

Impact of Innovation Characteristics on Accrual Basis International Public Sector Accounting Standards Implementation (IPSASIMPL) in Nigeria

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Abstract: Drawing from Roger's theory of diffusion of innovation, this paper examined the accrual basis IPSASIMPL in Nigeria. The population of the study comprised the 260 accounting staff of all the 6 Federal Government Institutions in Zaria. The sample size was 155 accounting staff using Krejcie and Morgan table. The sampling technique adopted was proportionate stratified random sampling techniques. Data were collected through the use of Questionnaires and analyzed using binary logistic regression techniques. The study found that Relative Advantage (RELADV) was positive and significantly related to accrual basis IPSASIMPL in Nigeria. However, Compatibility (COMPAT) and Observability (OBSERV) are positive but insignificantly related to accrual basis IPSASIMPL in Nigeria. Complexity (COMPLEX) is inversely and significantly related to accrual basis IPSASIMPL in Nigeria. Trial-ability (TRIALA) is the only factor that was negative and insignificantly related to accrual basis IPSASIMPL in Nigeria. It was therefore concluded that RELADV and COMPLEX have impacted on accrual basis IPSASIMPL in Nigeria. However, COMPAT, OBSERV and TRIALA have not impacted on the accrual basis IPSASIMPL in Nigeria. The study recommends for an increased consideration of the benefits of IPSAS and its complexity to facilitate the implementation process of accrual basis IPSAS in Nigeria.

Keywords: Innovation diffusion theory, IPSAS, IPSAS Implementation, Federal Government Institutions, Nigeria

1. Introduction

Accrual basis implementation by the International Public Sector Standards IPSASs is considered as part of accounting innovation in public sector (Chan, 2006; Ezzamel, Hyndman, Johnsen and Lapsley 2014; Liguori and Steccolini, 2014). Accounting innovations involves designing and implementing technical features and understanding their effect on accounting, individual agency, environment and institutions. Innovation also entails a practice, an idea, or object perceived as new by an individual or another unit of adoption (Rogers, 2003; Ezzamel, Hyndman, Johnsen and Lapsley 2014). Innovation involves five characteristics that determine its effectiveness. These are relative advantage, complexity/simplicity, goodness of fit, possibility of trial test (trial-ability), and observability (Rogers, 2003). Diffusion theory explains the combination of these characteristics.

Though scholars have highlighted the importance of the diffusion theory in the public sector (Ezzamel, Hyndman, Johnsen and Lapsley 2014), the theory has been predominantly explored in private sector setting. Again, empirical studies have been conducted to explore the

relationship between the innovation characteristics and the adoption of new system in various fields of endeavors such as Information technology (Moore and Benbasat, 1991), Marketing (Taylor and Todd, 1995; Sarel and Marmorstein, 2003), Education (Lee, 2007; Shih, 2007), Health care (Kaminski, 2011), Mobile marketing (Tanakinjal, 2012), Mobile banking (Longyara and Van, 2015), Library science (Abdullahi, Gbaje and Mohammed, 2015). Against this backdrop it is imperative to investigate the impact of innovation characteristics on IPSASIMPL in Nigeria.

A large body of empirical literature has been developed on IPSASs implementation across many countries. The studies have documented findings with regard to the factors that affect IPSASs Implementation which may not be generalisable to other countries due to technological, jurisdictional, cultural and contextual differences, thus, providing motivation for further studies.

However, in Nigeria, the literature is scanty and researchers in this area did not exploit the advantage of employing this theory to explain the implementation/adoption of IPSASs (Obazee, 2011; Baba, 2013; Bello, 2013; Bello, 2014; Acho, 2014; Nongo, 2014; Ofoegbu, 2014; Francis and Samuel, 2015; Nkwagu, Okoye and Nkwagu, 2016; Felix, 2016). This study therefore seeks to extend our knowledge on the impact of innovation characteristics on IPSASIMPL in Nigeria.

This study is also motivated by the expected contribution both practically and theoretically to various stakeholders and serves as basis for decision making. A study of this nature will practically aid policy makers and operators in Nigeria and beyond. Theoretically, students and researchers in the area of accounting, finance and economics are expected to benefit immensely from the findings of this study, as detail information provided on literature and empirical evidence of impact of innovation characteristics on accrual basis international public sector accounting standards implementation (IPSASIMPL) in Nigeria will serve as guide for further research.

The main objective of the study is to examine the impact of innovation characteristics on IPSAS implementation in Nigeria. Specifically, the study investigates the effect of relative advantage, complexity, compatibility, observability and trial-ability on IPSAS implementation in Nigeria. Based on the review and in line with the Rogers theory, the study hypothesized after the review of each independent and dependent variables.

This paper is comprised of five sections. Following this introduction is a brief literature review of innovation characteristics and empirical evidence allowing for the development of hypotheses of the study. Then the paper discusses the theoretical framework of the study. This is followed by a section outlining the research methodology and analysis of data and interpretations of findings of the study. The paper concludes by providing the summary of the findings and recommendations.

2. Literature Review

This section discusses the concept and characteristics of innovation which affect the choice to either accept or reject an innovation.

2.1 Review of Empirical Studies and Hypotheses Development

Relative advantage refers to the extent to which an innovation is perceived as superior to existing ways of running organizations (Roger, 1995; 2003). It is simply the positives of the new system over the old one regarding its relevance to the public sector in improving

accounting systems. It borders on the system's ability to provide relevant qualitative information at a lower cost. In the context of the present study, relative advantage is considered as the degree to which a proposed standard is perceived to be superior to the present practice. Researchers such as Taylor and Todd (1995), Sarel and Marmorstein, (2003), and Teo (2003) argued that relative advantage, compatibility, and complexity has a strong and consistent relationship with adoption decisions of a new system. Sarel and Marmorstein, (2003) found a positive relationship between the relative advantage and users' awareness and intention to adopt a new system. These scholars concluded that relative advantage is one of the best predictors of an innovations perception of adoption (Sarel and Marmorstein, 2003; Teo, 2003).

Ndekwa (2015) investigated the determinants of adopter and non-adopter of computerized accounting system (CAS) among small and medium enterprises (SMEs) using a sample of 364 respondents from Mwanza city and Shinyanga region of Tanzania in 2015. The study adopted quantitative research method and stratified systematic sampling technique. The result of binary logistic regression analysis revealed that compatibility, security and computer facilities were positively and significantly associated with computerized accounting system adoption. While the relationship between relative advantage, trade partners and computerized accounting system adoption is negative but significant. Again complexity, owners/managers, enforcement authority and employee competency have negative and insignificant impact on computerized accounting system adoption. The only factor that has positive but insignificant relationship with computerized accounting system adoption is organizational readiness. Based on the above review and in line with the Rogers theory, we hypothesized the first hypothesis as:

H1: Relative advantage of IPSASs is positively related to accrual basis IPSASs implementation in Nigeria.

Compatibility refers to the extent to which a system is in line with existing methods and processes, past experience, values and the need of the users (Rogers, 2003). This definition underscores the relevance of a system to fit into the organization's social structure and the target users of the new system. This means that for a system to be perceived as compatible, it must possess low risk and uncertainty to the users. In the context of this study, compatibility is considered as the extent to which a proposed standard corresponds to past experiences and the existing values. Prior studies found that compatibility impacts on the willingness to adopt new technologies (Sarel and Marmorstein, 2003).

Longyara and Van (2015) examined the relationship between attributes of innovation and adoption of mobile banking services using a sample of 300 respondents each from Seoul and Thai in Korea and Thailand in 2015. The result of the analysis indicated that relative advantage, compatibility and perceived status benefits were positively and significantly related to intention to use mobile banking. However, complexity is negatively and significantly related to intention to use mobile banking. Based on the above review and in line with the Rogers theory, we hypothesized the second hypothesis as:

H2: Compatibility of IPSASs is positively related to accrual basis IPSASs implementation in Nigeria.

Complexity refers to the relative ease or difficult in adopting and implementing a new innovation (Rogers, 2003). In the context of the present study, complexity is considered as the degree to which a proposed standard is perceived as being difficult to understand and adopt. Simple and easy to adopt innovations and technologies are usually accepted more rapidly than those requiring new understanding and skills. Therefore, there is an inverse relationship between complexity and adoptability of new technology, and a positive relationship between simplicity and adoptability (Rogers, 2003; Sarel and Marmorstein, 2003).

Also several studies found a negative effect of complexity and perception of adoption and awareness (Lee, 2007; Shih, 2007; Teo, 2003).

Al-tholaya (2013) examined the feasibility of full accrual basis of accounting adoption and implementation in the republic of Yemen central government. He reported positive and significant relationship between relative advantage, compatibility and attitude toward change. However, complexity was negatively and significantly related to attitude toward change. The result of this study is in line with the result of empirical studies conducted by Shih (2007) and Lee (2007). Based on the above review and in line with the Rogers theory, we hypothesized the third hypothesis as:

H3: Complexity of IPSASs is negatively related to accrual basis IPSASs implementation in Nigeria.

Trial-ability refers to the extent to which an innovation can be experimented. It is expected that innovations that can be tried or experimented before they are adopted are used more quickly. In the context of the present study, trial-ability is considered as the degree to which a proposed standard is tested on a trial basis in order to test its suitability. An empirical study revealed that trial-ability of Integrated Pest Management (IPM) Practices was positively and significantly related with its adoption in Iran (Ghane, Samah, Ahmad and Idris, 2011). In a related study conducted in Malaysia, Sanni, Ngah, Abdul karim, Abdullah and Waheed (2013), reported that trial-ability was positively and significantly related with the rate of adoption of e-journal among Malaysian journal publishers. Based on the above review and in line with the Rogers theory, we hypothesized the fourth hypothesis as:

H4: Trial-ability of IPSASs is positively related to accrual basis IPSASs implementation in Nigeria.

Observability is the degree to which "the results of an innovation are visible to others. The easier it is for individual to observe the results of an innovation, the more likely they are to adopt" (Rogers, 2003). Within the context of this study, observability is considered to be the degree to which the results of adopting the proposed standard are visible and communicable to others. An empirical study revealed that observability of IPM Practices was positively and significantly related with its adoption in Iran (Ghane et al., 2011). In a related study conducted in Malaysia, Sanni et al., (2013) reported that observability was positively and significantly related with the rate of adoption of e-journal among Malaysian journal publishers. Based on the above review and in line with the Rogers theory, we hypothesized the fifth hypothesis as:

H5: Observability of IPSASs is positively related to accrual basis IPSASs implementation in Nigeria.

2.2 Theoretical Framework of the Study

Gabriel Tarde developed the diffusion theory in 1903 and later and Everett Rogers made the theory more popular in 1962 (Kaminski, 2011). Rogers explored the theory in greater detail in 1962. In the words of Rogers (1995), innovation is an idea, object, or practice viewed by individuals or other organisations as new. Overall the diffusion of innovation is defined as "the process by which an innovation is communicated through certain channels over time among members of the social system" (Rogers, 1995).

Rogers (2003) specified five characteristics of innovations that are perceived by the members of the social system to highly determine its rate of adoption, and defined the relationship between these attributes to rate of adoption as follows: -

- i. Relative advantage: is the degree to which "the proposed innovation is perceived to work better than the one in practice. It is not so important if the innovation has an objective, but rather if individuals perceive the innovation as advantageous.

Advantages can be measured in economic terms: however social stature, convenience, and satisfaction may play a significant role” .

Rogers concluded with a generalization (hypothesis) of the construct to the rate of adoption as follows:

“The relative advantage of an innovation, as perceived by members of a social system, is positively related to its rate of adoption”.

- ii. Compatibility is the extent of consistency of an innovation with existing organizational ways and the need of the potential users. Innovations consistent with past experiences, values and the need of users diffuse more quickly than those not in line with values and norms of the social system. Rogers hypothesized as follows:-

“The compatibility of an innovation as perceived by members of a social system is positively related to its rate of adoption”.

- iii. Complexity refers to the extent to which innovation is viewed as simple or difficult to adopt and use. Easy and simple to use innovations, which allow for rapid development of skills, are more easily adopted than those perceived as complex and difficult.

Rogers concluded with a generalization (hypothesis) of the construct to the rate of adoption as follows:

“The complexity of an innovation as perceived by members of a social system is negatively related to its rate of adoption”.

If intended users perceive the innovation as simple and easy to use then the above hypothesis can be restated as follows:

“The noncomplex (ease of use) of an innovation as perceived by members of a social system is positively related to its rate of adoption”.

- iv. Trial-ability: is the degree to which “an innovation may be experimented with on a limited basis. New ideas that can be tried before the potential adopter has to make a significant investment into the innovation are adopted more quickly”.
- v. Observability: is the degree to which “the results of an innovation are visible to others. The easier it is for individual to observe the results of an innovation, the more likely they are to adopt” (Rogers, 2003).

The study is underpinned by the theory explained above. The theory provides an evidence of how both the dependent and independent variables intermingled together to explain the implementation of accrual basis IPSASs in Nigeria.

3. Research Methodology

This section focuses on the methods adopted in conducting the study. In order to achieve the objectives stated earlier, this section discusses and justify research designs, methods of data collection and instrumentation, techniques for data analysis, research population studied, sampling techniques and sample size of the study and justification for adopting them.

3.1 Research Design, Population, Sample and Sampling Technique, and Analysis Technique

The research designs of the paper are descriptive survey and correlation. The descriptive survey design focuses on the assessment of the respondents’ perceptions on the attributes

important in the IPSASIMPL decisions. The study uses correlation design to measure the relationship between the dependent variable and independent variables. The objective of the study is to determine direction and extent of the relationship between the independent and dependent variables. The study collects data through the closed questionnaire administered on 155 respondents consisting of accountants, internal auditors and budget officers.

The population of the study consists of 260 accountants, internal auditors and budget officers of the six (6) federal institutions in Zaria. The federal institutions located in Zaria include Ahmadu Bello University Zaria, Federal College of Education Zaria, Nigeria College of Aviation Technology Zaria, Nigeria Institute of Leather Research Zaria, Nigeria Institute of Transport Technology Zaria and ABUTH Nursing School, Zaria. The sample size was 155 accounting staff using Krejcie and Morgan table. The sampling technique adopted was proportionate stratified random sampling techniques.

Logistic regression technique was adopted to analyze the data and explain the relationship between the dependent variable (**IPSASIMPL**) measured as dichotomous/binary variable (i.e. "1" for adoption/implementation and non-adoption/non-implementation "0"); and the independent variables measured using five-point Likert scale ranging from 1 (strongly disagree) to 7(strongly agree) on the questionnaire items. Descriptive statistics was employed to give a picture of the basic characteristic of the data and Correlation was employed to examine the relationship between all pairs of independent variables.

3.2 Model Specification

In line with the theoretical underpinning, the functional form of the model used in this study in relation to innovation characteristics and accrual basis IPSAS implementation in Nigeria is specified as follows:

$$IPSASIMPL = \beta_0 + \beta_1 RELADV + \beta_2 COMPAT + \beta_3 COMPLEX + \beta_4 TRIALA + \beta_5 OBSERV + e$$

Where:

IPSASIMPL = International Public Sector Accounting Standards Implementation,

RELADV = Relative Advantage,

COMPAT = Compatibility,

COMPLEX = Complexity,

TRIALA = Trial-ability,

OBSERV = Observability,

β_0 = Intercept,

$\beta_1 \dots \beta_5$ = Coefficient of the independent variables,

e = Error Term.

The research instrument was subjected to both validity and reliability tests. Experts vetted the instruments while making observations and corrections. Both construct and face validation were undertaken and the researcher effected their corrections and observations in the final draft of the questionnaire. Reliability tests were carried out using the Chronbach's alpha.

4. Data Analysis and Interpretation

In this section, the results are presented and discussed. The presentation starts with descriptive statistics, followed by correlation matrix and lastly logistic regression.

4.1 Descriptive Statistics

Section 1 of the questionnaire asked respondents to indicate on a scale of 1 (strongly disagree) to 7 (strongly agree), the extent to which they consider each of the 22 individual items of innovation attributes to be important in their IPSASIMPL decision. The full results are presented in the appendix. Table 4.1 presents the summary of the descriptive statistics of the dependent and independent variables.

Table 4.1: Summary Statistics

	IPSASIMPL	RELADV	COMPAT	COMPLEX	TRIALA	OBSERV
Mean	0.66	6.63	6.81	6.82	6.85	6.91
Std. Dev.	0.47	0.22	0.12	0.19	0.35	0.22
Minimum	0	6.14	6	6.33	5	6
Maximum	1	7	7	7	7	7
Obs.	126	155	155	155	155	155

Source: Output of Summary statistics using STATA software

The results reveal that the average IPSASIMPL is 0.66 and the standard deviation is 0.47. Since the variable is binary, the minimum and maximum are 0 and 1 respectively. This indicates that there is no much difference between the mean and standard deviation which shows that most of the observation is clustered at the center. RELADV averages 6.63 and the standard deviation is 0.22 and lying between 6.14 and 7. The mean value of the COMPAT variable is 6.81, having standard deviation, minimum and maximum of 0.12, 6 and 7 respectively. COMPLEX variable averages 6.82 with a standard deviation of 0.19. The TRIALA variable has a mean of 6.85 and a standard deviation of 0.35. Both COMPAT and OBSERV have minimum and maximum of 6 and 7 respectively. OBSERV reveals an average of 6.91 and a standard deviation of 0.22 which is having a minimum of 6 and maximum of 7. It is worth noting that the mean of all independent variables have wide differences with their respective standard deviation. This attests to the fact that responses regarding the importance of these variables in explaining IPSAS implementation differs significantly across the respondents as well as the Federal Government Institutions studied. The wide disparity between the mean and the standard deviation indicates that the data may not be normally distributed, which will pose valid questions on the reliability of the result. This study goes ahead to perform goodness of fit test and the result is presented alongside the regression result. Overall, the summary statistics reveals the basic characteristics of the data. However, it does not yield itself to drawing inferences and hence making valid conclusions. This necessitates the use of logistic regression which is presented later.

The correlation matrix is presented in table 4.2. The full result is contained in the appendix.

Table 4.2: Correlation Matrix

Variable	IPSASIMPL	RELADV	COMPAT	COMPLEX	TRIALA	OBSERV
IPSASIMPL	1.0000					
RELADV	0.2033	1.0000				
COMPAT	0.1211	-0.1177	1.0000			
COMPLEX	-0.1768	0.3537	-0.2897	1.0000		
TRIALA	-0.1579	0.0796	-0.1065	0.2113	1.0000	
OBSERV	0.0196	0.1243	-0.1678	0.0067	0.2223	1.0000

Source: Output of Correlation result using STATA software

Table 4.2 is the correlation matrix table. The correlation matrix explains the relationship among all pairs of variables in a study. It is useful in explaining the compatibility of independent variables in a regression model. High correlations between independent variables

(above 0.80) according to Gujarati (2004) mean excessive relationships and could distort and inflate standard errors leading to spurious result. Though, there is the need for advance tests of multicollinearity such as the Variance Inflation Factor (VIF), the Pearson correlation is often used as an alternative test of exact correlations.

The result further indicates that RELADV, COMPAT and OBSERV positive correlation with IPSASIMPL. This implies that these variables move in the same direction with IPSASIMPL. On the contrary, COMPLEX and TRIALA have an inverse relationship with IPSASIMPL. It is also relevant to mention that RELADV is positively correlated with COMPLEX, TRIALA and OBSERV. The result is highly practical and expected because the institutions are expected to be filled with skilled and competent staff who know how to prepare financial statements. They are also expected to consider the benefits and complexity of IPSAS the qualified staff they enjoy. On the other hand, those institutions that have less experienced and qualified staff to man the IPSASIMPL process, they will be unable to convey the merits of innovation (IPSASs) to the government and it can lead to later implementation difficulties. Lastly the table reveals negative relationship between COMPAT and all the other explanatory variables.

4.2 Inferential Statistics

The summary of the logistic regression output is given in table 4.3. The full results are contained in the appendix

Table 4.3: Summary of Logistic Regression Result

Variable	Coefficient	Std. Error	Z	Prob.> z
Constant	0.69	19.07	0.04	0.971
RELADV	3.22	1.03	3.12	0.002
COMPAT	1.55	1.72	0.90	0.367
COMPLEX	-2.91	1.29	-2.26	0.024
TRIALA	-2.12	1.40	-1.52	0.129
OBSERV	0.40	0.99	0.40	0.687
R ²		0.1164		
LR chi ² (5)		18.44		
Prob		0.0021		

Source: Summary of Regression Result using STATA software

The estimated regression model is expressed thus:

$$IPSASIMPL = 0.69 + 3.22RELADV + 1.55COMPAT - 2.91COMPLEX - 2.12TRIALA + 0.40OBSERV + e$$

From the regression result on table 4.3, RELADV has a coefficient of 3.22 with a t- value of 3.12 which is significant at 1%. This implies that the IPSASIMPL rate or chance increases at 3% as a result of 1% increase RELADV.

Overall, the study found that RELADV and COMPLEX attributes dominate in Nigerian IPSASIMPL decisions. However, when the regression analysis was carried out, it was found that at 1% and 5% levels of significance, the regression was significant on IPSASIMPL and RELADV and COMPLEX respectively. Accordingly, it was concluded that a positive linear relationship existed between IPSASIMPL and RELADV and a negative linear relationship exists between IPSASIMPL and COMPLEX. This finding is not unexpected owing to the fact that it is in line with and support the theory underpinning the study. It is, therefore, a pointer to the fact that Institutions are attracted by relative advantages of IPSAS but mindful of its complexity during the implementation process. The findings also confirm the study of Taylor and Todd (1995), Sarel and Marmorstein, (2003), Teo (2003), Longyara and Van (2015) which provided evidence of positive interaction between Adoption of a new system and its

relative advantage. It, however, contradicts the findings of Ndekwa (2015) which report a negative but significant result. Again, the result of this study is in line with the result of empirical studies conducted by Al-tholaya (2013), Shih (2007), Lee (2007), Longyara and Van (2015). They all reported that complexity was negatively and significantly related to the decision to adopt a new system.

The table also reveals that the overall coefficient of determination (R^2) is 12% which implies that all the independent variables provide an explanation about the changes in the IPSASIMPL decisions. The LR Chi2 of 18.83 signifies that the overall model is significant at 1% level of significance. Hence the model could be used for IPSASIMPL decisions in 2019. This further indicates that there is a linear relationship between the dependent and independent variables used in the regression model.

5. Conclusion and Recommendations

This study examined the attributes affecting IPSASIMPL decision in Nigeria. From the foregoing analysis and findings, two conclusions with respect to IPSASIMPL may be drawn. The first is that RELADV is an important attribute in IPSASIMPL decisions, it is has a direct impact on IPSASIMPL in Nigeria. Secondly, COMPLEX of IPSAS inversely impact on IPSASIMPL in Nigeria. Based on the findings reported, the study recommends that the policy-setters may be able to consider RELADV/ benefits and also consider the COMPLEX of IPSAS when taking a decision to implement/adopt a new standards ie IPSAS.

A limitation of this study is that it focuses on the perceptions of Federal institutions directors of finance, internal auditors, area auditors and inspectors only. This limits the generalizability of the findings. Although directors of finance are major participants in IPSASIMPL decisions in Nigeria, the perceptions of other stakeholders or observers of IPSASIMPL might report different perceptions of the importance of IPSAS Implementation attributes in Nigeria decisions. Also, Federal institutions are just one organ of government. This organ has the benefit for this study and hence allowed the examination of IPSASIMPL decisions in Nigeria.

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