Atoko Kasongo

Centre for Science Technology and Innovation Indicators, Human Science Research Council 118 Buitengracht, Cape Town Email: akasongo@hsrc.ac.za

Abstract

Cash holding is one of the most significant components of a firm's current assets. The benefit of holding cash revolves around choosing the optimal timing of investment and avoiding under-price issues. This paper investigates the determinants of corporate cash holding of 80 non-financial firms in South Africa between 2007 and 2017. The Arellano-Bover/Blundell-Bond generalized method of moments (GMM) estimates indicate that leverage, firms growth opportunity, business confidence, economic growth and political stability have a negative effect on cash holdings, whereas debt maturity and cashflow exerts a positive influence. Other factors such as firm size, dividends payments, inflation rate and financial crises have an insignificant impact on company cash holdings.

Keywords: Cash holding; Growth opportunities; Firm size; Leverage; Business confidence.

1. Introduction and background

Corporate cash holding is deemed to be an important component of a firm's current assets. Cash holding in a firm measures the corporation's ability to pay current obligations on time. In each period, firms must choose an optimal level of cash holding that maximises investment decisions and reduces chances of under-price issues. Under the assumption of perfect markets, the value of a firm is independent of the choice of financing. Hence, firms do not have to hold cash because external financing is available at a fair price on the market (Modigliani and Miller, 1958). Under imperfect markets, however, there is usually a finance premium firms have to pay to finance their production through the market. The incentive to hold cash increases as transaction costs and the cost of external finance rises or is unavailable (Opler, Pinkowitz, Stulz, and Williamson, 1999).

The determinants of cash holding have been an area of debate in the academic literature in recent years. Chireka and Fakoya (2017) posit that South African companies tend to hold excess cash for reasons that are external to the firm. These reasons include political instability, planned offshore investments, and labour unrests in some sectors such as the mining sector. Other reasons include anticipated peak selling season, lower interest rates at local banks, and increased capital needed to fund expansion plans into the rest of Africa.

Subsequently, the total cash held by non-financial companies grew by 17.4 percent between 2007 and 2017, with the largest increase occurring within the last five years. In 2017, the top 100 non-financial firms held R765 billion worth of cash, up from R154 billion 10 years earlier (Tambo and Theobald, 2017). Besides, cash holding as a percentage of total assets varied between 6.4 percent and 10.2 percent. These high levels of cash holding have therefore, spurred the debate on whether South African firms are hoarding levels of cash that can be used for investment.

Furthermore, the South African economy is projected to grow by less than 1 percent, which is below the 5 percent target set in the National Development Plan (NDP) (SARB, 2017). In addition to the low growth rate, South African companies have been said to be on an investment strike by hoarding cash instead of investing to promote economic growth (Tambo and Theobald, 2017). Thus, understanding the determinants of cash holding is imperative to boosting economic growth, through the release of fund by investment.

Chireka and Fakoya in their 2017 analysis of cash holding in South Africa's retail firm used a partial analysis of the adjustment process of cash holding and

did not account for endogeneity even though cash holding is correlated over time. This paper extends on their work and accounts endogeneity by applying the generalised method of moments (GMM) estimation.

Finally, firm-specific determinants of cash holding have been extensively explored in the literature (see Chireka and Fakoya, 2017). However, macroeconomic and political determinants are yet to be explored, especially in South Africa. Hence, our study contributes to cash holdings literature by focusing on how South Africa's non-financial firms manage cash holding in response to macroeconomic conditions from an emerging market perspective

Thus, this study extends the literature on the empirical determinants of cash holdings by studying the contemporaneous effect of macro variables on corporate cash holdings and improve Chireka and Fakoya (2017) that only considers firm-specific variables. The study demonstrates that macroeconomic and political variables impact the adjustment speed of cash to target levels. Lastly, the study improves the methodological approach and controls for endogeneity by using Arellano-Bover/Blundell-Bond model.

The rest of the paper is structured as follows: Section 2 outlines the theoretical and empirical literature review. Then Section 3 outlines the research methodology and Section 4 discusses the results. Lastly, Section 5 concludes.

2. Literature review

2.1. Theoretical literature

Theories of cash holding

There are three predominant theories on cash holding, namely the tradeoff theory, the pecking order theory, and the agency cost theory.

The trade-off theory is one of the earliest theories espoused by Tobin (1956), and Miller and Orr (1966). The theory states that firms set their optimal cash levels by comparing marginal benefits against marginal costs of holding cash. As such, cash holding decisions are made with the view of maximising benefits. The model asserts that the major advantage of holding cash for firms is that it serves as a safety cushion against rising costs of external funds (or the cost of liquidating existing assets) to finance their growth opportunities.

In 1961, Donaldson developed the financial hierarchy (or pecking order) model, which was then extended by Myers and Majluf (1984). The theory asserts that a firm's investment decision should aim to minimise cost. Thus, the

financial hierarchy theory states that firms should finance investment first with retained earnings, then with safe debt and risky debt, and finally, with equity (Myers and Majluf, 1984). In essence, the theory explains that firms do not aim to accumulate cash, but cash is used as a buffer between retained earnings and investment needs. Therefore, the motive for holding cash is to avoid external financing costs. The financial hierarchy model differs from the Trade-off theory in that the latter focuses on maximising benefits as opposed to minimising costs.

Jensen (1986) advanced the agency cost theory. The theory focuses on the relationship between investors (who delegate authority) and the managers (agents) who have to perform the duties delegated to them. Jensen (1986) asserts that managers have an incentive to build up cash to increase the number of assets under their control and to gain discretionary power over the firm investment decisions. The availability of cash, therefore, permits management to make investments that financial markets would not be willing to finance.

Motives for holding cash

Firms usually hold cash for transaction, precautionary, speculative or tax motives. The first is the transaction motive whch emphasizes that the main advantage of holding cash is that the firm can lower transaction costs by using its cash to make payments thereby avoiding the need to liquidate assets (Miller and Orr, 1966). Consequently, firms hold more cash when they are likely to incur higher transactions costs to convert non-cash assets to cash equivalents. On the other hand, firms tend to hold a lower amount of cash when the opportunity costs of cash retention are greater (Baumol, 1952).

With regard to the precautionary motive, Keynes (1936) explained that firms hold cash as a shield against future cash shortfalls and finance their positive Net Present Value (NPV) investments. Along the same line of thought, Kim, Mauer, and Sherman, (1998) modelled the optimal level of cash holding using a trade-off between the low return on liquid assets and the benefits of minimising the firm's reliance on costly external financing.

The speculative motive of holding money designates that firms may keep cash in order not to face cash deficient when alternative investment opportunities arise. Jones and Ostroy (1984) argued that money offers flexibility to its holders, which other assets cannot provide. The tax motive is an additional motive that applies to multinationals or companies with foreign earnings. Daher (2010) discussed that multinationals might face negative tax consequences associated with the repatriation of foreign earnings. Repatriation of earnings from affiliates operating in lower-tax countries means relatively higher tax expenses, and as a result, such affiliates hold higher cash balances, than other affiliates.

Models on the optimal level of cash holding

The Baumol-Tobin model was developed by William Baumol (1952) and James Tobin (1956). The model asserts that there is a trade-off between the opportunity cost of holding cash and the trading cost associated with buying and selling of securities. The opportunity cost of holding liquid assets is the foregone interest rate that could have been earned in securities. As such, there is an inverse relationship between the interest rate and the optimal level of cash holding. This inverse correlation is because the interest rate makes cash holding less attractive, in the presence of more profitable investments. This model is the basis of the model adopted in the methodology.

Another model that is closely related to the Baumol-Tobin is the Miller-Orr model. The Miller-Orr model of 1966 assumes that cash balances fluctuate unevenly over time such that the average cash balance, the optimal cash balance and replenishment may not occur at set dates. This assumption is because revisions of the cash balance are done according to certain upper or lower bounds, for example, when cash holdings are excessive or very small.

The Orgler (1969) model asserts optimal cash management can be determined using multiple linear programming. The construction of the model comprises three sections:

- (1) selection of the appropriate planning horizon,
- (2) selection of the appropriate decision variables
- (3) formulation of the cash management strategy.

The advantage of the model's linear programming is that it enables the coordination of optimal cash management with other operations of the firm, such as production. It also has minimal restriction on capital balances.

2.2. Empirical literature

Kim, Mauer and Sherman (1998) analysed a sample of 452 US firms over the period 1975 to 1994 using a panel regression method. The authors document that cash holdings increased with higher market-to-book ratios and cash flow volatility. Their results also reveal that cash holdings decrease with firm size, leverage, the length of the cash conversion cycle, and the probability of financial distress. Finally, they reported a significant relationship between measures of

future economic conditions and liquidity, implying that firms accumulate cash to be able to maximise on future investment opportunities.

Opler, Pinkowitz, Stulz, and Williamson (1999) examined the determinants and implications of holding cash among the U.S. publicly traded companies. The authors estimated a static trade-off model of cash holding and found that firms with strong growth opportunities and risky cash flow hold relatively higher cash. Also, the results show that easy access to capital markets and good credit ratings are inversely correlated with cash holding. Ozkan and Ozkan (2004) found similar results for the UK using the Generalised Method of Movement (GMM) with panel data. Their focus was on the role of managerial ownership and other governance characteristics. Ozkan and Ozkan (2004) also reported a significant monotonic relation between managerial ownership and cash holding.

In 2004, Ferreira and Vilela used a sample of 400 firms from 12 Economic and Monetary Union (EMU) countries for the period of 1987-2000 to investigate the determinants of corporate cash holdings using fixed and random effect regression method. Their results suggest that cash holdings are positively correlated to investment opportunities and cash flows, but negatively related to asset's liquidity, leverage and size. They also reported an inverse relationship between bank debt and cash holdings, which supports the assertion that a stronger relationship between banks and firms allows the latter to hold less cash for precautionary purposes. Also, firms in countries with superior investor protection and concentrated ownership hold less cash, supporting the role of managerial discretion agency costs in the determination of cash firms hold. However, Ferreira and Vilela (2004) found that capital markets development has a negative impact on cash levels, which is a departure from the agency theory.

Drobtz and Gruninger (2006) studied the determinants of cash holding for a sample of non-financial Swiss non-financial firms between 1995 and 2004. Using random and fixed effect regression, the authors determine that firm size and asset tangibility have a negative influence on cash holding, while leverage has a non-linear negative relationship. Furthermore, dividend payment and cash flows are positively related to cash holding, while the availability of growth opportunities is insignificant.

In the German market, Ali and Yousaf (2013) used pooled-OLS regression method to investigate the determinants of cash holding among non-financial firms across different sizes and industries for the period 2000-2010. Their findings show that firm size, leverage, working capital and liquidity are significant in determinants of cash holding. The results are consistent with the predictions of the trade-off, pecking order, and agency cost theories. As for the empirical strategy, the results favour a random fixed effects regression.

The discussion of cash holding was extended to India by Bhole and Mahakud (2005) who investigated the trends and determinants of private corporate savings using panel data,pertaining to 330 public limited companies for the period 1966/67 to 2000/01. The authors divide their panel into three periods: 1987/8 to 1999/2000, 1987/8 to 1991/2 and 1995/6 to 1999/2000 and present results from these three samples. Their GMM estimates show that profit after tax, investment opportunities, availability of external funds, cost of borrowings, and cost of equity were the major determinants of corporate savings in India. They also found that the retention ratio of companies was positively related with profit after tax ratio, level of investment, cost of borrowing, and the growth rate of the firm, but negatively related to external sources of funds, corporate tax rate, and cost of equity.

Although Bhole and Mahakud (2005) presented evidence from the three subperiods, they did not report results for the whole period, which would have helped provide a holistic view.

In a search of the factors influencing cash holding in Nigeria, Ogundipe, Ogundipe and Ajao (2012) applied GMM technique on data from non-financial firms listed on the Nigerian Stock Exchange. The results show a significant inverse relationship between cash flows and firm size, working capital and return on asset. More so, they found a significant comovement between cash holding and growth opportunities, leverage, account receivables, inventories and financial distress. Interestingly, their results indicate that firms struggle to instantaneously adjust their cash holding to targeted levels due to high costs. Lastly, the study finds no significant relationship between cash flow and cash holding, which is contradictory from the prediction of the trade-off and pecking order theories.

In cross country research, Al-Najjar (2013) used an instrumental-variable approach in a dynamic panel regression model to identify the determinants of corporate cash holding in developing countries. They focused on companies operating in emerging markets namely Brazil, Russia, India, and China (BRIC) as the treated sample and compared with companies operating in the US and the UK, which they use as a control sample. The data consisted of non-financial firms during the period 2002-2008 and sourced from DataStream. The use of

dynamic panel regression allows the author to account for adjustments after a shock. The results show a positive relationship between cash holding and profitability or firm size. On the other hand, leverage, debt payment, dividend payment, and liquidity are inversely related to cash holding.

In contrast to Al-Najjar (2013), Horiaka and Terada-Hagiwara (2014) applied GMM to firm-level data of 11 developing countries in Asia between 2002 and 2011. Their main focus was the role of cash flow as a determinant of cash holding. The results indicate that cash flow is sensitive to changes in cash holding during 2008 Global Financial Crisis. Other results show that the Tobin's q and cash flow has a significant positive impact on cash holding. However, their research seems limited as the authors do not control any measure of uncertainty, such as the serial correlation and variance of income.

In southern Africa, Mugumisi and Mawanza (2014) investigated the determinants of cash holding in 29 non-financial corporate firms in Zimbabwe from 2009 to 2012. The authors employed a random effect panel method and reported a positive relationship between dividends, return on assets, cash flow to assets ratio and firm cash holding. In addition growth in sales, debt maturity structure, capital expenditure and net working capital have a significant negative impact on firm corporate cash holding. Kariuki, Namusonge and Orwa (2015) echoed similar results, but for Kenyan manufacturing firms. However, they found a positive relationship between cash flow variability and cash holding.

On the other hand, Chireka and Fakoya (2017) examine the determinants of cash holding in South Africa from selected retail firms. The authors reported results from three estimation techniques: pooled-OLS, random effects and fixed effects. Their data is of 17 retail firms listed on the JSE sourced from INET BFA database for the period 2000-2015.

The results indicate that dividend payments and cash flow volatility positively influence retail cash holdings, whereas liquid asset substitutes and capital expenditure exert a negative influence. On the other hand, firm size, leverage, investment opportunities and cash flows have an insignificant impact on the cash holdings. The tests for the most appropriate approach favours fixed effects over random effects or pooled-OLS. Because the study focuses on the retail industry only, their findings cannot be generalised to other sectors with companies listed on the JSE. Also, they exclude retail companies whose data was missing in some years. While this exclusion ensures the panel is balanced, leaving out companies with missing observations gives rise to survivorship bias.

3. Methodology

Using the Baumol-Tobin model, determinants of cash holding were identified as the transaction cost, the total amount of funds needed, and the interest. These three variables do not provide sufficient information in determining cash holding. Therefore, based on the theories of Trade-off, Pecking order and Agency cost, as well as the motive of holding cash, more variables, has been added to the model to provide a more comprehensive and in-depth analysis of cash holding. This addition is done following several other empirical studies such as Chireka and Fakoya (2017), Mugunisi and Mawanza (2014), Ogundipe *et al.* (2012), and, Opler *et al.* (1999) among many more. This paper goes a step further to include external factors of macroeconomic and political factors to control for political and economic climate.

The model is specified as:

 $\begin{array}{l} _{i,t} = \beta_1 + \beta_2 \, growth + \beta_3 size + \beta_4 cashflow + \beta_5 leverage + \beta_6 dividen \\ \qquad + \beta_7 debt + \beta_8 BCI + \beta_9 INF + \beta_{10} EC + \beta_{11} PS + \beta_{12} fincris + \end{array}$

Where;

CH = cash holding, Growth = Firms growth opportunities, Size = Firm Size, Cashflow = Firms available cash flow, leverage = Firms ability to issue debt, Dividends = Dividend payout, Debt = Debt maturity structure, BCI = Business confidence index, INF = Inflation rate EC = Economic growth PS = Political stability Fincris = 2008 Global Financial crisis dummy.

We discuss their aprior expectations below:

Growth: Both the trade-off and pecking order theories predict a positive relationship between growth opportunities and cash holding. Because costly external financing raises the probability of a firm to pass on valuable investment opportunities, firms hold sufficient liquid assets, (e.g. in the form of cash). Holding cash enables a firm to take advantage of future profitable investment opportunities at minimum costs. Growth opportunities influence future investments and future capital requirements (Mugumisi and Mawanza, 2014).

Higher growth tends to result in more savings, thereby improving the ability to maximise future investment opportunities.

Firm size: The trade-off theory asserts that cash holdings and firm size have an inverse relationship. It stems from the fact that larger firms can earn profit from the economies of scale, more diversification, greater constant cash flows, and a lower possibility of financial distress (Titman and Wessels, 1988). Besides, larger firms have easier access to capital markets (Ferri and Jones, 1979), decrease the borrowing cost, and are not likely to go bankrupt (Ferreira and Vilela, 2004; Opler *et al.*, 1999). The Miller and Orr model assert that smaller firms may be encouraged to hold more money than larger firms because raising funds for investment is relatively expensive.

On the other hand, the pecking order theory predicts a positive relationship between the firm size and corporate cash holding because large companies usually do perform better as compared to small companies; and for that reason, they must have extra cash (Opler *et al.*, 1999). However, Ferreira and Vilela (2004) showed contradictory results that small companies facing more growth opportunities and higher business risk tend to hold extra cash because the cost of borrowing is very high for small firms.

Moreover, companies operating in large competitive industries hold more cash reserves, compared to other industries. On the other hand, the companies having large access to capital market raise funds from external investors. Given these contradictory results, this study does not have apriori expectation.

Cashflow: The pecking order theory suggests that firms prefer to finance internally rather than externally. Therefore, the higher the cash flow, the higher the retained amount of cash for internal financing. In contrast, the trade-off theory asserts that cash flow can be seen as a source of liquidity and acts as a substitute for cash holding. As such, the theory predicts a negative relation to cash holding. Ferreira and Vilela (2004) found a positive relationship between cash flows and cash holding. On the other hand, Ogundipe *et al.* (2012) find no significant association.

Leverage: According to the trade-off perspective, the variable leverage has somewhat an ambiguous relation to cash holding due to competing assumptions. Also, the theory assumes that firms with higher leverage also have a high risk of bankruptcy, because of the rigid nature amortisation plans by creditors. In a bid to avoid this kind of risk, highly levered firms are expected to hold larger amounts of cash. On the other hand, the extent to which a firm is financed by debt indicates a firm's ability to raise debt. Thus, firms with high leverage ratios are also expected to have better access to debt, and hence they would hold less cash, accordingly.

Dividend: Ozkhan and Ozkan (2004) noted that dividends can be viewed as negative equity to the extent that a firm can raise funds by cutting dividends. The companies paying a dividend are generally less risky and have greater access to the capital market. Therefore, the precautionary motive of cash holding is weak for dividend-paying companies (Afza and Adnan, 2007; Opler *et al.*, 1999). Hence the expectation is that dividend payments have a negative influence on cash holdings.

Debt: The term structure of debt also influences the level of cash holding because the use of more short-term debt forces the company to repay the debt on periodic basis. This in turn puts pressure on the firm to hold a higher amount of cash in case of repayment or insolvency (Guney *et al.*, 2007). Ferreira and Vilela (2004) also reported that companies operating in better investor protection hold a lower level of cash. Therefore, we can predict a negative effect of debt maturity on cash holdings of the firms.

BCI: The business confidence index is expected to have a negative impact on cash holding. The higher the business confidence, the more managers are confident of the returns on investment and the less cash will be held.

INF: Inflation erodes economic agents of their purchasing power. As such, during inflationary periods, firms require more money to purchase the same amount of raw materials. So firms use more of their working capital while they generate less money. Therefore, the expectation is that when inflation rate increases, firms have to hinge against increasing costs by exchanging their liquidity with real estate and gold, which values will increase as inflation rate increases. This in turn, leads to a decrease in firms cash holding (Friedman, 1977). On the other hand, a continuous increase in the inflation rate leads the government to regulate macroeconomics through monetary policies, including an increase in interest rate. An improvement in interest rate, as well as the control of credit scale in commercial banks, will encourage lending where banks will implement external financing constraints (Chen and Mahajan, 2010). In response, the firms will convert their assets into cash, thus increasing cash holding.

EC: Economic growth is hypothesised to be inversely related to cash holding. In other word a companies' cash holdings will decrease when the economy grows (Tambo, and Theobald, 2017). This is because firms will invest during periods of economic growth. However, during a recession, companies turn their assets into cash to absorb any negative earnings shocks.

PS: Political stability is expected to have a negative relationship with cash holding. A firm's management will delay investment spending during times of

political instability. Thus the reduction in investment spending will lead to an accumulation of cash holding.

Fincris: To account for the 2008 global financial crisis, a dummy variable is included in the model. The time frame spans from 2007 to 2017. Since there is only one year before the financial crisis, it is difficult to divide the time into the pre and post-crisis times. Therefore, a dummy variable (one during the crises and zero otherwise) is included to account for the financial crisis shock.

3.1. Data

The panel data is from SHARENET database available through their website, covers the period 2007-2017, and focus only on non-financial firms. Financial and insurance firms are excluded because they have legal obligations to maintain specific minimum cash reserves. Thus, including these financial or insurance firms may lead to misleading results.

The growth variable represents the firm's growth opportunities proxied by the yearly growth rate of sales. A firm size is measured by the natural log of its total assets. Cashflow is the ratio of the sum of cash and market securities to sales while leverage is a firms ability to issue debt represented by the ratio of total liabilities to total assets. Dividends represent the firms' ability to pay a dividend and is indicated by dummy variable that takes the values of one in years dividends were paid and zero otherwise. Debt represents a firm's debt structure, proxied by the ratio of current liabilities to total liabilities.

With regard to macroeconomic variables, the inflation rate is proxied by the yearly percentage change in consumer price index in local currency. Economic growth is measured by the yearly percentage change of gross domestic product (GDP). A financial crisis is a dummy variable for the 2008 Global Financial Crisis and takes the value of one for the period 2008-2009 and zero otherwise.

Political stability reflects the political status of a country for a given year. The data is sourced from the World Governance Index (WGI) compiled by the World Bank. The WGI compiles data for five categories, namely: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. The political stability and violence index measures the perception of the likelihood of political instability and/or politically motivated violence including terrorism. The index ranges between -2.5 and +2.5 points. When the score of a country on the related index is close to -2.5 it shows that it fails (i.e. political instability) whereas a more politically stable country will score to + 2.5.

Business Confidence Index (BCI) shows the confidence investors or firms have in the profitability of their investment. Data on BCI in South Africa can be obtained from the Bureau of Economic Research (BER) and the department of the South African Chamber of Commerce and Industry (SACCI). BER BCI is a composite of business respondents in the retail, wholesale, motor trade, manufacturing, building and construction sectors who are asked to rate the current business conditions as "satisfactory" or "unsatisfactory". The business confidence index is derived as the gross percentage of the respondents responding as "satisfactory". It varies between 0 and 100, where a value of 50 is indicative of neutral sentiments, 100 indicates maximum confidence and 0 indicates complete lack of confidence. The BER BCI reveals the perceptions of the respondents while the SACCI BER reflects what they are doing and experiencing. The paper uses the BER BCI because the index provides a better reflection on the feelings of investors. Because the data is published every quarter, the data has been transformed to yearly, by averaging across the four quarters.

4. Empirical results

The results indicate that on average South African firms hold 17 percent of total assets. The statistic is relatively higher than other middle-income countries such as Brazil at 2 percent, China at 3.5 and Russia at 5 percent (Al-Najjar, 2013). Furthermore, the growth opportunity, in yearly sales, is 38 percent greater than 27.6 percent Kariuki, *et al.* (2015) found for Kenyan manufacturing firms.

It is important to note that the variable of growth is derived from the growth in yearly sales, as such the standard deviation and the range is quite high, as firms' sales fluctuate from year to year due to varying economic conditions. The mean leverage ratio is 22 percent shows that firms do not rely on debt for financing. Chireka and Fakoya (2017) showed the mean leverage ratio for South Africa retail firms to be 28 percent.

The South African political sphere is predominantly recorded as unstable with a mean index of -0.06. The index is a reflection of the turbulent political uncertainty in South Africa. A host of problems ranging from the Xenophobic attacks, the resignation of President Jacob Zuma, the allegation of corruption and state capture inquire has further dimmed the light on a previously stable country. Business confidence has followed suit with investors losing confidence in the economic climate. The average business confidence scored is 43.5 percent which is below the neutral stance of 50 percent. The dwindling business confidence is compounded by the low ratings from rating agencies that put South Africa one notch above junk status.

Variable	Mean	Maximum	Minimum	Standard deviation
Cashholding	0.17	41.70	0	1.63
Growth	38.21	82.20	-9.99	15.23
Dividend	0.67	1	0	0.47
Cashflow	3.34	6.50	0.04	0.85
Leverage	0.22	1.1	0	0.44
Debtmaturity	0.68	1.52	0.0028	0.23
lsize	5.50	6.49	0	0.98
EC	2.09	5.36	-1.53	1.68
INF	6.24	11.54	4.26	1.89
PS	-0.06	-0.26	0.21	0.12
BCI	43.5	74.8	26	11.47

TABLE 1: DESCRIPTIVE STATISTICS RESULTS

Source: Authors own computation. Where: CH= cash holding; DV= dividends; GR= growth; LV= leverage; CF= cashflow; DM= debtmaturity; LS= frimsize; BC= business confidence; EC=economic growth; IN=inflation rate; PS= political stability; FC= financial crisis.

TABLE 2:	CORRELATION	MATRIX	RESULTS
----------	-------------	--------	---------

	СН	DV	GR	LV	CF	DM	LS	BC	EC	IN	PS	FC
СН	1											
DV	-0.05	1										
GR	0.03	-0.1	1									
LV	-0.09***	-0.05	-0.001	1								
CF	-0.02	-0.06	-0.001	0.02	1							
DM	0.11**	0.02	-0.002	-0.45**	0.04	1						
LS	0.04	0.07	-0.06	0.04	0.01	-0.09	1					
BC	0.12*	-0.06	0.02	0.11*	-0.01	0.04	0.04	1				
EC	0.08*	0.04	-0.08	0.06	0.03	0.62	0.84	-0.57	1			
IN	0.01	0.02	0.01	0.02	0.11	0.76	0.02	0.11	0.24	1		
PS	0.08	0.03	-0.01	0.08	0.21	0.04	0.4	0.73	0.45	0.39	1	
FC	0.09*	-0.02	0.03	0.08*	0.08*	0.05	0.05	0.55*	0.05*	0.54	0.34	1

Source: Authors own computation.

Note: Sig. level *** = 1%, ** = 5% and * = 10%. Where: CH= cash holding; DV= dividends; GR= growth; LV= leverage; CF= cashflow; DM= debtmaturity; LS= frimsize; BC= business confidence; EC=economic growth; IN=inflation rate; PS= political stability; FC= financial crisis.

Table 2 shows the association between the key variables. In the table, the correlation between most of the explanatory variables is less than 0.50 implying there is no problem of multicollinearity. The highest correlation is between

the financial crisis and BCI at 55 percent, suggesting that investors have more confidence in the returns of their investment in good financial times. Also, the financial crisis is correlated to economic growth and is significant at 10 percent.

Table 3 shows Arellano-Bover/Blundell-Bond GMM estimates for the determinants of cash holding of non-financial firms listed on the South African JSE. The Arellano-Bover/Blundell-Bond estimator assumes that the first differences of instrumenting variables are uncorrelated with the fixed effects. This allows the introduction of more instruments and improves efficiency. The model builds a system of two equations, namely the original equation and the transformed one, hence is known as 'system GMM'. It offers forward orthogonal deviations and allows finer control over the instrument matrix as stated by Roodman (2006).

Variable	Coefficient	Standard Error	P> z
Cashholding [1]	0.02	0.00	0.00
Dividend	-0.004	0.03	0.74
Leverage	-0.17*	0.07	0.06
Growth	-0.01*	0.00	0.08
Cashflow	0.09**	0.00	0.02
Debtmaturity	0.002*	0.03	0.09
Lsize	0.02	0.04	0.67
BCI	-0.06***	0.03	0.00
EC	-0.008**	0.004	0.03
INF	-0.005	0.006	0.16
PS	-0.064*	0.035	0.07
Fineris	0.015	0.025	0.54
Diagnostic tests:			
Sargan test of overid. Restrictions	Prob > chi2 = 0.231		
Difference-in-Sargan tests of exogeneity of instrument subsets	Prob > chi2 = 0.176		
AR(1) in first differences	z= -4.78: Pr> z = 0.000		
AR(2) in first difference	z= -0.65: Pr> z= 0.489		
Number of instruments = 38 Number of groups: 80			
Wald $chi2(12) = 366.91$			
Prob > chi2 = 0.0000			

TABLE 3: ARELLANO-BOVER/BLUNDELL-BOND GMM

Source: Authors own computation.

Note: Sig. level *** = 1%, ** = 5% and * = 10%.

The coefficient of the lagged dependent variable (cash holding) is positive and statistically significant. It implies that higher cash reserves from the previous year have a positive impact on the current cash levels. This result is consistent with Ogundipe *et al.* (2012) who report similar results for Nigerian firms. The adjustment coefficient is about 0.97 (1- 0.02), which shows that the dynamic model is reasonable and that firms cannot instantly adjust towards the target cash level following changes in firm-specific characteristics or random shocks.

The coefficient for leverage is negative which is consistent with the prior expectations. The sign indicates that firms with higher leverage hold less cash. Thus high leverage ratios imply better access to debt and less cash is required. This result is in line with the prediction of the trade-off theory. However, Chireka and Fakoya (2017) found leverage to be insignificant in determining cash holding for selected South African retail firms listed on the JSE. This difference in results could be attributed to sectors selected for the study. Whereas Chireka and Fakoya (2017) focus only on retail firms, this paper considers non-financial firms. The coefficient of the dummy variable of dividend is insignificant, but negative pointing to a negative relationship between cash holding and dividend pay-out. Intuitively, firms that declare dividends are most probably very profitable and likely to be in a good state of affairs such that hold lots of cash.

The coefficient of growth opportunities is negative and significant, at 10 percent. This result is in line with agency theory in that firms with abundant investment opportunities face higher costs of holding liquid assets due to forgone opportunities. The results are also similar to Mugumisi and Mawanza (2014) for Zimbabwean listed firms and Kariuki, Namusonge, and Orwa (2015) for Kenyan manufacturing firms. However, these results are in contrast to findings in Ogundipe *et al.* (2012), and Chireka and Fakoya (2017) who reported growth to be statistically insignificant for retail firms in South Africa.

It can be seen that there is a significant positive relationship between cash flows and cash holding. The positive coefficient is consistent with the trade-off theory. It shows that firms prefer to use internal financing as a precautionary motive. The results from literature are mixed. Ogundipe *et al.* (2012) found no significant relationship between cash flow and cash holdings for Nigeria, while Chireka and Fakoya (2017) also reported a positive relationship for retail firms in South Africa.

The estimate for firm size echoes the results in Chireka and Fakoya (2017), that is, negative and insignificant. Therefore the result does not find support for the assumption that small firms should hold more cash. In contrast, Mugumisi

and Mawanza (2014) found firm size to have a negative and significant impact for Zimbabwean firms. The debt maturity variable has a positive and significant impact on cash holding. The positive association implies that the debt structure will increase firms cash holding, as firms need to hold cash in cash of repayment or insolvency.

The coefficient of business confidence index is negative and statistically significant at 1 percent. The higher the business confidence, the less cash a firm holds, leading to an increase in investment. As such the business climate of a country has a significant impact on the investment decisions (cash holding) of firms. In their descriptive report on cash holding, Tambo and Theobald (2017) also found business confidence to have negative effect on a firms cash holding. As expected in the apriori expectation economic growth is inversely related to cash holding and is significant. During bad economic times, firms hold more cash to hinge against increasing cost of external financing. Tambo and Theobald (2017) confirmed these results. The dummy variable for the global financial crisis and the inflation rate are statistically insignificant. The insignificant result suggests that the global crisis did not fundamentally change firm's cash holding decisions.

Lastly, the political stability is inversely related to cash holding as expected in the apriori assumptions. The implication is that during political instability firms hold more cash, and a more stable political atmosphere encourages investment. The host of political problems in South Africa which have seen the political stability index dwindle is at the root of the increase in cash holding by firms.

The Sargan statistic of over-identifying restrictions fails to reject the null of the hypothesis (over-identifying restrictions are valid). The test is also not weakened by the number of instrument as the number of groups (80) is greater than the number of instruments (38). Furthermore the test for exogeneity also shows that the instrumental variables are exogenous. The null hypothesis of the Sargan test is that the instruments as a group are exogenous is not rejected given the p-value of 0.176.

The results of the test for autocorrelation with a null hypothesis of no autocorrelation are consistent with theory as the test for AR(1) process in first differences rejects the null hypothesis. However, the more important test for autocorrelation is the AR(2) process where autocorrelation is tested at first difference. The results fail to reject the null hypothesis with a p-value of 0.489, showing no autocorrelation in the model.

5. Conclusion

Corporate cash holding has been a major topic in economics and finance in recent years and has attracted huge debate amongst academics and policymakers. In spite of the growing debate, very little research has been done on cash holdings behaviour in emerging economies and specifically Africa. This paper fills in the gap by providing empirical evidence of non-financial firms in South Africa. The specific model is estimated using the Arellano-Bond GMM estimation technique. The Arellano-Bover/Blundell-Bond GMM produces efficient estimators in the presence of heteroskedasticity. Data was collected from a sample of 80 JSE listed South African non-financial firms from the year 2007 to 2017. Data was obtained from the SHARENET database.

Results obtained were consistent with the evidence on available corporate cash holding literature. Six internal variables – firm size, leverage, growth opportunities, dividend payments, cash flows, and debt maturity – were studied to ascertain whether they have significant explanatory impact on the cash holdings levels of the companies. Our findings show that leverage and growth opportunities are inversely related to cash holdings, whereas debt maturity and cash flow exerts a positive influence. Firm size and dividends payments were all found to have an insignificant impact on the cash holdings of companies.

On the other hand, five external factors – business confidence, economic growth, inflation rate, political stability and financial crisis – were also included. The results reveal that business confidence, economic and political stability are inversely related to cash holding while inflation rate and financial crisis were statistically insignificant.

Therefore, based on the findings of our study, an investor can reasonably conclude that a company with high leverage and high cash flow should retain lower cash holdings. If for some reason, a firm with high leverage ratio and high cash flow also holds large cash holdings, this might be a signal of possible agency conflict.

In terms of policy, the results suggest that cash holding is directly responsive to economic policy. A policy environment that promotes economic growth and provides certainty is more likely to reduce firms' weariness about economic conditions. Ultimately, company investment decisions are driven by the prospect of good returns, and the current trajectory of declining economic growth, in South Africa, is dimming those prospects.

Biographical Notes

Atoko Kasongo is with the Centre for Science Technology and Innovation Indicators, Human Science Research Council (HSRC), Cape Town, South Africa.

References

- Abushammala, S. and Sulaiman, J. (2014). Impact of macroeconomic performance on corporate cash holdings: some evidence from Jordan. *Asian Economic and Financial Review*, Vol. 4, No. 10, pp. 1363-1377.
- Afza, T., and Adnan, S. (2007). Determinants of corporate cash holdings: A case study of Pakistan. Proceedings of Singapore Economic Review Conference (SERC) 01.
- Ali, A., and Yousaf, S. (2013). Determinants of Cash holding in German Market. *IOSR Journal of Business and Management*, Vol. 12, No. 6, pp. 28-34.
- Al-Najjar, B. (2013). The financial determinants of corporate cash holdings: Evidence from some emerging markets. *International Business Review*, Vol. 22, No. 1, pp. 77-88.
- Anand, L., Thenmozhi, M., Varaiya, N., and Bhadhuri, S., (2018). Impact of macroeconomic factors on cash holdings? A Dynamic Panel Model. *Journal* of Emerging Market Finance, Vol. 17, No. 1, 1–27.
- Baum, C., Caglayan, M., Ozkan, N., and Talavera,O. (2006). The impact of macroeconomic uncertainty on cash coldings for non-financial firms. *Review* of *Financial Economics*, Vol. 15, No. 4, pp. 289-304.
- Baumol, W. J. (1952). The Transactions Demand for Cash: An Inventory Theoretic Approach. *Quarterly Journal of Economics*, Vol. 66, pp. 545–556.
- Bates, T. W., Kahle, K. M., and Stulz, R. M. (2009). Why do US firms hold so much more cash than they used to? *The Journal of Finance*, Vol. 64, No. 5, pp. 1985-2021.
- Bhole, L. M. and Mahakud, J. (2005). Trends and Determinants of Private Corporate Sector Savings in India. *Economic and Political Weekly*, Vol. 40, No. 39, pp. 4243-50.
- Chen, N. and Mahajan, A. (2010). Effects of Macroeconomic Conditions on Corporate Liquidity—International Evidence. *International Research Journal of Finance and Economics*, Vol. 35, pp. 112-121.

- Chireka, T. and Fakoya, M. (2017). The determinants of corporate cash holdings levels: evidence from selected South African retail firms. *Investment Management and Financial Innovations*, Vol. 14, No. 2, pp. 79-93.
- Daher, M. (2010). The Determinants of Cash Holdings in UK Public and Private Firms. Dissertation, Lancaster University Business School, Lancaster University.
- Drobetz, W., and Grüninger, M. C. (2007). Corporate cash holdings: Evidence from Switzerland. *Financial Markets and Portfolio Management*, Vol. 21, No. 3, pp. 293-324.
- Faulkender, M., and Wang, R. (2006). Corporate financial policy and the value of cash. *The Journal of Finance*, Vol. 61, No. 4, pp. 1957-1990.
- Ferreira, M. A., and Vilela, A. S. (2004). Why do firms hold cash? Evidence from EMU countries. *European Financial Management*, Vol. 10, No. 2, 295-319.
- Ferri, M. G., and Jones, W. H. (1979). Determinants of financial structure: A new methodological approach. *The Journal of Finance*, Vol. 34, No. 3, pp. 631–644.
- Foley, C. F., Hartzell, J. C., Titman, S., and Twite, G. (2007). Why do firms hold so much cash? A tax-based explanation. *Journal of Financial Economics*, Vol. 86, No. 3, pp. 579-607.
- Gill, A., and Shah, C. (2012). Determinants of corporate cash holdings: Evidence from Canada. *International Journal of Economics and Finance*, Vol. 4, No. 1, pp. 70-79.
- Guney, Y., Ozkan, A., and Ozkan, N. (2007). International evidence on the nonlinear impact of leverage on corporate cash holdings. *Journal of Multinational Financial Management*, Vol. 17, No. 1, pp. 45-60.
- Harford, J. (1999). Corporate cash reserves and acquisitions. *The Journal of Finance*, Vol. 54, No. 6, pp. 1969-1997.
- Horioka, C. and Terada-Hagiwara, A. (2014). Corporate cash holding in Asia. *Asian Economic Journal*, Vol. 28, No. 4, pp. 323 345.
- Jensen, M. C. (1986). Agency cost of free cash flow, corporate finance, and takeovers. Corporate Finance, and Takeovers. *American Economic Review*, Vol. 76, No. 2, pp. 323-329.
- Jensen, M., and Meckling, W. (1976). Theory of the firm: Managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics*, Vol. 3, pp. 305–360.

- Kariuki, S. N., Namusonge, G. S., and Orwa, G. O. (2015). Determinants of corporate cash holdings: evidence from private manufacturing firms in Kenya. *International Journal of Advanced Research in Management and Social Sciences*, Vol. 4, No. 6, pp. 15-33.
- Kim, C., Mauer, D. C., and Sherman, A. E. (1998). The determinants of corporate liquidity: Theory and evidence. *Journal of Financial and Quantitative Analysis*, Vol. 33, No. 3, pp. 335-359.
- Magerakis, E., Siriopoulos, C., and Tsagkanos, A. (2015) Cash Holdings and Firm Characteristics: Evidence from UK Market. *Journal of Risk and Control*, Vol. 2, No. 1, pp. 19-43.
- Megginson, W.L., and Wei, Z. (2010). Determinants and value of cash holdings: Evidence from China's privatized firms. SSRN Working Paper Series, 1-37.
- Miller, M. H., and Orr, D. (1966). A Model of the Demand for Money by Firms. *The Quarterly Journal of Economics*, Vol. 80, No. 3, pp. 413-435.
- Mugumisi, N. and Mawanza, W. (2014). Corporate cash holding under liquidity crisis: A Panel analysis of Zimbabwean firms. *Research Journal of Economics and Business Studies*, Vol. 3, No. 3, pp. 66-76.
- Myers, S. C. (1977). Determinants of corporate borrowing. *Applied Economics*, Vol. 42, No. 8, pp. 965–976.
- Myers, S. C., and Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, Vol. 13, No. 2, pp. 187-221.
- Keynes, J.M. (1936). The General Theory of Employment, Interest, and Money: The Classical Theory of the Rate of Interest. Cambridge: Macmillan Cambridge University Press.
- Nadiri, M.I. (1969). The determinants of real cash balances in the U.S. total manufacturing sector. *The Quarterly Journal of Economics*, Vol. 83, No. 2, pp. 173-196.
- Ogundipe, L. O., Ogundipe, S. E., and Ajao, S. K. (2012). Cash holding and firm characteristics: Evidence from Nigerian emerging market. *Journal of Business Economics and Finance*, Vol. 1, No. 2, pp. 45-58.
- Opler, T., Pinkowitz, L., Stulz, R., and Williamson, R. (1999). The determinants and implications of corporate cash holdings. *Journal of Financial Economics*, Vol. 52, No. 1, pp. 3-46.

- Ozkan, A., and Ozkan, N. (2004). Corporate cash holdings: An empirical investigation of UK companies. *Journal of Banking and Finance*, Vol. 28, No. 9, pp. 2103-2134.
- Rizwan, M.F., and Javed, T. (2011). Determinants of corporate cash holdings: Evidence from Pakistani public sector. *Economics, Management and Financial Markets*, Vol. 6, No. 1, pp. 344-358.
- Pinkowitz, L., Stulz, R., and Williamson, R. (2007). Does the contribution of corporate cash holdings and dividends to firm value depend on governance? A cross-country analysis. *Journal of Finance*, Vol. 61, pp. 2725–2751.
- Saddour, K. (2006). The determinants and the value of cash holdings: Evidence from French firms. Cahier de recherche n, 6.7.
- Shabbir, M., Hashmi, S., and Chaudhary, G. (2016) Determinants of corporate cash holdings in Pakistan. *International Journal of Organizational Leadership*, Vol. 5, pp. 50-62.
- Stulz, R. (2002). Managerial discretion and optimal financing policies. *Journal* of *Financial Economics*, Vol. 26, pp. 3-27.
- Tambo, O. and Theobald, S. (2017) The myth of corporate cash hoarding: A study of cash holdings of South African companies. Intellidex research report.
- Titman, S. and Wessels, R., (1988) The determinants of capital structure choice. *The Journal of Finance*, Vol. 43, No. 1, pp.1-19.
- Tobin, J. (1956). The interest elasticity of transactions demand for cash. *Review* of *Economics and Statistics*, Vol. 38, No. 3, pp. 241–247.
- Uyar, A., and Kuzey, C. (2014). Determinants of corporate cash holdings: evidence from the emerging market of Turkey. *Applied Economics*, Vol. 46, No. 9, pp. 1035-1048.