put at 34.8 percent; domestic violence, 21 percent; physical assault 20.2 percent; burglary 13.7 percent; robbery was put at 13.5 percent while theft of agricultural products recorded 10.3 percent. Crimes like murder, rape, same sex intercourse, and car theft recorded low rates within the period surveyed. Some of the states that recorded high incidences of personal victimisation include Jigawa, Rivers, Federal Capital Territory, FCT; and Ebonyi; while Osun, Imo, Enugu, Abia, Ogun and Lagos states recorded the lowest. The report said more than half of the respondents, representing 56.1 percent, reported their bitter experiences to only family members and friends while about 16 percent, which is less than one fifth reported to the police.

Even among those that reported to the police, only 29 percent respondents were satisfied with the way the police treated their cases, while about 35.8 percent of the respondents were not satisfied at all by the response of the police. About 31 percent of them said the police did not do enough to apprehend the offenders and only 12percent accused the police of not responding promptly in their excruciating periods. Other respondents in the report also accused the police of demanding for bribe before taking action or in some cases colluded with the suspects to thwart investigation.

The report also looked into the action of rape victims and noted that victims are generally reluctant to report their experiences to law enforcement agencies due to fear of stigmatisation and insensitivity on the part of the public. In this case, only 27.8 percent of the victims of rape or attempted rape reported to the police. Among the victims, 47.8 percent were satisfied with the handling of the case, while 40.9 percent said they were not satisfied with the action of the police because they did not do enough either to apprehend the offenders or arrive at the right time. The report also listed factors responsible for the upsurge in rape cases in the country during the period under review. These include provocative dressing among young women, bad influence of the media, lack of self-control by some men, mental illness among men, influence of alcohol, keeping late nights by women and greed among the womenfolk.

The report also took a swipe on corruption in the country, which it says, is the most devastating threat to Nigeria's security, unity and development. The organisation noted that most of the critical problems in the country occur due to corruption. Some of the evils associated with corruption include inter-group conflicts, bureaucratic ineffectiveness, deterioration and absence of critical developmental and welfare infrastructure, widespread poverty, unemployment and crime. According to the organisation, there is high level of official corruption as there are perceptions of public officials asking for bribe before they carry out their duties, especially in agencies like the Economic and Financial Crimes Commission, EFCC, Federal Road Safety Commission, State Security Service, Independent Corrupt Practices and other related offences Commission, Nigeria Customs Service, Nigeria Immigration Service, Nigeria Police Force, Nigeria Prisons Service and Power Holding Company of Nigeria and other government agencies and institutions.

Innocent Chukwuma, executive director of the foundation, said long neglect of the police during the long years of military rule was responsible for the high rate of crime in the country. He noted that in spite of the various control measures that have been implemented in the country over the past 11 years, criminals have continued to operate in greater number. Chukwuma said the fear of crime was a major obstacle to personal well-being, social interaction and economic transactions and activities. "It appears that crime fighting in many states has been reduced to a desperate game with criminal elements having the upper hand. Bandits kidnap on daily basis collecting huge sums of money from helpless citizens, while the federal government, which controls law enforcement and security agencies appears helpless in responding to the phenomenon," Chukwuma said.

Etannibi Alemika, professor of Criminology and a leading researcher on crime and policing in Nigeria, said the survey were critical instruments of law making, policies, programmes and decisions aimed at promoting security and safety in the society. The analyses are also to be used for effective and efficient planning, operations and administration by the police, prosecutors, judges and prison officials. He insisted that the significance of the crime surveys originated from the inadequacies of official criminal statistics provided by the police, prosecutors, courts, prisons and other law enforcement and regulatory agencies in the various countries. "Due to the significance of the project,

nations strive to develop adequate capacity and deploy enough human, financial and infrastructural resources for the collection and analysis of the incidence, prevalence, trends and patterns of criminal activities and victimisation to acquire necessary knowledge and ability for crime prevention and control," he said.

But Peter Efosa, a public affairs analyst, identified some loopholes in the report. He said the surveys were hurriedly done and, therefore does not reflect the true picture of victimisation, insecurity and violent crimes in the country. "I commend the efforts of the foundation, but the report remains controversial because there are some issues raised that cannot be supported. Not every Nigerian will accept the report hook, line and sinker," Efosa said.

In investigating the ways by which crime rate affect business activities, Bates and Robb (2008) concluded that the effect of crime on firm performance might be indeterminate. Low crime areas offer higher returns than high crime areas. If high-crime locations are riskier than low-crime areas, investments flows should be driven towards the high-crime area, only if firms operating in that area earn above-average profits that exceed the cost of crime because of the disutility or decreased production up to a point where expected returns to capital are equalized across the two areas. Garrett and Ott (2009) examined the influence of city-level business cycle fluctuations on crime in 20 large cities in the United States. Their monthly timeseries analysis considers seven crimes over an approximately 20-year period: murder, rape, assault, robbery, burglary, larceny, and motor vehicle theft. Short-run changes in economic conditions, as measured by changes in unemployment and wages, are found to have little effect on city crime across many cities, but property crimes are more likely to be influenced by changes in economic conditions than are more violent crimes.

A study shows that property crime rate and population size are related but population size has no correlation with violent crime rates (Nolan, 2004). Harries (2006) on the other hand found violent and property crimes to be correlated with population density. Another study by Baltagi (2006) shows that although crime rates tend to increase with population density, the correlation is not significant. Yet another study suggests that violent and property crime rates are positively associated with percentage of commercially zoned areas, percentage of one-person household and unemployment rate (Kepple & Freisthler (2012).

Other studies have revealed findings of different shades on the subject matter including one by Chamlin & Cochran (2004) which concludes that population size (not density) is a strong predictor of violent and property crime counts; and another by Christens & Speer (2005) which argues that population density is among the most significant negative predictors of violent crime per capita (Christens & Speer, 2005). Studies have also attributed crime to other factors such as unemployment (Edmark, 2005; Andresen, 2006; Omotor, 2009; Hassan et al, 2012); absence/presence of tree canopy (Troy et al, 2012); presence of young populations (Andresen, 2006); combination of industrial/commercial land use with household dwellings (Shopeju, 2006); urbanization, weak criminal justice system and negative role models (Hassan et al, 2012).

One study has demonstrated that there is regional variation in rates of personal crime in Nigeria with the North-East having the highest rate and the South-West having the lowest rate. In addition, the study shows that the urban areas have higher rates of crime than the rural areas (Ikoh, 2011).This study seeks to solve the puzzle on state and regional variation in armed robbery cases in Nigeria. In a recent study in Nigeria, Omotor (2010) argued that population density is positively correlated to all forms of crime. The current study also seeks to interrogate this assertion by exploring the association between one form of crime, armed robbery and population density in a given year in which census was conducted in Nigeria.

This takes away the need for projections which come with errors.

METHODOLOGY

Research design

This research was designed to assess the crime rate in Lagos State. The ten most prevalent crimes (Assault, Theft, Store breaking, Burglary, Unlawful possession, Rape, Suicide, Murder, Breach of public peace, and Armed robbery) recorded during the past years were simulated and analysed statistically using SPSS version 25.

Method of data analysis

The method employed for the data analysis was a log-linear model. A log-linear model is a mathematical model that takes the form of a function whose logarithm equals a linear combination of the

parameters of the model, which makes it possible to apply (possibly multivariate) linear regression. That is, it has the general form

$$e^{[a+\sum_i b_i f_i(X)]} \quad \_\_\_(1)$$

in which the $f_i(X)$ are quantities that are functions of the variable X, in general a vector of values, while a and the b_i stand for the model parameters.

The term may specifically be used for:

- A log-linear plot or graph, which is a type of semi-log plot.
- Poisson regression for contingency tables, a type of generalized linear model.

The specific applications of log-linear models are where the output quantity lies in the range 0 to ∞, for values of the independent variables X, or more immediately, the transformed quantities $f_i(X)$ in the range −∞ to +∞. This may be contrasted to logistic models, similar to the logistic function, for which the output quantity lies in the range 0 to 1. Thus the contexts where these models are useful or realistic often depend on the range of the values being modelled.

Log-linear analysis is a widely used method for the analysis of multivariate frequency tables obtained by cross-classifying sets of nominal, ordinal, or discrete interval level variables. Log-linear models go beyond a single summary statistics and specify how the cell counts depend on the levels of categorical variables. They model the association and interaction patterns among categorical variables. The log-linear modeling is natural for Poisson, Multinomial and Product-Mutlinomial sampling.

Suppose we have a frequency table formed by two categorical variables which are denoted by A and B with indices a and b. The number of categories of A and B is denoted by A^* and B^*, respectively. Let m_{ab} be the expected frequency for the cell belonging to category a of A and b of B. The saturated log-linear model for the two-way table AB is given by

$$\log m_{ab} = \lambda + \lambda_a^A + \lambda_b^B + \lambda_{ab}^{AB} \qquad (2)$$

It should be noted that the log transformation ofmabcis tractable becauseit restricts the expected frequencies to remain within the admissible range.

DATA ANALYSIS

Table 1: Simulated crime rate

Crime / Year	Assault (1)	Theft& others (2)	Store breaking (3)	Burglary (4)	Unlawful possession (5)	Rape (6)	Suicide (7)	Murder (8)	Breach of public peace (9)	Armed robbery (10)
1	500	7276	437	941	608	864	30	162	3431	363
2	7281	7901	292	506	646	381	3	105	3153	363
3	2405	18611	301	353	262	0	101	40	1165	42
4	1466	1563	114	292	240	0	42	69	712	215
5	2942	2332	159	240	361	207	3	37	1267	70
6	7549	10305	751	501	119	747	61	250	4125	559
7	2405	18611	486	501	3940	933	71	229	6244	6138

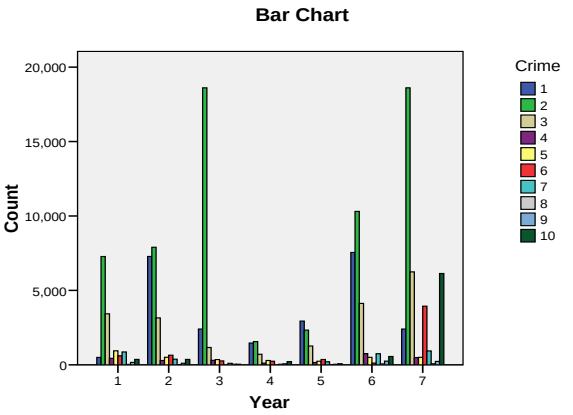

Figure 1: Bar chat of the simulated crime rate

Table 2: Year * Crime crosstabulation

		Crime										Total
		1	2	3	4	5	6	7	8	9	10	
Year	1	500	7276	3431	437	941	608	864	30	162	363	14612
	2	7281	7901	3153	292	506	646	381	3	105	363	20631
	3	2405	18611	1165	301	353	262	0	101	40	42	23280
	4	1466	1563	712	114	292	240	0	42	69	215	4713
	5	2942	2332	1267	159	240	361	207	3	37	70	7618
	6	7549	10305	4125	751	501	119	747	61	250	559	24967
	7	2405	18611	6244	486	501	3940	933	71	229	6138	39558
Total		24548	66599	20097	2540	3334	6176	3132	311	892	7750	135379

Table 3: Convergence information[a,b]

Maximum Number of Iterations	20
Converge Tolerence	.00100
Final Maximum Absolute Difference	4.1007E-005(c)
Final Maximum Relative Difference	3.6761E-005
Number of Iterations	6

a Model: Multinomial Logit
b Design: Constant + col

c The iteration converged because the maximum absolute changes of parameter estimates is less than the specified convergence criterion.

Table 4: Cell counts and residuals (a,b)

Year	Crime	Observed		Expected		Residual	Standardized Residual	Adjusted Residual	Deviance
		Count	%	Count	%				
1	1	500	3.4%	2649.564	18.1%	-2149.564	-46.154	-48.866	-40.836
	2	7276	49.8%	7188.298	49.2%	87.702	1.451	1.537	13.284
	3	3431	23.5%	2169.150	14.8%	1261.850	29.360	31.086	56.092
	4	437	3.0%	274.152	1.9%	162.848	9.929	10.512	20.187
	5	941	6.4%	359.852	2.5%	581.148	31.020	32.843	42.533
	6	608	4.2%	666.601	4.6%	-58.601	-2.323	-2.460	-10.578
	7	864	5.9%	338.049	2.3%	525.951	28.943	30.644	40.268
	8	30	.2%	33.567	.2%	-3.567	-.616	-.653	-2.596
	9	162	1.1%	96.277	.7%	65.723	6.720	7.115	12.985
	10	363	2.5%	836.489	5.7%	-473.489	-16.861	-17.852	-24.619
2	1	7281	35.3%	3740.977	18.1%	3540.023	63.967	69.480	98.474
	2	7901	38.3%	10149.314	49.2%	-2248.314	-31.310	-34.008	-62.905
	3	3153	15.3%	3062.670	14.8%	90.330	1.769	1.921	13.539
	4	292	1.4%	387.082	1.9%	-95.082	-4.879	-5.299	-12.830
	5	506	2.5%	508.083	2.5%	-2.083	-.094	-.102	-2.039
	6	646	3.1%	941.188	4.6%	-295.188	-9.849	-10.698	-22.051
	7	381	1.8%	477.299	2.3%	-96.299	-4.460	-4.844	-13.104
	8	3	.0%	47.395	.2%	-44.395	-6.456	-7.012	-4.069
	9	105	.5%	135.936	.7%	-30.936	-2.662	-2.892	-7.364
	10	363	1.8%	1181.057	5.7%	-818.057	-24.516	-26.629	-29.266
3	1	2405	10.3%	4221.315	18.1%	-1816.315	-30.897	-33.954	-52.020
	2	18611	79.9%	11452.476	49.2%	7158.524	93.847	103.132	134.436
	3	1165	5.0%	3455.914	14.8%	-2290.914	-42.230	-46.408	-50.335
	4	301	1.3%	436.783	1.9%	-135.783	-6.559	-7.208	-14.971
	5	353	1.5%	573.320	2.5%	-220.320	-9.317	-10.239	-18.504
	6	262	1.1%	1062.035	4.6%	-800.035	-25.129	-27.616	-27.081
	7	0	.0%	538.584	2.3%	-538.584	-23.481	-25.804	.000
	8	101	.4%	53.480	.2%	47.520	6.505	7.149	11.333
	9	40	.2%	153.390	.7%	-113.390	-9.186	-10.095	-10.370
	10	42	.2%	1332.703	5.7%	-1290.703	-36.413	-40.016	-17.042
4	1	1466	31.1%	854.599	18.1%	611.401	23.115	23.528	39.778
	2	1563	33.2%	2318.536	49.2%	-755.536	-22.014	-22.407	-35.109
	3	712	15.1%	699.644	14.8%	12.356	.506	.515	4.993
	4	114	2.4%	88.426	1.9%	25.574	2.746	2.795	7.610
	5	292	6.2%	116.068	2.5%	175.932	16.535	16.831	23.212
	6	240	5.1%	215.007	4.6%	24.993	1.745	1.776	7.265
	7	0	.0%	109.035	2.3%	-109.035	-10.565	-10.754	.000
	8	42	.9%	10.827	.2%	31.173	9.485	9.654	10.671
	9	69	1.5%	31.054	.7%	37.946	6.832	6.954	10.497
	10	215	4.6%	269.804	5.7%	-54.804	-3.436	-3.498	-9.881
5	1	2942	38.6%	1381.357	18.1%	1560.643	46.408	47.772	66.697
	2	2332	30.6%	3747.636	49.2%	-1415.636	-32.443	-33.396	-47.038
	3	1267	16.6%	1130.891	14.8%	136.109	4.386	4.515	16.970
	4	159	2.1%	142.930	1.9%	16.070	1.357	1.397	5.821
	5	240	3.2%	187.610	2.5%	52.390	3.873	3.987	10.873
	6	361	4.7%	347.534	4.6%	13.466	.739	.761	5.239
	7	207	2.7%	176.243	2.3%	30.757	2.344	2.413	8.161
	8	3	.0%	17.500	.2%	-14.500	-3.470	-3.572	-3.253
	9	37	.5%	50.194	.7%	-13.194	-1.869	-1.923	-4.751
	10	70	.9%	436.105	5.7%	-366.105	-18.056	-18.586	-16.004
6	1	7549	30.2%	4527.216	18.1%	3021.784	49.636	54.962	87.862
	2	10305	41.3%	12282.387	49.2%	-1977.387	-25.032	-27.718	-60.148
	3	4125	16.5%	3706.349	14.8%	418.651	7.452	8.252	29.714
	4	751	3.0%	468.434	1.9%	282.566	13.180	14.594	26.626
	5	501	2.0%	614.866	2.5%	-113.866	-4.650	-5.149	-14.325
	6	119	.5%	1138.996	4.6%	-1019.996	-30.937	-34.257	-23.186

	7	747	3.0%	577.613	2.3%	169.387	7.131	7.896	19.601
	8	61	.2%	57.356	.2%	3.644	.482	.533	2.741
	9	250	1.0%	164.505	.7%	85.495	6.688	7.405	14.466
	10	559	2.2%	1429.278	5.7%	-870.278	-23.708	-26.252	-32.397
7	1	2405	6.1%	7172.972	18.1%	-4767.972	-62.220	-73.956	-72.500
	2	18611	47.0%	19460.354	49.2%	-849.354	-8.542	-10.153	-40.756
	3	6244	15.8%	5872.381	14.8%	371.619	5.255	6.246	27.682
	4	486	1.2%	742.193	1.9%	-256.193	-9.493	-11.284	-20.287
	5	501	1.3%	974.201	2.5%	-473.201	-15.351	-18.247	-25.814
	6	3940	10.0%	1804.639	4.6%	2135.361	51.454	61.159	78.440
	7	933	2.4%	915.176	2.3%	17.824	.596	.709	5.999
	8	71	.2%	90.875	.2%	-19.875	-2.087	-2.481	-5.920
	9	229	.6%	260.644	.7%	-31.644	-1.967	-2.337	-7.699
	10	6138	15.5%	2264.565	5.7%	3873.435	83.831	99.644	110.637

a Model: Multinomial Logit

b Design: Constant + col

Table 5: Goodness-of-Fit tests[a,b]

	Value	df	Sig.
Likelihood Ratio	39610.289	54	.000
Pearson Chi-Square	39368.241	54	.000

a Model: Multinomial Logit

b Design: Constant + col

Table 6: Analysis of dispersion[a,b]

	Entropy	Concentration	df
Model	.000	.000	0
Residual	209343.633	94247.104	1218402
Total	209343.633	94247.104	1218402

a Model: Multinomial Logit

b Design: Constant + col

Table 7: Measure of association[a,b]

Entropy	.000
Concentration	.000

a Model: Multinomial Logit

b Design: Constant + col

Table 8: Parameter estimates(c,d)

Parameter		Estimate	Std. Error	Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Constant	[row = 1]	6.729(a)					
	[row = 2]	7.074(a)					
	[row = 3]	7.195(a)					
	[row = 4]	5.598(a)					
	[row = 5]	6.078(a)					
	[row = 6]	7.265(a)					
	[row = 7]	7.725(a)					
[col = 1]		1.153	.013	88.486	.000	1.127	1.178
[col = 2]		2.151	.012	179.220	.000	2.127	2.175

[col = 3]	.953	.013	71.263	.000	.927	.979
[col = 4]	-1.116	.023	-48.792	.000	-1.160	-1.071
[col = 5]	-.844	.021	-40.727	.000	-.884	-.803
[col = 6]	-.227	.017	-13.309	.000	-.260	-.194
[col = 7]	-.906	.021	-42.791	.000	-.948	-.865
[col = 8]	-3.216	.058	-55.604	.000	-3.329	-3.102
[col = 9]	-2.162	.035	-61.147	.000	-2.231	-2.093
[col = 10]	0(b)	.	.	.	.	.

a Constants are not parameters under the multinomial assumption. Therefore, their standard errors are not calculated.

b This parameter is set to zero because it is redundant.

c Model: Multinomial Logit

d Design: Constant + col

Table 9: Correlations of parameter estimates(a,b,c)

	[col = 1]	[col = 2]	[col = 3]	[col = 4]	[col = 5]	[col = 6]	[col = 7]	[col = 8]	[col = 9]
[col = 1]	1	.825	.741	.433	.478	.581	.468	.171	.280
[col = 2]	.825	1	.804	.470	.519	.630	.508	.186	.304
[col = 3]	.741	.804	1	.422	.466	.566	.456	.167	.273
[col = 4]	.433	.470	.422	1	.272	.331	.267	.098	.160
[col = 5]	.478	.519	.466	.272	1	.365	.294	.108	.176
[col = 6]	.581	.630	.566	.331	.365	1	.357	.131	.214
[col = 7]	.468	.508	.456	.267	.294	.357	1	.105	.172
[col = 8]	.171	.186	.167	.098	.108	.131	.105	1	.063
[col = 9]	.280	.304	.273	.160	.176	.214	.172	.063	1

a Model: Multinomial Logit

b Design: Constant + col

c Constants and redundant parameters are not displayed.

Table 10: Covariances of parameter estimates(a,b,c)

	[col = 1]	[col = 2]	[col = 3]	[col = 4]	[col = 5]	[col = 6]	[col = 7]	[col = 8]	[col = 9]
[col = 1]	.000	.000	.000	.000	.000	.000	.000	.000	.000
[col = 2]	.000	.000	.000	.000	.000	.000	.000	.000	.000
[col = 3]	.000	.000	.000	.000	.000	.000	.000	.000	.000
[col = 4]	.000	.000	.000	.001	.000	.000	.000	.000	.000
[col = 5]	.000	.000	.000	.000	.000	.000	.000	.000	.000
[col = 6]	.000	.000	.000	.000	.000	.000	.000	.000	.000
[col = 7]	.000	.000	.000	.000	.000	.000	.000	.000	.000
[col = 8]	.000	.000	.000	.000	.000	.000	.000	.003	.000
[col = 9]	.000	.000	.000	.000	.000	.000	.000	.000	.001

a Model: Multinomial Logit

b Design: Constant + col

c Constants and redundant parameters are not displayed.

DISCUSSION OF RESULTS

The goodness-of-fit table presents two tests of the null hypothesis that the model adequately fits the data. Since the significance values (0.000) for both the Likelihood Ratio and the Pearson Chi-square are less than the conventional 0.05 level of significance, then the model does not

adequately fit the data. The Pearson goodness-of-fit statistic is based on the cells of the cell count and residuals table.

The observed columns in the cell count and residuals table report the number and percentage of cases observed in the data file that are in the covariate pattern. The expected columns report the number and percentage of cases you would expect to see in the covariate pattern if the model is correct. Residuals are measures of the difference between the observed and predicted values. Large residuals can indicate covariate patterns that are not well fit by the model.

From the measure of association table, smaller entropy and concentration statistics indicate that more of the dispersion is not explained by the model. The measures of association are based on the analysis of dispersion table. Each measure is equal to the ratio of the dispersion accounted for by the model to the total dispersion.

The parameter estimates table summarizes the effect of each predictor (note that the constant terms have been removed due to size constraints). The ratio of the coefficient to its standard error equals the Z statistic. Since the significance level of the Z statistic is small (less than 0.05) then the parameter is different from 0.

CONCLUSIONS

The parameters table shows that there is no interaction between crimes and years at which they were committed. However the correlation of parameter estimates table shows that there is strong positive association between some crimes committed.

RECOMMENDATIONS

1. In essence, for the problem of crime to be reduced, we have to restructure the educational sector to better equip our youths to cope with the changing times in our economy. This has a significant role in reducing crime because we find out that students who graduate from the institutions of learning have no jobs because they have not been properly schooled in the prevailing ways of life and as such, due to frustration, the youths of today may result to criminal activities.
2. The homes and religious organizations have important roles to play in curbing the crime wave in Nigeria. These criminals live in home-sand even receive religious instructions from religious groups. The

family heads and religious leaders should pay more attention to the moral upbringing of these youths. If these youths are given the right training from childhood, they will not depart from the right path.

3. To achieve and maintain a serene society where law and order thrives, much must be done to legislate and enforce, even draconian laws that will put to check, to a reasonable extent, the life-threatening actions of the daredevil criminals. The consequences of every strange action should be clearly spelt out and enforced to the last detail, if possible. Politicizing and trivialization of serious national matters and the preferential treatment of some so-called sacred cows should be out of it, if we want to succeed in combating crime.

4. Our armed forces should be well trained and equipped to deal with the problems posed by the 21th century criminals that have sophisticated weapons at their disposal. More money as well as more attention should be put into our security sector. Often times, we hear that our uniformed men ran for their lives, leaving the civilians they should be protecting at the mercies of these heartless set of human beings. The reasons being, the lack the moral standing or ignorance of what to do or even more likely, the possession of less sophisticated weapons to fight with.

When these are done, people will only be left with the option of not just stopping crime, but fleeing from anything that looks like it or can lead to it. On the other hand, any 'die-hard' fellow that eventually commits any crime should be bold enough to consent to the crime and should also be free enough to bear the full weight of the punishment even if it means dying for it, since his or her conscience is dead.

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