



Factor Analysis-Based Investigation into Financial Crime Related Issues in Nigeria

By Gabriel Babatunde Iwasokun

Federal University of Technology

Abstract- This paper proposes sixteen indices that were considered very important for the analysis of financial crime related issues in Nigeria. The indices were listed in the questionnaire that was administered on the FCT and thirty out of thirty-six states that span the six geo-political zones of Nigeria to obtain relevant data. Copies of the questionnaire were administered during meetings with stakeholders of banks, insurance companies, educational institutions and other relevant government and private owned establishments. The data obtained were subjected to factor analysis by principal component using SPSS. The analysis identified policies and regulations, responses and management, capacity building and awareness and litigation as the major issues to be addressed if financial crimes are to be checked. The percentage of the contributory effect of these issues and the degree of relevance of their associated indices were determined and found to be less than 100, indicating that the indices of some extraneous issues were not considered in the research instrument. Such issues include but not limited to economic status and cultural and societal impacts. Moreover, a coefficient score matrix was generated and used to estimate and rank the contribution of each respondent to the extracted issues.

Keywords: *PCA, financial crimes, Nigeria, causal factors, extracted factors.*

GJCST-E Classification: *1.1.2*



FACTORANALYSIS-BASED INVESTIGATION INTO FINANCIAL CRIME RELATED ISSUES IN NIGERIA

Strictly as per the compliance and regulations of:



RESEARCH | DIVERSITY | ETHICS

Factor Analysis-Based Investigation into Financial Crime Related Issues in Nigeria

Gabriel Babatunde Iwasokun

Abstract- This paper proposes sixteen indices that were considered very important for the analysis of financial crime related issues in Nigeria. The indices were listed in the questionnaire that was administered on the FCT and thirty out of thirty-six states that span the six geo-political zones of Nigeria to obtain relevant data. Copies of the questionnaire were administered during meetings with stakeholders of banks, insurance companies, educational institutions and other relevant government and private owned establishments. The data obtained were subjected to factor analysis by principal component using SPSS. The analysis identified policies and regulations, responses and management, capacity building and awareness and litigation as the major issues to be addressed if financial crimes are to be checked. The percentage of the contributory effect of these issues and the degree of relevance of their associated indices were determined and found to be less than 100, indicating that the indices of some extraneous issues were not considered in the research instrument. Such issues include but not limited to economic status and cultural and societal impacts. Moreover, a coefficient score matrix was generated and used to estimate and rank the contribution of each respondent to the extracted issues.

Keywords: PCA, financial crimes, Nigeria, causal factors, extracted factors.

I. INTRODUCTION

Financial crime is a non-violent but intentional crime committed for illicit monetary or other unlawful gain from individuals, corporations, government bodies and financial institution (IMF, 2001; Ladan, 2005). It constitutes a very serious threat that manifests itself in virtually all aspects of national life. It is widely spread and involves Internet-based cheque issuance, cash deposit, wire transfer and Automated Teller Machine (ATM) withdrawals performed by institutions, government and individuals on a daily basis. Notable financial crimes include theft, scams, embezzlement, identity theft, money laundering, bribery, smuggling, forgery, counterfeiting and tax evasion (Ibrahim *et al.*, 2015). Financial crimes are characterized by deceit, concealment or violation of trust and can be committed with every form of dynamism, subtleness and camouflage (Agus *et al.*, 2010a). Considerably, financial crime may lead to colossal loss of money as well as undermining the integrity of financial institutions and markets. It may also subvert national growth and

development (Spencer and Pickett, 2002; McDowell and Novis, 2001; Okoye and Gbegi, 2013; Ejiofor *et al.*, 2007). Financial crimes may lessen the ability of a country to attract foreign investment and subvert the growth and development of local manufacturing industries (IMF, 2001; Spencer and Pickett, 2002; Yusu, 2009). Financial crime may manifest in form of corruption, fraud and theft. Corruption is any illegal act such as kickbacks, embezzlement and extortion and another misuse of entrusted funds and power for private gain or improper and unlawful enrichment (Gottschalk, 2010; Ksenia, 2008).

Fraud is a despicable act with the aim of achieving a personal gain or creating a loss for another through concealment of an illegal act and it is a significant and growing threat to several organizations (Golden *et al.*, 2006; Edelherz, 1977). Most prominent financial frauds are the conversion of public money into personal use, granting of unauthorized loans or overdraft, fraudulent transfer or withdrawals, misrepresentation of quality and quantity during procurement and pyramid trading schemes. Others are posting of fictitious credits, cheque counterfeiting or forging, payroll padding (ghost workers), contract over billings and over-invoicing among others (Okeyi and Gbegi, 2013). Theft of cash, intellect, art or identity is said to take place if it is carried out unlawfully and out of all proportions. Several strategies and measures for combating financial crimes include the use of technology and establishment of agencies and commissions. Technological tools offer a more holistic view of data and highlight potential areas of risk to organizations thereby reducing the incidence of fraud (Deloitte, 2014). Big data and text mining, machine learning and forensic accounting are some of the existing technologies for combating financial crimes (Adegbeie and Fakile, 2012; Shai and Shai, 2014; Agus *et al.*, 2010b; Raghavendra *et al.*, 2011; Kitten, 2016). Impact of criminal personality, opportunity structures, corporate identity, values on crime, and business ethics had been identified as causes of financial crimes (Bussman, 2003). These causes could be attributed to bio-genetic factors which include genetic mutation and heredity (Horton, 1939), psychological factors comprising of personality disorders and sociological factors that include learning environment (Sutherland, 1939).

Author: Department of Software Engineering, Federal University of Technology, Akure, Nigeria. e-mail: gbiwasokun@futa.edu.ng

The fundamental techniques for combating financial crime still require a good understanding of its causes and dynamics as all technical and scientific proof have yielded unsatisfactory results (Ayoola *et al.*, 2015). Existing techniques for presenting the understanding of the causes and dynamics of financial crimes include some baseline and dimension-reduction tools such as *Missing Values Ratio (MVR)*, *Low Variance Filter (LVF)* and *High Correlation Filter (HCF)*. Others are *Random Forests Ensemble Trees (RFET)*, *Backward Feature Elimination (BFE)*, *Forward Feature Construction (FFC)*, *Principal Component Analysis (PCA)* (Silipo, 2015) and Factor Analysis (FA). Factor analysis is a method for investigating whether some variables of interest N_1, N_2, \dots, N_m , are linearly related to a smaller number of unobservable factors F_1, F_2, \dots, F_k . It is used to identify dimensions underlying response (outcome) for a set of variables such that the observed values for the variables are determined as manifest variables. Some standardized variables are generally used with the correlation matrix modelled such that its dimensions correspond to the factors. Several of manifest variables can be used but more appropriate if they have more than a few distinct values and an approximate bell-shaped distribution. Factor analysis based on principal components uses weights and scores to produce factor loadings and scores. These attributes informed its choice for the analysis of the financial security-related issues in Nigeria. The main objective of the study is to take a holistic view of the conceptualization of the main issues that relate to financial crime and provides data that serve the basis for the determination of their impact in Nigeria. Also, the study also provides data that is relevant for drawing conclusion based on a comparison between results from current and some related works.

II. RELATED WORKS

An exploration of the statistical methods for fighting financial crime by financial institutions is carried out in (Agus *et al.*, 2010a). Issues on the growing losses of revenue by governments, financial institution and individuals to the various forms of financial crime as well as the review of some statistical techniques for investigative studies of financial crimes were also discussed. The research formulated the necessary steps for account opening, described some visualization, description, analysis and computational tools for data on high volume transactions as well as a machine learning algorithm for detecting financial crime. An investigative study on the impact of economic and financial crime on the Nigerian economy is presented in (Yusus, 2009). A review of the conceptual legal framework as well as the nature, scope and effects of economic and financial crimes under the Nigerian law, was presented. The authors concluded that ICT

infrastructure is the main tool that financial criminals rely on in carrying out their unlawful acts.

The authors in (Okoye and Gbegi, 2013) evaluated the effect of fraud and related financial crime on the Nigerian economy. The research placed a premium on how the Internet, electronic money transfer (wire transfer) and other related platforms contributed to the current spate of financial crime. Regression-based analysis on available financial crime data revealed that financial crimes portend dwindling Gross Domestic Product (GDP) and shrinking economy. In (Iwasokun *et al.*, 2012), an investigation on the effect of financial crime on the society was presented. A platform for determining the correlation between crimes was also presented based on PCA-based analysis of financial crime data from a Criminal Investigation Department. The authors in [3] examined the effect of financial crime and corruption on manufacturing firms and organizations. The Two Way-ANOVA-based analysis of financial crime data obtained from primary and secondary sources revealed significant and negative implications of financial crime on the manufacturing firms as manifested through drained revenue, operational instability and low level of interest from foreign and domestic investors.

III. RESEARCH METHODOLOGY

The research methodology is conceptualized in Figure 1 showing data survey, factor analysis by principal components and results phases.

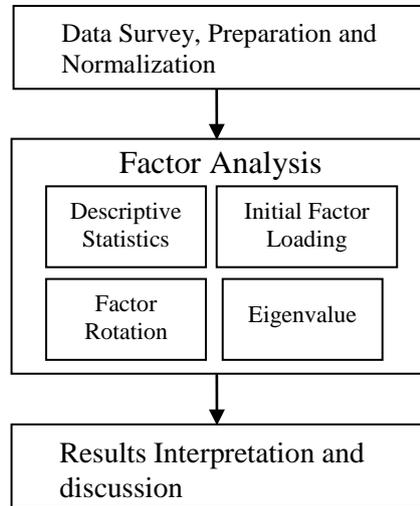


Figure 1: Conceptualization of the Factor Analysis-based model

a) *Data Survey, preparation and Normalization*

Data survey involved a survey of public and private agencies such as banks, insurance company, educational institutions that are involved in different forms of financial activities both offline and online. The selection was based on stratified sampling and respondents were randomly chosen with equal probability. Data preparation involved determination of all relevant variables for inclusion in the analysis, determination of the number of observations sufficient to provide reliable estimations of the correlations between the indices, estimation of valid measure of associations among selected variables and the arrangement of the surveyed observations as a set of data vectors y_1, y_2, \dots, y_d with each denoting a grouped observation of V variables. Data normalization is used to transform the surveyed data to a formatted form. Data with ratings were restructured to a notionally common scale before averaging.

b) *PCA-Based Factor Analysis*

The variables for PCA-based factor analysis of the inducement factors of financial crime are related to one another for the j^{th} respondents, and it is represented as follows (Iwasokun *et al.*, 2012; Gulumbe *et al.*, 2012):

$$\text{var}(Z_j) = \lambda_j \tag{1}$$

$$\alpha_{j1}^2 + \alpha_{j2}^2 + \dots + \alpha_{jk}^2 = 1 \tag{2}$$

Z_j represents the j^{th} respondent (the principal component of j^{th} data), α_{jk} represents the assessment of the j^{th} indices by the k^{th} respondent (the elements of the j^{th} eigenvector λ_j for the correlation matrix).

The principal components analysis of the survey involved descriptive statistic, correlation matrix, Bartlett's and Kaiser-Mayer Olkin (KMO) tests, component extraction and other statistics of relevance. Descriptive

statistics ensured standardization of the measurements used in the normalized data and covered the assigning of the data set variables to zero means, unit variances and standard deviation. The sample correlation coefficient is calculated as follows:

$$r_{x,y} = \frac{s_{x,y}}{s_x s_y} \tag{3}$$

$s_{x,y}$ is the variance between two columns in the data matrix, s_x and s_y are the standard deviations of columns x and y respectively. For multivariate analysis, the correlation matrix is analogous to the covariance matrix with correlations in place of covariances. Barlett's test of sphericity β is used to confirm the adequacy of a sample population by testing the null hypothesis that the variables in the population correlation matrix are uncorrelated. The observed significance level of .0000 is used to reject this hypothesis. The test is based on the formula (Donal, 1993):

$$\beta = - \left[\left[n - 1 - \frac{2p + 5}{6} \right] \ln |R| \right] \tag{4}$$

$|R|$ is the determinant of the correlation matrix, n is the number of observation and p is the number of variables. The KMO test γ for the hypothesis that the variables are uncorrelated in the population is based on the formula:

$$\gamma = \frac{\sum_i \sum_{i \neq j} r_{ij}^2}{\sum_i \sum_{i \neq j} r_{ij}^2 + \sum_i \sum_{i \neq j} a_{ij}^2} \tag{5}$$

r_{ij} is the correlation coefficient in the correlation matrix; a_{ij} is the partial correlation coefficient and i, j represent the rows and column sizes respectively. A near-zero partial correlation, A guarantees effective factorization and it is obtained from the correlation matrix R as follows:

$$A = - \frac{1}{R \times \sqrt{v_{ii} \times v_{jj}}} \quad (6)$$

The Communality of the squared component loadings for component *i* is computed as follows:

$$c_i = \alpha_{i1}^2 + \alpha_{i2}^2 + \dots + \alpha_{ip}^2 = \sum_{i=1}^p \alpha_{ip}^2 \quad (7)$$

p is the number of variables, α_{ip} is the value in *A* for row *i*, column *p*. The communalities narrate how well the model performs for each variable while the total communality gives an overall assessment.

The eigenvalues of *R* is calculated as follows:

$$|R - \lambda I_p| = 0 \quad (8)$$

I_p is a $p \times p$ identity matrix with eigenvalues $\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_p$ and the eigenvector *V* is calculated as follows:

$$V = DR^{-1} \quad (9)$$

D is the $p \times p$ diagonal matrix of eigenvalues of *R*.

From *p* variables, the principal components (unrotated factors) are extracted based on the criterion presented as follows (Kaiser, 1960):

$$\bar{\lambda} = \frac{1}{p} \sum_{j=1}^p \lambda_j \quad (10)$$

The criterion only extracted a principal component with an eigenvalue greater than $\bar{\lambda}$. The unrotated factors are subjected to orthogonal transformation using varimax, equimax, quartimax and promax and the best result was taken. Orthogonal transformation is used to obtain meaningful representation of variables and component mapping along the principal axis. Rotation by varimax is based on the assumption that the interpretability of a factor can be measured by the variance of the squares of its factor loadings. Quartimax rotation involves the minimization

of the number of factors needed to explain each variable while equamax rotation is a compromise that attempts to simplify both components and variables. Promax is an oblique rotation that allows factors to be correlated and because it is often more easily calculated than any direct oblimin rotation, it is more useful for large datasets.

The determination of component scores is based on a linear equation of the weighted standard scores of each respondent on the variables as follows:

$$M_{b,c} = \sum_{m=1}^f d_{a,c} W_{b,a}, b = 1, 2, \dots, x; \quad m = 1, 2, \dots, f \quad (11)$$

$M_{b,c}$ represents the contribution of b^{th} respondent to c^{th} component, $d_{a,c}$ is the component score coefficient of a^{th} variable for c^{th} component, *f* is the number of the extracted components, $W_{b,a}$ represents the standard score of b^{th} respondent for a^{th} variable and *x* is the respondents' population. $W_{b,a}$ is estimated as follows:

$$W_{b,a} = X + \frac{S_b - T_b}{u_b} \quad (12)$$

X represents the allowable minimum score, which in this case is 1, S_b represents the raw score for b^{th} index, T_b and u_b represent the mean and standard deviation respectively, of the raw scores of b^{th} index by the sampled respondents.

IV. RESULTS AND INTERPRETATION

The result from the analysis is interpreted to determine the correlation and relationship between indices. The Questionnaire shown in Appendix 1 was designed using the indices for the analysis of financial security-related issues. Each of these indices was offered loosed linguistic description and range of values as shown in Table 1.

Table 1: Matrix of Weight Attached to Linguistic Value

| Linguistic Representation | Excellent | Very Good | Good | Average | Poor |
|---------------------------|-----------|-----------|----------|----------|---------|
| Range of Values | 4.01-5.0 | 3.01-4.0 | 2.01-3.0 | 1.01-2.0 | 0.0-1.0 |

The first part of the Questionnaire provided vital information about each respondent while the second part presented five columns for the respondent to rank each of the sixteen indices based on the scale presented in Table 1. The Questionnaire was administered to Thirty States in the six geo-political zones and the Federal Capital Territory (FCT) in Nigeria and the summary of the survey is presented in Table 2.

Table 2: Summary of the survey

| Serial No. | State | No. of LG Surveyed | Total Questionnaire Administered | Total Questionnaire Returned | Total Questionnaire not Returned |
|------------|-------------|--------------------|----------------------------------|------------------------------|----------------------------------|
| 1 | Abia | 5 | 300 | 263 | 37 |
| 2 | Adamawa | 6 | 425 | 415 | 10 |
| 3 | Akwa-Ibom | 8 | 524 | 522 | 2 |
| 4 | Anambra | 5 | 275 | 254 | 21 |
| 5 | Bauchi | 7 | 589 | 487 | 102 |
| 6 | Benue | 7 | 652 | 623 | 29 |
| 7 | Delta | 10 | 524 | 451 | 73 |
| 8 | Cross River | 11 | 687 | 671 | 16 |
| 9 | Ebonyi | 6 | 165 | 128 | 37 |
| 10 | Edo | 8 | 785 | 687 | 98 |
| 11 | Ekiti | 7 | 570 | 457 | 113 |
| 12 | Enugu | 8 | 622 | 528 | 94 |
| 13 | Imo | 7 | 522 | 420 | 102 |
| 14 | Jigawa | 3 | 420 | 259 | 161 |
| 15 | Kaduna | 3 | 186 | 181 | 5 |
| 16 | Kano | 11 | 894 | 856 | 38 |
| 17 | Kebbi | 3 | 202 | 202 | 0 |
| 18 | Kogi | 6 | 414 | 401 | 13 |
| 19 | Kwara | 4 | 551 | 510 | 41 |
| 20 | Lagos | 20 | 1026 | 896 | 130 |
| 21 | Nasarawa | 6 | 239 | 239 | 0 |
| 22 | Ogun | 7 | 658 | 452 | 206 |
| 23 | Niger | 8 | 659 | 659 | 0 |
| 24 | Ondo | 18 | 1524 | 1325 | 199 |
| 25 | Osun | 8 | 354 | 258 | 96 |
| 26 | Oyo | 12 | 742 | 468 | 274 |
| 27 | Plateau | 6 | 231 | 197 | 34 |
| 28 | Rivers | 6 | 402 | 401 | 1 |
| 29 | Sokoto | 3 | 189 | 175 | 14 |
| 30 | Taraba | 5 | 580 | 574 | 6 |
| 31 | FCT | 3 | 627 | 587 | 40 |
| Total | | 158 | 11289 | 9500 | 1789 |

A total of Sixteen Thousand Five Hundred and Thirty-Eight (16538) copies of the Questionnaire were administered through direct and online contacts. In the direct contact, the researcher visited the surveyed states or engaged the services of third parties while indirect contact involved hosting the Questionnaire on Google forms for online assessment. In both cases, Fourteen Thousand Five Hundred and Forty-Six (14546) respondents returned duly completed Questionnaires. Where necessary, the responses were verified and

validated through follow-up meetings and personal interviews with the respondents

All the 14546 responses were subjected to factor analysis by principal components using SPSS. The analysis of the respondents' knowledge of financial crime, times fallen victim of financial crime and the distribution of crimes are presented in Tables 3, 4 and 5 respectively.

Table 3: Knowledge of Financial Crime

| Values | Frequency | Percent | % Cumulative |
|-----------|-----------|---------|--------------|
| Poor | 988 | 6.8 | 6.8 |
| Average | 3102 | 21.3 | 28.1 |
| Good | 4803 | 33.0 | 61.5 |
| Very Good | 3863 | 26.3 | 87.7 |
| Excellent | 1790 | 12.3 | 100.0 |
| Total | 14546 | 100.0 | |

Table 4: Distribution Range of Occurrences

| Range | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-----------|---------|---------------|--------------------|
| 0 | 11655 | 80.1 | | |
| 1-5 | 1372 | 9.4 | 47.4 | 47.4 |
| 6-10 | 447 | 3.1 | 15.4 | 62.8 |
| 11-15 | 164 | 1.1 | 5.7 | 68.5 |
| 16-20 | 357 | 2.5 | 12.4 | 80.9 |
| > 20 | 551 | 3.3 | 19.1 | 100.0 |
| Total | 14546 | 100.0 | | |

Table 5: Classes of Financial Crime Victims Distribution

| Classes of Financial Crime | Number of Occurrences | % |
|----------------------------|-----------------------|-------|
| Advance fee fraud | 1177 | 12.72 |
| Forgery (Fake Cheque) | 834 | 9.02 |
| Money Theft Through ATM | 850 | 9.18 |
| Kickbacks and Extortion | 730 | 7.89 |
| Embezzlement | 775 | 8.37 |
| Corruption and Bribery | 1014 | 10.95 |
| Fraud | 865 | 9.34 |
| Money Laundering | 536 | 5.8 |
| Identity theft | 462 | 4.99 |
| Counterfeit Money | 700 | 7.57 |
| Financial Grooming | 640 | 6.92 |
| Insider Trading | 372 | 4.03 |
| Phishing | 297 | 3.22 |
| Total | 9252 | 100 |

Table 6: Descriptive Statistics of Variables

| Variables | N | Mean | Std. Deviation |
|---|------|------|----------------|
| National Policy on Financial operations and Security | 1341 | 3.47 | 1.245 |
| Legislative, Regulatory and Institutional Framework on Financial operations | 1350 | 3.25 | 1.172 |
| Legislative, Regulatory and Institutional Framework on Financial Security | 1347 | 3.27 | 1.184 |
| Implementation of Conventional Security in Financial Institution | 1338 | 3.21 | 1.177 |
| Implementation of Financial Security Policy | 1340 | 3.13 | 1.219 |
| Financial Crime Case Assessment | 1338 | 3.15 | 1.210 |
| Prosecution of Financial Criminals | 1344 | 3.05 | 1.223 |
| Proficiency of litigators on Financial Crime Cases | 1323 | 3.13 | 1.223 |
| Public Awareness on Financial Security | 1344 | 3.17 | 1.196 |
| IT Literacy of Conventional Security Personnel | 1346 | 3.13 | 1.150 |
| Availability of IT Security Facility at Financial Centres | 1259 | 3.05 | 1.213 |
| Capacity Building/ IT Staff Development | 1268 | 3.04 | 1.197 |
| Rapid Response to Financial Emergency by Security Agencies | 1346 | 3.11 | 1.270 |
| Development and Usability of Financial Crime Database System | 1355 | 3.07 | 1.267 |
| Collaboration Between Financial Agencies | 1341 | 3.09 | 1.221 |
| Availability of Independent/Private Financial Security organization | 1343 | 3.03 | 1.235 |

The descriptive statistics shown in Table 6 presents the means and standard deviation of the rating of the indices for the analysis of the financial crime related issues by the respondents. The mean and standard deviation of the rating on 'National Policy on Financial operations and Security' are 3.47(69.0%) and 1.245 respectively while the mean and standard deviation of the rating on 'Legislative, Regulatory and Institutional Framework on Financial operations' are 3.25(65.0%) and 1.172 respectively. These values reveal that on the average, the respondents agreed that the 'National Policy on Financial Operations and Security' and 'Legislative, Regulatory and Institutional Framework on Financial Operations' are strong financial crime related issues. The interpretation is based on the matrix of weight attached to the linguistic values presented in Table 1. Similarly, standard deviations represent the statistical measure of dispersion from the mean for the

response values for 'National Policy on Financial Operations and Security' and for 'Legislative, Regulatory and Institutional Framework on Financial Operations' respectively. The communalities of the indices for financial crime related issues are presented in Table 7 showing that communalities of the 'National Policy on Financial operations and Security' and 'Legislative, Regulatory and Institutional Framework on Financial operations' are 0.719 and 0.731 respectively. These imply that 71.9% of the variance in 'National Policy on Financial operations and Security' can be explained by the extracted factors while the remaining 28.1% is attributed to extraneous factors. Similarly, 73.1% of the variance in 'Legislative, Regulatory and Institutional Framework on Financial operations' can be explained by the extracted factors while the remaining 26.9% is credited to extraneous factors.

Table 7: Communalities of Variables

| Variables | Initial | Extraction |
|---|---------|------------|
| National Policy on Financial operations and Security | 1.000 | 0.719 |
| Legislature's, Regulatory and Institutional Framework on Financial operations | 1.000 | 0.731 |
| Legislature's, Regulatory and Institutional Framework on Financial Security | 1.000 | 0.718 |
| Implementation of Conventional Security in Financial Institution | 1.000 | 0.648 |
| Implementation of Financial Security Policy | 1.000 | 0.664 |
| Public Awareness on Financial Crime/Security | 1.000 | 0.698 |
| Development and Usability of Financial Crime Database System | 1.000 | 0.795 |
| IT Literacy of Conventional Security Personnel | 1.000 | 0.69 |
| Capacity Building/ IT Staff Development | 1.000 | 0.761 |
| Collaboration Between Financial Agencies | 1.000 | 0.756 |
| Availability of Independent/Private Financial Security organization | 1.000 | 0.68 |
| Availability of IT Security Facility at Financial Centres | 1.000 | 0.791 |
| Proficiency of litigators on Financial Crime Cases | 1.000 | 0.788 |
| Financial Crime Case Assessment | 1.000 | 0.623 |
| Rapid Response to Financial Emergency by Security Agencies | 1.000 | 0.621 |
| Prosecution of Financial Criminals | 1.000 | 0.681 |



Table 8: Correlation Matrix of Variables

| Variables | NpFos | AsFrO | AsFrS | CsAss | FsAss | FCCcAs | ProFC | LigPr | PubAr | ItLit | FCSEc | CapSt | RapRe | FCDbs | Collb | InOrg |
|-----------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| NpFos | 1.000 | .711 | .656 | .573 | .542 | .558 | .473 | .441 | .421 | .432 | .383 | .376 | .451 | .458 | .470 | .420 |
| AsFrO | .711 | 1.000 | .710 | .594 | .556 | .570 | .500 | .460 | .449 | .493 | .439 | .441 | .515 | .493 | .489 | .445 |
| AsFrS | .656 | .710 | 1.000 | .604 | .565 | .572 | .522 | .523 | .466 | .476 | .466 | .446 | .484 | .488 | .478 | .421 |
| CsAss | .573 | .594 | .604 | 1.000 | .632 | .585 | .496 | .472 | .464 | .464 | .462 | .431 | .500 | .497 | .518 | .451 |
| FsAss | .542 | .556 | .565 | .632 | 1.000 | .635 | .442 | .419 | .431 | .485 | .448 | .483 | .489 | .453 | .489 | .468 |
| FCCcAs | .558 | .570 | .572 | .585 | .635 | 1.000 | .565 | .481 | .455 | .456 | .471 | .438 | .471 | .463 | .481 | .476 |
| ProFC | .473 | .500 | .522 | .496 | .442 | .565 | 1.000 | .631 | .502 | .488 | .457 | .416 | .512 | .498 | .491 | .471 |
| LigPr | .441 | .460 | .523 | .472 | .419 | .481 | .631 | 1.000 | .605 | .519 | .440 | .453 | .481 | .517 | .499 | .455 |
| PubAr | .421 | .449 | .466 | .464 | .431 | .455 | .502 | .605 | 1.000 | .593 | .482 | .460 | .458 | .489 | .474 | .454 |
| ItLit | .432 | .493 | .476 | .464 | .485 | .456 | .488 | .519 | .593 | 1.000 | .612 | .558 | .515 | .498 | .506 | .471 |
| FCSEc | .383 | .439 | .466 | .462 | .448 | .471 | .457 | .440 | .482 | .612 | 1.000 | .668 | .531 | .451 | .475 | .522 |
| CapSt | .376 | .441 | .446 | .431 | .483 | .438 | .416 | .453 | .460 | .558 | .668 | 1.000 | .525 | .471 | .501 | .492 |
| RapRe | .451 | .515 | .484 | .500 | .489 | .471 | .512 | .481 | .458 | .515 | .531 | .525 | 1.000 | .643 | .540 | .527 |
| FCDbs | .458 | .493 | .488 | .497 | .453 | .463 | .498 | .517 | .489 | .498 | .451 | .471 | .643 | 1.000 | .696 | .590 |
| Collb | .470 | .489 | .478 | .518 | .489 | .481 | .491 | .499 | .474 | .506 | .475 | .501 | .540 | .696 | 1.000 | .626 |
| InOrg | .420 | .445 | .421 | .451 | .468 | .476 | .471 | .455 | .454 | .471 | .522 | .492 | .527 | .590 | .626 | 1.000 |

The analysis of the correlation matrix presented in Table 8 shows that the highest correlation of 0.711 exists between 'National Policy on Financial Operations and Security' and 'Legislative, Regulatory and Institutional Framework on Financial Operations'. The next highest correlation of 0.710 exists between 'Legislative, Regulatory and Institutional Framework on Financial Security' and 'Legislative, Regulatory and Institutional Framework on Financial Operations'. The implication of the former is that 'National Policy on Financial Operations and Security' is most likely to share the same factor with 'Legislative, Regulatory and Institutional Framework on Financial Operations'. Similarly, in the later, 'Legislative, Regulatory and Institutional Framework on Financial Security' and 'Legislative, Regulatory and Institutional Framework on Financial operations' will likely share the same factor.

The Least correlation of 0.376 exists between 'Capacity Building/ IT Staff Development' and 'National

Policy on Financial Operations and Security'. This means that 'Capacity Building/ IT Staff Development' and 'National Policy on Financial Operations and Security' are not likely to share the same factor. The Barlett's test of sphericity produces a χ^2 of 7493.525 with a significance level of 0.000 which indicates that the sample population is adequate while the Kaiser-Meyer Olkin (KMO) test produced a measure of 0.950, which further confirmed the adequacy of the sample population.

The result of Kaiser Criterion based initial component extractions is presented in Table 9. The orthogonal transformation of the initial component extractions by varimax, promax, equamax and quartimax were carried out and the result obtained from the rotation by varimax, which is presented in Table 10, appeared most realistic and meaningful for interpretation among all others. Table 10 reveals four factors with their corresponding loadings.

Table 9: Extracted Initial Component Matrix

| Variables | Component | | | |
|---|-----------|--------|--------|--------|
| | 1 | 2 | 3 | 4 |
| Legislative, Regulatory and Institutional Framework on Financial Security | 0.762 | | | |
| Legislature's, Regulatory and Institutional Framework on Financial operations | 0.761 | | | |
| Implementation of Conventional Security in Financial Institution | 0.750 | | | |
| Collaboration Between Financial Agencies | 0.748 | | | |
| Development and Usability of Financial Crime Database System | 0.746 | | -0.421 | |
| Financial Crime Case Assessment | 0.744 | | | |
| Rapid Response to Financial Emergency by Security Agencies | 0.740 | | | |
| Implementation of Financial Security Policy | 0.732 | | | |
| IT Literacy of Conventional Security Personnel | 0.732 | | | |
| Prosecution of Financial Criminals | 0.724 | | | |
| National Policy on Financial operations and Security | 0.717 | -0.450 | | |
| Proficiency of litigators on Financial Crime Cases | 0.717 | | | -0.469 |
| Availability of IT Security Facility at Financial Centres | 0.708 | | | |
| Availability of Independent/Private Financial Security organization | 0.708 | | | |
| Public Awareness on Financial Crime/Security | 0.699 | | | |
| Capacity Building/ IT Staff Development | 0.695 | | | |

Principal Component 1(Policies and Regulations) loads on National Policy on Financial Operations and Security, Legislature’s, Regulatory and Institutional Framework on Financial Operations, Legislature’s, Regulatory and Institutional Framework on Financial Security, Implementation of Financial Security Policy, Implementation of Conventional Security in Financial Institutions and Financial Crime Case Assessment. Principal Component 2 (Responses and Management) loads on Collaboration between Financial Agencies, Development and Usability of Financial Crime Database System, Availability of Independent/Private Financial Security organization and Rapid Response to Financial Emergency by Security Agencies.

Similarly, Principal Component 3 (Capacity Building) loads on Capacity Building/ IT Staff Development, Availability of IT Security Facility at Financial Centres and IT Literacy of Conventional Security Personnel. Principal Component 4 (Awareness and Litigation) loads on Proficiency of litigators on

Financial Crime Cases, Public Awareness on Financial Crime and Security and Prosecution of Financial Criminals.

The result highlighted government-approved policies and regulation as the most critical issues on financial crimes. This view was corroborated by the authors in (Galina, 2014; Sofia de Oliveira *et al.*, 2016) who mentioned that the state of national financial security depends solely on governance efficiency as well as policies and regulations. Other financial crimes related issues highlighted are response and management strategies, capacity building and public awareness and litigation measures. These also agreed with the opinions presented in (Galina, 2014; Sofia de Oliveira *et al.*, 2016; Usman *et al.*, 2012; Durmus, 2007). The Component Score which is a linear combination of the original variables to the extracted factors is presented in Table 11.

Table 10: Rotated Component matrix

| Variables | Component | | | |
|---|-----------|-------|-------|-------|
| | 1 | 2 | 3 | 4 |
| National Policy on Financial operations and Security | 0.788 | | | |
| Legislature’s, Regulatory and Institutional Framework on Financial operations | 0.773 | | | |
| Legislature’s, Regulatory and Institutional Framework on Financial Security | 0.744 | | | |
| Implementation of Conventional Security in Financial Institution | 0.688 | | | |
| Implementation of Financial Security Policy | 0.685 | | | |
| Financial Crime Case Assessment | 0.66 | | | |
| Development and Usability of Financial Crime Database System | | 0.784 | | |
| Collaboration Between Financial Agencies | | 0.754 | | |
| Availability of Independent/Private Financial Security organization | | 0.701 | | |
| Rapid Response to Financial Emergency by Security Agencies | | 0.582 | | |
| Availability of IT Security Facility at Financial Centres | | | 0.792 | |
| Capacity Building/ IT Staff Development | | | 0.77 | |
| IT Literacy of Conventional Security Personnel | | | 0.614 | 0.441 |
| Proficiency of litigators on Financial Crime Cases | | | | 0.783 |
| Public Awareness on Financial Crime and Security | | | | 0.691 |
| Prosecution of Financial Criminals | | | | 0.658 |

Table 11: Component Score Coefficient Matrix

| Variables | Component | | | |
|---|-----------|--------|--------|--------|
| | 1 | 2 | 3 | 4 |
| National Policy on Financial operations and Security | 0.346 | -0.063 | -0.162 | -0.06 |
| Legislative, Regulatory and Institutional Framework on Financial operations | 0.316 | -0.08 | -0.077 | -0.072 |
| Legislature's, Regulatory and Institutional Framework on Financial Security | 0.288 | -0.148 | -0.066 | 0.033 |
| Implementation of Conventional Security in Financial Institution | 0.252 | -0.018 | -0.032 | -0.099 |
| Implementation of Financial Security Policy | 0.270 | -0.051 | 0.124 | -0.246 |
| Public Awareness on Financial Crime/Security | -0.135 | -0.159 | 0.061 | 0.493 |
| Development and Usability of Financial Crime Database System | -0.113 | 0.522 | -0.209 | -0.022 |
| IT Literacy of Conventional Security Personnel | -0.096 | -0.166 | 0.35 | 0.167 |
| Capacity Building/ IT Staff Development | -0.081 | -0.066 | 0.547 | -0.171 |
| Collaboration Between Financial Agencies | -0.083 | 0.486 | -0.138 | -0.092 |
| Availability of Independent/Private Financial Security organization | -0.108 | 0.433 | -0.001 | -0.146 |
| Availability of IT Security Facility at Financial Centres | -0.083 | -0.13 | 0.567 | -0.112 |
| Proficiency of litigators on Financial Crime Cases | -0.125 | -0.073 | -0.156 | 0.602 |
| Financial Crime Case Assessment | 0.228 | -0.083 | -0.012 | -0.015 |
| Rapid Response to Financial Emergency by Security Agencies | -0.052 | 0.283 | 0.039 | -0.087 |
| Prosecution of Financial Criminals | -0.031 | -0.03 | -0.185 | 0.454 |

Table 12: Standard scores by Ten Respondents

| Respond-nets | NpFos | AsFO | AsFfs | CsAs | FsAss | FCAs | ProFC | LigPr | PubAr | Illit | FCSEC | Capst | RapRe | FCDos | Collb | InOrg |
|--------------|-------|------|-------|------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Res1 | 5 | 3 | 4 | 2 | 5 | 3 | 2 | 5 | 3 | 4 | 1 | 3 | 3 | 4 | 5 | 5 |
| Res2 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 2 | 3 | 1 | 1 | 1 | 3 | 5 | 3 | 1 |
| Res3 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 |
| Res4 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 3 | 3 | 1 | 5 | 5 | 4 | 3 |
| Res5 | 5 | 4 | 3 | 5 | 1 | 2 | 5 | 4 | 3 | 4 | 1 | 1 | 5 | 4 | 3 | 2 |
| Res6 | 5 | 2 | 4 | 1 | 3 | 5 | 5 | 2 | 4 | 5 | 4 | 5 | 3 | 5 | 4 | 4 |
| Res7 | 4 | 3 | 3 | 3 | 4 | 3 | 2 | 3 | 4 | 4 | 3 | 4 | 3 | 2 | 3 | 2 |
| Res8 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 2 |
| Res9 | 5 | 4 | 5 | 4 | 5 | 4 | 4 | 3 | 5 | 4 | 3 | 5 | 4 | 3 | 3 | 5 |
| Res10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 4 | 3 | 2 | 4 | 2 | 3 |

Given that the standard scores by the bth respondent in the sixteen variables under consideration are $W_{b,1}, W_{b,2}, W_{b,3} \dots, W_{b,16}$, the financial crimes related issues based on the view of each respondent, in the areas of policies and regulations, responses and management, capacity building and awareness and litigation denoted by $M_1, M_2, M_3,$ and M_4 are modeled as follows:

$$M_1 = 0.346W_{b,1} + 0.316W_{b,2} + \dots - 0.031W_{b,16} \quad (9)$$

$$M_2 = -0.063W_{b,1} - 0.800W_{b,2} + \dots - 0.30W_{b,16} \quad (10)$$

$$M_3 = -0.162W_{b,1} - 0.077W_{b,2} + \dots - 0.185W_{b,16} \quad (11)$$

$$M_4 = -0.060W_{b,1} - 0.072W_{b,2} + \dots + 0.454W_{b,16} \quad (12)$$

The standard scores by ten randomly selected respondents for each of the sixteen variables under consideration are presented in Table 12. Table 13 shows the calculated percentage contributions of each of the ten sampled respondents to each of the four factors. It is revealed that sampled respondent described with identity Res2 has the highest contribution of 5.76 (17.47%) to issue 1 while sampled respondent Res6 has the highest contribution of 3.89 (21.85%) to issue 2. Similarly, sampled respondent described with identity Res7 has the highest contribution of 3.29 (19.35%) to issue 3 and sampled respondent Res6 has the highest contribution of 4.50 (19.93%) to issue 4.

Table 13: Aggregate factor scores with percentage contributions for a subset of respondents

| Respondents | Factor 1 | | Factor 2 | | Factor 3 | | Factor 4 | |
|-------------|----------|----------------|----------|----------------|----------|----------------|----------|----------------|
| | Score | % Contribution |
| Res1 | 3.76 | 11.36 | 0.80 | 4.51 | 2.31 | 13.56 | 2.68 | 11.85 |
| Res2 | 5.79 | 17.47 | 0.02 | 0.10 | 0.65 | 3.84 | 1.62 | 7.19 |
| Res3 | 3.22 | 9.73 | 2.34 | 13.15 | 2.92 | 17.14 | 3.03 | 13.42 |
| Res4 | 4.62 | 13.96 | 1.83 | 10.28 | 1.08 | 6.32 | 3.51 | 15.54 |
| Res5 | 3.47 | 10.48 | 2.55 | 14.33 | -0.30 | -1.77 | 2.77 | 12.28 |
| Res6 | 1.17 | 3.52 | 3.89 | 21.85 | 1.57 | 9.20 | 4.50 | 19.93 |
| Res7 | 2.66 | 8.04 | 1.74 | 9.77 | 3.29 | 19.35 | 0.78 | 3.47 |
| Res8 | 4.02 | 12.12 | 0.45 | 2.53 | 0.93 | 5.47 | 0.21 | 0.93 |
| Res9 | 3.91 | 11.80 | 1.67 | 9.41 | 3.05 | 17.91 | 2.49 | 11.01 |
| Res10 | 0.50 | 1.51 | 2.50 | 14.08 | 1.53 | 8.98 | 0.99 | 4.38 |
| Total | 33.12 | 100.00 | 17.78 | 100.00 | 17.03 | 100.00 | 22.58 | 100.00 |

The eigenvalues and percentage variance for each of the four issues is shown in Table 14. It is revealed that the four extracted issues contributed 71.02% to financial crime related issues in Nigeria. Component 1 described as 'Policies and Regulations' contributes 53.37% out of 71.02%. This implies that government policies and regulations are very germane issues of financial security and must not be taken with levity. Components 2, 3 and 4 contribute 7.43%, 5.13% and 5.10% respectively. These imply that government must also focus on raising the awareness of its people

to the need for safe and secure financial system as well as ensuring strong litigation measures against financial related crimes. It is also important that adequate attention be given to building strong capacity for all relevant groups and agencies as well as putting in place facilities for timely response and management of threats to safe financial system. The remaining 28.98% is considered as the expected influences of some extraneous components that are important but their related indices were not considered.

Table 14: Eigenvalue of factors

| Component | Extraction Sums of Squared Loadings | | |
|-----------|-------------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % |
| 1 | 8.539 | 53.367 | 53.367 |
| 2 | 1.188 | 7.426 | 60.793 |
| 3 | .821 | 5.131 | 65.925 |
| 4 | .815 | 5.095 | 71.020 |

V. CONCLUSION

Nigerian economy has suffered greatly in recent years due to the rising cases of financial crimes in several agencies of public and private sectors. Financial criminals have used the Internet to commit all manners of frauds, embezzlement, tax invasion, money laundering and other despicable financial acts. Nigeria's international image has also suffered due to the involvement of some of her citizens in cases of financial crimes at local and international levels. In view of these, factor analysis by principal components has been used for the analysis of financial crimes related issues in Nigeria. Four issues were extracted with their respective related indices. The initial component matrix generated was subjected to orthogonal transformation to ensure reasonable factorization. The obtained factor score coefficient matrix provided the basis for the determination of the degree of reasonability of the assessment of every respondent.

The obtained eigenvalue of each issue gave its percentage impact on the current spate of financial

crimes in Nigeria. The percentage contribution was less than 100, which is a pointer to some significant extraneous (latent) factors whose indices were not considered in the research instrument. The results of the factor analysis placed a high premium on government policies and regulations, responses and management, capacity building as well as awareness and litigation as the major issues for safe and secure financial system in Nigeria. These corroborated the positions held by the authors in [30-33] who opined that good governance should be provided at all levels for economic and social security, promoting selflessness and patriotism. The authors also agreed on the need for adequate counter-measure and litigation systems as necessary strategies for curbing the menace of financial crime. Findings from the research also established that systemic ways of ensuring that citizens adopt technical know-how for national development rather than committing crimes should be introduced and enforced by the Nigerian government.

REFERENCES RÉFÉRENCES REFERENCIAS

1. Adegbie F., Fakile, A. (2012). Economic and Financial Crime in Nigeria: Forensic Accounting. *British Journal of Arts and Social Sciences*, 6.
2. Agus S., Sheela, N., Ming, Y., Aijun, Z., Daniel, K., Fernando, C. D. (2010). *Statistical Methods for Fighting Financial Crimes*. American Statistical Association.
3. Agus, S., Nair, S., Yuan, M., Zhang, A., Kern, D., Cala-Diaz, F. (2010a). *Statistical Methods For Fighting Financial Crimes*. *Technometrics*, 5-19.
4. Ayoola F. J., Adeyemi M. A., Jabaru, S. O. (2015). On the Estimation of Crime Rate in the Southwest of Nigeria: Principal Component Analysis Approach. *Global Journal of Science Frontier Research: F Mathematics and Decision Sciences*.
5. Bussman K. (2003). Causes of Economic Crime and the Impact of Values: Business Ethics As a Crime Preventive Measure.
6. Deloitte J. (2014). *Risk Angles: Five questions on financial crime*. Deloitte Touche Tohmatsu Limited.
7. Donald J. A. (1993). Stopping Rules in Principal Component Analysis: A comparison of Heuristical and Statistical Approaches. *Ecology* 74(8), 2204-2214.
8. Durmuş Y. (2007): *Financial Security and Stability*. İstanbul.
9. Edelherz E. (1977). White – collar and Professional Crime: The Challenge for the 1980s. *American Behavioural Scientist*, 109 – 128.
10. Ejiofor, O. C., Oni, S., Nwajei, R. I. (2007). Economic Crimes and National Security: A Perspective of The Nigerian Military. *International Journal of Social Sciences and Humanities Reviews*, 7, 190-202.
11. Galina P. (2014). Issues of Country Financial Security Governance, *Forum Scientiae Oeconomia*, 2.
12. Golden, T., Skalak, S., and Clayton, M. (2006). *A Guide to Forensic Accounting Investigation*. New York: Wiley.
13. Gottschalk, P. (2010). Categories of Financial Crim. *Journal of Financial Crime*.
14. Gulumbe S. U., Dikko, H., Bello, Y. (2012). Analysis of Crime Data using Principal Component Analysis: A Case Study of Katsina State. *CBN Journal of Applied Statistics*.
15. Horton E. H. (1939). *The American Criminal* Cambridge, MA: Harvard University Press.
16. Ibrahim, J., Adeyemi, M., Odunayo, K. (2015). Implication of Financial Crimes and Corruption on Manufacturing Firms in Osun State, Nigeria. *European Journal of Business and Management*.
17. International Monetary Fund (IMF) (2006). *Financial System Abuse, Financial Crime and Money Laundering- Background Paper*.
18. Iwasokun G. B., Alese B. K., Thompson A. B. Aranwuwa O. F. (2012). Statistical Evaluation of the Impact of ICT on Nigerian Universities', *International Journal of Educational Development with ICT*, 8(1): 104-120.
19. Kaiser H. F. (1960). The Application of Electronic Computers to Factor Analysis. *Education and Psychological Measurement*, 141-151.
20. Kitten T. (2016). News:BankInfo Security. Retrieved from BankInfo Security, Available: <http://www.bankinfosecurity.com/big-datas-tie-to-fraud-prevention-a-6251>
21. Ksenia, G. (2008). Can corruption and economic crime be controlled in developing countries and if so, is it cost-effective. *Journal of Financial Crime*, 223-233.
22. Ladan, M. (2005). *Crime Prevention and Control and Human Rights in Nigeria*.
23. McDowell, J., Novis, G. (2001). The consequences of Money Laundering and Financial Crime. *An Electronic Journal of the U.S. Department of State*.
24. Okoye, E., Gbegi, D. (2013). An Evaluation of the Effect of Fraud and Related Financial Crimes on the Nigerian Economy. *Kuwait Chapter of Arabian Journal of Business and Management Review*.
25. Raghavendra K., Konugurthi, P. K., Agarwal, A., Raghavendra, R. C., Rajkumar, B. (2011). *The Anatomy of Big Data Computing*.
26. Shai S. S., Shai B. D. (2014). *Algorithm, Understanding Machine Learning: from Theory to*. Cambridge University Press.
27. Silipo R. (2015). Seven Techniques for Data Dimensionality Reduction, Available: <https://www.kdnuggets.com/2015/05/7-methods-data-dimensionality-red>
28. Sofia de Oliveira, I., Keatinge, T., Stickings, A. (2016). *Building Trust and Taking Risks in the Global Effort to Tackle Financial Crime*. RUSI Occasional Paper.
29. Spencer P., and Pickett, J. (2002). *Financial Crime, Investigation and Control*. John Wiley and Sons, Inc.
30. Sutherland, E. (1939). The White-collar Criminal. *American Sociological Reviews*, 1-12.
31. Usman, U., Yakubu, M., Bello, A.Z. (2012). Encouraging Public-Private Partnerships to Fight Financial Crime An Investigation on the Rate of Crime in Sokoto State Using Principla Componenet Analysis. *Nigerian Journal of Basic and Applied Science*, 152-160.
32. Yusuf, I. (2009). The Devastating Impact of Money Laundering and other Economic and Financial Crimes on the Economy of Developing Countries: Nigeria as a Case Study. *Curtin International Business Conference*.

10. *Have You Been a Victim of Computer Crime* (Please Tick (√) as appropriate)

| | |
|-----|--|
| Yes | |
| No | |

IF YES:

11. TICK (√) AS APPROPRIATE, THE INCIDENTS

| | |
|--|--|
| Advance fee fraud (“Yahoo Yahoo”) | |
| <i>Forgery</i> (Fake Office Documents, Certificates, etc.) | |
| <i>ATM</i> (Money Theft Through ATM) | |
| <i>Piracy</i> (Pirated Software, Video/Audio CDs, etc.). | |
| <i>Phreaking</i> (Making Fraudulent free calls) | |
| <i>Spamming</i> (Unsolicited emails) | |
| <i>Embezzlement</i> (Executive Theft, Salami Shaving. etc.). | |
| <i>Computer Virus and/or Denial of Service</i> | |
| <i>Pornography/Financial Grooming</i> | |
| <i>Others</i> (Specify): | |

12. TICK (√) AS MANY AS POSSIBLE MODE OF OCCURRENCES

| | |
|----------|--|
| 1-5 | |
| 6-10 | |
| 11-15 | |
| 16-20 | |
| Above 20 | |

13. Financial Crime Gender Incidence

| | | | | |
|--------------|-----------|------|--------|-----|
| <i>Index</i> | Very High | High | Medium | Low |
| Male | | | | |
| Female | | | | |

14. Financial Criminals' Age Range

| | | | | |
|--------------|------------------|-------------|---------------|------------|
| <i>Index</i> | <i>Very High</i> | <i>High</i> | <i>Medium</i> | <i>Low</i> |
| 2-11 | | | | |
| 12-17 | | | | |
| 18-25 | | | | |
| 26-45 | | | | |
| Above 45 | | | | |

Section B: Assessment of Financial Security Related Issues

Pls. Tick/Write as appropriate depending on the level/Intensity of Indices using the scale of Excellent, Very Good, Good Average or Poor.

| <i>Index</i> | Excellent | Very Good | Good | Average | Poor |
|---|-----------|-----------|------|---------|------|
| National Policy on Financial operations and Security | | | | | |
| Legislative, Regulatory and Institutional Framework on Financial operations | | | | | |
| Legislative, Regulatory and Institutional Framework on Financial Security | | | | | |
| Implementation of Conventional Security in Financial Institution | | | | | |
| Implementation of Financial Security Policy | | | | | |
| Financial Crime Case Assessment | | | | | |
| Prosecution of Financial Criminals | | | | | |
| Proficiency of litigators on Financial Crime Cases | | | | | |
| Public Awareness on Financial Security | | | | | |
| IT Literacy of Conventional Security Personnel | | | | | |
| Availability of IT Security Facility at Financial Centers | | | | | |
| Capacity Building/ IT Staff Development | | | | | |
| Rapid Response to Financial Emergency by Security Agencies | | | | | |
| Development and Usability of Financial Crime Database System | | | | | |
| Collaboration Between Financial Agencies | | | | | |
| Availability of Independent/Private Financial Security organization | | | | | |

