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# CORPORATE LIFE CYCLE AND CASH HOLDING DECISIONS: A SOUTH AFRICAN STUDY

## Abstract

The resource-based view theory suggests that as firms' resource bases differ along the corporate life cycle, even corporate policies such as cash holdings vary along the life cycle. This study seeks to understand the effect of firm's life cycle on corporate cash holding behavior. Previous literature has sought to investigate the firm and institutional determinants of corporate cash holdings. Using the resource-based view theory, this study investigates whether corporate life cycle can be another determinant of corporate cash holdings. A panel data analysis of a sample of 112 Johannesburg Stock Exchange (JSE) listed firms from 2011 to 2018 is utilized to determine if firm's life cycle does influence cash holding behavior. Dickinson's cash flow analysis is used to proxy life cycle stages and control other known determinants of corporate cash holdings such as firm size, leverage, profitability, dividend payments, and growth opportunities. Contrary to other studies, this study finds no significant relationship between life cycle stages and corporate cash holdings, suggesting that corporate cash holdings for South African firms are driven by other factors other than life cycle resource allocations. However, it is found that prior year cash balances, firm size, and profitability have significant positive relationships with cash holdings. It is also found that liquid asset substitutes, leverage, and investment opportunities exert a significant and negative influence on corporate cash holdings.

## Keywords

corporate cash holdings, corporate life cycle, resource-based view

## JEL Classification

G32, M41, O55

## INTRODUCTION

This study investigates whether corporate cash holdings vary with the different corporate life cycle stages. Corporate cash holdings are an important component of corporate finance management. According to a recent global survey of chief financial officers (CFOs) conducted in 29 countries, corporate liquidity management activities make up 75% of the CFOs value-adding functions (Lins et al., 2010). Duong, J. Nguyen, M. Nguyen, and Rhee (2020) state that cash holdings are critical to corporate performance as they mitigate refinancing risk and make firms innovative and competitive.

Corporate cash holdings studies have predominantly focused on the firm-specific and institutional determinants of corporate cash holdings (Alzoubi, 2016; Chireka & Fakoya, 2017; Orlova et al., 2017; Florackis & Sainani, 2018; Graham & Leary, 2018; Kasongo, 2019). These studies have generally found that firm size, leverage, capital expenditure, net working capital, investment opportunities, corporate governance, national culture, and investor protection are important determinants of cash holdings. Researchers have also found that corporations have various motives for holding cash ranging from transaction motives, precautionary, agency, and predation motives (Orlova et al., 2017; Mitani, 2020). This study factors in the "dynamic resource-based view" that posits that as corporates move along the life cycle stages, their re-

sources, capabilities, and their strategies evolve (Hasan, 2018). As such, the resource-based theoretical lens postulates that corporate life cycle stages have a significant impact on corporate cash holdings.

This study tests the assumption that corporate strategy and risk-taking, specifically corporate cash holdings, is varied throughout the different stages of the corporate life cycle (Hasan et al., 2015; Drobetz et al., 2015). La Rocca et al. (2011) assert that the lack of consensus in the determinants of capital structure decisions literature results from the failure to factor in the idiosyncratic corporate characteristics and needs at specific junctures of their life cycle. Drobetz et al. (2015) remark that literature astonishingly ignores the importance of corporate life cycle in corporate financing decisions. Hence, this study sought to establish if corporate cash holdings decisions, essential to corporate liquidity management, are affected by the corporate life cycle.

## 1. LITERATURE REVIEW

The literature on the determinants of corporate cash holdings has mainly focused on the firm-specific factors such as firm size, leverage, capital expenditure, investment opportunities, working capital, and profitability (Chireka & Fakoya, 2017; Kasongo, 2019). Other studies have also found that behavioral characteristics of managers (Florackis & Sainani, 2018; Xu et al., 2019) and institutional factors such as national culture, corporate governance, and investor and creditor protection (Seifert & Gonenc, 2016; Orlova et al., 2017; Graham & Leary, 2018) determine corporate cash holdings. However, there is a paucity of literature investigating corporate life cycle as a determinant of cash holdings.

Corporate life cycle theory posits that corporates, akin to living creatures, evolve from one stage of development to another. Each stage dictates the amount and quality of resources, competitive capabilities, and the most appropriate strategic orientations to be adopted (Hasan et al., 2015). This conjecture has been confirmed by recent studies that found the cost of equity capital (DeAngelo et al., 2010; Hasan et al., 2015), costing systems (Kallunki & Silvola, 2008), and corporate social responsibility (Lee & Choi, 2018) to vary with the corporate life cycle stages. Despite growing evidence on the importance of corporate life cycle and the importance of cash holdings to corporate performance and economic growth, very few studies have investigated the nexus between corporate life cycle and cash holdings. Therefore, this study is to close this gap by investigating the relationship between corporate life cycle and corporate cash holdings in South African non-financial firms.

Corporate life cycle studies have been circumscribed by the complexity of identifying an appropriate measure of corporate life cycle stage. DeAngelo et al. (2006) used retained earnings to proxy the life cycle stage, DeAngelo et al. (2010) and Dittmar and Duchin (2010) used the number of years listed as a proxy for the corporate life cycle stage. These univariate approaches suggest that companies grow linearly and sequentially from introduction to decline and thus reject corporate dynamism which suggests that companies often rejuvenate and restructure themselves through strategic initiatives (Drobetz et al., 2015). Faff et al. (2016) argue that the non-monotonicity of cash policies postulated by the linear life cycle models often leads to wrongful analysis and interpretations.

To overcome the problems of univariate corporate life cycle measures, this study uses a modified dynamic life cycle model of Dickinson (2011). The original model identifies five life cycle stages: (1) introduction, (2) growth, (3) maturity, (4) shake-out, (5) decline stages as the observable stages of corporate evolution. This model is modified to identify only four stages by combining the shake-out and decline stages into one stage (Alzoubi, 2019). Dickinson (2011) argues that, from a resource-based view, corporate cash flow patterns are unique to each life cycle stage, and that by observing the mix of cash flows from operating, investing, and financing activities, one can determine the life cycle stage of a firm (Table 1).

This study is closely related to Drobetz et al. (2015) and Alzoubi (2019). Both studies employ the life cycle model of Dickinson (2011) in investigating

**Table 1.** Firm life cycle proxies

Source: Adapted from Dickinson (2011).

Cash Flows (CF)	(1) Introduction	(2) Growth	(3) Maturity	(4) Decline
Operating CF	–	+	+	–
Investing CF	–	–	–	+
Financing CF	+	+	–	+/-

the relationship between corporate life cycle and cash holdings dynamics of firms based in the US and Jordan, respectively. This study adds to the nascent literature, which focuses on the role of corporate life cycle on corporate cash holdings by focusing on South African listed non-financial firms. South African corporates have been accused of embarking on an investment strike by holding too much cash resulting in poor economic growth and choking unemployment levels (Hadebe, 2020). While a few studies have investigated the cash holdings of South African corporates (Chireka & Fakoya, 2017; Kasongo, 2019; Tambo & Theobald, 2017), none has looked at the role of corporate life cycle stage on cash holding decisions. This study fills this gap in corporate cash holding literature.

The findings confirm those of Alzoubi (2019) that the introduction and growth stages have no significant impact on corporate cash holdings. However, Alzoubi (2019) finds that Jordanian corporates in the mature and decline stages significantly reduce their cash holdings. Drobetz et al. (2015) find that US firms in their early life cycle stages and decline stages hold large amounts of cash, but cash ratios decrease when firms move towards maturity. This study finds that, for South African firms, life cycle stages are not significantly related to corporate cash holdings. Future studies can investigate why corporate life cycle theory is insignificant in determining cash holdings of South African firms. The studies can also investigate how life cycle theory affects other corporate activities such as dividend payout, investment activities, and capital structure decisions in South African firms.

## 2. RESEARCH HYPOTHESES

Although firms will vary their cash holding policies following their idiosyncratic characteristics, firms' life cycle stages will also influence cash holding decisions.

### 2.1. Introduction stage

Akin to being in the cradle, introduction stage firms are still trying to establish unique competencies to grab a worthwhile niche market for themselves (Kallunki & Silvola, 2008). Such firms will have net cash outflows owing to huge investment expenditure and low to negative operating income due to a lack of market share (Tian, Han, & Zhang, 2015). During the introduction stage, firms are relatively unstructured with little reputation and limited access to external financing. Introduction stage firms will utilize all of their available cash to satisfy their financial needs. With little external cash coming in and all internal cash being expended, firms in the introduction stage will not have any cash holdings.

*H1: Firms in the introduction stage do not hold cash.*

### 2.2. Growth stage

In the growth stage, firms will begin to experience sales growth as their product mix becomes diversified, and as their unique competencies become more pronounced (Tian et al., 2015). The rapid growth experienced by these firms often means the demand for finance supersedes their internal cash generation capacity (Lemmon & Zender, 2010).

Alzoubi (2019) confirms that as firms transition from the no-profit introduction stage into the growth stage, investment opportunities are plentiful. Firms will, therefore, commit all their available resources to invest in these opportunities, but following the financial hierarchy theory, they will opt to utilize cheap, internally generated cash before seeking external financing. Therefore, in this stage, it is expected that firms will not hold cash.

*H2: Growth firms do not hold cash.*

### 2.3. Maturity stage

In the maturity stage, competition takes root, the market is flooded, and the degree of innovation is stalled. Investment opportunities are scarce, and therefore generated operating cash flows become sufficient to cover firms' financial needs. At this stage, firms can easily secure external funds at reasonable costs because of their reputation and positive operating cash flows. This improved access to financial markets will mean that a dollar of cash holding will have a detrimental effect on firm value.

Although firms can easily access capital markets at a reasonable cost at this stage, the positive operating cash flows and reduced need for investment capital means firms will not utilize external finances. Again as managers have little profitable opportunities, any cash surpluses in the mature stage will be utilized in servicing debt or paid out to shareholders in the form of cash dividends or share buybacks, resulting in declining cash holdings.

*H3: Firms in their maturity stage have modest cash holdings.*

### 2.4. Decline stage

Unless they find ways to reinvent themselves, firms in the decline stage face stagnation for long spells until they liquidate. This stage is sometimes referred to as the final stage and is characterized by market stagnation or loss in market share, dwindling sales, and profitability. As new players disrupt and redefine the market, decline firms are parsimonious in innovation expenditure, leading to a vicious cycle of losing market shares and worsening profitability. Unable to generate cash flows and with debt and other financial obligations from previous life cycle stages, declining firms might resort to asset disposals resulting in increasing cash holdings.

*H4: Firms in the decline stage have large cash holdings.*

## 3. METHODOLOGY

This study employs panel data analysis to test the hypotheses to investigate how firms adapt their

cash holding policies in each of the four life cycle stages. Financial data required for this empirical study are collected IRESS database that houses all financial data of firms listed on the Johannesburg Stock Exchange. The sample study consists of 112 listed firms drawn from across all industries, while observations are taken from 2011 to 2018. Firms that had missing variables were excluded from the sample. The study applied panel data regression analysis to analyze the relationship between corporate life cycle and cash holdings.

The following model was used to estimate the relationship between cash holdings and corporate life cycle:

$$\begin{aligned} CASH_{i,t} = & \alpha_{it} + \beta_1 I_{i,t} + \beta_2 G_{i,t} + \\ & + \beta_3 M_{i,t} + \beta_4 D_{i,t} + \beta_1 D_1 + \beta_1 SIZE_{i,t} + \\ & + \beta_2 LEV_{i,t} + \beta_3 MTB_{i,t} + \beta_4 LIQ_{i,t} + \\ & + \beta_5 PROF_{i,t} + \beta_6 DIV_{i,t} + u_{i,t}. \end{aligned}$$

**Table 2.** Definition of variables

Variable	Code	Description
<b>Dependent variable</b>		
Corporate cash holding level	CASH	The ratio of total cash and cash equivalents to total assets
<b>Independent variables</b>		
Introduction stage	I	Firms are classified into this stage if they have negative cash flows from operating activities; negative cash flows from investing activities and positive cash flows from financing activities.
Growth stage	G	Firms are said to be in this stage if they have positive cash flows from operating activities; negative cash flows from investing activities and positive cash flows from financing activities.
Mature stage	M	Mature firms exhibit positive cash flows from operating activities and negative cash flows from investing and financing activities.
Decline stage	D	Declining firms have negative operating cash flows; positive investing cash flows and either positive or negative cash flows from financing activities.
<b>Control variables</b>		
Firm size	SIZE	The natural log of total assets
Leverage	LEV	The ratio of total debt to total assets
Investment opportunities	MTB	The ratio of book value of total assets minus the book value of equity plus the market value of assets
Liquidity asset substitutes	LIQ	The ratio of net working capital less total cash to total assets
Profitability	PROF	Return on Capital Employed (ROCE)
Dividend payments	DIV	Dummy variable equal to one is firm paid a dividend otherwise equal to zero

## 4. EMPIRICAL RESULTS AND DISCUSSION

This section summarizes the empirical results of the study. First, the descriptive statistics of the key variables is discussed. Second, the detailed results for corporate life cycle effects on corporate cash holdings are presented and discussed.

### 4.1. Descriptive statistics

Table 3 presents the descriptive statistics of the key variables included in the study. The mean corporate cash holdings for the sample are 18%, with a standard deviation of 55%. The average cash holding by South African companies is higher than the 10% of Jordanian firms (Alzoubi, 2019) but comparable to the US companies, as found by Drobetz et al. (2015) and to the Chinese firms (Xu et al., 2019). The average

leverage is 49%, suggesting that South African firms are highly levered compared to 22% for US firms and 34% for Jordanian firms.

The mean for firm size is 15.48, signifying a good mix of large and small firms in the sample. Moreover, the mean (2.43) market to book (MTB) value implies that there are firms with lucrative growth opportunities in the sample.

### 4.2. Correlation analysis

Table 4 presents the Pearson correlations amongst the cash holdings, firm life cycle proxies, and the control variables used in this study. As hypothesized, the corporate cash holding level is negatively correlated with both the introduction and the growth stages and positively correlated with the mature and decline stage. Although the correlation between cash and liq-

**Table 3.** Descriptive statistics

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
CASH	0.180929	0.096912	8.552795	0.000000	0.550131	896
I	0.087054	0.000000	1.000000	0.000000	0.282071	896
G	0.371652	0.000000	1.000000	0.000000	0.483516	896
M	0.388393	0.000000	1.000000	0.000000	0.487657	896
DC	0.152902	0.000000	1.000000	0.000000	0.360094	896
SIZE	15.48398	15.56606	21.34994	7.355002	1.988184	896
LIQ	0.003001	0.408934	21.34994	-8.29747	0.573846	896
LEV	0.487560	0.475500	2.908600	0.001500	0.286903	896
MTB	2.432798	1.423050	161.0956	-5.9373	5.872403	896
PROF	6.990089	8.657900	299.5817	-1173.215	46.50575	896
DIV	0.709821	1.000000	1.000000	0.000000	0.454098	896

Notes: The table presents the summary statistics of all the variables used in this study. The sample consists of 896 firm-year observations from 2011 to 2018 from 112 firms in South Africa with financial data from the IRESS database. Definitions of the variables are given in Table 2.

**Table 4.** Correlation matrix

	cash	i	g	m	d	size	liq	lev	mtb	prof	dvd
cash	1										
i	-0.0342	1									
g	-0.0283	-0.2375	1								
m	0.0102	-0.2461	-0.6129	1							
d	0.0339	-0.0523	-0.1303	-0.135	1						
size	-0.1625	-0.1108	0.2163	-0.029	-0.0889	1					
liq	-0.9024	0.0366	-0.0169	-0.0077	-0.0151	0.0447	1				
lev	0.0035	0.0485	0.0697	-0.0326	-0.0333	0.0947	-0.2316	1			
mtb	-0.0245	0.0541	0.0169	0.0158	-0.0449	-0.0027	-0.0342	0.096	1		
prof	0.0086	-0.0804	0.0579	0.0082	-0.0596	-0.0155	0.0249	-0.0519	-0.1214	1	
div	0.0513	-0.1689	0.0744	0.0958	-0.1306	0.1833	-0.0357	0.0215	0.1354	0.1464	1

Notes: The definitions of the variables are available in Table 2.

uid asset substitutes is high, the relationship is also significant, and thus there is no multicollinearity. The rest of the variables show small correlations with each other, showing that there is no multicollinearity amongst the variables.

## 5. DISCUSSION OF RESULTS

Table 5 presents the results of the panel data analysis. Column 1 employs the fixed effects regression, which was deemed more suitable for this study than the random effect model by the Hausman specification test. Column 2 presents the results of the Arellano-Bover/Blundell-Bond estimation (System GMM). Both estimation methods find similar results on the impact of firm's life cycle stage on cash holding levels. The coefficients of the introduction and growth stages are both insignificant, with the former being negative and the latter being positive. This is consistent with the findings of Alzoubi (2019) who also finds the introduction and growth stages insignificant. Although the results are insignificant, the sign of the coefficients confirms those of Drobetz et al. (2015) who found an increasing pattern of cash holdings from the introduction stage to the growth stage. The findings support our initial hypothesis that firms in the introduction and growth stages invest all available cash in surviving and establishing themselves. Therefore, these firms will not hold any cash.

The results also show that the coefficients for the mature and decline stages are positive and negative, respectively. However, the relationships with cash holdings remain insignificant. This is at variance with both Alzoubi (2019) and Drobetz et al. (2015) who find that firms reduce the cash holdings as they move towards maturity and increase post-maturity. These results reject the hypothesis that mature firms will reduce their cash holdings due to their improved access to capital markets. One also rejects the hypothesis that declining firms increase their cash holdings due to cash flows from the disposal of fixed assets.

The control variables show that firm size is positively and significantly related corporate cash

holdings. At the same time, liquid assets, leverage, and growth opportunities (proxied by the market-to-book ratio) are all negatively and significantly related to cash holdings. While most studies find that larger firms with better access to financial markets should hold less cash, the results contradict this finding. One proffers that large firms hold more cash as a defense against hostile takeovers, as well as an unwillingness to invest in uncertain economic environments. Al-Najjar (2013) finds a similar positive relationship in Chinese firms and avers that large and diversified firms have more need for cash.

One also avers that the negative relationship between liquid assets and cash holdings is that the two are perfect substitutes. The relationship between cash holdings and leverage is also significantly negative, consistent with studies that find that firms that have access to debt will reduce their cash holdings and vice versa (Chen et al., 2020; Phan et al., 2019).

One also finds a significantly negative relationship between growth opportunities (MTB) with corporate cash holdings consistent with Kasongo (2019) findings. This relationship shows that firms invest their cash in available growth opportunities, thereby reducing their cash holdings. However, with the allegations that corporate South Africa is not investing in the country, it is postulated that these corporates might be investing in offshore opportunities. The agency theory supports the negative relationship between these two variables and posits that self-seeking managers in firms with lesser growth opportunities tend to hoard cash, only to expend it in negative net present value projects (Bates et al., 2009). System GMM also finds that prior year cash holding levels (cash L1) are significantly and positively related to cash holding levels consistent with Kasongo (2019).

Overall, there is no evidence that firm life cycle stages influence cash holding decisions in South African listed firms suggesting that managers do not consider the life cycle stage when making liquidity decisions.

**Table 5.** Panel data regression results

Variables	Fixed effects	System GMM
Cash L1		0.1122***
		(0.0139)
Introduction	-0.01097	0.0012
	(0.0168)	(0.0199)
Growth	0.0209	0.0223
	(0.0133)	(0.0161)
Mature	0.0009	-0.0075
	(0.013)	(0.0154)
Decline	-0.0056	0.0046
	(0.0258)	(0.0323)
Size	0.0345***	0.0504***
	(0.0088)	(0.0128)
Liquid assets	-0.7836***	-0.9211***
	(0.017)	(0.0137)
Leverage	-0.4462***	-0.6092***
	(0.0223)	(0.0283)
Growth (MTB)	-0.0037***	-0.0169***
	(0.0007)	(0.0035)
Profitability	0.0001	0.0002**
	(0.0001)	(0.0001)
Dividend dummy	0.0173	-0.0045
	(0.012)	(0.0163)
Constant	-0.1446	-0.288
	(0.1373)	(0.2023)
R-squared	0.7356	6
Observations	896	784
Number of instruments		38
Number of groups		112

*Notes:* This table presents the panel regression estimation of corporate cash holdings on corporate life cycle stages and firm-specific control variables. The t-statistics based on robust standard errors clustered by firms are shown in parentheses. The determinants of Cash are estimated using the fixed effects model and the system GMM estimator. The determinants of target cash holdings include life cycle stages, market-to-book ratio, size, liquid assets, leverage, and dividend (dummy). Detailed definitions of all variables are in Table 2. The sample consists of 112 non-financial firms listed on the JSE from 2011 to 2018, with no missing observations on variables. Significance levels are indicated as follows: \* = 10%, \*\* = 5%, \*\*\* = 1%.

## CONCLUSION

This study empirically tests whether corporate life cycle theory can explain corporate cash holdings. The literature has largely ignored the role of life cycle theory on corporate cash holdings by focusing on firm-specific and institutional determinants of corporate cash holdings. The study employs Dickinson's (2011) life cycle measure to a sample of 112 JSE listed firms from 2011 to 2018. Results from the fixed effects panel data analysis and the system GMM estimation find that life cycle stages are irrelevant to corporate cash holding levels. This empirical evidence shows that South African companies disregard the life cycle theory when making corporate cash holdings decisions. It is concluded that this lack of predictability of corporate cash holdings, along life cycle stages, might explain why South African corporates have been accused of holding too much cash at the expense of growing the economy.

Consistent with Alzoubi (2019), it is found that being in the introduction and growth stage does not influence corporate cash holdings as these firms use all the available cash to sustain operations and to invest in projects that can lead to market share growth. The results contradict Drobetz et al. (2015) who find that firms in the introduction and decline stage retain more cash holdings, although they reduce them as they approach the mature stage. It is also found that cash holdings are irrelevant in the mature

and decline stages, contradicting Alzoubi (2019) and Drobetz et al. (2015) who find that firms decrease cash holdings when in the mature stage and increase their reserves when in decline.

The literature provides evidence that corporate life cycle theory has an important role in corporate activities such as innovation and investment. The findings of this study suggest that life cycle theory is irrelevant to corporate cash holdings. Future studies could also investigate whether corporate life cycle impacts other corporate decisions such as investment, innovation, capital structure, and corporate social responsibility in the South African context.

## AUTHOR CONTRIBUTIONS

Conceptualization: Trust Chireka.  
 Data curation: Trust Chireka.  
 Formal analysis: Trust Chireka.  
 Investigation: Trust Chireka.  
 Methodology: Trust Chireka.  
 Project administration: Trust Chireka.  
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 Software: Trust Chireka.  
 Validation: Trust Chireka.  
 Writing – original draft: Trust Chireka.  
 Writing – review & editing: Trust Chireka.

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