FIRMS' LIFE CYCLE STAGE AND CASH HOLDING DECISIONS

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ABSTRACT

This study investigates how different stages in a firm's life cycle affect their cash holding decisions. Previous research has focused on the fundamental factors that determine the cash level held by firms, while other research has focused on the value of cash held by firms, and how cash affects other corporate decisions. This research will consider a new dimension to cash holding decisions by considering firms' life cycle stage and how it affects cash holding decisions. The study conducts a fixed effect panel data analysis on a sample of 141 non-financial listed firms from Amman Stock Exchange, over the period 2000-2016. By controlling for firm size, profitability, financial leverage and dividend paying, the results show that; during the introduction and growth stages, cash holding decisions are irrelevant, while during the maturity and decline stages, cash holding becomes significantly negatively related. Firm's size and financial leverage are also significantly and negatively related to cash holding decisions, while firm's profitability and dividend paying are significantly positively related to cash holding decisions.

Keywords: Cash Holding, Firms' Life Cycle, Value of Cash, Panel Data.

JEL Classification: G30, G32

INTRODUCTION

Cash holding decisions are some of the most important decisions to make in any corporate firm. Corporate firms should balance the benefits of holding cash; being able to meet their financial obligations, provide financing for any future projects and investments, and using cash as a precaution against any unexpected needs of liquidity; with the costs of holding cash; as holding cash is associated with high opportunity cost, since cash in itself will not generate any income for the corporate firm and by holding cash corporations are underinvesting in income generating assets.

Cash holding has been studied from several angles; one of these angles was the determinants of cash holding, where firms' characteristics were studied in order to explain how and why firms hold cash (Kim et al., 1998; Schnure, 1998; Opler et al., 1999; Faulkender, 2002; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004; Almeida et al., 2004; Chen and Mahajan, 2010; Alzoubi, 2013).

Another angle was the value of cash holding; many researchers investigated the value of the cash held by firms and how that cash contributes towards the value of firms. Holding cash when the corporate governance system is strong and shareholders are protected is associated with a higher value, especially when access to financial markets is limited or the cost of raising funds externally is high. On the other hand, when the corporate governance system is weak and shareholders are not protected the value of cash held by firms is low due to the free cash flow problem (Jensen, 1986), meaning the value of each dollar invested in cash could be valued at premium or discount based on the business environment and the situation surrounding firms (Pinkowitz et al., 2006; Faulkender and Wang, 2006; Dittmar and Mahrt-Smith, 2007; Kalcheva and Lins, 2007; Harford et al., 2008; Fresard and Salva, 2010; Haw et al., 2011; Tong, 2011; Alzoubi, 2013; Alzoubi, 2016).

Another angle was how the cash holding will affect other decisions made by firms; holding cash can affect or interact with other corporate decisions in firms. Concerns about cash holding can affect other corporate issues such as investment decisions. When more/less cash is available to the firm that will influence firms' investment decisions (Fazzari et al., 1988; Hoshi et al., 1991; Kaplan and Zingales, 1997; Alti, 2003; Allayannis and Mozumdar, 2004; Carpenter and Guariglia, 2007; Wei and Zhang, 2008; and Alzoubi, 2015). Cash holding can also affect capital structure decisions; since cash can be used to pay off debts, cash can be considered as negative debt (Alzoubi, 2013).

In this study the author will investigate an entirely new issue regarding cash holdings decisions; that is, how firms change their cash holding decisions according to their stage in the business life cycle. Since the effect of the firm's life stage on cash holding decisions has not been investigated before, the objective of this research is to study how firms change the level of cash held according to the stage in their life cycle. This research is attempting to answer the question of how the firms adjust the cash level held at the different stages of their life cycle?

LITERATURE REVIEW

As there is no existing literature which considers how a firm's life cycle affects the cash holding decisions, the author will refer to literature about the two topics separately.

Dickinson (2011) examines the validity of using patterns in a firm's cash flow to identify the corresponding stages of a firm's life cycle. The result shows that even though cash flow pattern is a parsimonious measure of life cycle it is a robust measure which overcomes the distributional assumptions associated with univariate or composite measures of the life cycle.

Habib and Hasan (2015) investigate how corporations change their risk-taking decisions and how their performance changes as the stages in the corporation's life cycle change. They found that at different stages of their life cycle firms change their risk-taking decisions; during the introduction and decline stages risk-taking is high and this will affect future performance negatively, while in growth and mature stages risk-taking is low and this will affect future performance positively.

Yan and Zhao (2010) introduce a measure of the firm life-cycle stage, by following four steps; firstly, calculate the adjusted sales growth rate based on quarterly data. Secondly, find the four periods moving average of these adjusted sales growth rate. Thirdly, rank these moving averages and find the 33rd and 67th percentiles. Finally, identify the life-cycle stages. However, this methodology cannot be applied to the sample of this research due to the lack of quarterly data.

Drobetz et al. (2015) investigate how the level and the value of cash holding changes over the firm life-cycle. They found that firms hold large amount of cash in their earlier and post maturity stages, and cash ratio decline as firm reaches maturity stage. They also found that the value of cash held by the firm in the introduction and growth stages is high, while this value become low in later stages due to agency problem.

Bulan and Yan (2009) investigate how firm's financing choices will be affected by the firm life cycle stage; by considering two stages which are growth and maturity, they found that pecking order theory explains the financing choices during the mature stage better than the growth stage.

Firms' decisions are influenced by the different stages of their life cycle. Damodaran (2002) suggested that firms adjust the capital structure according to their life cycle base on the cost and benefits of the debt financing at each stage.

A firm's decisions to hold cash are affected by the firm's characteristics. Firms' size, growth opportunities, operating cash flows, profitability, leverage, dividends and liquid assets

substitutes are the most important factors affecting cash holding decisions. Several researchers have studied the influence of these variables on cash holding decisions. Using different samples from different countries, including both developed and emerging countries, and over different periods of time, studies have produced mixed results (Kim et al., 1998; Schnure, 1998; Opler et al., 1999; Faulkender, 2002; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004; Almeida et al., 2004; Chen and Mahajan, 2010; and Alzoubi, 2013).

Based on the adjusted model introduced by Fama and French (1998) several researchers studied the effect of holding cash on the value of firms, while others used the model proposed by Faulkender and Wang (2006). The results show that when the corporate governance system is strong, investors are protected, or external financing is limited, costly, or difficult to obtain, each dollar invested in cash will contribute more than one dollar towards the value of the firm (cash valued at premium). On the other hand, when the corporate governance system is weak, investors are not protected, or external financing is easy and cheap to obtain, each dollar invested in cash will contribute less than one dollar towards the value of a firm (cash valued at discount), as free cash flow problems will arise. (Pinkowitz et al., 2006; Faulkender and Wang, 2006; Dittmar and Mahrt-Smith, 2007; Kalcheva and Lins, 2007; Harford et al., 2008; Fresard and Salva, 2010; Haw et al., 2011; Tong, 2011; Alzoubi, 2013; and Alzoubi, 2016).

Alzoubi (2016) found that even when the corporate governance system is weak and investors are not protected the existence of the financial crisis led to a higher value in cash held by a firm from the investor's point of view.

Cash held by a firm will also influence other corporate decisions, such as investment and financing decisions. Firms with greater stocks of cash will be able to invest more than other firms, especially if there are financial constraints (Fazzari et al., 1988; Hoshi et al., 1991; Kaplan and Zingales, 1997; Alti, 2003; Allayannis and Mozumdar, 2004; Carpenter and Guariglia, 2007; Wei and Zhang, 2008; and Alzoubi, 2015). Firms that hold more cash tend to have less debt in their capital structure, since firms that hold more cash can use this cash as a cheaper source of financing compared to debt financing (Alzoubi, 2013).

Firms are expected to adjust the policy of holding cash based not only on their characteristics but also on their life cycle stage; at the earliest stage (introduction) firms are expected to use all of the available cash to meet their financial obligations, and since firms will not be able to take out loans at this stage it is expected that firms will not hold large amounts of cash.

H_1: firms will not hold cash during their introduction stage.

As firms enter the growth stage they will use all of the available resources to invest in the projects available, and since cash represents the cheapest source of financing firms will start financing their projects with all the cash available before seeking other sources. Therefore, at this stage, too, it is expected that firms will not hold large amounts of cash.

H_2: firms will not hold cash during their growth stage.

When firms enter their maturity stage the scope of financing required becomes larger and holding large amounts of cash will be associated with high opportunity cost, since at this stage the firm will be able to access financial markets at a reasonable cost, meaning they will depend more on external sources of financing and less on cash.

H_3: firms in their maturity stage will hold less cash.

When firms enter the decline stage the profitability of the firm begins to decline; therefore, their balance of cash will also decline. Therefore, these firms will seek financing

from other sources (external sources), which also requires a repayment made in cash, contributing towards a declining cash balance.

H_4: as firms enter the decline stage their cash balance will also decline.

METHODOLOGY

Based on a sample of 141 non-financial firms taken from the companies' guides of Amman stock exchange over the period 2000-2016, this research will investigate how firms adjust their cash holding decisions based on their current stage in the business life cycle; financial firms have been excluded as cash holding decisions in financial firms are based on the regulations that control financial firms. A panel data regression analysis was applied to understand how firms adjust the levels of cash they hold based on their life cycle stage.

The dependent variable used in this study is the cash ratio (CASH): Which has been calculated as cash plus cash equivalents divided by the total assets. This measure has been used by other researchers such as (Opler et al., 1999; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004; Almeida et al., 2004; Chen and Mahajan, 2010; and Alzoubi, 2013).

The independent variables used in this study are the different stages of a firm's life cycle and other control variables. Firms' life cycle stage will be identified as a dummy variable based on the patterns of the firm's cash flows; following the methodology of Dickinson (2011) and Habib and Hasan (2015) the stages can be identified as follows:

Introduction stage (I): firms are considered to be in their introduction stage if their cash flow from operating activities is negative, their cash flow from investment activities is negative and their cash flow from financing activities is positive. In this case a value of 1 will be given; otherwise 0 will be given.

Growth stage (G): Firms are considered to be in their growth stage if their cash flow from operating activities is positive, their cash flow from investment activities is negative and their cash flow from financing activities is positive. In this case a value of 1 will be given; otherwise 0 will be given.

Maturity stage (M): Firms are considered to be in their maturity stage if their cash flow from operating activities is positive, their cash flow from investment activities is negative and their cash flow from financing activities is negative. In this case a value of 1 will be given; otherwise 0 will be given.

Decline stage (D): Firms are considered to be in their decline stage if their cash flow from operating activities is negative and their cash flow from investment activities is positive. In this case a value of 1 will be given; otherwise 0 will be given.

For the control variables, the following variables will be considered:

Firm size (SIZE): Which is measured as the natural logarithm of the firm's total assets. This measure has been used by other researchers such as (Opler et al., 1999; Ozkan and Ozkan, 2004; Almeida et al., 2004; Chen and Mahajan, 2010; and Alzoubi, 2013).

Firm profitability (PROF): Which is measured as the return on assets of the firm, by dividing the net income after taxes divided by the total assets. This measure has been used by other researchers such as (Almeida et al., 2004; and Alzoubi, 2013).

Leverage (LEV): Which is measured as total liabilities divided by total assets. This measure has been used by other researchers such as (Opler et al., 1999; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004; Chen and Mahajan, 2010; and Alzoubi, 2013).

Cash dividends (DIV): Which is measured as total cash dividends divided by total assets. This measure has been used by other researchers such as (Opler et al., 1999; and Alzoubi, 2013).

The following model will be used to understand how firms' life cycles affect cash holding decisions:

$$CASH_{i,t}=B_1I_{i,t}+ B_2G_{i,t}+B_3M_{i,t}+B_4D_{i,t}+B_5SIZE_{i,t}+B_6PROF_{i,t}+B_7LEV_{i,t}+B_8DIV_{i,t}+\varepsilon_{i,t} \quad (1)$$

RESULTS AND DISCUSSION

Table 1 shows the descriptive results. From Table 1 it can be seen that the range in the research variables is high; this can be explained based on the fact that the sample of this study includes firms with different sizes and ages.

Table 1
DESCRIPTIVE RESULTS

	Mean	Median	Minimum	Maximum	Standard deviation
CASH	10.50%	4.78%	0.00%	120.30%	14.82%
I	0.19	0.00	0.00	1.00	0.39
G	0.14	0.00	0.00	1.00	0.35
M	0.42	0.00	0.00	1.00	0.49
D	0.08	0.00	0.00	1.00	0.27
SIZE	16.71	16.64	12.31	21.31	1.49
PROF	1.26%	2.31%	-195.99%	84.01%	13.01%
LEV	33.95%	29.46%	0.00%	575.64%	29.30%
DIV	2.35%	0.00%	0.00%	51.55%	4.32%

Source: Companies' guides for several years, available on Amman stock exchange website.

Table 2 shows the correlation matrix. From Table 2 it can be seen that all correlation coefficients are small; the only high coefficient is between firm's profitability and dividends. This can be explained by the fact that firms which generate high levels of profit can afford to pay more dividends. The Variance Inflation Factor (VIF) was estimated; a value of 1.18 confirms that there is no multicollinearity in the data.

Table 2
CORRELATION MATRIX

	CASH	I	G	M	D	SIZE	PROF	LEV	DIV
CASH	1.0000								
I	-0.1105	1.0000							
G	-0.0691	-0.1951	1.0000						
M	-0.0178	-0.4119	-0.3453	1.0000					
D	0.0187	-0.1426	-0.1195	-0.2524	1.0000				
SIZE	-0.1836	-0.0269	0.0960	0.2421	-0.1990	1.0000			
PROF	0.0940	-0.1446	0.0482	0.1961	-0.1811	0.2541	1.0000		
LEV	-0.2427	0.1788	0.0585	-0.0728	0.0067	0.2496	-0.2740	1.0000	
DIV	0.2463	-0.1783	-0.0903	0.2894	-0.1050	0.2042	0.4723	-0.1790	1.0000

Source: Companies' guides for several years, available on Amman stock exchange website.

Table 3 shows the regression results. From Table 3 we can lean the following: cash holding decisions are statistically insignificant in the introduction and growth stages. These results do not match the results of Drobetz et al. (2015) as they found that firms at their earlier stages hold more cash. Our results support the first two hypotheses, which suggested that firms at their introduction and growth stages use all available cash to meet their financial needs and will not hold cash.

During firms' maturity and decline stages cash holding decisions become statistically significant; firms at their maturity and decline stages hold less cash, which supports the third and fourth hypotheses, which suggested that at the maturity stage firms become larger and more stable, making the process of raising funds from external sources (financial markets) easier and cheaper. While during the decline stage, as everything in the firm starts to decline,

cash level will decline as well. These results are consistent with the results of Drobetz et al. (2015) as they found that firms' cash ratio decline as firms reach their maturity stage.

Table 3
REGRESSION RESULTS

Variable	Coefficient	t-Statistic
I	-0.0138	-1.5549
G	0.0049	0.5290
M	-0.0144*	-1.8696
D	-0.0250**	-2.4133
SIZE	-0.0338***	-6.8981
PROF	0.0389*	1.6990
LEV	-0.1016***	-6.9102
DIV	0.6371***	8.0503
Adjusted R^2	55.54%	
F statistic	16.1670***	
Likelihood ratio test	1447.8349***	
Hausman test	36.5136***	
Observation	1,992	

Note: The dependent variable is cash ratio (CASH). The independent variables are; introduction stage (I), the growth stage (G), the maturity stage (M), the decline stage (D), firm's size (SIZE), firm's profitability (PROF), leverage (LEV) and dividends (DIV). For the period 2000-2016. ***, **, and *, indicates that the coefficients are significant at the 1%, 5%, and 10% levels respectively.

The significant negative relationship between cash holding and firm size can be explained as follows: larger firms are better able to enter financial markets to raise funds externally, so these larger firms tend to hold less cash. This result is consistent with the results of several researchers such as; Kim et al. (1998), Schnure (1998), Opler et al. (1999), Almeida et al. (2004), Ferreira and Vilela (2004) and Ozkan and Ozkan (2004).

Cash holding is significantly positively related to firms' profitability; profitable firms depend more on internal financing, especially if there is an asymmetrical flow of information between firms and investors. This result is consistent with the result of Alzoubi (2013).

The relationship between cash holding and leverage is significantly negative; when firms are able to obtain debt, they will depend less on cash, as cash represents an opportunity cost; but when debt is not available, difficult to obtain or has a high cost, firms will hold more cash. This result is consistent with the results of several researchers such as; Kim et al. (1998), Faulkender (2002), Ferreira and Vilela (2004), Ozkan and Ozkan (2004), Chen and Mahajan (2010) and Alzoubi (2013).

Firms that pay cash dividends hold more cash to be able to make these cash dividend payments to their shareholders, which explains the significant positive relationship between cash holding and dividends. This result is consistent with the results of several researchers such as; Ozkan and Ozkan (2004), Chen and Mahajan (2010) and Alzoubi (2013).

The adjusted R^2 is 55.54%, representing a high explanatory power of the model; the overall model is significant with an F statistic of 16.1670. The fixed effect model is the most suitable model among pooled ordinary least square, fixed effect and random effect models as suggested by both Likelihood ratio and Hausman tests.

CONCLUSION

This study investigated a new issue to do with cash holding decisions, by considering the firm life cycle to understand how firms make decisions to hold cash. Most of the previous research on cash holding decisions focused on the motivations for holding cash, how firms'

characteristics affect cash holding decisions, the value associated with cash, or how cash holding affects other managerial decisions.

Based on a sample of 141 non-financial firms from the Amman stock exchange over the period 2000-2016, a fixed effect panel data analysis was conducted to understand how the different stages in a firm's life cycle affect cash holding decisions in order to expand previous knowledge of the determinants of cash holding decisions. The results show that cash holding is irrelevant during the introduction and growth stages of the firm's life; while during their maturity and decline stages firms start to hold less cash as the relationship becomes significantly negative. The results also show that cash holding decisions are negatively related to firm size and leverage, while positively related to profitability and dividends.

The author recommends applying this methodology to other samples to confirm the results, as the size of the sample used in this study might be considered a limitation.

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