

A NON-LINEAR RELATIONSHIP BETWEEN CASH HOLDINGS AND FIRM VALUE: STUDY OF COMPANIES IN THE EMERGING ECONOMY

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Abstract

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This research aims to gauge the effect of cash holdings on Jordanian companies' value and to detect whether there is a non-linear association between them. By conducting a multivariate regression on 86 non-financial companies listed on Amman Stock Exchange (ASE) during the period from 2006 to 2017. The results of the research reveal that there is a significantly positive association between cash holdings and firm value. The study also shows the positive impacts of financial leverage and revenues growth on firm value, while the results show that a size of a company has a negative effect on a value of a company. Moreover, the study notices that there is no optimal level to reserve some cash in order to increase firm value in Jordan. The methodology of the study depends on the work of Martínez-Sola, García-Teruel, and Martínez-Solano (2013) and Nguyen, Nguyen, and Le (2016). This research documents a substantial contribution to the existing research works that investigate the association between cash holdings and firm value in an emerging market like Jordan. Moreover, the findings are recognized to be an interest to policymakers, scholars, and potential investors.

Keywords: Amman Stock Exchange, Cash Holdings, Firm Value, Non-Financial Companies, Jordan

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1. INTRODUCTION

Cash is a liquid asset that is available for use at any time, and there is no doubt about the importance of having adequate cash holdings in business because they are of great importance to companies. More

specifically, the liquidity of the assets gives us an indication that the company is able to meet its short-term obligations when they became due. The importance of cash holdings goes back to the pioneering work of Keynes (1937) who pinpointed that there are three reasons for reserving

cash in firms. Firstly, transaction reason: It refers to the cash required by the company to meet the daily needs of its normal business operations. The company needs cash to pay salaries, dividends, interests, purchased goods, taxes, etc., likewise, it also gets cash from sales, debtors, investments, etc. Secondly, precautionary reason: This motivation refers to the tendency of the company to maintain cash to meet the unexpected or emergency conditions that arise in the workplace such as increasing raw material prices, strikes by employees and suppliers, change in demand, etc. Lastly, speculative reason: The company maintains cash to exploit potential opportunities that are outside a normal business, for instance, the low-interest rate on borrowed funds, the expected decline in raw material prices, or an appropriate change in government policies.

Therefore, it is important to investigate the association between cash holdings and firm value to demonstrate the phenomenon that there is a trade-off between liquidity and profitability that can improve the company's value. For instance, in the seminal work of Myers and Majluf (1984), they note that firms may incur higher costs of raising funds from external sources because of the transaction costs, asymmetry of information, and insufficient investment and this may lead to a lower firm value.

Mikkelson and Parch (2003) illustrate that there is a positive relationship between cash holdings and firm value. They notice that firms can benefit from the reserved cash in investing in positive net present value projects. Similar to that, Pinkowitz and Williamson (2001) document that one marginal dollar of cash holdings denoted more than one dollar of corporate market value. Nevertheless, Harford (1999) and Couderc (2005) reveal that companies that reserve more cash to enter in merge and acquisition activities may face a reduction in value.

Zaheer (2017) tests the effect of excess cash on firm value by employing a sample of 10 manufacturing Karachi companies over the period 2005-2015. The study finds that excess cash holding is significant and negatively associated with firm value. Furthermore, Jensen and Meckling (1976) reveal that keeping a large amount of cash can accelerate the information asymmetry between insider and outside investors and this could lead to a reduction in firm value. On the other hand, Martínez-Sola et al. (2013), Nguyen et al. (2016), and Anton and Nucu (2019) demonstrate that there is a non-linear association between cash holdings and firm value. More specifically, they illustrate that firms seek to reach an optimal level of cash in order to increase firm value. In other words, firms that have less (more) cash than the optimal level will decrease (increase) in their value. Moreover, reserving more cash will lead to a trade-off between opportunity costs and agency costs.

This research aims to investigate the effect of cash holdings on firm value and to test whether there is an optimal level of cash holdings in a Jordanian corporate setting, in which the value of the company can be maximized. Therefore, this research seeks to answer the following research questions:

RQ1: Does cash holdings influence the Jordanian non-financial firms?

RQ2: Is there an optimal level of cash holdings, in which the Jordanian non-financial firms can be maximized?

The remaining of this research is structured as follows. Section 2 discusses the literature review and the research hypotheses. Section 3 presents the research methodology. Section 4 documents the data analysis both descriptive and empirical figures. Section 5 mentions the research results and discussions. Lastly, Section 6 concludes the research and mentions some of its implications.

2. LITERATURE REVIEW

Previous studies have gauged the effect of cash holdings on firm value both in developed and developing markets (Abushammala & Sulaiman, 2014; Alzoubi, 2016; Anabestani & Shourvarzi, 2014; Anton & Nucu, 2019; Asante-Darko, Adu Bonsu, Famiyeh, Kwarteng, & Goka, 2018; Cao & Chen, 2013; Change, Benson, & Faff, 2017; Gill & Shan, 2012; Lee & Lee, 2009; Martínez-Sola et al., 2013; Saddour, 2006; Zaheer, 2017).

In the context of developed markets, in France, Saddour (2006) investigates the determinants of cash holdings on a sample of 279 firms over the period 1998-2002 and documents a positive relationship between the level of cash holdings and firm value. Nevertheless, Gill and Shan (2012) examine the effect of cash holdings on value of the Canadian firms. By utilizing a sample of 166 Canadian firms during the period 2008-2010, they note a negative association between the level of cash holdings and firm value.

In the US, Martínez-Sola et al. (2013) test the effect of cash holdings on firm value over the period 2001-2007. Interestingly, they document a non-linear association between cash holdings and firm value. More specifically, they illustrate that the relationship between the level of cash holdings and firm value is positive (negative) when the cash level is below the optimum (above the optimum).

However, in the context of developing markets, for example, China, Cao and Chen (2013) investigate the association between cash holdings and firm value by incorporating 2,261 Chinese industrial firms over the period 2010-2013. They reveal a positive association between cash holdings and firm value. The study of Ifada Indriastuti, and Hanafi (2020) examines the role of cash holding in increasing firm value over the period 2016-2018 on a sample of 141 manufacturing companies listed on the Indonesia Stock Exchange. They showed a significant positive effect of cash holding on firm value. From Tehran, Anabestani and Shourvarzi (2014) examine the association between cash holdings, firm value, and corporate governance on a sample of 99 over the period 2006-2011. The results demonstrate that there is a significant positive association between cash holdings and corporate governance. However, no statistically significant association has been detected between cash holdings and firm value. The study of Doan (2020) aimed to identify the impact of cash holdings on firm performance on a sample of Vietnam in the period 2008-2018. The study showed

the positive impact of cash holding on firm performance. It provides a reliable basis for financial managers to make appropriate cash holding decisions to improve the firm performance.

Zaheer (2017) tests the effect of excess cash on firm value by employing a sample of 10 manufacturing Karachi companies over the period 2005-2015. The study finds that excess cash holding is significant and negatively associated with firm value. From Ghana, Asante-Darko et al. (2018) examine the effect of ownership management and cash holdings on firm value over the period 2010-2014. They showed that management ownership has a positive and statistically significant association with firm value. However, a negative association has been detected between cash holdings and firm value. The study of Nguyen et al. (2016) aimed to identify the non-linear relationship between firm value and corporate cash holdings. The sample includes non-financial Vietnamese for the period 2008-2013. The results revealed an inverse relationship between firm value and cash holdings. Anton and Nucu (2019) investigate the impact of corporate cash holdings on firm value on a sample of Polish listed firms in an emerging economy during the period 2007-2016. By employing regression analysis, they document a non-linear association between cash holdings and firm value.

From the Jordanian corporate settings, Abushammala and Sulaiman (2014) test the effect of cash holdings on firm performance during the period 2000-2011. They note that there is a positive association between cash holdings and firm performance. In the same vein, Alzoubi (2016) investigates the impact of the financial crisis on the value of cash holdings by using a sample of 80 non-financial companies over the period 2001-2011. He documents that during the 2007-2009 financial crisis the external financing was more difficult and costly which stimulate the firms to reserve more cash.

From the above-mentioned studies, this study notices that there are mixed results on the association between the level of cash holdings and firm value. More specifically, some scholars find that there is a positive association between cash holdings and firm value, while the other works have documented a negative relationship. Nevertheless, this research contributes to expanding the existing literature, by identifying the type of association between cash holdings and firm value (linear or non-linear) in the context of emerging economies in general and Jordan in particular, as well as shedding light if there is an optimal level of cash holdings at which the value of those companies be maximized.

To sum up, this research examines two aspects. Firstly, this study shows the effect of cash holdings on firm value. Secondly, the research investigates if there is an optimal level of cash holdings, in the Jordanian firms that can be maximized over the period 2006-2017. Therefore, the following hypotheses are:

H1: There is a statistically significant effect of cash holdings on the Jordanian non-financial firms.

H2: There is an optimal cash holdings level, in which the Jordanian non-financial firm value can be maximized.

3. RESEARCH METHODOLOGY

3.1. The research sample and data

In this research, the statistical population is all of the non-financial companies listed in the Amman Stock Exchange (ASE) over the period 2006-2017. However, the research imposes several requirements on the selected firms to be included in this study: 1) the regularity of publishing the financial reports and the fiscal year-end of the firm on December 31; 2) the firm should not change its fiscal during the research period; 3) having the disclosed data to compute the variables of the study. After studying the data and excluding firms that did not meet the above conditions and excluding the missing values, non-financial public shareholding companies were selected as the sample of 86 companies, which represents 6,134 firm-year observations. After deleting 1% of the extreme values from the first and last, we contained the final sample of 6,014 firm-year observations. This study uses unbalanced panel data analysis by using STATA to regression Models 1 and 2.

3.2. Statistical models

To attain the aims of the study, the statistical models were used to examine the direction of the effect of cash holdings on firm value and whether there is an optimal level of cash holdings, in which firm value of the Jordanian non-financial companies can be maximized.

Therefore, this research employs two regression models.

The first model (Model 1) is based on the hypothesis (*H1*) that there is a statistically significant effect of cash holdings on Jordanian non-financial firm value.

$$Value_{it} = \beta_0 + \beta_1(CASH_{it}) + \beta_2(LEV_{it}) + \beta_3(SIZE_{it}) + \beta_4(GROWTH_{it}) + \varepsilon_{it} \quad (1)$$

To check the robustness of the study results, two proxies of firm value were used — the market-to-book (MTB_1 and MTB_2) ratio. However, the research employs the well-known determinants of cash holdings and uses them as control variables mainly leverage, size, and growth. These variables were calculated according to previous studies such as Ozkan and Ozkan (2004), Martínez-Sola et al. (2013), Nguyen et al. (2016), and Anton and Nucu (2019).

Where, $Value_{it}$ is the dependent variable in our study and represents firm value, which is measured by the market-to-book (MTB_1 and MTB_2) ratio. MTB_1 is calculated as the ratio of the market value of equity plus the book value of debt to total assets. MTB_2 is calculated as the ratio of the book value of total assets minus the book value of equity plus the market value of equity to the book value of total assets. Whereas, $CASH$ is the independent variable that represents the corporate cash holdings, which is calculated as cash and cash equivalent to total assets. $CASH$ and its square ($CASH^2$) are employed to examine the non-linear association in research Model 2. A set of control variables are used to adjust the relationship between corporate cash holdings

and firm value; *LEV* represents leverage, which is computed as total liabilities to total assets; *SIZE* denotes firm size, which is the natural logarithm of total assets; *GROWTH* indicates firm growth, which is proxies as the percentage change in total revenues of firms; ε_{it} is the random error term.

The second model (Model 2) is based on the hypothesis (*H2*) that there is an optimal cash holdings level, in which Jordanian non-financial firm value can be maximized.

Based on the works of Martinez-Sola et al. (2013), Nguyen et al. (2016), and Anton and Nucu (2019), this research tests the effect of cash holdings and its square on firm value by using the following regression.

$$Value_{it} = \beta_0 + \beta_1(CASH_{it}) + \beta_2(CASH_{it}^2) + \beta_3(LEV_{it}) + \beta_4(SIZE_{it}) + \beta_5(GROWTH_{it}) + \varepsilon_{it} \quad (2)$$

Model 2 only differs from Model 1 by adding the cash squared variable (*CASH²*).

4. DATA ANALYSIS AND HYPOTHESES TESTING

4.1. Descriptive statistics

Table 1 presents the statistical description of the study variables including the minimum, maximum, mean, and standard deviation. The results point out that the average *MTB₁* in the listed non-financial companies (ASE) reached 1.362 during the study period, which is close to *MTB₂* that is 1.223, and the standard deviation *MTB₁* and *MTB₂* was 0.738 and 0.628 respectively.

The variable of cash and cash equivalents (*CASH*) is ranged from 0.001-0.592, indicating that some companies held a little cash and its equivalent

while other reaches as much as 59% from their total assets. On average, the Jordanian firms held 10.8% to be used in short-term investments due to the rapid conversion into cash and the desire of these companies to take advantage of quick profits. The total debt to total assets ratio (*LEV*) average is 33%, which indicating less dependency on financing from third parties compare to internal sources. In addition, the results show that the average size of all companies of equals measured in natural logarithm is 7.467. The firms in this sample are growing at 9% during the study period. The minimum growth of -0.949, indicates that the current year revenues for some companies are lower than the previous year, which led to appear negative results.

Table 1. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max	Obs.
<i>MTB₁</i>	1.362235	0.737973	0.156	4.581	1004
<i>MTB₂</i>	1.222783	0.627532	0.122	4.351	1004
<i>CASH</i>	0.108075	0.117854	0.001	0.592	1004
<i>LEV</i>	0.330224	0.209564	0.004	0.933	1004
<i>SIZE</i>	7.466686	0.538782	5.990	9.055	1004
<i>GROWTH</i>	0.091454	0.576409	-0.949	7.496	994
Total					6014

4.2. Correlation

Testing the Spearman correlation coefficient in Table 2 shows the correlations coefficients between *MTB₁* and *MTB₂* and *CASH*, *LEV*, *SIZE*, and *GROWTH* in the ASE. In general, most variables have high pair-wise correlation coefficients, except the one between the *LEV* and the market-to-book value when using *MTB₂*.

Table 2. Spearman correlation

Variables	<i>MTB₁</i>	<i>MTB₂</i>	<i>CASH</i>	<i>LEV</i>	<i>SIZE</i>	<i>GROWTH</i>
<i>MTB₁</i>	1					
<i>MTB₂</i>	0.8760*	1				
<i>CASH</i>	0.2958*	0.2767*	1			
<i>LEV</i>	-0.1989*	-0.0211	-0.2446*	1		
<i>SIZE</i>	0.2203*	0.1659*	-0.1233*	0.1916*	1	
<i>GROWTH</i>	0.1476*	0.1590*	0.0207	0.0354	0.0849*	1

Note: * denotes significance at <0.05 levels.

The results showed that cash, size, and growth are statistically positively associated with firm value *MTB₁* (*MTB₂*), the coefficient of Spearman was 0.2958* (0.2767*), 0.2203* (0.1659*), 0.1476* (0.1590*) respectively. In addition, the results in Table 2 shows a significant negative relationship between *LEV* and firm value is whether using *MTB₁* or *MTB₂*.

These results also provide initial evidence of the positive relationship between cash holdings and firm value (*MTB₁* and *MTB₂*) in the listed non-financial companies. This indicates that the greater the cash holdings, the greater firm value.

4.3. Collinearity test

Table 3 presents the variance inflation factor (VIF) to test the collinearity of the variables. The values of VIF were ranged between 1.00 and 1.14 since these values are less than ten; this points out that there is

no multicollinearity problem with the variables. Tolerance values also confirm the previous result, as they are greater than 0.2, it indicates that the linear relationship between the variables is accepted, as Gujarati and Porter (2010) pointed out.

Table 3. VIF and tolerance tests variation

Variables	Tolerance	VIF
<i>CASH</i>	0.880	1.14
<i>LEV</i>	0.923	1.08
<i>SIZE</i>	0.948	1.05
<i>GROWTH</i>	0.997	1.00
Mean VIF		1.07

4.4. Hypotheses testing

The first hypothesis (*H1*) is tested using multivariate regression analysis in order to understand the effect of cash holdings on the value of the company. In Table 4, Model 1 showed that the F-value is 88.88

and 61.24 by using MTB_1 and MTB_2 respectively, and the statistical significance at 1%. This indicates that the independent variable ($CASH$) and the existence of control variables (LEV , $SIZE$, and $GROWTH$) have a statistically significant effect at 1% level. The results of this analysis showed that the Adj. R^2 values are equal to 0.2735 and 0.2046 by using MTB_1 and MTB_2 , respectively, which means that the research variables explain 27.4% and 20.5% of the variance in MTB_1 and MTB_2 , respectively, which are statistically significant at a level less than 1%. Beta values in Table 4 showed that the $CASH$ variable was the most effective compared to the other variables, as the beta coefficient of this variable ($CASH$) was positive (2.333 and 2.155) with t-statistic of 12.90 and 13.03 respectively, and a p-value of 0.000 significant at a level less than 1%. The regression coefficients of the leverage (LEV) are negative (-0.789 and -0.140) with t-statistic of -7.40

and -1.45 by using MTB_1 and MTB_2 , respectively and a p-value of 0.000 significant at 1% only by using a dependent variable (MTB_1), but by using MTB_2 is not significant. As for the size of the company ($SIZE$), the results show that the value of the coefficients are positive (0.434 and 0.252) with a t-statistic of 10.79 and 6.95 and a p-value of 0.000 significant at 1%. Based on this result if the $SIZE$ increases by one unit, the increase in MTB_1 and MTB_2 will be 43% and 25% respectively. The regression coefficient of the growth of the firm ($GROWTH$), showed the values of the beta coefficients are positive (0.105 and 0.125) with t-statistic of 2.73 and 3.60 by using MTB_1 and MTB_2 , respectively and a p-value of 0.000 significant 1%. Based on this result, the growth increased by one unit, increases approximately the MTB_1 and MTB_2 by 11% to 13% respectively.

Table 4. Regression results for Model 1

Variables	MTB ₁			MTB ₂		
	β	t	Sig.	β	t	Sig.
Intercept	-1.884	-6.38	0.000	-0.850	-3.19	0.001
CASH	2.333	12.90	0.000	2.155	13.03	0.000
LEV	-0.789	-7.40	0.000	-0.140	-1.45	0.147
SIZE	0.434	10.79	0.000	0.252	6.95	0.000
GROWTH	0.105	2.73	0.007	0.125	3.60	0.000
Observation	935			938		
Adj. R ²	0.2735			0.2046		
F-value	88.88		0.000	61.24		0.000

Source: Authors' elaboration.

To test the second hypothesis (H_2) a multivariate regression analysis was also performed to determine if there is an existence of an optimal level of cash holdings, in which the value of the Jordanian non-financial companies can be maximized. If the deviation from this level the value of the company will be decreased, the cash coefficient is expected to be positive ($\beta_1 > 0$) and significant, and the cash square coefficient is expected to be negative ($\beta_2 < 0$) and significant.

In Table 5, Model 2 showed that the F-value is 71.09 and 49.07 by using MTB_1 and MTB_2 , respectively, and statistical significance at 1%. The results of this analysis showed that the Adj. R^2 values are equal to 0.2728 and 0.2042 by using MTB_1 and MTB_2 in Model 2 respectively, which means that

the research variables explain 27.28% and 20.42% of the variance in MTB_1 and MTB_2 , respectively. The beta coefficient in Table 5 showed that $CASH$ was positive (2.536 and 1.863) with t-statistic of 5.26 and 4.26 respectively, and a p-value of 0.000 significant at a level less than 1%, this result was expected. While the regression coefficient of the cash squared ($CASH^2$) is negative (-0.483) with a t-statistic of -0.45 by using MTB_1 and a p-value of 0.650, which is not significant. When MTB_2 was used, the results showed $CASH^2$ is positive (0.700) with t-statistic of 0.72 and a p-value of 0.472 is also not statistically significant. This result was the opposite of what was expected. The control variables (LEV , $SIZE$, and $GROWTH$) in Model 2 were consistent with the results in Model 1.

Table 5. Regression results for Model 2

Variables	MTB ₁			MTB ₂		
	β	t	Sig.	β	t	Sig.
Intercept	-1.903	-6.38	0.000	-0.823	-3.06	0.001
CASH	2.536	5.26	0.000	1.863	4.26	0.000
CASH ²	-0.483	-0.45	0.650	0.700	0.72	0.472
LEV	-0.788	-7.38	0.000	-0.142	-1.48	0.147
SIZE	0.435	10.79	0.000	0.250	6.89	0.000
GROWTH	0.105	2.72	0.007	0.125	3.60	0.000
Observation	935			938		
Adj. R ²	0.2728			0.2042		
F-value	71.09		0.000	49.07		0.000

Source: Authors' elaboration.

5. RESULTS AND DISCUSSION

The correlation results showed that cash, size, and growth are positive correlated with firm value. The results of Model 1 in Table 4 show that the level

of cash holdings has a positive effect on the value of the Jordanian companies. This indicates that as firms increasing their level of cash, they will have a higher value. In addition, the results are consistent with some of the other research that found

the positive impact between cash holdings and firm value (Cao & Chen, 2013; Saddour, 2006). The Jordanian non-financial companies may retain cash for precautionary motivation to face events and emergencies and unexpected volatility of the business in the future to protect themselves from the possibility of a cash deficit and thus lower the value of the company.

The main motivation for retaining internal funds or liquid assets may be the transaction cost. Companies' retention of cash enables them to meet their current expenses, and internal financing enables the Jordanian companies to carry out their investment projects with positive net present value without the need to depend on external funds, which usually have high transaction costs. These advantages of cash holdings make them valuable to shareholders. In practice, the Jordanian companies hold cash reserves to give them the benefits of financial flexibility because dependence on external financing is not always available, difficult to obtain, and its costs are high. Horioka and Terada-Hagiwara's (2014) study found that companies in Asia usually retain more cash balance to finance future projects and investments, compared to companies located in developed countries.

The existence of cash reserves or highly liquid assets is usually considered the backbone of the company. Moreover, it indicates its ability to meet liabilities on the maturity date, which is necessary to consider the company as a going concern to protect them from liquidation (Hamad & AL-Momani, 2018; Hamad, AL-Momani, & Al-Mawali, 2019). Companies that hold cash as if they maintain a buffer zone against the cash deficit in the future (Lins, Servaes, & Tufano, 2010).

The results also showed that leverage reduces the value of the company as the total debts have had a negative effect on the value of the company when using MTB_1 , where the appearance of high amounts of liabilities in the financial statements is a negative indicator for shareholders and therefore the value of the company decreases.

The size of a company plays a positive role by influencing its value. The larger the company, the greater its value. It means that large companies hold of cash increases their value, which increases their ability to take an advantage of investment opportunities and take profitable projects.

The results also show that companies with high growth, which means high performance, increase and maximize their value.

Cash retention, high volume, and high performance help increasing the value of the company. Based on these results, $H1$ has been accepted, and the alternative hypothesis has been rejected.

The results of $H2$ are contrary to what is expected. The non-linear relationship does not exist between firm value and the cash holdings, whether using MTB_1 or MTB_2 . The cash squared coefficient has shown a negative value when using MTB_1 but is not statistically significant. The cash squared coefficient has shown a positive value when using

MTB_2 and is not statistically significant. However, this hypothesis confirmed what has been stated in $H1$, that the relationship between cash holding and firm value is a positive linear relationship only since the coefficient of the cash variable is positive and significant as expected. The result of $H2$ is insignificant which is contrary to Martinez-Sola et al.'s (2013) as they based their analysis on a sample of US companies for the period 2001-2007.

We concluded from the above that the Jordanian non-financial companies do not maintain an optimal level of cash balance. This means that they do not balance between the benefits and the costs of cash assets to determine the optimal level of cash. This also means that the relationship between cash holdings and firm value is not concave.

Based on these results, there is no optimal cash holdings level, in which the value of the Jordanian non-financial companies can be maximized, so $H2$ is rejected.

6. CONCLUSION

The analysis has shown that there is a significant and positive relationship and effect of cash holdings and the value of the Jordanian non-financial companies. In other words, the greater cash holdings in the Jordanian non-financial companies, the greater market-to-book value (MTB_1 and MTB_2). In addition, control variables (LEV , $SIZE$, and $GROWTH$) have an influence on firm value. Adopting the model used by Martinez-Sola et al. (2013), Nguyen et al. (2016), and Anton and Nucu (2019) to test the existence of a non-linear relationship between cash holdings and firm value on the Jordanian non-financial companies, we found that a concave relationship does not exist between cash holdings and firm value, which means that there is no optimal level of cash holdings, at which the value of the companies to be maximized.

We note from the results of the study that the Jordanian non-financial companies behave differently from developed countries. They retain cash to increase the value of their companies for the reasons mentioned above.

One of the limitations of this paper is that the sample was limited to a sample of the Jordanian non-financial companies and did not extend to all sectors. Therefore, the results of this study cannot be generalized to all companies in Jordan. In addition, the sample size is small.

Future researches are suggested to investigate the effect of cash holdings on firm value in all Jordanian sectors, including industrial and services for each sector separately, and compare them, because of the different characteristics and the importance of cash holdings for each sector. Important control variables such as profitability (ROA and ROE), corporate governance, dividends, etc., are recommended to be included in these future researches.

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