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The Trend Analysis of the Level of Fin-Metrics and E-Stat Tools for Research Data Analysis in the Digital Immigrant Age

Momoh Saliu Musa
Department of Marketing, Federal Polytechnic, P.M.B 13, Auchi, Nigeria.
Tel: +2347032739670 e-mail: momohsm2011@yahoo.com

Shaib Ismail Omade (Corresponding author)

Department of Statistics,
School of Information and Communication Technology,
Federal Polytechnic, P.M.B 13, Auchi, Nigeria.
Phone: +2347032808765 e-mail: shaibismail@yahoo.com

Abstract

The current trend in the information technology age has taken over every spare of human discipline ranging from communication, business, governance, defense to education world as the survival of these sectors depend largely on the research outputs for innovation and development. This study evaluated the trend of the usage of fin-metrics and e-stat tools application among the researchers in their research outputs- digital data presentation and analysis in the various journal outlets. The data used for the study were sourced primarily from the sample of 1720 out of 3823 empirical on and off line journals from various science and social sciences fields. Statistical analysis was conducted to evaluate the consistency of use of the digital tools in the methodology of the research outputs. Model for measuring the chance of acceptance and originality of the research was established. The Cockhran test and Bartlet Statistic revealed that there were significant relationship among the research from the Polytechnic, University and other institution in Nigeria and beyond. It also showed that most researchers still appeal to manual rather than digital which hampered the input internationally and found to be peculiar among lecturers in the system that have not yet appreciate IT penetration in Learning. It therefore recommended that training and workshop should be conducted within and outside the countries' academic world to improve the analytical strength and applications of the tools to enhance research credibility, accuracy, acceptability, usability and currency of research objectives and purposes which are significant to the individual and society in general.

Keywords: e-Stat, Fin-matrics, trend, digital, Journals, IT

1. Introduction

The current trend of research in all areas of human disciplines have placed more emphasis on the empirical reliability, validity, rightful use of statistical tools (manual or electronic) techniques employed, the use and misuse of hypothesis testing procedure for justification of research outputs in various areas of studies as observed in the literature of (Libutti & Kopala1995). Very importantly, the sampling procedure and technique adopted is a significant factor in research. Reliability is the consistency of result of experiment conducted over period of time. This could be longitudinal or cross session frame of research time. The reliability is measured by test and retest, multiple form, parallel or correlation (Pesaran & Shin1999). Validity is the truthfulness of research measured by context, content, criterion and face validity. Although, researching findings might be reliable but scarcely valid therefore, all validity research is reliable. The study attempts to evaluate the trend of fin-metrics and e-stat tools usage in data analysis among researchers. It further compares the research outputs of polytechnics, monotechnics and universities for the level of electronic data mining and analysis and softwares usability. The acceptance of the findings in most journals based on empirical evaluation is of great importance in the contemporary research outputs as far as quality research is concerned.

2. The Statement of the Problem

Research outputs in most journal articles scarcely utilized e-stat and fin-matrix tools. This has presented most research data analysis empirically deficient and lack the validity of finding and subsequently analytical discussion. Therefore level of IT literacy has contributed greatly to this shortfall. However the paper tends to evaluate the trend of e-stat and fin-matrix application among researchers in the area of research outputs, empirical credibility across institutions and digital divide.

3. Objective

The followings are the objectives of this paper:

- To compare the applications of e-stat/finmetrix tools on research ouput based on institutions' category
- To examine the currency of software usage in research data analysis
- To evaluate the significance of usage of softwares
- To measure the level of IT familiarity and applications among researchers
- To examine the various available and possible sotwares applications.

4. Research Hypothesis

The hypotheses for the research study are stated as:

- There is consistency in the usage of IT and software tools in research output drive
- There is significant relationship between the social sciences and sciences journal outputs based on softwares applications.

5. Significance

The study is expected to establish the need of paradigm shift from the tradition method of analysis to the digital appeal. To inform the researcher of the relevance of IT penetration and appreciation in the robustness of research outputs for local and international journal outlets. To inform and educate researchers on the viability and usability of softwares quality teachings and research for individual, organizational/institutional needs and society in general.

6. Electronic tools/Softwares for Research analysis

It is very significant that the researchers today transformed the concept and principleof traditional methods of analysis into digital. The analysis done electronically is mostly carried out via the applications of softwares in the view of (Cooper 1988). The software is application form of user friendly computer application packages majorly statistical and mathematical in nature which help aids researches in various field of human endeavours. The softwares use are open source, properiatory, public and freeware. Open source allows modifications and easy of use with cost, public attracts no cost and it is share wirelessly or through the network environment. The properiatory is expensive and always on demand while freeware is made available freely downloadable form and can be used for research purpose and transferable. The followings are the list of softwares unfortunately not put to use in most of the Nigerian institutions because of manpower, low level of IT literacy and usage, cost, availability and capability to instruct and use e-stat tools.

Aabel – Graphic display and plotting of statistical data sets
ADAPA – batch and real-time scoring of statistical models
Angoss
ASReml – for restricted maximum likelihood analyses
BMDP – general statistics package
CalEst – general statistics and probability package with didactic tutorials
Data Applied – for building statistical models
DPS – comprehensive statistics package
EViews – for econometric analysis
FAME – a system for managing time series statistics and time series databases
GAUSS – programming language for statistics
GenStat – general statistics package
GLIM – early package for fitting generalized linear models

GraphPad InStat – Very simple with lots of guidance and explanations
GraphPad Prism – Biostatistics and nonlinear regression with clear explanations
IMSL Numerical Libraries – software library with statistical algorithms
JMP – visual analysis and statistics package
LISREL – statistics package used in structural equation modeling
Maple – programming language with statistical features
Mathematica – programming language with statistical features
MATLAB – programming language with statistical features
MedCalc – for biomedical sciences
Mentor – for market research
Minitab – general statistics package
MLwiN – multilevel models (free to UK academics)
NCSS – general statistics package
NMath Stats – statistical package for .NET Framework
O-Matrix – programming language
OriginPro – statistics and graphing, programming access to NAG library
Partek – general statistics package with specific applications for genomic, HTS, and QSAR data
Primer-E Primer – environmental and ecological specific.
PV-WAVE – programming language comprehensive data analysis and visualization with IMSL statistical package
Q research software – quantitative data analysis software for market research
Quantum – part of the SPSS MR product line, mostly for data validation and tabulation in Marketing and Opinion Research
RATS – comprehensive econometric analysis package
SAS – comprehensive statistical package
SHAZAM – comprehensive econometrics and statistics package
SigmaStat – for group analysis
SOCR – online tools for teaching statistics and probability theory
Speakeasy – numerical computational environment and programming language with many statistical and econometric analysis features
SPSS – comprehensive statistics package
Stata – comprehensive statistics package
Statgraphics – general statistics package
STATISTICA – comprehensive statistics package
StatXact – package for exact nonparametric and parametric statistics
Systat – general statistics package
S-PLUS – general statistics package
Unistat – general statistics package that can also work as Excel add-in
The Unscrambler (free-to-try commercial Multivariate analysis software for Windows)
WINKS – Statistical Data Analysis and Graphs from TexaSoft – a general statistics package designed for scientific data analysis
XploRe
Analyse-it – add-on to Microsoft Excel for statistical analysis
Sigma Magic - add-on to Microsoft Excel for statistical analysis designed for Lean Six Sigma
SigmaXL – add-on to Microsoft Excel for statistical and graphical analysis
SPC XL – add-on to Microsoft Excel for general statistics
SUDAAN – add-on to SAS and SPSS for statistical surveys
XLfit add-on to Microsoft Excel for curve fitting and statistical analysis
XLSTAT add-on to Microsoft Excel for statistics and multivariate data analysis
Stats Helper – add-on to Microsoft Excel for descriptive statistics and Six Sigma Others are Gretl, SSP, Excel, Simluk, ALGOL, MATCAD,

The lists of softwares above come in versions as a result of system upgrade and compatibility. This also depends on the Pentium and system specifications as it may affect the installation process. (Bruce1990) argued that statsoft sometimes require coding using excel to enhance and accept analysis to be performed

effectively. The mastering of the softwares applications in research outputs dwell on the understanding of coding techniques.

7. Use of Statistical Techniques

Most often than not researchers tends to use the test statistic interchangeably which has the ability of influencing their result negatively. This is evident on the sample size and determination, test tool to apply and the decision to be made at a given point in research. The sample size determination depends finite or infinite which inform the right formulae to apply, the simple size may or may not follow normality as a result the research make choice of student t-statistic or standard normal test (Z) opined by (Bruce 1997). The nature of hypothesis requires special techniques such as ANOVA, Chisquares, Regression, Correlation or non parametric procedures. These are inferential in nature while others could be descriptive depending on the research questions and objectives. In addition, Anova investigates significant difference and comes in various ways (one, two, three ways, nested multistage, co founding form). There are ordinary, probabilistic and contingency chi-squares- measures relationship, discrepancies and dependency of variables. Regression determines relationship which could be linear or nonlinear, simple or multiple. Descriptive tends to measure centrality of degree of dispersion of variables under study. Whichever techniques apply depend on the researchers' frame of mind and objective in line with the hypothesis and data mining available for the study see (Bourner 1996).

8. Methodology

On line and printed journals were randomly selected and studied based on institution, IT divide and the application of software usage in the research data analysis (Leedy 1997). The journals were marked according to the research study stratifications. The Cochran and Bartlet statistic was adopted to evaluate the significance and consistency of the usage. The e-view was demonstrated as case in point research data analysis and interpretation (Bruce 1993).

8.1. Analysis

The data were subjected to electronic analysis with the use of software such as STATA and SPSS to determine consistency and relationship.

8.2.Findings

The social sciences have more research outputs than the science based on the research study and the parameters usage. The online are more in the social science than the science and same applicable to the printed journal. In terms of e-stat tool application, there were few or less usage of software for empirical analysis which has contributed to low level of research and acceptability of findings. Hence, research from the university is far significantly differing from those of the polytechnic. These might be justifiable by the low level of IT penetration and application in the currency of research and teaching. This was also found to have significantly affected the output of research from the polytechnic.

8.3 Discussion of Results

The OLS result in table1 showed the independent variables have positive relationship with Nigeria economic growth. This study has contributed to the cointegrating and causal relationship between foreign direct investment and economic growth in the case of three Sub-Saharan African countries. To this end, we use two recent econometric procedures which are the (Pesaran 2001) approach to cointegration and the procedure for non-causality test popularized by (Toda &Yamamoto1995). We build vector Auto-regression models and compute bounds F-statistics to test for the absence of a long-run relationship between foreign direct investment and growth. We also construct vector autoregressive models and compute modified Wald statistics to test for the non-causality between FDI and economic growth. Granger test revealed that NGDP causes SAFDI and both SAFDI and GFDI granger cause which implies that there is long run relationship between FDI from South Africa and Ghana to the economic growth in Nigeria.

9. Conclusion

The findings revealed there were significant relationship among the research from the Polytechnic, University and other institutions in Nigeria and beyond. It also showed that most researchers still appeal to manual rather than digital which hampered the input internationally and found to be peculiar among

lecturers in the system that have not yet appreciate IT penetration in Learning. It therefore recommended that training and workshop should be conducted within and outside the countries' academic world to improve the analytical strength and applications of the tools to enhance research credibility, accuracy, acceptability, usability and currency of research objectives and purposes which are significant to the individual and society in general.

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9. Data Presentation/Analysis

Table1 Journal Nature

Category	Social Science	Science
Online	700	423
Printed	285	312
Total	985	735

Souce: Field Survey, 2011.

Table2 e-stat and fin-matrix usage level

Category	Social Science	E-stat/ Finmatrix Usage	Science	E-stat/ Finmatrix usage
Online	700	120	423	102
Printed	285	25	312	29
Total	985	145	735	131

Souce: Field Survey, 2011.

Table3 Journal based on Institution

Category	University	Polytechnic/Others
Online	634	56
Printed	765	275
Total	1399	331

Souce: Field Survey, 2011

Table4 Institutions Based on IT level

Category	University	Polytechnic/others
High	954	220
Low	100	312
Poor	32	104
Total	1086	636

Souce: Field Survey, 2011.

10. Case of E-views analysis output

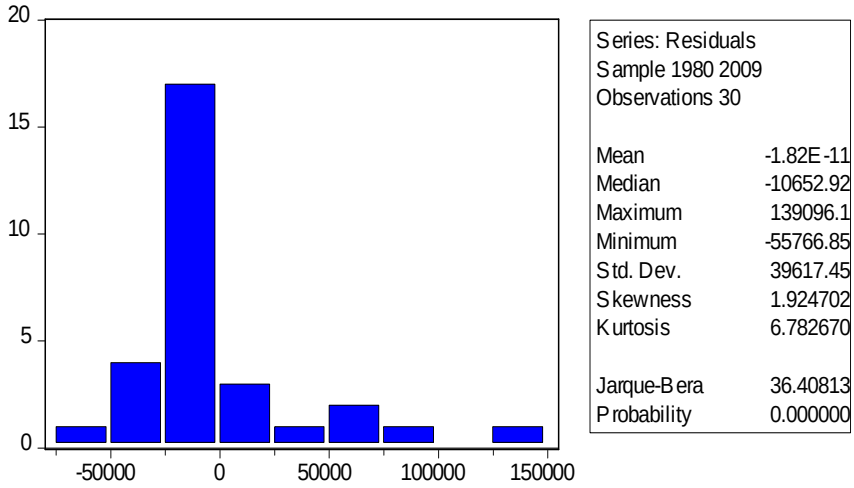
Empirical Analysis Result
Appendix
Dependent Variable: NGDP
Method: Least Squares
Table 1
Sample(adjusted): 1980 2009
Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAFDI	37.32926	15.45081	2.416007	0.0230
GFDI	27.79444	12.89845	2.154867	0.0406
OTHERS	38.95335	40.22011	0.968504	0.3417
C	-11009.12	11588.40	-0.950012	0.3509

R-squared	0.848101	Mean dependent var	87062.37
Adjusted R-squared	0.830574	S.D. dependent var	101650.4
S.E. of regression	41840.69	Akaike info criterion	24.24469
Sum squared resid	4.55E+10	Schwarz criterion	24.43152
Log likelihood	-359.6704	F-statistic	48.38884
Durbin-Watson stat	0.961045	Prob(F-statistic)	0.000000

Source: E-Views version 3.1

Table2 Diagnostic Test



Source: E-Views version 3.1

Table3 Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	4.783712	Probability	0.017845
Obs*R-squared	8.550633	Probability	0.013908

Source: E-Views version 3.1

Table 4 White Heteroskedasticity Test:

F-statistic	1.480964	Probability	0.228631
Obs*R-squared	8.360262	Probability	0.212880

Source: E-Views version 3.1

Table5 Ramsey RESET Test:

F-statistic	5.813862	Probability	0.002384
Log likelihood ratio	21.63842	Probability	0.000237

Source: E-Views version 3.1

Table6

Unit Root at 2 NGDP

ADF Test Statistic	-5.911813	1% Critical Value*	-3.7076
		5% Critical Value	-2.9798
		10% Critical Value	-2.6290

*MacKinnon critical values for rejection of hypothesis of a unit root.

Source: E-Views version 3.1

Unit Root 2 DFF GFDI

ADF Test Statistic	-5.620173	1% Critical Value*	-3.7076
		5% Critical Value	-2.9798
		10% Critical Value	-2.6290

*MacKinnon critical values for rejection of hypothesis of a unit root.

Source: E-Views version 3.1

Unit Root at 2 DFF

ADF Test Statistic	-9.323026	1% Critical Value*	-3.7076
		5% Critical Value	-2.9798
		10% Critical Value	-2.6290

*MacKinnon critical values for rejection of hypothesis of a unit root.

Source: E-Views version 3.1

Unit Root at 2 DFF

ADF Test Statistic	-0.128973	1% Critical Value*	-3.7076
		5% Critical Value	-2.9798
		10% Critical Value	-2.6290

*MacKinnon critical values for rejection of hypothesis of a unit root.

Source: E-Views version 3.1

Table 7 Johnsen Co-integration test

Sample: 1979 2009

Included observations: 28

Test assumption: Linear deterministic trend in the data

Series: DNGDP DGFDI DLFDI

Lags interval: No lags

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.637847	65.25730	29.68	35.65	None **
0.613204	36.81804	15.41	20.04	At most 1 **
0.305853	10.22199	3.76	6.65	At most 2 **

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 3 cointegrating equation(s) at 5% significance level

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

DNGDP	DGFDI	DLFDI	C
1.000000	0.000000	-39.94833	-106.9733
		(18.4275)	
0.000000	1.000000	-0.066066	9.382873
		(0.25829)	

Log likelihood	-752.1599

Source: E-Views version 3.1

Table 8
Sample(adjusted): 1983 2009
Included observations: 27 after adjusting endpoints
Standard errors & t-statistics in parentheses

	DNGDP
DNGDP(-1)	-0.033437 (0.22998) (-0.14539)
DNGDP(-2)	-0.144454 (0.21316) (-0.67766)
C	13462.02 (8386.27) (1.60525)
DGFDI	-8.467041 (15.4113) (-0.54941)
DSAFDI	-9.591634 (20.3233) (-0.47195)
R-squared	0.043083
Adj. R-squared	-0.130901
Sum sq. resids	2.86E+10
S.E. equation	36064.12
F-statistic	0.247627
Log likelihood	-318.8591
Akaike AIC	23.98956
Schwarz SC	24.22953
Mean dependent	9719.389
S.D. dependent	33912.74

Source: E-Views version 3.1
Table 9 Estimation Proc:
==========
LS 1 2 DNGDP @ C DGFDI DSAFDI

VAR Model:
==========
DNGDP = C(1,1)*DNGDP(-1) + C(1,2)*DNGDP(-2) + C(1,3) + C(1,4)*DGFDI + C(1,5)*DSAFDI

VAR Model - Substituted Coefficients:
==========
DNGDP = - 0.03343657098*DNGDP(-1) - 0.144454019*DNGDP(-2) + 13462.01598 - 8.467040848*DGFDI - 9.59163364*DSAFDI

Table 10 Pairwise Granger Causality Tests

Sample: 1979 2009
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
DGFDI does not Granger Cause DNGDP	27	0.30725	0.73857
DNGDP does not Granger Cause DGFDI		0.31069	0.73611
DSAFDI does not Granger Cause DNGDP	27	0.45098	0.64276
DNGDP does not Granger Cause DSAFDI		0.94809	0.40275
DSAFDI does not Granger Cause DGFDI	27	1.86962	0.17787
DGFDI does not Granger Cause DSAFDI		1.56559	0.23137

Source: E-Views version 3.1