

The Role of Accrual Accounting Basis in the Prediction of Future Cash Flows: The Nigerian Evidence

Oba Efayena

Department of Accounting and Finance, Delta State University, P.M.B. 1, Abraka, Nigeria

E-mail: efaoba@yahoo.com

Abstract

The study examines the role of past accrual based earnings derived from accrual accounting basis in comparison to cash flows in the prediction of future operating cash flows of quoted non-financial companies in Nigeria. Using a sample of 40 quoted non-financial companies in the Nigeria Stock Exchange, studied over a period of 13 years from 2001 – 2013, and employing the OLS regression technique, the results suggest that both past accrual based earnings and cash flows have predictive ability in forecasting future operating cash flows. The results show that cash flows are a better predictor of future operating cash flows than past earnings. Our findings do not support the assertion of the FASB (1978) and the IASB (1989) that earnings are a better predictor of future cash flows. The study recommends that the quality of accounting information produced by the accrual accounting basis should be improved upon by the urgent enforcement of international financial reporting standards (IFRS) in Nigeria.

Keywords: past accrual based earnings; accrual accounting basis; cash flows; future operating cash flows; predictive ability; OLS regression

1. Introduction

The two main approaches that have been used in predicting future cash flows are the accrual-basis accounting and the cash-basis accounting. The FASB (1978) and the IASB (1989) unanimously agree on the superiority of the accrual-basis accounting over the cash-basis accounting in the prediction of future performance. This led many researchers to investigate the predictive ability of the accrual accounting basis and the cash accounting basis in the prediction of future cash flows. The results have been mixed, contradictory, and inconclusive. Some researchers (Greenberg, Johnson, & Ramesh, 1986; Kim & Gross, 2005; Pae, 2005; Ebaid, 2011) found that accrual based earnings information have superior predictive ability than cash flow based information in the prediction of future operating cash flows. Other researchers (Finger, 1994; Farshadfar, Ng, & Brimble, 2008; Penham & Yehuda, 2009; Waldron & Jordan, 2010) concluded that cash based information were superior to accrual based earnings information. McBeth (1993) reported that neither cash flows nor accrual-based earnings were good predictors of future cash flows. The objective of this study is to investigate whether accrual-basis accounting has superior ability than cash-basis accounting in predicting future operating cash flows of Nigerian quoted companies, and to find out whether the results are consistent with findings of studies conducted in other countries.

Nigeria provides an interesting setting for this study. Nigeria shares common orientation and accounting practices with the Anglo-Saxon accounting countries that include the United States, the United Kingdom, Canada, Australia, and New Zealand. This provides a strong ground for expecting that results of this study would be consistent with results of studies carried out in some of the Anglo-Saxon accounting countries. Although, many studies conducted in the United States of America have provided empirical evidence that accrual basis accounting has predictive ability in forecasting future cash flow, it is yet to be confirmed whether this evidence holds for a developing country like Nigeria. For one, Nigeria stock markets are far less developed than those in the United States. Also, accounting regulation and enforcement is not as strict in Nigeria as it is in the developed countries. Even though Nigerian adopts high quality accounting standards (Nigerian local accounting standards are imitation of accounting standards formulated in developed countries), the level of enforcement of these standards is still low. The literature calls attention to the fact that high quality accounting standards alone are not sufficient, but of importance also, are how these standards are enforced. Leuz, Nanda, and Wysocki (2003) observed that accrual based earnings quality is appreciably lower for countries with poor enforcement mechanisms.

The literature on cash flow prediction in developing countries is scarce, except for few studies such as Chotkunakitti (2005) and Chong (2012). The literature in this area is also very scarce in Nigeria. This study, therefore, would be of immense benefit to users of financial statements in Nigeria. Specifically, it would assist investors, financial analysts, creditors, auditors and management in understanding cash flow predictions and use it to assess the ability of a company to generate future cash flows. The rest of this paper is organized as follows. Section 2 is literature review and hypotheses development. Section 3 provides the theoretical framework and research methods. Empirical results are presented in section 4. Section 5 discusses the findings. Lastly section 6 summarizes and concludes the paper.

2. Literature Review and Hypothesis Development

2.1 Accrual basis accounting

The literature in differentiating between the accrual-basis accounting and the cash-basis accounting highlighted the information product of these accounting methods. These are the accrual based earnings information derived from the income statement prepared on the accrual accounting basis; and the cash flow information derived from cash flow statement prepared on the basis of cash accounting. The accrual based earning information is supported for many reasons. First it is considered relevant in measuring a firm's performance (Godfrey, Hodgson, & Holmes, 2003) because it avoids the distortion of uncertain variations in cash flows (Kremer & Rizzuto, 2000) in the measurement of performance. Second, the concept of matching expenses and revenue in arriving at accrual based earnings reflects the uses of assets in generating revenue. The usefulness of accrual based earnings for predicting a firm's future cash flows has been widely affirmed by a number of researchers (Board & Day, 1989; Watts & Zimmerman, 1986). However, Arnedo, Lizarraga, and Sanchez (2012) reiterated that accruals "are also fraught with measurement error due to the assumptions underlying their determination and the discretion allowed under GAAP". Other critics of the accrual based earnings approach argue that accrual based earnings suffer from "flexible accounting techniques, subjective judgment, and manipulative practices" (Bernard & Stober, 1989; Lee, 1993). It is also argued that under inflationary condition, accrual-basis accounting show a tendency of overstating profits and understating assets (Board & Day, 1989; Lawson, 1992; Lee, 1993). Bierman (1988) and Sharma (2001) posit that under these circumstances, accrual based earning is less effective in predicting future operating cash flows, and users of financial statements turn to cash flow information instead.

Motivated by the assertion of the FASB (1978) that accrual based earnings provide a better indicator of future cash flows, a number of empirical studies were carried out to determine the predictive ability of accrual based earnings in predicting future cash flows. Greenberg et al. (1986) using a sample of 157 industrial companies in the United States on Compustat data for the period 1963 to 1982 sought to test empirically whether current earnings or current cash flows are better predictors of future cash flows. They reported that current earnings were a better predictor of future cash flows than current cash flows, and thus provide evidence supporting FASB's statement regarding the importance of earnings. Arnedo et al. (2012) in their study of 4,397 Spanish companies reported lower out-of-sample prediction error for accrual based earnings model than for the cash flow model. Consequently they concluded that accrual based earnings model was a better predictor of future operating cash flows than the cash flow model. We therefore hypothesize that:

H1: *Past accrual based earnings information have significant ability in predicting future operating cash flows of quoted non-financial companies in Nigeria.*

2.2 Cash basis accounting

On the other side of the debate are those in support of the cash basis accounting. Lee (1986) defines the cash basis accounting (also known as cash flow accounting) as "the term used to denote a system of financial reporting which describes the performance of an entity in cash terms. It is based on matching periodic cash inflows and cash outflows, free of credit transactions and arbitrary accounting allocations". Cash flows are not infected by measurement problems and thus accelerate the prediction of future dividends and credit and loan payments (Hodgson & Stevenson-Clarke, 2000).

Many empirical studies found that cash flow information were a better predictor of future operating cash flows than accrual earnings. Bowen, Burgstahler, and Daley (1986) using a sample size of 324 firms in the United States, on the Compustat for the period 1971 to 1981, found that overall earnings did not provide a better predictor than cash flows. Al-Debie (2011) examining the relative predictive ability of current operating cash flows and current accrual earnings for the prediction of future operating cash flows for a sample of service and industrial shareholding companies in Jordan for the period 2000 – 2009, found that the predictive ability of operating cash flows is stronger than that of earnings for forecasting future operating cash flows for one- to three year ahead forecast horizon. Lev and Sougiannis (2010) in their cash flow prediction study in the United States for the period 1988 – 2004, found that for one- to- three year forecasting period, the cash flow model had a better predictive ability than the accrual based earnings model for predicting future operating cash flow. We therefore hypothesize that:

H2: *Past cash flows have significant ability in predicting future operating cash flows of quoted non-financial companies in Nigeria.*

The results of some studies were inconclusive. McBeth (1993) using data from 4,415 firms in the United States on Compustat Disclosure for the period 1988 – 1990 and concentrating on the variables: net income and actual cash flows from operation, found that neither the net income nor cash flow from operation provided a better predictor of future cash flows. However, on the basis of the FASB (1978) and the IASB (1989) assertion that accrual based earnings are a better predictor of future operating cash flow than cash flows, we hypothesize that:

H3: *Past accrual based earnings information have superior predictive ability than past cash flows in predicting future operating cash flows of quoted non-financial companies in*

Nigeria.

3. Theoretical Framework and Research Methods

3.1 Theoretical Framework

The theoretical framework for this study is based on two models: the accrual based earnings model (model 1) and the cash flow model (model 2). The accrual-based earnings model was built by Dechow, Kothari, and Watts (1998). They posit that future cash flow is dependent on past aggregate earnings. The accrual based earnings model is expressed as follows:

$$CF_{i,t} = \phi + \phi_{EARN} EARN_{i,t-1} + \varepsilon_{i,t} \quad 1a$$

$$CF_{i,t+1} = \phi + \sum_{\tau=0}^k \phi_{t-\tau} EARN_{i,t-\tau} + \varepsilon_{i,t} \quad 1b$$

Where: $CF_{i,t+1}$ = Future cash flows (i = firm; t = year)

$$\sum_{\tau=0}^k \phi_{t-\tau} EARN_{i,t-\tau} = \text{Aggregate past earnings}$$

$\phi, \phi_{t-\tau}$ = Constant and coefficient of earnings

The cash flow model was designed by Quirin, O'Bryan, Wilcox, and Berry (1999) and Stammerjohan and Nassiripour (2000/2001) in which they suggested that year lags of cash flow themselves provide a good predictor of future operating cash flows. The cash flow model is expressed as follows:

$$CF_{i,t} = \phi + \phi_{CF} CF_{i,t-1} + u_{i,t} \quad 2a$$

$$CF_{i,t+1} = \phi + \sum_{\tau=0}^k \phi_{t-\tau} CF_{t-\tau} + u_{i,t} \quad 2b$$

Where:

$CF_{i,t+1}$ = Future cash flows

i = firm

t-τ = year lags

φ = intercept and coefficient of independent variable

In both models, future cash flow is the dependent variable, and future cash flow refers to future operating cash flow.

3.2 Research Methods

3.2.1 Research Design

This study used the longitudinal survey research design. The survey research design is justified on the grounds that it is aligned with the positivism paradigm on which the study is based. The population of interest in this study is all 120 non-financial companies quoted in the Nigerian stock exchange. The sample size is made up of 54 quoted non-financial companies which was selected using the convenience sampling technique. The sample size was determined using the Slovin's formula (Yamene, 1967): $n = N/1 + Ne^2$; where n is the sample size, N is the population and e is the sampling error margin (10%, 5% level of significance). Applying the 10% error margin, the study arrived at a calculated sample size, n, of 54 quoted non-financial companies. However, due to missing data, the sample size of 54 was reduced to 40 non-financial quoted companies in the Nigerian stock exchange.

Secondary data sourced from the Nigeria stock exchange fact book and the annual reports and accounts of the sampled firms were used for this study. The study focused on the profit and loss account, balance sheet and the cash flow statements of the listed companies. For proper analysis, the dependent variable and the independent variables were made to fall within certain time frame. Annual data for the dependent variable were from the end of year 2002 to the end of year 2013. The annual data for the independent variables were lagged, t-1, from the end of year 2001 to 2012. This annual data matching in different periods was adapted from Chotkunakitti (2005) and Chong (2012).

3.2.2 Model Specification

The two models specified for this study, the accruals based earnings model and the cash flow model are specified as follows.

Accrual based earnings model

$$CFO_t = b_0 + b_1 EARN_{t-1} + \varepsilon \quad 3a \text{ (one year lag)}$$

$$CFO_t = b_0 + b_1 EARN_{t-1} + b_2 EARN_{t-2} + \varepsilon \quad 3b \text{ (two year lag)}$$

$$CFO_t = b_0 + b_1 EARN_{t-1} + b_2 EARN_{t-2} + b_3 EARN_{t-3} + \varepsilon \quad 3c \text{ (three year lag)}$$

Where:

CFO_t = Net cash flow from operating activities for the year, t, scaled by the average total assets. This is the dependent variable.

$EARN_{t-1}$; $EARN_{t-2}$; $EARN_{t-3}$ = Profit after tax and before extraordinary items and discontinued operations scaled by average total assets in year t-1, t-2, and t-3.

b_0, b_1, b_2, b_3 = the unknown regression coefficients; ε = the error term.

Cash Flow Model

$$CFO_t = b_0 + b_1CFO_{t-1} + u \quad 4a \text{ (one year lag)}$$

$$CFO_t = b_0 + b_1CFO_{t-1} + b_2CFO_{t-2} + u \quad 4b \text{ (two year lag)}$$

$$CFO_t = b_0 + b_1CFO_{t-1} + b_2CFO_{t-2} + b_3CFO_{t-3} + u \quad 4c \text{ (three year lag)}$$

Where:

CFO_t = Net cash flow from operations for year t, scaled by the average total assets.

CFO_{t-1} , CFO_{t-2} , and CFO_{t-3} are net cash flow from operations for year t-1, t-2, and t-3 lags respectively; b_0, b_1, b_2 , and b_3 = unknown regression coefficients; u = the error term.

3.2.3 Data Analysis Method

The ordinary least squares (OLS) technique was used in running the models. Prior to interpretation of the results, regression diagnostic was carried out to check for the normality, homoskedasticity, and the independent errors assumption of the residuals, and to check for presence of multicollinearity. The Pearson correlation matrix was employed to test for the presence of multicollinearity. To test the hypotheses, the study utilized the following statistics: F-statistic with its associated p-value, the adjusted R^2 and the t-statistic with its associated p-values.

3.2.4 Operationalization of Variables

Table 1 presents the measurement of the variables and prior studies supporting their validity.

Table 1. Operationalization of variables

Variable Acronym	Variable Type	Measurement	Prior Studies
CFO_t	Depend.	<i>Net cash flows from operating activities</i> <i>Average Total Assets</i>	Chong (2012); Ebaid (2011); and Chokunakitti (2005).
$EARN_{t-i}$	Independ.	<i>Profit after tax and extraordinary items, special items and discontinued operations</i> <hr/> <i>Average total assets</i>	Barth, Cram, and Nelson (2001); Quirin et. al. (1999); Stammerjohan and Nassiripour (2000/2001).
CFO_{t-i}	Independ.	<i>Net cash flows from operating activities</i> <i>Average Total Assets</i>	Al-Attar and Hussain (2004); and Chotkunakitti (2005).
Average total assets	Scale	<i>Total assets book value at the beginning + closing book value</i> <hr/> <i>at the end of the period</i> <i>2</i>	Chong (2012); Barth et al. (2001)
<p>CFO_t: Operating cash flows in year t (Future operating cash flows) $EARN_{t-i}$: Past earnings from operations; CFO_{t-i}: Past operating cash flows</p>			

Source: Authors computation based on the literature.

4. The Empirical Results

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics for the data set. Earnings (EARN) has a mean of 4.4 percent and a median of 5.8 percent suggesting that on the average Nigerian firms' assets earn positive income. Cash flow (CFO) has a mean of 12.10 percent and a median of 11.9 percent suggesting that on the average Nigerian quoted firms have positive net cash flows. A comparison of the EARN and CFO shows that the positive mean percent and the median percent of CFO are higher than the mean percent and median percent of the EARN variable, suggesting that EARN is having a positive effect on CFO. It means that as EARN increases so too does CFO.

Table 2: Descriptive Statistics

Vars	Obs	Mean	Median	Std. Dev	Min	Max	Skew	Kurt.	J.Bera	Prob
CFO	520	0.121	0.119	0.173	-0.754	1.142	0.235	7.084	337.339	0.000
CFO _{t-1}	480	0.120	0.119	0.175	-0.754	1.142	0.286	7.241	335.768	0.000
CFO _{t-2}	440	0.122	0.111	0.177	-0.754	1.142	0.356	7.453	339.016	0.000
CFO _{t-3}	400	0.121	0.112	0.177	-0.754	1.142	0.573	7.663	345.867	0.000
EARN	520	0.044	0.058	0.168	-0.955	0.855	-1.924	12.960	2275.635	0.000
EARN _{t-1}	480	0.043	0.057	0.170	-0.955	0.855	-1.752	12.194	1774.907	0.000
EARN _{t-2}	440	0.042	0.057	0.168	-0.955	0.855	-1.682	12.059	1556.519	0.000
EARN _{t-3}	400	0.041	0.057	0.170	-0.955	0.855	-1.557	11.593	1253.129	0.000

Source: Author's computation based on Eviews 8 output

The Jarque-Bera (JB) statistic for all the variables have significant p-values ($p = 0.000$) suggesting that each variable series is not a normal distribution. The high kurtosis for the variables suggest the presence of outliers which again indicates non-normality of the data. However the study ignored the non-normality of the data by invoking the central limit theorem. According to Brooks (2008), as regards large data, appealing to the central limit theorem, the test statistic will asymptotically follow the appropriate distribution even in the absence of error normality. The sample data of 520 observations is relatively large to benefit from the central limit theorem.

4.2 Multicollinearity

The study tested for the presence of multicollinearity which could affect the regression results. Table 3 shows the correlation between the variables, presented as a matrix. Hair, Anderson, Tatham, and Black (1998) state that a correlation exceeding 0.90, is an indication of the presence of multicollinearity. An inspection of table 3 shows that the correlation between the variables ranges from 0.183 to 0.685. The highest correlation is 0.685. This indicates that multicollinearity is not present in our data.

Table 3: Correlation Matrix

	CFO	CFO _{t-1}	CFO _{t-2}	CFO _{t-3}	EARN	EARN _{t-1}	EARN _{t-2}	EARN _{t-3}
CFO	1.000							
CFO _{t-1}	0.349	1.000						
CFO _{t-2}	0.289	0.377	1.000					
CFO _{t-3}	0.183	0.311	0.372	1.000				
EARN	0.440	0.399	0.318	0.264	1.000			
EARN _{t-1}	0.315	0.430	0.404	0.313	0.685	1.000		
EARN _{t-2}	0.216	0.259	0.372	0.373	0.547	0.639	1.000	
EARN _{t-3}	0.235	0.217	0.253	0.581	0.450	0.521	0.586	1.000

Source: Author's computation from Eviews 8 output

4.3 Heteroskedasticity

Table 4 presents the results of the Breusch-Pagan / Cook-Weisberg, and White tests for heteroskedasticity. The Breusch-Pagan / Cook-Weisberg test of heteroskedasticity test the null hypothesis against the alternative hypothesis as follows:

H_0 : variance (u) = 0

H_a : variance (u) \neq 0

The null hypothesis of a constant variance would be rejected where there is a significant p-value. This implies that there is heteroskedasticity in the sample data.

The White test is a test for homoskedasticity. A significant p-value means that the null hypothesis of homoskedasticity is rejected otherwise it is not rejected. The White test of homoskedasticity tests the hypothesis stated as follows:

H_0 : homoskedasticity

H_a : unrestricted heteroskedasticity

Table 4: Results of Heteroskedasticity Test

Model / Lags	Breusch-Pagan / Cook-Weisberg		White Test	
	χ^2	$p > \chi^2$	χ^2	$p > \chi^2$
Accrual based earnings model				
1 Year Lag	109.31***	0.000	39.11***	0.000
2 Year Lag	74.90***	0.000	42.28***	0.000
3 Year Lag	75.93***	0.000	28.16***	0.000
Cash Flow Model				
1 Year Lag	3.64	0.056	3.42	0.181
2 Year Lag	3.50	0.061	6.91	0.223
3 Year Lag	2.82	0.093	7.53	0.582

Source: Developed from Stata 13 Output.

The results in table 4 indicate that under the accrual based earnings model, the Breusch-Pagan / Cook-Weisberg tests and White test show very high significant p-values. Therefore the null hypothesis of constant variance and null hypothesis of homoskedasticity are strongly rejected. White (1980) suggests that to correct for heteroskedasticity, the regression should be run using heteroskedasticity robust standard errors. The OLS regression for the accrual based earnings model was carried out using heteroskedasticity robust standard errors. The p-values reported under the cash flow model (using both tests) show insignificant p-values ($p > 0.05$) under all the year lags. Therefore the null hypothesis of constant variance and homoskedasticity are not rejected. This is an indication that there is no heteroskedasticity in the cash flow model. We can therefore rely on the result of the OLS regression of the cash model.

4.4 Hypothesis Testing

Under this section the hypotheses earlier postulated would be tested. In testing the hypotheses the following statistics would be used: t-values, p-values, and the adjusted R^2 . Table 5 presents the results of the regression analysis carried out on the accruals based earnings model, while table 6 provides the result of the regression analysis on the cash flow model.

Table 6: Accrual based earnings model regression (robust standard error)

e.s		Dependent Variable: CFO _t		
		One-year lag	Two – year lag	Three-year lag
Intercept		0.108***	0.102***	0.098***
<i>p-value</i>		(0.000)	(0.000)	(0.000)
EARN _{t-1}	+	0.279***	0.206	0.286**
<i>p-value</i>		(0.001)	(0.147)	(0.019)
EARN _{t-2}	+	-	0.104	-0.034
<i>p-value</i>		(-)	(0.335)	(0.677)
EARN _{t-3}	+	-	-	0.123
<i>p-value</i>		(-)	(-)	(0.219)
Adj. R ²		0.068	0.069	0.097
F-Statistic		32.921	15.768	13.791
Prob(F-Stat)		0.000	0.000	0.000
Durbin Watson		1.448	1.488	1.555
Obs.		439	399	359

Source: Author's computation from Eviews 8 Output.

Table 6: Cash flow model regression

e.s		Dependent Variable: CFO _t		
		One-year lag	Two – year lag	Three-year lag
Intercept		0.075*** (0.000)	0.053*** (0.000)	0.056*** (0.000)
CFO _{t-1}	+	0.370*** (0.000)	0.304 *** (0.000)	0.275*** (0.000)
CFO _{t-2}	+	- (-)	0.198*** (0.000)	0.182** (0.001)
CFO _{t-3}	+	- (-)	- (-)	0.025 (0.642)
Adj. R ²		0.132	0.173	0.149
F-Statistic		67.405	42.562	21.900
Prob(F-Stat)		0.000	0.000	0.000
Durbin Watson		2.110	2.090	1.980
Obs.		439	399	359

Source: Author's computation from Eviews 8 output.

Test of Hypothesis one (H1)

H1: Past accrual based earnings information have significant ability in predicting future operating cash flows of quoted non-financial companies in Nigeria.

An inspection of table 5 shows that earnings (EARN) at all lags (1 year lag, 2 years lag, and 3 years lag) are highly significant in explaining future cash flows (CFO_t). This is indicated by the highly significant F-statistics ($p = 0.000$). With regard to the Adjusted R², the accrual based earnings model explains about 6.8 percent (Adj. R² = 0.068) of future operating cash flows (CFO_t). The earnings models of two years lag (EARN_{t-1}, EARN_{t-2}) and three years lag (EARN_{t-1}, EARN_{t-2}, EARN_{t-3}) explain 6.9 percent (Adj. R² = 0.069) and 9.7 percent (Adj. R² = 0.097) respectively. The accrual based earnings model of three years-lag had the highest adjusted R² of 9.7 percent, an indication that it has the highest predictive ability in predicting future operating cash flows. Overall, we accept our hypothesis that states that past earnings have significant ability in predicting future operating cash flows of quoted non-financial companies in Nigeria.

Test of Hypothesis two (H2)

H2: Past cash flows have significant ability in predicting future operating cash flows of quoted non-financial companies in Nigeria.

An inspection of table 6 shows that the F-statistics are very significant ($p = 0.000$). This is an indication that the variables, CFO_{t-1}, CFO_{t-2}, and CFO_{t-3} jointly have an impact on future operating cash flows (CFO_t). The cash flow model of one year lag, two year lag, and three year lags explain 13.2 percent, 17.3 percent, and 14.9 percent respectively of the variations of future operating cash flows. However the two years lag model had the highest forecasting ability (Adj. R² = 0.176) of future operating cash flows. The Durbin Watson statistics under the cash flow model were all very close to 2, an indication that the residuals of the cash flow regression model were uncorrelated and independent. The estimators of the cash flow model are therefore reliable. Based on the above analysis, we therefore accept our hypothesis that states that past operating cash flows have significant ability in predicting future operating cash flows of quoted non-financial companies in Nigeria.

Test of hypothesis three (H3)

H3: Past accrual based earnings information have superior predictive ability than past operating cash flows in predicting future operating cash flows of quoted non-financial companies in Nigeria.

To determine the model that has the superior predictive ability, the study compared the statistics in table 5 against the statistics in table 6. Specifically, the t-statistic (and their P-values), the F-statistics (and their p-values), and the Adjusted R² in both models were compared. On the basis of t-statistic, the cash flow model did better because t-values for CFO_{t-1} were statistically significant (p-values = 0.000) under all the year lags (one-year lag, two-year lag, and three-year lag) (See table 6). However t-values for EARN_{t-1} in table 5 were only significant ($p = 0.001$; 0.019) under the one-year lag and the three-year lag respectively. The t-values for CFO_{t-2} were statistically significant (p values = 0.000; 0.001) under the two year lag and three year lags respectively. However an inspection of the table 5 indicates the t-values for EARN_{t-1} were insignificant (p-values = 0.335; 0.667). The cash flow model used more past information in forecasting future cash flows, thus improving the quality of the forecast. This makes the cash flow model superior to the accrual based earnings model. On the

basis of F-statistics, the two models had F-statistic that were statistically significant (p values = 0.000). However the cash flow model in table 6 had bigger F-statistics (67.405; 42.562; and 21.90) under all the year lags, compared to the F-statistics (32.921; 15.768; and 13.791) of the accrual based earnings model in table 5.

The adjusted R^2 is the best criteria for determining which model is superior. The adjusted R^2 is an indication of the explanatory power of the models. A comparison of table 5 with table 6 shows that the cash flow model has higher adjusted R^2 than the accrual based earnings model (**Cash flow model:** 0.132; 0.173; 0.149; **Earnings model:** 0.068; 0.069; 0.097). This is an indication that the cash flow model has a stronger explanatory power than the accrual based earnings model. We therefore reject our hypothesis which states that past accrual based earnings information have superior predictive ability than past operating cash flows in predicting future operating cash flows non-financial quoted companies in Nigeria.

5. Discussion of Findings

This section discusses the findings of this study. A priori, the study posited that past earnings and cash flow information are useful in predicting future operating cash flows of quoted non-financial companies in Nigeria. The findings of this study confirmed these hypotheses. However, the study finds out that past accrual based earnings information has less predictive ability than past operating cash flows in predicting future cash flows of quoted non-financial companies in Nigeria. This finding is inconsistent with the assertion of the FASB (1978) and IASB (1989) that earnings provide a better indicator of future cash flows. The findings of this study thus show that in the Nigerian context cash flow information are a better predictor of future cash flows than accrual based earnings information. This finding is consistent with findings of studies carried out in the developed countries by Bowen et al. (1986); Finger (1994); Farshadfar et al. (2008); Penham and Yehuda (2009); Lev et al. (2010); Waldron and Jordan (2010) and Arnedo et al. (2012). The finding that cash flows are a better predictor than accrual based earnings information is also consistent with the findings of the studies carried out in the developing countries by Chotkunakitti(2005) and Al-Debi'e (2011). However this finding is inconsistent with the findings of a study carried out by Chong (2012) on companies in Malaysia (a developing country). Chong found that cash flow model had the weakest predictive ability in forecasting future cash flows.

The preponderance of studies seems to be in support of the cash flow model being a better predictor of future operating cash flows than the accrual based earnings model. This is not surprising because earnings under accrual accounting basis suffer from flexible accounting techniques, subjective judgment and manipulative practices which result to estimates (Bernard & Stober, 1989; Lee, 1992). Furthermore, the accrual based earnings method is less effective in predicting future cash flows under inflationary conditions. Nigeria suffers mostly from double digit inflation rates. Nigeria inflation rates were 13.9 %, 11.8 %, 10.3 %, 12.0 % and 8.0 % in 2009, 2010, 2011, 2012 and 2013 respectively (compared to U.S: 2.7%, 1.5%, 2.96%, 1.74%, 1.5%; Japan: -1.67%, -0.4%, -0.2%, -0.1%, 1.6%; Euro Area: 0.29%, 1.62%, 2.72%, 2.50%, 1.35) (CBN Statistical Bulletin, 2013; [Http://www.globalrates.com/economic-indicators](http://www.globalrates.com/economic-indicators); [Http://www.rateinflation.com/inflation-rate/euro-a](http://www.rateinflation.com/inflation-rate/euro-a)).

6. Conclusion

This study has shown that past accrual based information and past cash flows are useful in predicting future cash flows of quoted non-financial companies in Nigeria. The findings of this study do not support the assertion of the FASB (1978) and the IASB (1989) that past earnings (product of accrual-basis accounting) have more superior predictive ability than past cash flows (product of cash-basis accounting) in the prediction of future cash flows. The study finds that cash flow information have more predictive ability than earnings information in predicting future cash flows. The findings of this study are consistent with the preponderance of studies carried out in the developed countries. The findings of this study suggest that the cash flow statement has more decision usefulness than the income and balance sheet statements prepared on an accrual basis. The reason why the accrual based earnings information is less useful than the cash flow information is that earnings under accrual basis suffer from flexible accounting techniques and manipulative practices intended to show increased performance.

The findings of this study have important implications for investors, financial analyst, the Nigerian Securities and Exchange Commission, accounting standard setting bodies, auditors, suppliers, lenders, management, and government. Suppliers can employ the superior prediction model suggested in this study to assess their customers' ability to pay for goods bought. The findings of this study suggest the importance of qualitative accounting information. The IASB can apply the findings of this study in continually developing accounting standards that would promote qualitative and reliable financial statements. Auditors would also be affected by the findings of this study. This study would prompt auditors to thoroughly verify reported earnings and the claims made by the directors in the annual accounts and report that they had complied with accounting standard in the preparation and presentation of the financial statements. The Nigerian Securities and Exchange Commission and other regulatory bodies should properly enforce the use of accounting standards. Any company falsifying earnings and not complying with accounting standards, though claiming to comply, should be sanctioned by the Nigerian Securities and Exchange Commission.

The prediction of future cash flows depends on the stability of the variables used in the forecasting process. The awareness that high inflation can affect the variables used in predicting future cash flows can prompt government to embark on macroeconomic policies that would reduce the high rate of inflation in Nigeria.

The study recommends that Nigeria, should without delay, enforce the implementation of the international financial reporting standards (IFRS). These standards have the qualitative characteristics that would ensure the transparency of accounting information and thus improve the predictive ability of accounting information (earnings and cash flows) for the forecasting of future cash flows.

References

- Al-Attar, A., & Hussain, S. (2004). Corporate data and future cash flow. *Journal of Business Finance and Accounting*, 31(78): 861-903.
- Al-Debi'e, M. M. (2011). Are operating cash flows a superior predictor of future operating cash flows than earnings: Evidence from Jordan. *European Journal of Economics, Finance and Administrative Sciences* ISSN 1450-2275 (40): 30-46.
- Arnedo, L., Lizarraga, F., & Sanchez, S. (2012). The role of accounting accruals for the prediction of future cash flows: evidence from Spain. *SERIE*, 3: 499-520.
- Barth, M. E., Cram, D.P., & Nelson. K.K. (2001). Accruals and the prediction of future cash flows. *The Accounting Review*, 76(1): 27-58.
- Bernard, V. L., & Stober, T.L. (1989). The nature and amount of information in cash flows and accruals. *The Accounting Review*, LXIV(4): 624-652.
- Bierman, H. (1988). Extending the usefulness of accrual accounting. *Accounting Horizons*, 2(3): 10-14.
- Board, J.L.G., & J.F.S. Day. (1989). The information content of cash flow figures. *Accounting and Business Research*, 20(77): 3-11.
- Bowen, R. M., Burgstahler, D., & Daley, L.A. (1986). Evidence on the relationships between earnings and various measures of cash flow. *The Accounting Review*, 61(4): 713 – 725.
- Brooks, C. (2008). *Introductory Econometrics for Finance*. Second edition. United Kingdom: Cambridge University Press.
- Central Bank of Nigeria Statistical Bulletin, 2013.
- Chong, K. W. (2012). Prediction of operating cash flows using accrual-based and cash-based accounting information among Malaysian industrial corporations, DBA thesis, Southern Cross University, Lismore, NSW.
- Chotkunakitti, P. (2005). Cash flows and accrual accounting in predicting future cash flows of Thai listed companies, PhD thesis, Southern Cross University.
- Dechow, P. M., Kothari, S.P., & Watts, R.L. (1998). The relation between earnings and cash flows. *Journal of Accounting and Economics*, 25(2): 133-168.
- Ebaid, I. E. (2011). Accruals and the prediction of future cash flows: empirical evidence from emerging market. *Management Research Review*, 34(7): 1-32.
- Farshadfar, S., Ng, C., & Brimble, M. (2008). The relative ability of earnings and cash flow data in forecasting future cash flows. *Pacific Accounting Review*, 20(3): 251-268.
- Financial Accounting Standards Board (FASB) (1978). *Objectives of Financial Reporting by Business Enterprises*. Statement of Financial Accounting Concepts No. 1 Stamford, CT:FASB.
- Finger, C.A. (1994). The ability of earnings to predict future earnings and cash flow. *Journal of Accounting Research*, 32(2): 210-223.
- Godfrey, J. M., Hodgson, A., & Holmes, S. (2003). *Accounting Theory*. Fifth edition. Milton, Queensland: John Wiley & Sons Australia.
- Greenberg, R.R., Johnson, G.L., & Ramesh. K. (1986). Earnings versus cash flows as a predictor of future cash flow measures. *Journal of Accounting, Auditing and Finance*, 1(4): 266-277.
- Global inflation rate. Available at: <http://www.globalrates.com/economic-indicators>.
- Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1998). *Multivariate Data Analysis*, 5th edn., New Jersey: Prentice Hall.
- Historical inflation rates for Euro Area (2005 to 2015). Available at: <http://www.rateinflation.com/inflation-rate/euro-a>.
- Hodgson, A., & Stevenson-Clarke, P. (2000). Accounting variables and stock returns: The impact of leverage. *Pacific Accounting Review*, 12(2): 37-64.
- Kim, M., & Kross, W. (2005). The ability of earnings to predict future operating cash flows has been increasing – not decreasing. *Journal of Accounting Research*, 43(5): 753-780.
- Kremer, C., & Rizzuto, R. (2000). Three bottom lines. *Executive Excellence*, 17(9): 6-7.
- Lawson, G. H. (1992). *Studies in Cash Flow Accounting and Analysis*, New York and London:Garland Publishing Inc.

- Lee, T. A. (1986). *Towards a Theory and Practice of Cash Flow Accounting, Accounting Thought and Practice through the Years* New York: Garland Publishing.
- Lee, T. A. (1993). *Cash Flow Reporting: Recent History of an Accounting Practice. New Works in Accounting History*, New York: Garland Pub.
- Leuz, C., Nanda, D., & Wysocki, P.D. (2003). Earnings management and investor protection. An international comparison. *J Financ Econ*, 69: 505-527
- Lev, B., Li, S., & Sougiannis, T. (2010). The Usefulness of Accounting Estimates for Predicting Cash Flows and Earnings. *Review of Accounting Studies*, 15: 779-807.
- McBeth, K. H. (1993). Forecasting operating cash flow: Evidence on the comparative predictive abilities of net income and operating cash flow from actual cash flow data. *The Mid- Atlantic Journal of Business*, 29(2): 173-187.
- Pae, J. (2005). Expected accruals models: the impact of operating cash flows and reversals of accruals. *Review of Quantitative Finance and Accounting*, 24(1): 5-22
- Penham, S. H., & Yehuda, N. (2009). The Pricing of earnings and cash flows and the affirmation of accrual accounting. *Review of Accounting Studies*, 14(4): 453-479.
- Quirin, J. J., O'Bryan, D., Wilcox, W.E., & Berry, K.T. (1999). Forecasting cash flow from operations: additional evidence. *The Mid-Atlantic Journal of Business*, 35(2-3), 135-142.
- Sharma, D. S. (2001). The role of cash flow information in predicting corporate failure. The State of the literature. *Managerial Finance*, 27(4): 3-28.
- Stammerjohan, W. W., & Nassiripour, S. (2000/2001). Predicting SFAS 95 Cash flows: the relative importance of prior earnings, cash flows, and accruals. *Accounting Enquiries*, 10(1): 87-146.
- Waldron, M. A., & Jordan, C.E. (2010). The comparative predictive abilities of accrual earnings and cash flows in periods of economic turbulence; the case of the IT bubble. *The Journal of Applied Business Research*, 26(1): 85-97.
- Watts, R. L., & Zimmerman, J.L. (1986). *Positive Accounting Theory*. Englewood Cliffs, N.J.:Prentice-Hall.
- Yamane, Taro 1967. *Statistics: An Introductory Analysis*. 2nd edition., New York: Harper and Row.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:

<http://www.iiste.org>

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: <http://www.iiste.org/journals/> All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

Academic conference: <http://www.iiste.org/conference/upcoming-conferences-call-for-paper/>

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

