

Assessment of the Efficacy of Benford's Law in Detecting Payroll Fraud in Borno State, Nigeria

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***Abstract:** This study focuses on the Assessment of the Efficacy of Benford's Law in detecting Payroll Fraud in Borno State, Nigeria. Personnel cost budget was sourced from annual budget of Borno state. The approved annual budgets for the period of ten (10) years covering 2009-2018 was used, and the study covered the entire Ministries, Department and Agencies in the state. The result was analyzed using inferential statistics in form of Benford curve analysis tableau using 2013 Microsoft Office Excel and regression analysis was also conducted together with Pearson product correlation analysis using STATA 11 package. Findings of the study revealed that, there is a slight deviation of salaries, allowances and number of employees' data set as against that of Benford curve, it clearly shows that, Benford Law has significant effect in detecting fraud of employee salaries in Borno state government ministries departments and agencies. It also shows that Benford law is effective and applicable to the employee salaries, employee allowances and number of employees in Borno State. This findings is in line with the findings made by Benford (1938). Therefore, the study recommends that, there is need for government to adopt the use of Benford law in the preparation of its payroll budget as this will significantly impact in detecting payroll fraud.*

***Key words:** Benford's law, Fraud, Payroll, and Salary*

INTRODUCTION

Benford's principle has been applied to different sets of financial data, to detect fraud in insurance claims, corporate income tax, employee payment reports, vendor invoices, accounts receivable, accounts payable and also fixed asset records. Benford's Law makes fraud detection possible when it is known that real data correspond to the Benford's distribution (Bhattacharya, Xu, & Kumar, 2011). Audit software that incorporates Benford's Law enables the identification of fraud and other irregularities in accounts payable, income tax forms, claims payments, payroll and other disbursements (Diekmann & Jann, 2010). It is crucial to note that Nigeria economy is driven by government businesses leading to a wider believed that job guarantee is only obtainable in government jobs. This has mitigated

the sound employment process leading to government is now fighting for the geniuses of what it pays as salary.

Salary is a fixed amount of money or compensation paid to an employee by an employer in return for work performed. Salary is commonly paid in fixed intervals, monthly payments of the annual salary in cash basis or through employees' designated bank account. Salary is also determined by leveling the pay rates and salary ranges established by an individual employer. An allowance is the financial benefit given to the employee by the employer over and above the regular salary. Salary is also determined by leveling the pay rates and salary ranges established by an individual employer. An allowance is the financial benefit given to the employee by the employer over and above the regular salary. Usually, government must have a proper employee's data in ministries, departments and agencies that are receiving wages or salary in the state payroll list. A payroll is a list of employees or staff receiving wages or salaries with amount due to each. The payroll consists mainly of two sections; Payroll payment and payroll deductions. Payroll payments consist of the annual basic salary, the monthly basic salary, grade level, and allowances of each staff. While the payroll deductions consist of deduction that are made out of the employee's total emolument such as tax deductions and union dues.

In a circumstance where the total benefit of a worker overdo the agreed remuneration, it is said that there is payroll fraud. Failure by government agencies to regularly update their staff records will create opportunities for nonexistent employees to continue receiving salaries even though they no longer work for the government. Borno state government on the need to improved governance has embarked on the effective cost-cutting strategies which include but not limited to direct labour in executing project and the use of Biometric technology and Integrated Payroll and Personnel Information System (IPPIS) to eradicate ghost workers and prevent payroll fraud. Ghost worker fraud has been a serious problem facing Borno state over the years as billions of naira are pumped out annually from its treasury through salary payments to non-existing employees who have been fraudulently been listed in the payroll system. Some of these may be retired civil servants, deceased or fictitious names. In addition evidence are bound on ghost figures and other related payroll fraud.

From 2001 up-to the time of this study (2019) Borno State Government is making effort on war against fraud in personnel cost which is largely attributed to ghost workers' syndrome. In 2001, the Borno State government made effort to conduct physical verification on employee record, but no report was produced to indict any employee. Also, physical verification and biometric data capture was conducted in 2008, but it also failed to address the issue of personnel-cost / payroll fraud. Another high powered committee was set up in 2016 chaired by the Secretary to the State Government to carry out a verification of the State Civil Service. Financial experts argued that there is no financial fraud committed in government without the knowledge of civil servants. They create the loopholes for monies to leave the treasury and sometimes use dubious means to earn above their monthly income (Olanrewaju, Mudathir, & Rihanat, 2010); hence, considering the importance of curtailing personnel-cost / payroll fraud to the perpetuity and sustainability of the current system (Borno State Government) and coupled with the dearth in literature on personnel-cost / payroll in the Nigerian domain.

The main objective of this paper is to examine the efficacy of Benford's' Law in preventing payroll fraud in Borno state, Nigeria. The specific objectives are to: i. examine

the efficacy of Benford's Law in detecting fraud on employee budgeted salaries in Borno State; and ii. examine the efficacy of Benford's Law in detecting fraud on employee budgeted salaries and allowances in Borno State. The research question was "to what extent does Benford's Law application effective in detecting fraud on employee budgeted salaries and allowances in Borno State". The hypothesis which was stated in a null form was 'Benford's Law has no significant effect in detecting fraud on employee salaries and allowances in Borno state'.

LITERATURE REVIEW

The term "fraud" can be defined in numerous ways and has different meanings and connotations to different people and associations. The most common way to label fraud is Ramamorti's (2008) definition that it is the unlawful and intentional making of a misrepresentation which causes actual prejudice or which is potentially prejudicial to another. Financial frauds can be perpetrated in many ways. The three primary factors which facilitate any fraud are confined by the fraud triangle which consists of opportunity, pressure, and rationalisation. With the purpose of detecting fraud, a forensic accountant needs to be competent in identifying an event or action as being a symptom or red flag. A forensic accountant ought to understand the definition of fraud and be aware of the different types of fraud. A clear understanding of the term "fraud" will contribute to implementing the correct investigative techniques to detect fraud, since some types of fraud are not detected easily. Association of Certified Fraud Examiners (1999) defined fraud as the use of one's profession for personal enhancement through the conscious misuse, misapplication or employment of organizational possessions or property. Cressey (1980) opined that fraud is an act of commission which is planned to cause unlawful gain to one person and criminal loss to the other, either by way of concealment of information or otherwise. Okeye and Gbegi (2013) observed that fraud impacts organization in several areas including financial, operational and psychological; where the monetary loss owing to fraud is significant, the full impact of fraud on an organization can be staggering and the losses ranging from reputation, goodwill and customer relations can be devastating. From the foregoing, any dishonest intention to benefit the perpetrator to the detriment of the organisation or another person is fraudulent.

Application of Benford's Law

Diekmann and Jann (2010) contends that Benford's Law offers a powerful, economical and accessible tool for auditors, managers and analysts to verify a large data set of calculated totals for possible fraud, error, manipulative bias or processing inefficiency or other anomalies. Asilani and Naco (2015) concur by describing Benford's Law as a useful and inexpensive tool for uncovering suspect accounts for supplementary analysis. Aris, Othman, Bukhori, Arif and Malek (2017) maintains that fraud is persuasive and fraud examiners have to be acquainted with all potential tools and techniques to avoid and identify errors and anomalies. In addition, Benford's Law is a rapid, sophisticated tool that a fraud examiner might find valuable in auditing enormous pools of data. This law is capable of narrowing the testing as required, emphasizing the irregularities, and smoothing the progress of fraud detection.

In the last two decades, in particular, Benford's law was increasingly applied to real and scientific data as a method to identify fraud or manipulation. Recently, Diekmann and Jann (2010) investigated the first and second digits of published statistical results in the

field of sociology. He analyzed estimates (means, standard deviations, correlations and unstandardized regression coefficients) in two samples. He discovered that only the digits of the unstandardized regression coefficients follow Benford's law; meanwhile, this study will apply the efficacy of Benford's Law in preventing payroll fraud in public sector. Nigrini and Mittermaier (1997) publications were quite influential for introducing Benford's law in finance and accountancy. He analysed tax declarations of American taxpayers and figured out that people tend to understate their true taxable income due to U.S. law, where taxes are set after tax tables, even minor understatement (PwC, 2011) can result in significant tax reductions.

However, according to Bierstaker, Brody and Pacini, (2006), Mark J. Nigrini was the first researcher to have applied Benford's Law extensively to accounting data with the aim of detecting fraud. This law takes its name from Frank Benford; a physicist born in 1883; he noticed that the pages of logarithms tables containing low numbers, such as one and two, were more worn than those with higher numbers, eight and nine (Benford, 1938); moreover, he tested his theory by analysing 20,229 sets of numbers gathered from a variety of fields, for example, surface areas of rivers, baseball averages, numbers in magazine articles, and atomic weights. The data ranged from sources that include random numbers to types that followed mathematical laws. The results of the analysis substantiated the empirical observation. The chance of a multi-digit number beginning with 1 was, without a doubt, higher than for the first digit to be 9. By means of Benford's Law, the individual digits have diverse probabilities of occurrence as the first digit; for this reason, the law is also referred to as the "first digit law" (Bhattacharya, Xu, & Kumar, 2011).

Benford's Law offers a unique method of data analysis, allowing the forensic accountant to identify fraud, manipulative prejudice, processing inefficiencies, errors, and other non-compliant abnormal patterns as applicable to the accounting records of a company (Panigrahi, 2006). Lekubu (2013) found that, despite the potential of Benford's Law and its use by practitioners in the South African context, it is surprising to find that no attempt has been made to publish proof on the effectiveness of Benford's Law in the detection of accounting data error or fraud in a domestic environment. Benford's Law can be applied widely and, since it is not well known, chances are slim that those individuals manipulating data would try to find preserve fit to the distribution of the Law. In this context, it seems to be a superior diagnostic tool, at least until it becomes commonly known (Nigrini, 2012).

In a ground-breaking doctoral thesis by Nigrini in 1992, "The detection of income tax evasion through an analysis of digital distribution", the application of Benford's Law to cases of tax evasion was pioneered. In June 1993, Nigrini published his first article on Benford's Law, consisting of only two pages, in *The Balance Sheet*, the journal of the Investigative and Forensic Accounting Interest Group of the Canadian Institute of Chartered Accountants. He made a somewhat daring prophecy on the subject of analysis of digital frequencies, namely that Benford's Law can be used in fraud detection (Nigrini, 2012). The study was based on the suggestion that "individuals, either through psychological habits or other constraints peculiar to the situation, will invent fraudulent numbers that will not adhere to the expected digit frequencies". According to Pearson and Singleton (2008), with the exponentially increased availability of digital data and computer force, the use of subtle and vigorous statistical tests for fraud detection and other

manufactured data is to increase dramatically. Benford's Law is just the start. The table below explored the possible in which Benford's Law may be applicable.

Area	Objective	Test unit
Accounts receivable	Identify questionable or unusual receivables	Invoice amount
Expense reports	Identify questionable or unusual employee disbursements	Amount paid
Fixed assets	Identify questionable or unusual vendor disbursements	Amount paid
Income tax	Compliance - identify suspicious corporate returns	Amount
Insurance claims	Identify potentially fraudulent claims	Amount paid
Inventory	Identify potentially over/under reported inventory valuation	Physical inventory counts
Net income	Identify potentially fraudulent net income	Amount
Payroll	Identify potential ghost employees	Address
Sales	Identify potentially fraudulent revenue	Amount
Total assets	Identify potentially fraudulent assets	Amount

Source: **Fraud detection application of Benford's Law** (Bell & Carcello, 2000)

Falsified salary/wages schemes

Fraudsters every so often use fabricated hours and salary schemes to overstate the employees' pay rates or to even pay employees inflated overtime (Pearson & Singleton, 2008). Another popular scheme is that of ghost employees, which refer to people on the payroll who are, in fact, not employed by the victim company. Falsification of personnel or payroll records results in cheques to be produced to this "ghost" (Wells, 2002) In other words, while the ghost employee reflects on the payroll of the company, the individual collects wages at regular intervals without working for the company in reality

Payroll Fraud in the Public Sector

Payroll fraud is a problem for many countries around the world, especially the less developed ones. Salary leakages in the public services has become a major concern for most developing nations (Adongoi & Victor, 2016). Statistics regarding the prevalence of ghost workers in public sectors could be found in Uganda, Honduras, and Papua New Guinea (Nyaledzighor, 2015). A survey conducted by the World Bank to quantify the share of ghost names on the payrolls of countries revealed that teachers and health workers in the countries where the surveys were conducted were found to continue to receive salaries even though the workers were no longer in employment in the public services (Adongoi & Victor, 2016). According to the World Bank (2001), 5% and 8.3% of teachers and health workers on the government payroll in Honduras in 2000 were ghosts. In Papua New Guinea, the figure was 15% for teachers in 2002 (World Bank, 2004). In 2010, the

percentage of ghost teachers in Honduras rose to 23% of the payroll which was equivalent to 1,347,403,178 Lempiras, or approximately USD \$70,915,957 per year (World Bank, 2010). The situation on ghost workers in Africa was not different from countries already mentioned. In Uganda, for example, 20% of teachers in 1993 and 4.6% of primary school teachers in 2006 were identified as ghost workers (Adongoi & Victor, 2016 and Nyaledzighor, 2015).

Types of payroll frauds

In public sector, payroll fraud involves falsification of wages which also includes falsifying overtime and other allowances (Okoye & Gbegi, 2013) false persons on the payroll (ghost names), and delayed termination of separated staff from the payroll (Lekubu, 2013). The key indicator for payroll fraud in the civil service is the number of ghost workers on the civil service payroll (Olken & Pande, 2012). The various types of payroll frauds in the public service.

Nonexistent Employees (Ghost workers).

Nonexistent employees in the public service are individuals who receive salary from government but do not work or may not exist but their salaries are received by someone. They are workers who have died, retired, or left the civil service but were never recorded as such. They are fictitious persons whose pay is claimed by others. (Ibietan, 2013) Ghost workers are therefore nonexistent employees whose names are kept on the payroll and salaries paid to them. Ghost workers may be kept on the payroll if payroll managers delay in terminating the names from the payroll (Lekubu, 2013). In some cases, payroll clerks include names of fictitious or separated employees on the payroll, forge their signatures, and collect the salaries on their behalf (Izedonmi & Ibadin, 2012)

Delayed termination of names from the payroll

Delay in terminating names of separated staff from the payroll is another way of keeping deceased employees on the government payroll unlawfully (Lekubu, 2013) the delays may be prevalent at remote office locations where communication facilities may be lacking. For example, "an office manager at a satellite office might delay the reporting the termination of an employee who may be dead, resigned, or left employment and pocket that employee's cheque" (Wells, 2002). The delayed termination may also be prevalent on the government payrolls due to the large number of employees who work in public institutions across the country (Association of Fraud Examiners, 2011). This problem may be common in countries where payroll systems are centralized and required physical transfer of payroll data to a central location for processing (Association of Fraud Examiners, 2011).

Review of Related Empirical Studies

Nyaledzighor (2015) Payroll Fraud: Effects of Ghost Names on the Government Wage Bill in Ghana. Nonprobability quotes sampling to select 85 heads of public agencies for participation in a cross-sectional survey. The research questions focused on the relationship between size of government agency, the estimated number of opportunities for ghost workers, and the dependent variable of occurrence of ghost workers in the public sector in Ghana. Correlation and multiple regression analysis was used to discern the relationship between the independent variables of agency size and opportunities for ghost workers and the dependent variable of number of ghost workers. Results revealed a statistically significant, positive relationship between the number of opportunities for ghost workers and the number of ghost workers. However, there was a negative relationship between the size of government agencies and both the number of

opportunities for ghost workers and the number of ghost workers. The study made recommendations to revise the Financial Administration Act of Ghana by introducing new controls in the payroll administration at the Controller and Accountant General's Department to eliminate ghost workers from the payroll so that public funds can be saved to provide more public services for Ghanaians. Based on the findings and recommendation, similar study can be carried out on small area such as the state with a view to assess its feasibility.

Asllani and Naco (2015) Using Benford's Law for Fraud Detection in Accounting Practices. The variables aims at preventing, detecting, and controlling incidents of financial reporting fraud. A local hospital in a major city in central Albania are used to illustrate the technique. 420 beds and serves about 12,000 patients per year. The finding shows the distribution of the digits in the first position of numbers in a data set created by a selected group of hospital units. As shown, there is no indication of fraud in the emergency department as the data set related to this department seems to follow Benford's Law. That is not the case for other hospital units such as pathology, dispensary, and inpatient services. This indicates that the methodology not only can eliminate unnecessary internal audits, but also can be used to apply a more due care methodology instead of leaving fraud to be discovered by accident. The study recommends Benford's Law can be used as an effective tool to target potential areas of concern in accounting data. The major concern of the researcher is detecting and preventing fraud on financial statements based on Benford's Law. While this study will focus on preventing payroll fraud based on the efficacy of Benford's Law.

In the work of Shalini and Kinjal (2009) in Joshi, Bedmutha, Patel and Bathani (2013) entitled, "Devising a Model for Accounting Fraud Detection Based on Benford's Law". The study aims to identify the possibility of fraud on the basis of the financial statements of the concerned companies. The authors used Benford's law to devise a model that highlights the possibility of fraud in the financial statements. The model was tested for a sample of 35 companies comprising of both "good" and "fraudulent companies" using Benford's Law, Z-Statistic, Chi-square and Kolmogorov-Smirnov Test. The finding shows that odd numbers have occurred unusually often for First Leasing Company of India. This can be used to understand whether there is abnormal duplication of numbers or not. And the accounting fraudulent company showed several peaks and troughs, indicating significant deviation from Benford's frequency distribution. While this study will use the efficacy of Benford's Law in preventing payroll fraud.

Adongoi and Victor (2016) Corruption in the Civil Service: the variable of the study consists of Payroll Fraud in Selected Ministries, Departments and Agencies (MDAs) in Bayelsa State, Nigeria. The study investigates factors responsible for payroll fraud in Bayelsa State Civil Service, Nigeria. The study adopted ex post-facto research, whose data were gathered from secondary sources such as, government records/publications, academic journals. The study found that the crime of payroll fraud persists in Bayelsa State civil service despite measures taken by government to stem the fraud. It also discovered that challenges such as inadequate funding of Economic and Financial Crime Commission (EFCC) are responsible for the futile prosecution of culprits. The study recommends amongst others that Bayelsa State Government should train Forensic accountants to manage all her Ministries, Departments and Agencies (MDAs) as a proactive measure to check fraud.

Theoretical Framework

Graft estimation model

The graft estimation model was also developed by Reinikka and Smith (2004) to determine leakages or theft of public funds in government institutions. To determine the level of leakages or theft of public funds, an individual needs to compare budget allocations at the central level with the actual expenditure through the various levels of government agencies up to the frontline service, delivery points or facilities (Reinikka & Svenesson, 2001). In measuring the graft, “an individual obtains two measures of the same quantity, one measure before corruption takes place and another measure after corruption takes place. The estimate of corruption is thus the difference between the two measures” (Olken & Pande, 2012)

Fraud Triangle Theory

The fraud triangle was developed by Cressey 1950 (Kassem & Higson, 2012) and has been used in various fraud studies including those relating to the public sector. The fraud triangle has identified opportunities, pressure, and rationalization as factors responsible for fraud. Policy makers could implement measures to eliminate the factors responsible for fraud and minimize fraud in organizations. The fraud triangle is a theory that explains the actions individuals and why they must take in defraud (Dorminey, Fleming, Kranacher, & Riley Jr, 2012). Focuses on the motives of opportunity and present aspect of fraudsters. The processes involved in committing fraud as specified in the triangle of fraud action are categorized into three major stages namely, the act, concealment, and conversion. The act means the methods a fraudster uses to undertake the fraud action. Concealment refers to the act of hiding the illegal actions to avoid detection, and finally, conversion is the ability to change the ill-gotten gains into legitimate possessions (Dorminey, et al 2012).

The fraud triangle was used in many fraud studies relating to the public sector. In a study on why corruption was prevalent in the Nigerian public service, Ibietan (2013) applied the fraud triangle theory and concluded that fraud persists in the Nigerian public service because the government continues to pay low salaries to public servants. Also due to weak internal control systems and the inability of the government to sanction corrupt public officials, corruption will continue to persist in the Nigerian public service (Ibietan, 2013).

The major contribution of the triangle of fraud theory is the ability to provide evidential trail on the fraud actions. The evidence on fraud is required mostly by law enforcement agencies for prosecuting criminals in the court of law (Dorminey, et al 2012). Similarly, fraud experts need evidence to investigate and unravel the motives behind the fraud actions (Dada, Owolabi , & Okwu, 2013).

METHODOLOGY

The study will cover the entire Ministries, Department and Agencies in the state. In this paper, a census was used, hence there is no need for sampling. The study used secondary data on budgeted salaries, budgeted allowance and number of employees in payroll of the Ministries, Department and Agencies in the state’s annual budget. The time frame was ten years covering 2009 to 2018 this period was specifically chosen in view of the fact that year 2009 was the beginning of insurgency in the state leading to loss of lives while 2018 is the current year of the study. Data for the study was analyzed using both descriptive and inferential analysis. The descriptive statistics used was the summary of the data collected

in terms of mean, standard deviation, minimum and maximum; while inferential statistics in form of Benford curve analysis tableau using 2013 Microsoft Office Excel and regression together with Pearson product correlation analysis using STATA 11 package was used in testing the hypothesis.

The Variables of the Study and their Measurement

The model as expressed in equation 1 in form of a multiple regression and was adapted from the studies cited as stated in Table 3.3 below.

Table of Variables and Measurement

Variables	Measurement	Justification
Benford Law (independent variable)	Measured as the average Benford law Curve for the first digits only.	Nigirni (2012)
Employee Salaries (SAL) (Dependent variable)	Total Employee Salaries for all the ministries in the working population.	Boyle (1994)
Allowances (AL) (Dependent variable)	Total Allowances paid to employees for all the ministries in the working population	Boyle (1994)
Number of Employees (N.E) (Dependent variable)	Total number of employees for all the ministries in the working population	Boyle (1994)

Source; Author, 2018

Model Specification

The model of this study was adopted from Nigirni (2012) and Boyle (1994) and modified to accommodate the variables of this study,hence

$$\text{Benford Law} = \beta_0 + \beta_{1it} \text{SAL} + \beta_{2it} \text{AL} + \beta_{3it} \text{NE} + \sum \dots \dots \dots (1)$$

Where;

β_0, \dots, β_k is the regression model coefficients of the independent variables

x_0, \dots, x_k is the parameters of the explanatory variables

\sum is the random error term

it at a given period or point in time

Where; Benford Law= Benford Law Curve

SAL= Salaries

AL= Allowances

NE= Number of Employees

Results

The results of the Pearson’s correlation between the dependent variables (employee salaries, employee allowances and number of employees in Borno state) and independent variable (Benford Law) are presented in Table below.

Table Correlation Matrix of the Dependent and Explanatory Variables

	benfort	sal	al	ne
benfort	1.0000			
sal	0.9599	1.0000		
al	0.9665	0.9304	1.0000	
ne	0.6757	0.6341	0.7877	1.0000

Source: Generated by the Author from Annual Reports of the sampled Ministries using STATA Output, 2018.

The table above shows that, the relationship between Benford’s Law and the Explained variables salaries and allowances of employee is almost perfect and positive while that of number of employees and Benford’s Law is very strong and unsurprisingly positive. This suggests that, there is a very strong and positive correlation between the variables in the study and Benford law in Borno state.

Results of Regression on the efficacy of Benford’s law

Table Showing OLS Regression Results

Source	SS	df	MS	Number of obs = 9		
				F(3, 5) = 48.82		
Model	.052548226	3	.017516075	Prob > F = 0.0004		
Residual	.001793882	5	.000358776	R-squared = 0.9670		
				Adj R-squared = 0.9472		
Total	.054342109	8	.006792764	Root MSE = .01894		

benfort	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	

sal	.4180567	.2914579	1.43	0.211	-.3311598	1.167273
al	.6687054	.2783863	2.40	0.061	-.0469093	1.38432
ne	-.1644631	.1804667	-0.91	0.404	-.6283675	.2994413
_cons	.0086335	.0183796	0.47	0.658	-.0386127	.0558796

Source: Generated by the Author from Annual Reports of the sampled Ministries using STATA Output, 2018.

FINDINGS

The above coefficients and t-statistics of OLS regression result on Benford’s Law and its determinants. The OLS regression results reveal the cumulative adjusted R² (0.94) which is the multiple coefficient of determination that gives the proportion or percentage of the

total variation in the dependent variables (salaries, allowances and number of employees) explained by the Benford's Law. Hence, it signifies that 94% of the total variation in salaries, allowances and number of employees in Borno state are explained by Benford's Law First Digits while only 6% of the total variation in the total salaries of employees, allowances of employees and number of employees was explained by factors not explained by the model. This indicates that the model is fit and the variable are properly selected, combined and used as substantial conformers with Benford's Law. This can be confirmed by the p-value statistics of 0.004 at 5% level of significance, confirming the rejection of the null hypotheses and acceptance of the alternate hypotheses, that, Benford's law is significantly effective in affecting the efficacy of salaries, allowances and number of employees in Borno state.

The study also reveals that the normal Benford's Law Curve (Exponential Count) plot of the standardized residual indicates a good fit and does not suggest the presence of outliers among the standardized residuals of the first digits of Benford's law curve. In other words, the points on the plot do not appear to deviate significantly from the line of best fit indicating that the normality assumption is valid. Equally, the bell shaped nature of the histogram of standardized residuals affirms the normality of the research data. The results of the tests therefore suggest that the data of the research did not differ significantly from a normal distribution, as evidenced by the normal probability plot, and the histogram of standardized residual. This means that the null hypothesis that Benford's Law has no significant effect in detecting fraud on employee salaries, employee allowances and number of employees in Borno state is rejected and we accept the alternate hypothesis that Benford's law is effective and applicable to the employee salaries, employee allowances and number of employees in Borno State.

Discussion of Findings

The study reveals that, there is a slight deviation of salaries, allowances and number of employees data set as against that of Benford curve, it clearly shows that, Benford Law has significant effect in detecting fraud on employee salaries in Borno state government ministries departments and agencies that Benford law is effective and applicable to the employee salaries, employee allowances and number of employees in Borno State. This findings is in line with the findings made by Benford (1938) but in slight contrast to Diaconis and Freedman (1979) whom offer convincing evidence that Benford manipulated round-off errors to obtain a better fit to a logarithmic law, but even the non-manipulated data are a remarkably good fit (Hill 1995). This findings is consistent with the application of Benford's Law to spot signs of accounting fraud such as (Adongoi & Victor, 2016, Nyaledzigbor 2015, Dada, Owolabi , & Okwu, 2013, Olken & Pande, 2012 and Reinikka & Smith, 2004)

CONCLUSION

The study concludes that, Benford Law can detect the deviation in employee salaries, employee allowances and the number of employees. Benford's Law offers a unique method of data analysis, allowing the forensic accountant to identify fraud, manipulative prejudice, processing inefficiencies, errors, and other non-compliant abnormal patterns as applicable to the accounting records. Fabricated numbers will not conform to Benford's Law, except if the fraudster intentionally follows this Law in allocating values to fake data (Lowe, 2000a). Forensic accountants can, thus, employ Benford's Law to detect possible error, fraud,

manipulative bias or processing inefficiency. Thus it has significant effect in detecting fraud on employee salaries in Borno state government ministries departments and agencies and can be effectively applied in preparing the payroll budget of Borno state government ministries departments and agencies.

RECOMMENDATIONS

The following recommendations in view of the findings of this study were made and to ensure that all hands are on deck to reduce financial frauds in Borno state, Nigeria.

Since the study shows a slight deviation of salaries, allowances an number of employees in Borno state payroll budget of ministries departments and agencies set against the Benford law, we recommend that Borno state Government should sustain and closely monitor its on going head count exercise to eliminate ghost workers and reduce the size of the public service to minimize government expenditure on wages. The headcount exercises were useful tools for verifying the existence of employees in the public services and have assisted many countries to identify and eliminate ghost workers from their payrolls.

It is further recommended that the state should embark on Training of personnel to be able to handle changes in adopting payroll fraud prevention and detection mechanism and tools such as Benford law and any other prevention and detection tools that may be useful in checking payroll fraud should be done regularly in order to update their skills.

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