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CASH HOLDING AND FIRM CHARACTERISTICS: EVIDENCE FROM NIGERIAN EMERGING MARKET

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KEYWORDS

Cash holding, firm characteristics, leverage, net working capital, Nigeria.

ABSTRACT

This paper aims at shedding light on the empirical relationship between cash holding and firm characteristics. A sample of 54 Nigerian firms listed on Nigerian Stock Exchange for a period of 15 years (from 1995-2010) was selected. This study applied co-relational research design. The results show that cash flow, net working capital, leverage, profitability and investment in capital expenditure significantly affect the corporate cash holdings in Nigeria. The study, therefore, contributes to the literature on the factors that determine the corporate cash holdings. The findings may be useful for the financial managers, investors, and financial management consultants.

1. INTRODUCTION

Empirical studies about the determinants of corporate cash holdings have occupied a central place in corporate finance literature. Cash holding, according to Gill and Shah (2012) is defined as cash in hand or readily available for investment in physical assets and to distribute to investors. Cash holding is therefore viewed as cash or cash equivalent that can be easily converted into cash. In this context, cash holding will include cash in hand and bank, short time investment in money market instrument such as treasury bills. Owing to the significance of cash and its importance in working capital management, different approaches are being used to determine factors that influence it. Holding cash is at a cost, which is the opportunity cost of the capital invested in liquid assets. The potential profit forgone on holding large cash balance is an opportunity cost to the firm. Adetifa (2005) observes that the costs of cash holding are of two categories: cost of excessive cash holding such as opportunity cost of interest foregone, costs of purchasing power among others and cost of inadequate cash holding including cost of corporate image, loss of cash discount on purchases and loss of business opportunities.

The corporate cash holding determinants have since been a subject of explanation in the framework of three theories, namely: the Trade-off Model, Pecking Order Theory and Free Cash Flow Theory. According to tradeoff theory, they set their optimal level of cash holding by weighing the marginal costs and marginal benefits of holding cash (Afza & Adnan, 2007). The main advantages associated with cash holding include reduction in the likelihood of financial distress, pursuance of the optimal investment policy even when financial constraints are met, and its contribution to minimize the costs of raising external funds or liquidating existing assets. According to Ferreira and Vilela (2004) the benefits of cash holding are: i) reduction in the likelihood of financial distress, ii) allowing the pursuance of investment policy when financial constraints are met, and iii) minimizing the costs of raising external funds or liquidating existing

assets.While marginal cost of holding cash is associated with the opportunity cost of the capital due to the low return on liquid assets.

As per the pecking order theory, Myers (1984) opines that firms finance investments firstly with retaining earnings, then with safe debt and risky debt, and finally with equity. When current operational cash flows are sufficient enough to finance new investments, firms repay debt and accumulate cash. When retained earnings are not enough to finance current investments, firms use the accumulated cash holdings and, if needed, issue debt while free cash flow theory as explained by Jensen (1986) that managers have an incentive to hoard cash to increase the amount of assets under their control and to gain discretionary power over the firm investment decision. With the cash holding, they do not need to raise external funds and could undertake investments that have a negative impact on shareholders' wealth.

The fallout of his submission has foreclosed the necessity of maintaining optimum cash holding. Pandey (2006) emphasizes that firm should maintain optimum cash holding. How to determine the optimum cash holding is a major concern for the financial manager globally, Nigeria inclusive. Efforts have been on to identify what are the determinants of cash holding bearing in mind the firm's characteristics such as size, growth opportunities, leverages, cash flow, dividend payout, Account receivable and payable among others. Hence, this study examines the correlation relationship between the cash as dependent variable and firms' characteristic as explanatory variables. The degree of determination will also be evaluated. Thus, this study will add substance to the existing theory developed by previous authors.

2. REVIEW OF RELEVANT THEORIES AND EMPIRICAL STUDIES

Several studies, undertaken on the developed economy market and recently, on emerging markets samples, tried to answer this question: Why do firms hold cash and what determines its volume using the theoretical models of the trade-off model? (Myers 1977), the pecking order model (Myers and Majluf 1984) and Free cash flow theory (Jensen 1986). By utilizing trade-off theory on the case of detention of cash, it was concluded that there is an optimal cash level which results from weighing its marginal benefits and costs. Cash holding generates costs and benefits and is very important in financing the growth opportunities of the firm. The important benefit of holding cash is that, it constitutes a safety buffer which permits firms to avoid the costs of raising external funds or liquidating existing assets and which allows firms to finance their growth opportunities. Insufficient cash forces firms to forgo profitable investment projects or to support abnormally high costs of financing. Two principal costs are associated with cash holding. These costs depend on whether managers maximize shareholders' wealth or not. If managers' decisions are in line with shareholders' interests, the only cost of cash holding is its lower return relative to other investments of the same risk. If managers don't maximize shareholders' wealth, they increase their cash holding to increase assets under their control and so to be able to increase their managerial discretion. In this case, the cost of cash holding will increase and include the agency cost of managerial discretion**.**

Pecking order theory (Myers and Majluf 1984) offers explanation on the determinants of cash, leading to the conclusion that there is optimal cash level. It is used as a buffer between retained earnings and investment needs. Under this theory, the cash level would just be the result of the financing and investment decisions. Issuing new equities is very costly for firms because of information asymmetries. Thus, firms finance their investments primarily with internal funds, then with debt and finally with equities. Thus, when operational cash flows are high, firms use them to finance new profitable projects, to repay debts, to pay dividends and finally to accumulate cash.

When retained earnings are insufficient to finance new investments, firms use their cash holdings, and then issue new debt.

The Free Cash Flow Theory (Jensen, 1986) explains that managers have an incentive to hoard cash to increase the amount of assets under their control and to gain discretionary power over the firm investment decision. With the cash holding, they do not need to raise external funds and could undertake investments that have a negative impact on shareholders' wealth. Thus, management may hold excess cash simply because it is risk averse. The possibility that management could be using cash for its own objectives raises the costs of outside funds, because outsiders do not know whether management is raising cash to increase firm value or to pursue its own objectives. Finally, management may accumulate cash because it does not want to make payouts to shareholders, and wants to keep funds within the firm. Having the cash, however, management must find ways to spend it, and hence chooses poor projects when good projects are not available (Opler, 1999).

Nadiri (1969) pioneered study on cash holdings by collecting data from US manufacturing sector from 1948 to 1964 to estimate a model relating to the desired level of real cash balances. The results showed that the demand for real cash balances is determined by output, the interest rate, the expected rate of change in general price level, and factor prices. Campbell and Brendsel (1977), extending the findings of Nadiri (1969), conducted an empirical study by collecting data from US manufacturing firms from 1953-1963 using Ordinary Least Square (OLS) regression analysis to examine the impact of compensating balance requirements on the cash holdings. and found that compensating balance requirements are not binding. Still on US, Opler *et al.* (1999) collected data in the 1971 to 1994 period from 1048 publicly traded US firms to find the determinants and implications of corporate cash holdings. Through time-series and cross-section tests, they found that firms with strong growth opportunities and riskier cash flows hold relatively high ratios of cash to total non-cash assets. Firms that have the greatest access to the capital markets tend to hold lower ratios of cash to total non-cash assets. Opler et al.(1999) also found that firms that do well tend to accumulate more cash.

Ferreira and Vilela (2004) investigated the determinants of corporate cash holdings using a sample of 400 firms in 12 Economic and Monetary Union (EMU) countries for the period of 1987-2000. Their results suggest that cash holdings are positively affected by the investment opportunity set and cash flows and negatively affected by asset's liquidity, leverage and size. Bank debt and cash holdings are negatively related, which supports that a close relationship with banks allows firm to hold less cash for precautionary reasons. In addition, firms in countries with superior investor protection and concentrated ownership hold less cash, supporting the role of managerial discretion agency costs in explaining cash levels. Ferreira and Vilela also found that capital markets development has a negative impact on cash levels, contrary to the agency view.

Nguyen (2005) investigated the hypothesis that cash balances have a precautionary motive and serve to mitigate the volatility of operating earnings. He collected a sample of 9,168 firm-year observations from Tokyo Stock Exchange for the period of 1992 to 2003. Through regression analysis, Nguyen found that cash holdings are positively associated with firm level risk, but negatively related to industrial risk. He also found that cash holding decreases with the firm's size and debt ratio, and increases with its profitability, growth prospects, and dividend payout ratio.

In New Zealand, Hofmann (2006) examined the determinants of corporate cash holdings of non-financial firms. His findings suggest that the main determinants of corporate cash holdings in New Zealand firms' growth opportunities, the variability of its cash flows, leverage, dividend payments, and the availability of liquid asset substitute. While growth opportunities and the variability of

cash flows are positively related to cash holdings, large dividend payments and liquid asset substitutes indicate lower cash holdings.

Saddour (2006) used regression analysis to investigate the determinants of the cash holdings by collecting data from 297 French firms over a period of (1998-2002) based on the trade-off theory and the Pecking Order Theory. He found that French firms increase their cash level when their activities are risky and the levels of their cash flow are high, and reduce it when they are highly leveraged. Growing companies hold higher cash levels than mature companies. For growing companies, there is a negative relationship between cash and the following firm's characteristics: size, level of liquid assets and short term debt. The cash level of mature companies increase with their size, their investment level, and the payout to their shareholders in the form of dividends or stock repurchases, and decreases with their trade credit and their expenses on research and development.

Afza and Adnan (2007) focused on determining the level of corporate cash holdings of non-financial Pakistani firms, across different firm sizes and different industries. They used dataset for a period of 1998 to 2005 for the firm size, growth opportunities, cash flow, net working capital, leverage, cash flow uncertainty, and dividend payments. They found negative relationships between market-to-book ratio, net working capital, leverage, dividends and cash holdings and positive relationships between firm size, cash flow, and cash holdings. Their findings show that firm size, cash flow, cash flow uncertainty, net working capital, and leverage significantly affect the cash holdings of non-financial firms in Pakistan.

Drobetz and Grüninger (2007) investigated the determinants of cash holdings for a comprehensive sample of 156 Swiss non-financial firms between 1995 and 2004. Through regression analysis, they found that, asset tangibility and firm size are both negatively related to corporate cash holdings. Dividend payments and operating cash flows are positively related to cash reserves. In addition, Drobetz and Grüninger found a positive relationship between i) CEO duality and corporate cash holdings, and ii) a non-significant relationship between board size and corporate cash holdings. That is, CEO duality leads to significantly higher cash holdings and larger board size has no impact on the corporate cash holdings.

Hardin III *et al.* (2009) used a sample of 1,114 firm-year observations for 194 equity real estate investment trusts (REITs) from USA over 1998 to 2006 period. Through Ordinary Least Square regression analysis, they found that REIT cash holdings are inversely related to funds from operations, leverage and internal advisement, and are directly related to the cost of external finance and growth opportunities. Cash holdings are also negatively associated with credit line access and use. The results imply that REIT managers prefer to hold little cash to reduce the agency problems of cash flow thereby increasing transparency and reducing the future cost of external capital.

Isshaq, Bokpin and Onumah, (2009) examine the interaction between corporate governance, ownership structure, cash holdings, and firm value on the Ghana Stock Exchange. Board size is found to be positively and statistically significantly related to share price among the corporate governance variables. However, a significant relationship between inside ownership and share price is not found. The results also indicate that additional units of cash holdings do not have a statistically significant influence on share price. Finally, leverage and income volatility are found to be significant determinants of share price.

Megginson and Wei (2010) studied the determinants of cash holdings and the value of cash in China's share-issue privatized firms from 1993 to 2007. Through regression analysis, they found that smaller, more profitable and high growth firms hold more cash. Debt and net working capital are negatively related to cash holdings, while cash holdings decline as state ownership increases.

Chen and Mahajan (2010) investigated corporate liquidity (cash holdings) in 15 European Union (EU) countries and 31 non-EU countries from 1994 to 2004. Their findings are three-fold. First, the introduction of the euro and the establishment of the Economic and Monetary Union(EMU) have reduced corporate liquidity in EU. Second, cash and debt are more substitutable in EU than non-EU countries in the transition to the monetary union. Lastly, corporate governance variables such as closely held shares, anti-director rights and creditor rights are important determinants of corporate liquidity and should be ignored in international corporate liquidity studies.

Kim *et al.* (2011) examined a panel data set obtained from 125 publicly traded US restaurant firms between 1997 and 2008 and found that restaurant firms with greater investment opportunities tend to hold more cash. At the same time, large restaurant firms, firms holding liquid assets other than cash, firms with higher capital expenditures, and firms paying dividends were shown to hold less cash. Kim *et al.* describe that both precautionary and transaction motives play important roles in explaining the determinants of cash holdings for restaurant firms.

Rizwan and Javed (2011) collected data from 300 Pakistani firms listed on Karachi Stock Exchange (KSE) over the period 1998 to 2007. Authors found that the cash holding of Pakistani firms increases with increase in cash flow and market-to-book ratio. They also found that net working capital and leverage are negatively related with corporate cash holdings of the Pakistani firms.

In summary, the literature review indicates that market-to-book ratio, cash flow to net asset ratio, net working capital to asset ratio, leverage, firm size, Return on Assets and investment determine corporate cash holdings as shown in the table below.

SUMMARY OF EMPIRICAL STUDIES BASED ON YEAR AND COUNTRIES

AUTHOR	YEAR	COUNTRIES	FINDINGS
Nadiri M. I	1969	USA	Determinants of real cash balance are output, interest rate and change in general price level.
Campbell T. and Brendell L.	1977	USA	Compensating balance requirement has no impact on cash holding.
Opler T., Pinkowitz L., Stulz R., and Williamson R.	1999	USA	The firms with strong growth opportunities and rising cash flow hold relative high cash to total asset (net of cash ratio and greater access to the capital market leads to lower ratio)
Hardin III W.G., Highfeild M.J., Hill M.D. and Kelly G.W.	2009	USA	Cash holdings are inversely related to funds from operations, leverage and internal advisement, and are directly related to the cost of external finance and growth opportunities. Cash holdings are also negatively associated with credit line access and use.
Kim, J., Kim, H. and Woods, D.	2011	USA	Firms with greater investment opportunities tend to hold more cash while firms holding liquid assets other than cash, higher capital expenditures and higher dividend pay-out hold less cash. Precautionary and transaction motives were found to be playing important roles in explaining the determinants of cash holdings for restaurant firms.
Ferreira, M.A., and Vilela, A.S.	2004	Economic and Monetary Union(EMU)	Cash holding has positive relationship with growth opportunities and cash flow and negatively related to liquidity, leverage, size, bank debt and capital market development.
Chen N. and Mahajan A.	2010	EMU	The introduction of the euro and the establishment of the Economic and Monetary Union(EMU) have reduced corporate liquidity in EU. Cash and debt are more substitutable in EU than non-EU countries in the transition to the monetary union. Corporate governance variables such as closely held shares, anti-director rights and creditor rights are important determinants of corporate liquidity and should be ignored in international corporate liquidity studies.

SUMMARY OF EMPIRICAL STUDIES BASED ON YEAR AND COUNTRIES

Nguyen P.	2005	Tokyo	Cash holding is positively associated with firm level but negatively related to industrial risk. Also, he found that cash holding decreases with firm size and debt ratio and increases with its profitability growth, prospect and dividend payout ratio.
Hofmann C.	2006	New Zealand	Determinants of corporate cash holdings in New Zealand are firms' growth opportunities, the variability of its cash flows, leverage, dividend payments, and the availability of liquid asset substitute. The growth opportunities and cash variability are positively related to cash holding while others are negatively related to cash holding
Saddour K.	2006	France	Cash holding level increases with riskier activities and growth opportunities but inversely related to leverage. For growing companies, there is a negative relationship between cash and size, level of liquid assets and short term debt while cash level of mature companies increase with their size, investment level and dividend payout to shareholders and decreases with their trade credit and their expenses on research and development.
Afza T. and Adnan S.M.	2007	Pakistan	Cash holding and Market-to-book ratio, net working capital, leverage, dividends are negatively related and positively related to firm size, cash flow, and cash holdings.
Rizwan M.F. and Javed T.	2011	Pakistan	Cash holding of Pakistani firms increases with increase in cash flow and market-to-book ratio but net working capital and leverage are negatively related with corporate cash holdings
Drobetz W. and Grüninger M.C.	2007	Switzerland	Asset tangibility and firm size are both negatively related to corporate cash holdings while dividend payments, operating cash flows and CEO duality are positively related to cash reserves
Isshaq Z.,and Bokpin G.A.,	2009	Ghana	There is no statistically significant influence of cash holding on share price while leverage and income volatility are found to be significant determinants of share price.
Megginson W.L. and Wei Z.	2010	China	Size, profitability and growth opportunities and state of ownership have positive influence on cash holding while debt and net working capital are negatively related to cash holding.

3. METHODOLOGY AND MODEL SPECIFICATION

The study applies co-relational and non-experimental research design. This study covers non-financial quoted companies in Nigeria. Sample of 54 companies was purposively selected. The sample of firms cut across fifteen (15) out of thirty-one (31) sectors of the Nigerian Stock Exchange classification. They are Automobile and Tyre, Breweries, Building Materials, Chemical and Paints, Computer and Office Equipment, Conglomerates, Construction, Food Beverages and Tobacco, Healthcare, Industrial/Domestic Products, Machinery, Packaging, Petroleum, Printing and Publishing, and Real Estate. The rationale for the exclusion of financial related quoted companies is due to the fact that their cash holding policies are exogenously determined by Central Bank of Nigeria. Also excluded were non-quoted companies because of non-disclosure of their financial reports and newly quoted companies that will result in missing data for the period being studied. Data for this study were obtained from the annual financial reports over a period of 1995 to 2009 from Nigerian Stock Exchange fact book and the headquarters of the sampled companies majorly in Lagos, Nigeria. Data collected were analyzed using Statistical Package for Statistical Scientists (SPSS 17.0). The model specification is built on the variables that are consistent with previous studies. The model and measurements of the independent and dependent variables are as follows:

$$CASH^*_{it} = \beta_0 + \beta_1 MTB_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 CF_{i,t} + \beta_4 NWC_{i,t} + \beta_5 LEV_{i,t} + \beta_6 ROA_{i,t} + \beta_7 INV_{i,t} + \varepsilon_{it}$$

Where,

CASH=Corporate cash holdings for firm i in time t. It is quotients of cash and cash equivalents to book value of assets less Cash and equivalents.

MTB = Market-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

SIZE = taken as a proxy for the real size (SIZE) of firms. It is calculated as the natural logarithm of sales.

CF = Cash flow magnitude is measured by Cash flow to net assets ratio where cash flow is taken as ratio of pre-tax profits plus depreciation to total assets less cash and equivalents

NWC = Net working capital-to-assets ratio of net current assets less cash and cash equivalents to total assets less cash and equivalents.

Leverage (LEV) is measured as ratio of total debts to net Total assets

Return on Asset (ROA) is measured as ratio of operating profit to net total asset

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

β_0 is the intercept

$\beta_1 - \beta_7$ are the independent variable coefficients

ε_{it} is the error term

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Descriptive Statistics

The descriptive statistics of the variables used in analysis are reported in Table 1. Descriptive statistics show the mean, median, minimum, maximum and standard deviation of the variables and provide a general overview of the characteristics of the data. Moreover, the relatively 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 negatively skewed and leptokurtic (peaked) relative to the normal, except for growth opportunities (MTB) and firm size (SIZE). The mean of cash holding of all firms analyzed is 0. 07180, with the variation of individual data set varying from the mean of 1.476767. The distribution of cash also shows that it is negatively skewed. The independent variables denoted by MTB, SIZE, CF, NWC, LEV, ROA and INV have means value of -4.75672, 15.666, 0.9844, 0.01082, 0.1874, 0.63199 and 1.5976, respectively.

4.2. Correlation Analysis

Correlation explains how two variables react to each other e.g. what change will occur in one variable with the change in other variable. A correlation analysis was conducted to determine these relationships between the variables using Pearson Product-Moment correlation coefficient at the significance level of $p<.01$ and $p<0.05$. A "correlation coefficient" is a value that indicates whether there is a linear relationship between two variables. The absolute value of the correlation coefficient will be in the range 0 to 1.

The result in table 2 below shows positive and significant relationship between cash holding and CF, ROA and INV and negative but significant relationship with NWC. There is positive and significant relationship between CASH and CF (r=.639) at 1% significant level. The result supports that there is a strong relationship between cash flow and cash. The higher the cash flow from operation, the higher the cash holding of the firms. The theoretical proposition on the relationship between ROA and INV was upheld as these variables also show positive and significant relationship with the cash holding thus r=.176 and r=.264 at 1% significant level respectively. The analysis further shows that there is a negative and significant relationship between CASH and NWC (r=-212) at 1% significant level.

4.3. Regression

As part of diagnostic test, the multi-colinearity test was conducted. The co-linearity statistics is to ensure that there was no violation of the assumption underlying the use of regression analysis as regards the existence of multi-collinearity among the independent variables. The Tolerance statistic was high ranging between 0.832 and 0.969 which are well above 0.5 the acceptable standard and the Variance Inflation Factor (VIF) took value from 1.032 to 1.202, the values are lower than 2. This is within the acceptable range, hence it indicates that there were no multi-collinearity problems among the independent variables in the data

Another diagnostic test carried out to find out the auto-correlation in the residuals was Durbin-Watson. The value 1.961 implying that in this model that there exists no auto-correlation in the residual. Multiple regression analysis helps us to understand how much on the variance in the dependent variable is explained by a set of predictors. Therefore, the regression analysis was conducted to determine the contribution of the independent variables to the variance in the

dependent variable. The R square value indicated that 50.1% of the variance in cash was explained by the contributions of independent variables (refer to table 3). The value of F test explains the overall significance of a model. It explains the significance of the relationship between dependent variables and all the other independent variables. The F-statistic is also significant at F= 97.28 p<0.000)

The value of beta explains the change in the dependent variable with the per unit change in independent variable. It also explains the nature and strength of the relationship between dependent variable and independent variable.Using OLS regression the β value of cash flow gives the highest value of .616 and leverage with lowest value of 0.053. Therefore as shown in table 3 below, there is a significant positive impact of CF, LEV, ROA and INV and negative impact of NWC on the CASH except for the MTB and SIZE that have insignificant positive impact on CASH. The analysis of variance (ANOVA) tests are also significant at 0.000.

5. DISCUSSION

The result showing a positive relationship between cash and cash flow is in line with the findings of Ferreira and Vilela (2004), Afza and Adnan (2007) and Alam *et al.* (2011). This indicates that firms with large cash flows will keep higher cash levels.

The finding of a positive relationship between cash holding and leverage is in accordance with agency theory that highly leveraged firms find it difficult and expensive to raise additional funds nor renegotiate existing debts hence, hold larger cash and induce a positive relationship. This is in variance with the findings of Ferreira and Vilela (2004) that cash and leverage are negatively related.

The trade-off theory predicts a negative relationship between return on assets and cash holdings (Kim et al., 1998; Ozkan and Ozkan, 2002 and Bates et al. 2009). The pecking order theory, on the other hand, predicts the opposite (Almeida et al. 2004). The finding of the paper supports the pecking order theory of positive relationship between ROA and cash holding.

Afza and Adnan (2007), Megginson and Wei (2010) and Alam *et al.* (2011) who found a negative relationships between net working capital and cash holdings. The position supported by this findings.

Growth opportunities represented by MTB and firm SIZE are insignificant as cash holding determinants in Nigeria. This is contrary to Nguyen (2005), Saddour (2006) and Afza and Adnan (2007) findings that MTB and SIZE were significant in determining corporate cash holding.

6. CONCLUSION

For the past half century, the topic on cash holding has attracted intense debate in the financial management arena. The basic question always raised is; Why do firms hold cash? what factors determine a firm's optimal cash holding? While, most of the literature seeks the nature of relations between the cash holding and the firm's specific characteristics in both Developed Economies and Developing Countries, Nigerian economy is the focus of this paper.

In conclusion, the results are almost consistent with previous study except for the findings of insignificant relation between growth opportunities and size and cash holding in Nigeria which

contradict the previous findings in other countries. Thus, the present findings represent unique characteristics of Nigerian firms' cash holding.

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Appendix

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
CASH	693	-37.044	4.044	.07180	1.476767	-23.072	579.471
MTB	692	-641.840	1.250	-4.75672	44.591977	-8.878	89.627
SIZE	689	9.578	23.197	15.66632	2.575679	.392	-.396
CF	693	-45.538	42.307	.09844	2.852608	-1.103	186.296
NWC	693	-37.792	9.516	.01082	1.752481	-15.286	323.813
LEV	693	-39.558	5.931	.18738	1.556208	-24.007	617.621
ROA	693	-30.324	397.690	.63199	15.175752	25.940	680.103
INV	692	-196.764	461.394	1.59760	26.915187	13.339	219.806

Table 2: Correlations

		CASH	MTB	SIZE	CF	NWC	LEV	ROA	INV
CASH	Pearson Correlation	1	-.002	-.007	.639**	-.212**	.048	.176**	.264**
	Sig. (2-tailed)		.965	.859	.000	.000	.211	.000	.000
MTB	Pearson Correlation	-.002	1	.214**	-.066	-.009	.028	.004	.007
	Sig. (2-tailed)	.965		.000	.085	.814	.457	.908	.852
SIZE	Pearson Correlation	-.007	.214**	1	-.021	.008	-.032	-.031	-.056
	Sig. (2-tailed)	.859	.000		.578	.834	.409	.417	.140
CF	Pearson Correlation	.639**	-.066	-.021	1	-.043	.326**	.091*	.146**
	Sig. (2-tailed)	.000	.085	.578		.258	.000	.016	.000
NWC	Pearson Correlation	-.212**	-.009	.008	-.043	1	.233**	-.088*	-.079*
	Sig. (2-tailed)	.000	.814	.834	.258		.000	.021	.038
LEV	Pearson Correlation	.048	.028	-.032	.326**	.233**	1	.074	-.063
	Sig. (2-tailed)	.211	.457	.409	.000	.000		.050	.096
ROA	Pearson Correlation	.176**	.004	-.031	.091*	-.088*	.074	1	.015
	Sig. (2-tailed)	.000	.908	.417	.016	.021	.050		.690
INV	Pearson Correlation	.264**	.007	-.056	.146**	-.079*	-.063	.015	1
	Sig. (2-tailed)	.000	.852	.140	.000	.038	.096	.690	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3: The Effect of Firm Characteristics on the Cash Holding Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-.106	.257		-.414	.679		
	MTB	.001	.001	.033	1.177	.240	.948	1.055
	SIZE	.004	.016	.008	.278	.781	.949	1.053
	CF	.337	.015	.616	22.058	.000	.944	1.060
	NWC	-.110	.024	-.127	-4.611	.000	.969	1.032
	LEV	.211	.110	.053	1.927	.054	.988	1.012
	ROA	.010	.003	.107	3.914	.000	.978	1.022
	INV	.008	.002	.145	5.257	.000	.962	1.039

a. Dependent Variable: CASH

Model Summary[b]

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R^2	F Change	df1	df2	Sig. F Change	
1	.708[a]	.501	.496	1.053632	.501	97.280	7	677	.000	1.961

a. Predictors: (Constant), INV, MTB, ROA, LEV, NWC, SIZE, CF

b. Dependent Variable: CASH

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	755.958	7	107.994	97.280	.000[a]
	Residual	751.565	677	1.110		
	Total	1507.524	684			

a. Predictors: (Constant), INV, MTB, STO, NWC, SIZE, ROA, CF, LEV

b. Dependent Variable: CASH