

THE EFFECT OF CASH HOLDINGS ON THE PERFORMANCE OF FIRMS IN NIGERIA: EVIDENCE FROM GENERALIZED METHOD OF MOMENTS (GMM)

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Abstract

The paper examines the effect of cash holdings on the performance of firms in Nigeria over the period 2001-2012. The study adopts the generalized method of moments in analyzing the data. The results of the estimation show that cash holdings has significant positive impact on firm performance. In addition, the results reveal that cash flows, growth opportunities, size, and net working capital exert negative impact on firm's performance, while debt repayment is positively related to firm's performance. This clearly shows that a good financial performance of the firm is an outcome of vast corporate cash holdings. It reflects the beliefs of Nigerian firms' managers that the absence of effective liquidity management will cause cash shortages and will result in difficulties in paying obligations, which negatively affects the firms' profitability.

Keywords: Cash holdings, firm performance, Nigeria, GMM approach

JEL classification: G30, G32 and G39

1. Introduction

Empirical studies on the relationship between cash holdings and firm's performance occupies a central place in corporate finance literature (Wongthatsanekorn, 2010, Abbasi and Bosra 2012, and Abushammala and Sulaiman, 2014). The increasing spate of research on the subject matter is not unconnected with conflicting evidence on the relationship between the two variables. One school of thought argues that large cash reserves help firm gain market share at the expense of industrial rivals, fulfill their financial obligations in a situation that would otherwise lead to financial distress and thus enhance their level of profitability. The other school of thought argues that cash holdings involve a lot of costs which could adversely affect the profitability of the firms. These costs include lower rate of return of these assets, possible high taxation and probable agency problems i.e. management holding cash to pursue its own objective at shareholder expense. Clearly, the true effect of cash holdings on firm performance is still an open empirical question.

Asides, our knowledge about the effect of cash holdings on firm performance have mostly been derived from data from developed economies that have many institutional similarities. However, the developing countries have institutional structures that are quite different from that of the developed ones. Consequently, this raises the issue of the validity of the conclusions from theoretical and empirical research on the effect of cash holdings on firm's performance carried out in the developed economies for developing economies like Nigeria.

Hence, this work is motivated by three main factors. The first is the lack of consensus among researchers on the effect of cash holdings on firm performance. The second is the

need to ascertain the validity of the findings on the effect of cash holdings on profitability in developed economies for developing economies. The last is to fill the gap created by lack of empirical research on the subject matter in the developing or emerging economies. As pointed out by Al-Najjar (2012), in the emerging markets the strategic decision of cash holdings is necessary, but it has been under-researched or incompletely explored in the previous studies.

The paper contributes to knowledge in many areas. One, it helps to unearth the implications of firm's cash policy on profitability. As pointed out by Fresard (2009), this is an area in the literature that is not yet fully understood. Two, contrary to previous profitability studies, this paper depart from customary practices of measuring performance in terms of profit before interest and tax over total assets alone. We try to generate a composite index of firm's performance using Principal Component Analysis (PCA). The firm performance index combines three measures of profitability namely return on assets, return on equity and ratio of profit before interest and tax to total assets.

The rest of the paper is structured as follows: Section 2 provides the review of empirical literature. Section 3 explains the data and methodology. Section 4 gives the empirical results. The last section contains the conclusion.

2. Literature Review

There are few studies that addressed the effect of cash holdings decisions on the firm's profits and financial performance (Lehtinen, 2011). Results from these few empirical studies have been mixed. Lyroudi and Lazaridis (2000) studied the listed companies on the London Stock Exchange for a period of four years. They found that cash conversion cycle, current ratio and the quick ratio affect firm's profitability negatively. The study by Raheman and Nasr (2007) used a sample of 94 Pakistani listed firms to examine the effect of liquidity on profitability of firms. They found a significant negative relationship between liquid assets and profitability during the period 1999-2004.

Blanchard, Lopez-de-Silances, and Shleifer (1994) analyzed a small sample of firms that have cash windfalls from lawsuits. They found that managers retain cash rather than distribute it to shareholders even though they have no attractive investment opportunities. The results also show that such firms invest in projects that later fail.

Pinkowitz and Williamson (2005), using U.S firm level data for the period of 1950-1999, showed that firms with growth opportunities had their cash valued higher. They also demonstrated that cash holdings of firms with stable investment programs and those facing the possibility of financial distress were less valued. Similarly, Fakuda (2011) using Japanese firm data for the period of 2000-2004, showed that cash holdings of firms with big opportunities for investment were highly valued, although financial constraints such as debt ratios and capital market access had no significant effects on the relationship between cash holdings and corporate values.

Pinkowitz, Stulz and Williamson (2006) examined the determinants of the market value of cash holdings in US public firms over the period 1950 to 1999. Their results showed that both past and future changes of cash holding levels only contribute just a little to the market value of a firm. They also argued that the value of cash holdings increases for the firms with growth opportunities.

Fresard (2010) found evidence that firms holding higher cash than their competitors achieve better performance and profitability when measured by return on assets. The study presented evidence that firm's market-share increased than that of their competitors as a result of increasing levels of corporate cash holdings. The firm employed effective capital management to benefit from operational competitive advantages irrespective of the prevailing economic climate (Vuorikari, 2012).

Palazzo (2011) used a data set of US public companies and found evidence of the cash holding effects on firm's financial performance and that precautionary savings motive involves a positive relation between expected return on equity and cash holdings. This positive relationship tends to be stronger for firms with less valued growth opportunities

Bhutto, Abbas, Rehman and Shah (2011) examined the relationship between cash conversion cycle and firm's profitability based on 157 non-financial companies in Pakistan. The results of the analysis showed that length of conversion cycle (a measure of cash management) had negative effect on return on equity. It, however, had positive effect on return on assets. In the same way, the study by Uwuigbe, Uwolomwa and Egbide (2011) for 15 non-financial firms in Nigeria over the period 2005-2009 showed that cash holdings negatively impacted firm's profitability.

The study by Ebben and Johnson (2011) examined the effect of cash conversion cycle on the performance of 879 small U. S. manufacturing firms and 833 small U. S. retail firms. The results of the estimation revealed that firms with more efficient cash conversion cycle were more liquid, required less debt and equity financing, and had higher returns. In addition, the results showed that small firm owners and managers tend to be reactive in managing cash conversion cycle. Essentially, the findings reveal cash conversion cycle as a proactive management strategy could be used by small firm owner.

The study by Abbasi and Bosra (2012) analyzed the effect of cash conversion cycle components on the operational gross profit to assets ratio of 159 firms listed in the Tehran Stock exchange over the period 1998-2009. The results indicated that when all the cash conversion cycle components were incorporated into the model, net cash conversion cycle and the number of days inventory had no significant effect but number of days receivable accounts and number of days payable accounts had significant negative effect on operational gross profit to assets ratio.

Akinyomi (2014) examined the effect of cash management on profitability of 15 manufacturing firms listed in the Nigerian Stock Exchange over the period 2008-2012. The results obtained from regression estimation showed a significant positive relationship between cash conversion cycle and return on equity but a non-significant negative relationship between cash conversion cycle and return on assets.

The study by Abushammala and Sulaiman (2014) analyzed the effect of cash holding level on firms' profitability using panel data of 65 non-financial firms listed in Amman Stock Exchange over the period 2000-2011. The results of the regression analysis showed significant positive effect of cash holdings on profitability. The finding showed that a good financial performance of the firm is an outcome of vast corporate cash holdings.

3. Methodology

The study utilized data obtained from sixty (60) purposively selected firms from the listed non-financial firms on the Nigerian Stock Exchange (NSE). Most of the data used in this study were sourced from the Annual Reports and Statement of Accounts of the selected firms. Only firms listed since 2001 and which are still in operation till the end of 2012 financial year were chosen. Financial institutions such as banks, insurance companies and so on were excluded from the sample due to the format used in reporting their balance sheets.

The sample of firms cut across fifteen (15) sections of the Nigerian Stock Exchange classification. They are automobile and Tyres, Breweries, Building materials, chemical and paints, computer and office equipments, conglomerates, construction, food and beverage, Tobacco, Health care, Industrial/Domestic products, machinery, packaging, Petroleum, Printing and publishing and real estate.

Model of Cash Holdings and Profitability

In examining the impact of cash holdings on firms' performance, a relationship that takes the form below is specified:

$$Prf_{it} = \alpha + \beta_1 Prf_{it-1} + \sum_{i=1}^n \beta_i X_{it} + \mu_{it} \dots\dots\dots(1)$$

where $i = 1, 2, \dots, n$, Prf is firm's performance index generated through Principal Component Analysis that combines return on assets, return on equity and ratio of profit before interest and tax to total assets. Prf_{it-1} firm performance index lagged one year. X_{it} is other firm's characteristics that affect firms' profitability. If we state the eq. (1) more explicitly, we obtain:

$$Prf_{it} = \alpha + \beta_1 Prf_{it-1} + \beta_2 Cas_{it} + \beta_3 Cfl_{it} + \beta_4 Drp_{it} + \beta_5 Inv_{it} + \beta_6 Lev_{it} + \beta_7 Mkb_{it} + \beta_8 Nas_{it} + \beta_9 Nwc_{it} + \varepsilon_{it} \dots\dots\dots(2)$$

where Cas is the cash holdings, Nas is the natural logarithm of total assets (a measure of firm size), Lev is the leverage, Mkb is market to book value (measure of firm's growth opportunities), Nwc is the net working capital, Inv is investment in fixed assets, Drp is debt repayment and Prf is as earlier defined (see Appendix 1 for the definitions and measurement of variables).

Estimation Technique

The paper employs a dynamic panel general method of moments. In panel estimation, the Generalized Least Squares (GLS), the Fixed Effect (FE) and or Random Effect (RE) estimators do not produce consistent estimates in the presence of dynamics and endogenous regressors. The firm performance equation estimated has lagged endogenous regressors as well as unobserved firm fixed effects which are correlated with the regressor; hence the orthogonality condition is not likely to be met for a GLS or FE or RE estimator to produce consistent estimates. This explains the use of Generalized Methods of Moments approach as described below.

Matching the study's models with Arellano and Bond (1991) GMM mode, the following model based on one year lagged for dependent variable as regressor:

$$y_{i,t} = \alpha y_{i,t-1} + \beta_1 X_{i,t} + \beta_2 X'_{i,t} + \varepsilon_{i,t}$$

$$\varepsilon_{i,t} = \mu_i + \vartheta_{i,t} \dots\dots\dots(3)$$

where i is firms index, t is time index, y is the dependent variables, X is cash holdings and X' is the control variables. The error term has two components μ_{it} fixed effects and the idiosyncratic firm features ϑ_{it} .

Arellano and Bond (1991) propose the transformation of equation (3) to the first differences in order to eliminate firm's individual characteristics. The result is as given in equation 4:

$$y_{i,t} - y_{i,t-1} = \alpha (y_{i,t-1} - y_{i,t-2}) + \beta_1 (X_{i,t} - X_{i,t-1}) + \beta_2 (X'_{i,t} - X'_{i,t-1}) + \vartheta_{i,t} - \vartheta_{i,t-1} \dots \dots \dots (4)$$

Arellano and Bond (1991) state that the lagged level of predictor variables should be adopted as instrumental variables to take care of bias of explanatory variables as well as the possible correlation between lagged dependent variable ($y_{i,t-1} - y_{i,t-2}$) and error term ($\vartheta_{i,t} - \vartheta_{i,t-1}$). This is only valid if these two conditions are met. One, the lag of the regressors are weakly exogenous and two, there is serial correlation for the error term. The following equations describe moment's conditions for the *first-difference* Generalized Method of Moments dynamic panel estimator:

$$\begin{aligned} E y_{i,t-s} \vartheta_{i,t} - \vartheta_{i,t-1} &= 0, \quad s \geq 2; \quad t = 3, \dots, T \\ E X_{i,t-s} \vartheta_{i,t} - \vartheta_{i,t-1} &= 0, \quad s \geq 2; \quad t = 3, \dots, T \\ E X'_{i,t-s} \vartheta_{i,t} - \vartheta_{i,t-1} &= 0, \quad s \geq 2; \quad t = 3, \dots, T \end{aligned}$$

Although, the equation above is capable of controlling for firm-specific effects and simultaneity biases, suffers a major weakness. Blundell and Bond (1998) showed that in the condition that regressors are persistent, lagged level of the variables are weak instrumental variables that can lead to biased parameter estimation. Combining difference equation (4) and the level equation (3), Arellano and Bover (1995) proposed an alternative approach called system estimation. Subsequently, Blundell and Bond (1998) showed that system estimation is able to decrease biases and comparative inaccuracy related to difference estimation. Following Arellano and Bover (1995), additional moment's condition for level regressions are set as follows.

$$\begin{aligned} E y_{i,t-s} - y_{i,t-s-1} \mu_i + \vartheta_{i,t} &= 0 \quad \text{for } s = 1 \\ E X_{i,t-s} - X_{i,t-s-1} \mu_i + \vartheta_{i,t} &= 0 \quad \text{for } s = 1 \\ E X'_{i,t-s} - X'_{i,t-s-1} \mu_i + \vartheta_{i,t} &= 0 \quad \text{for } s = 1 \end{aligned}$$

The critical issue to be considered is the consistency of the GMM estimator. This is highly depended on the validity of the instruments. To test for this, we employed as measure of consistency Sargan test for over-identifying restrictions.

4. Empirical Results Descriptive Statistics

Table 1 provides the descriptive statistics of the variables employed in our study. Specifically, information on the mean, median, maximum, minimum values and the distribution of the sample measured by the Skewness, Kurtosis and Jaque-Bera statistics are provided.

Table 1: Descriptive Statistics

	<i>Cas</i>	<i>Cfl</i>	<i>Drp</i>	<i>Inv</i>	<i>Lev</i>	<i>Mkb</i>	<i>Nas</i>	<i>Nwc</i>	<i>Prf</i>
Mean	12.001	-1.553	13.133	-1.138	-2.659	9.061	14.328	12.888	-1.715
Median	11.951	-1.914	13.223	-1.741	-2.628	10.590	14.382	13.084	-1.561
Maximum	17.707	14.796	18.388	15.695	13.027	17.707	18.786	17.864	2.679
Minimum	3.584	-8.095	3.807	-8.762	-11.736	-2.385	9.933	-5.689	-7.601
Std. Dev	2.661	3.807	2.121	4.006	3.025	5.398	1.805	3.226	1.236
Skewness	-0.275	3.145	-0.339	2.965	2.513	-0.574	-0.036	-3.448	-0.941
Kurtosis	2.526	14.822	3.419	12.444	16.298	1.943	2.285	19.667	5.979
Jarque-Bera	13.139	4176.838	15.407	2222.858	4909.395	59.229	12.284	5259.612	257.112
Probability	0.0014	0.000	0.005	0.000	0.000	0.000	0.002	0.000	0.000

Sum	7189.124	-868.341	7643.418	-488.104	-1550.047	5292.046	8166.973	5000.451	-852.113
Sum Sq. Dev	4233.396	6782.905	2614.776	6868.334	5326.454	16986.43	1852.920	4027.519	757.743

Table 1 shows that all series display a high level of consistency as their mean and median values perpetually fall within the maximum and minimum values of these series. Moreover, the low standard deviations for most of the series indicate that the deviations of actual data from their mean values are very small. The statistics in table 1 equally show that the series are positively skewed and leptokurtic relative to the normal. The results in table 1 show that on average, firms included in the study hold approximately 12 per cent of their assets as cash. The mean growth opportunities rate for the 60 firms was 9.06. This shows that growth opportunities in private manufacturing firms in Nigeria are lower than 27 per cent for Kenya (Kariuki, Namusonga and Orwa, 2015) and higher than 7.3 per cent reported for Italy (Bigelli and Sanchez-Vidal, 2012). The performance (profit) level was -1.01 per cent for the period under consideration.

Correlation Analysis

The results of the correlation analysis are shown in table 2. The results show positive and significant correlation between cash holdings and computed firm's performance index. The same result was obtained when performance was measured as ratio of profit before interest and tax to total assets. In the same way, cash flow, growth opportunities, debt repayment and net working capital are significantly positively related to performance. Leverage is negatively correlated with performance. Though correlation provides some useful and interesting relationship between cash holdings and firm's performance, care must be exercised while interpreting the correlation matrices. This is based on the fact that it cannot provide a reliable indicator of association in a manner that controls for additional explanatory variables. Essentially, examining simple bivariate correlation in a conventional matrix cannot take account of each variable correlation with all other explanatory variables. Hence, the use of multivariate regression estimated using Generalized Method of Moments.

Table 2: Correlation Matrix

	<i>Cas</i>	<i>Cfl</i>	<i>Drp</i>	<i>Inv</i>	<i>Lev</i>	<i>Mkb</i>	<i>Nas</i>	<i>Nwc</i>	<i>Prf</i>
<i>Cas</i>	1.0000 -								
<i>Cfl</i>	0.6138*** 0.0000	1.0000 -							
<i>Drp</i>	0.7412*** 0.0000	0.2836*** 0.0000	1.0000 -						
<i>Inv</i>	0.0357 0.1784	-0.0285 0.6880	0.0783 0.2694	1.0000 -					
<i>Lev</i>	-0.0952 0.1784	0.0145 0.8380	0.0981 0.1657	0.1979** 0.0049	1.0000 -				
<i>Mkb</i>	0.5351*** 0.0000	0.3182*** 0.0000	0.5480*** 0.0000	0.1411** 0.0458	0.1573** 0.0257	1.0000 -			
<i>Nas</i>	0.7544*** 0.0000	0.1780*** 0.0115	0.8511*** 0.0000	0.0854 0.2281	-0.0093 0.8959	0.4318 0.0000	1.0000 -		
<i>Nwc</i>	0.6813*** 0.0000	0.2976*** 0.0000	0.7009*** 0.0000	-0.0761 0.2830	0.1281 0.0699	0.4133*** 0.0000	0.7722*** 0.0000	1.0000 -	
<i>Prf</i>	0.3076*** 0.0000	0.4409*** 0.0000	0.1673** 0.0176	0.1118 0.1142	-0.0374 0.5984	0.1363 0.0536	0.0907 0.2002	0.2058** 0.0034	1.0000 -

NB: The variables are as defined in Appendix 1. *** and ** denote significant at 1% and 5% respectively.

Regression Analysis

The results of the GMM are as shown in table 3. First we ascertained the robustness of the estimation using Sargan test of over-identifying restriction. Therefore, the values of the instrument rank and J-statistics of the GMM estimates were examined. As shown in table 3, the instrument rank is far greater than the number of estimated coefficient. Since the condition is fulfilled, the Sargan test of over-identifying restriction was constructed. The results produced p-value of 0.5891, thus confirming the validity of the instruments employed. This simply means that the instruments are not correlated with error term.

The results from table 3 show that the coefficient of lagged dependent variable is positive and significant at 1%. This shows that the current performance level is positively influenced by performance level in the previous year. Cash holdings is positively and significantly related to firm performance. The result show that a 1% increase in cash holdings increases firm performance by 1.17E-07 per cent. The positive relationship between cash holdings and firm performance index reflects the effectiveness of hedging behaviours by Nigerian firms' managers that such strategies help listed firms in Nigerian Stock Exchange avoid the cash shortages and easily paying obligations with positive impact on performance. This finding is consistent with the results of Martinez-Sola, Gacia-Teruel & Matinez-Sola (2013), Morellec and Schurhoff (2011) and Bates, Kahle, & Stulz (2009). These authors have argued that cash holdings increase the ability of firms to compete in financial markets. The finding equally corroborates the finding by Mikkelson and Partch (2003) that large cash holdings support investment without hindering corporate performance.

Table 3: Results of Effects of Cash Holding on Performance Panel Generalized Method of Moments (Dependent Variable: Prf)

Variable	Coefficient	t-statistic	Probability
<i>Prf (-1)</i>	0.0995***	8.9795	0.0000
<i>Cas</i>	1.17E-07***	4.7480	0.0000
<i>Cfl</i>	-0.4793***	-5.7914	0.0000
<i>Drp</i>	2.06E-08***	3.8887	0.0001
<i>Inv</i>	0.0090	0.7929	0.4282
<i>Lev</i>	-0.3723***	-4.0827	0.0001
<i>Mkb</i>	-0.0151***	-4.6826	0.0000
<i>Nas</i>	-1.58E-08***	-2.7513	0.0061
<i>Nwc</i>	-2.88E-08***	-3.1431	0.0018

*** and ** denote 1% and 5% significant levels respectively. Instrument Rank = 36. J-Statistic = 25.7698, Prob (J-Statistic) = 0.5314

Debt repayment is positively and significantly related to firm performance. Debt repayment is symptomatic of low likelihood of financial distress and thus higher investment and better performance. This is in line with the positive relation between cash holdings and firm's performance obtained in this work. Leverage is negatively related to performance. The coefficient is significant at 1 per cent. The negative relationship between leverage and firm's performance might be an indication that firms maintain high debt ratio to increase their liquidity holdings so as to decrease the likelihood of financial distress. This finding is consistent with many previous studies including Akinlo, (2012), Myers (1984), Ragan and Zingales (1995). The result is also in line with Myers (2003) suggestion that highly leveraged firms are booster competitors that will curtail investment so their insufficient power of competition may lead to decrease in profitability.

Other control variables cash flows, growth opportunities, net assets and net working capital have significant negative effects on firm performance. The significant negative relationship between cash flows and firm performance shows that increasing cash flows disposes more resources to firm managers and their usage of this money does not contribute to increasing profit. Thus, increasing cash flows tend to decrease the opportunity by which the manager can use available resources and increase shareholders return. The result is consistent with the works of Gregory (2005) and Heydari, Mirzaeifar and Javadghayedi (2014).

Net working capital is negatively related to firm performance and might be attributed to the fact that costs of higher investments in working capital increase faster than the benefits of holding more inventories and/or granting more trade credit to customers. Some existing studies have found negative relationship between profitability and liquidity. These include Shin and Soenen (1998), Eljely (2004) and Wang (2002).

The negative relationship between size and firm performance simply suggests that firms in Nigeria do not enjoy economies of scale in production which could possibly translate into higher profit. This is particularly true considering the small size of most firms in Nigeria. The finding is in line with the works of Stekler (1963) and Osborn (1970).

The relationship between growth opportunities and firm's performance is negative and significant. This could be that the value of these firms is largely determined by their growth opportunities and as such have large information asymmetry. Consequently, they not only incur high external financing, but also face high agency cost that ultimately leads to higher liquidity and low firm performance.

Robustness Check

As a way of checking the robustness of the analysis on the effect of cash holdings on firm performance, the study re-estimated equation 3 using GMM approach with firm's performance measured as ratio of profit before interest and tax to total assets. The results obtained are as shown in table 4. Additionally, we re-estimated equation 3 using Panel Least Squares for the two measures of firm's performance. The results obtained in both cases are as shown in tables 5 and 6 respectively.

Table 4: Result of Effect of Cash Holding on Profitability Panel Generalized Method of Moments (Dependent Variable: PROF)

Variable	Coefficient	t-Statistic	Prob
<i>Prof (-I)</i>	-0.1134***	-8.5210	0.0000
<i>Cas</i>	-1.75E-08	-0.5683	0.5701
<i>Cfl</i>	-1.0031***	-14.3111	0.0000
<i>Drp</i>	4.44E-08***	6.6232	0.0000
<i>Inv</i>	0.0002	0.0135	0.9892
<i>Lev</i>	-0.0888	-0.4313	0.6664
<i>Mkb</i>	-0.0025	-0.4099	0.6820
<i>Nas</i>	-5.66E-09	-0.7158	0.4715
<i>Nwc</i>	-2.92E-08***	-3.1953	0.0015

*** and ** denote 1% and 5% significant levels respectively. Instrument Rank = 36, J-Statistic = 24.3504

The results in table 4 show GMM estimates for performance measured as ratio of profit before interest and tax to total assets. Overall, the results of the two measures are quite consistent. The major difference observed is the coefficient of cash holdings that comes out negative. However, the coefficient is not significant. Hence, it is difficult to draw conclusive

inference from the result. Few minor areas of differences are equally discernible particularly in terms of significance of the coefficients of the variables. When performance is measured as the ratio of profit before interest and tax, the coefficients of leverage, growth opportunities and net assets are negative but insignificant. Hence, firm conclusion cannot be drawn from them.

The results from panel least squares estimation for computed performance index (*Prf*) and ratio of profit before interest and tax to total assets (*Prof*) are as shown in tables 5 and 6 respectively. The results are quite similar to those obtained using GMM approach. The signs are the same for all variables except for debt repayment that comes out with negative sign. However, the coefficients of growth opportunities, net assets and net working capital are not significant contrary to what obtained under GMM estimation.

Table 5: Results of Effects of Cash Holding on Performance Panel Least Squares (Dependent Variable: *Prf*)

Variable	Coefficient	t-Statistic	Prob
C	0.1509	1.7216	0.0857
<i>Prf</i> (-1)	0.1678***	1.9234	0.0550
<i>Cas</i>	5.05E-08**	2.2375	0.0257
<i>Cfl</i>	-0.6108**	-1.9436	0.0525
<i>Drp</i>	-9.22E-09**	-2.0224	0.0436
<i>Inv</i>	-0.0077	-0.8666	0.3866
<i>Lev</i>	-0.0381***	-7.4091	0.0000
<i>Mkb</i>	-0.0023	-0.1711	0.8642
<i>Nas</i>	-2.58E-09	-0.5533	0.5803
<i>Nwc</i>	-2.60E-09	-0.4107	0.6815

R2 = 0.4397. F-statistic = 6.1158. Prob (F-statistic) = 0.0000. Durbin-Watson stat = 2.0951

Table 6: Result of Effect of Cash Holding on Profitability Panel Least Squares (Dependent Variable: *PROF*)

Variable	Coefficient	t-Statistic	Prob
C	0.4351***	4.5232	0.0000
<i>PROF</i> (-1)	-0.0933	-0.7736	0.4395
<i>Cas</i>	7.10E-08***	2.9208	0.0036
<i>Cfl</i>	-1.1453***	-3.3061	0.0010
<i>Drp</i>	-2.96E-09	-0.4099	0.6820
<i>Inv</i>	6.69E-05	0.0133	0.9894
<i>Lev</i>	-0.0091***	-2.3470	0.0193
<i>Mkb</i>	-0.0020	-0.1233	0.9091
<i>Nas</i>	-9.97E-09	-1.8201	0.0693
<i>Nwc</i>	-2.07E-09	-0.2522	0.8010

*** and ** denote 1% and 5% significant levels respectively. R2 = 0.4317. F-statistic = 5.9202. Prob (F-statistic) = 0.0000

Durbin-Watson stat = 2.1026

In like manner, the results from panel least squares estimation for firm performance measured as ratio of profit before interest and tax to total assets do not diverge significantly from those obtained for the computed performance index using GMM approach. The signs are almost the same for all variables except debt repayment, lagged dependent variable and investment opportunities. However, as the coefficients of many of the variables are not significant, conclusive inference cannot be drawn from them.

In general, from almost all the estimations, the coefficient of cash holdings is positive and significant. This simply suggests that as cash holdings increases, the performance of firms increases.

5. Conclusion

The purpose of this study is to examine the effect of cash holdings on the performance of firms in Nigeria over the period 2000-2012 using General Methods of Moment approach. These are the main findings. First, cash holdings is positively and significantly related to firm performance. The result clearly reflects the effectiveness of hedging behavior by managers in Nigeria. Second, leverage is negatively related to profitability. Third, debt repayment is positively related to firm performance. Fourth, cash flows, growth opportunities, net assets and net working capital are negatively related to profitability.

These results are quite consistent with earlier studies by Martinez-Solano, Gacia-Teruel and Matinez-Sola (2013), Morellec and Schurhoff (2011) and Abushammala and Sulaiman (2014). Although, a few of the findings seem to conflict with some earlier studies on the issue, the development may be attributed to the evolving market and the institutional structures of developing countries like Nigeria. The reasons for this contradiction should therefore constitute an area of future research. Moreover, analysis of the effect of cash holdings on firm performance on sectoral basis should be explored in subsequent research.

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Appendix 1

Definition and Measurement of variables

The measurement of dependent and independent variables used in the study are provided below:

Nas (Firm size): This is defined as the natural logarithm of the book of total assets

Prof (Profitability): profitability is measured as return on total assets. Conventionally, it is calculated as profit after tax divided by investment, where investment represents the pool of funds supplied by shareholders and lenders: while profit after tax represents the residual income of shareholders. Therefore, it is conceptually unsound to use profit after tax in the calculation of return on assets. Consequently, we use the following measure return on investment to compare the operating efficiency of the firms: $\text{Prof} = \text{Profit before interest and tax} / \text{total assets}$.

Lev (Leverage): This is measured as the ratio of total debt to net assets. Net assets are net fixed plus net current assets. Net current assets are current assets minus current liabilities excluding interest bearing short-term debt for working capital. Net assets equals capital employed because capital employed includes total debt and net worth.

Mkb (Market to Book ratio): Markets-To-Book ratio is taken as a proxy for the firm's investment opportunity set. This is taken as ratio Book value of assets less Book value of equity plus market value of equity to Book value of assets.

Cfl (Cash flows): Cash flow magnitude is measured by cash flow to net assets ratio where cash flow is taken as ratio of pretax profits plus depreciation to total assets less cash and equivalents.

Nwc (Net Working Capital): Net working capital-to-assets ratio of current assets less cash and cash equivalents to total assets less cash and equivalents.

Inv (Investment): Investment in fixed assets is measured as ratio of variation in Investment on fixed asset to net total assets.

Drp (Debt repayment): This debt repayment. This is measured as the ratio of debt repaid to total bank borrowings.

Cas (Cash holdings): This is measured as the quotients of cash and cash equivalents to book value of assets less cash and equivalents.

Prf (Performance index): This firm performance index. It is computed using Principal Component Analysis (PCA). The performance index combines three measures of profitability namely; return on assets, return to equity and ratio of profit before interest and tax to total assets.