

Article

The Effect of Cash Holdings on Financial Performance: Evidence from Middle Eastern and North African Countries

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Abstract: This work aimed to examine the effect of corporate cash holdings on financial performance. The data covered 536 non-financial firms for the 2006–2020 period from 11 MENA region countries. This study used fixed- and random-effects testing models. To the best of the authors' knowledge, this is the first study that aimed to study the effect of corporate cash holdings on financial performance in MENA countries in two aspects: linear and non-linear relationships. By using the return on assets, return on equity, earnings before interest, and the tax margin as the indicators of financial performance, we developed two groups of models investigating the linear and non-linear relationships between cash holdings and profitability measures. The models included several control variables, namely leverage, firm size, sales growth rate, tangibility, dividend pay-out ratio, and gross domestic product (GDP) growth rate. The results of this study revealed that both the linear and non-linear models produced significant results for the return on assets and the return on equity, but for the earnings before interest and tax margins, the linear model was insignificant. The non-linear models indicated an optimal level of cash holdings. In this context, the policymakers must actively evaluate these policies, such as working capital management and its effect on financial performance. In addition, the policymakers must consider macroeconomic conditions when designing corporate cash-holding policies.

Keywords: cash holdings; financial performance; MENA countries

JEL Classification: G30; G32; G39



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1. Introduction

Since the last global 2008 economic crisis, raising the levels of cash reserves in business has triggered significant interest in the finance and accounting empirical literature. One of the most debated topics in the finance and accounting literature is the potential impact of corporate cash holdings on financial performance. Cash holdings have a substantial role in the financial decisions of firms (Yun et al. 2021). In this context, cash holdings are characterized by highly liquid assets with short-term maturity (Wellalage et al. 2023). Although increasing their cash holdings is not the main target of firms, this cash aims to reinforce the production process and activities, and it impacts production and investment decisions. Hence, this cash may have a positive role in firm sustainability. Firms usually keep a specific or optimal level of cash to avoid any liquidity problems in the future and avail any investment opportunities (Khan et al. 2019). However, the main motivation for cash holdings is precautionary. Hence, excess cash holdings may increase agency conflicts and the misuse of cash resources by firms for their self-benefit (Wellalage et al. 2023).

Prior studies documented that firms keep a relatively significant cash amount in their balance sheets in Europe and the UK (Ferreira and Vilela 2004; Guney et al. 2003; Ozkan and Ozkan 2004), in the USA (Bates et al. 2009; Graham and Leary 2018), and in other countries (Drobetz et al. 2010; Seifert and Gonenc 2016). Keeping the optimal level of cash is an important decision for both short- and long-term financial management and firms face

a trade-off between the positive and negative effects of holding cash. Cash holdings help firms run daily operations smoothly and undertake potential investment opportunities; however, excess cash has a cost as well, as it can be an issue of conflict of interest among different stakeholders.

In recent decades, several studies attempted to investigate corporate cash holdings from different aspects and in different contexts (Opler et al. 1999; Kalcheva and Lins 2007; Oler and Waagelein 2011; Bigelli and Sánchez-Vidal 2012; Abushammala and Sulaiman 2014; Kim and Bettis 2014; Harris and Raviv 2017). The influence of the level of cash holdings kept by firms on their financial performance is a topic with mixed results in the literature and the findings are inconclusive. This article aimed to contribute to the existing literature by presenting empirical evidence from Middle Eastern and North African (MENA) countries. MENA is a type of country classification used by several international organizations such as the International Monetary Fund (IMF) and World Bank, and the countries included in this classification possess some common characteristics. The access to external financing by these firms is relatively more challenging compared to firms in developed nations. This fact constitutes one of the most important motivations of the research aim of this article. A multi-country approach allows us to make inferences about the potential effects of macroeconomic factors. The main objective of this article was to study the association between cash holdings and firm performance in two aspects: linear and non-linear relationships. In this way, this paper aimed to answer the main research questions regarding firm financial performance. Three profitability ratios are used: the return on assets (ROA), return on equity (ROE), and EBIT margin.

The test sample of this paper consists of 536 non-financial firms in MENA countries. The reasons that justify this focus are that MENA economies have common characteristics in many cultural aspects such as language, and they are also distinguished by particular customs and traditions that are different from those prevalent in other nations in terms of the nature of commitment and preservation (Aljughaiman et al. 2023), which affect the practices and ownership structure of non-financial firms in this region.

The rest of the article is structured as follows: the next section presents the theoretical background, a review of related literature, and hypotheses development. The third section provides details about the data and the methodology of the paper. The fourth section presents the descriptive statistics and the outcomes of the analyses. The fifth section includes a discussion of the results and concludes the article.

2. Literature Review

2.1. Theoretical Background

Theoretically, there are three prime motives for firms to hold cash: transactional, precautionary, and speculative motives. The transactional motive aims to minimize the need for external financing in case of cash payments for routine business activities, while the precautionary motive may arise when firms face any uncertainty linked to future business conditions (Keynes 1936) and aim to meet unexpected or urgently arising cash payments. The speculative motive is related to potential investment opportunities and cash holdings help them avoid the higher costs of external financing and assure better financial flexibility (Bates et al. 2009; Rapp et al. 2014). Having considered these motives, several theories attempted to explain why and at which level firms hold cash. The trade-off theory claims that firms need to have a target level of cash, which aims to find a balance between the benefits and costs of holding cash, aiming at the maximization of shareholder wealth (Dittmar et al. 2003). However, the pecking order theory is known by its proposition under the capital structure context that firms should first use retained earnings, followed by debt issue, and finally, equity issue. Depending on the potential investment opportunities, firms should use cash holdings as a buffer between retained earnings and investment spending (Myers 1984; Myers and Majluf 1984; Opler et al. 1999). Therefore, according to the pecking order theory, information asymmetries play a critical role in financing decisions and there

is no optimal level of cash holdings (Myers 1977; Myers and Majluf 1984). According to the theory of free cash flow, managers opt to hold large amounts of cash to have more power for potential investment decisions that benefit their interests (Jensen 1986). This situation may cause some conflict of interest among different parties. Firms having large cash holdings are not valued highly due to the concern that they spend cash on less profitable investment projects.

2.2. Review of the Related Literature

The influence of cash holdings on financial performance has been widely investigated in different contexts and the results have been inconclusive. Some studies reported a positive impact on financial performance (Pinkowitz et al. 2003; Kalcheva and Lins 2007; Fresard 2010; Palazzo 2012; Debadatta 2017; Ashhari and Faizal 2018; Doan 2020). Having a higher level of cash holdings produces several benefits, such as financing potential investment opportunities by internal funds under tight and expensive external financing conditions (Yang et al. 2017). High cash reserves help lower the firm risk, resulting in a higher firm value (Al-dhamari and Ismail 2015; Ranajee and Pathak 2019). Rocca and Cambrea (2019) investigated the effect of cash holdings on financial performance for a sample of 261 Italian firms for a long period from 1980 to 2015 and reported a net positive effect. They stated that the linkage is moderated by different factors, which may change the sign and intensity of the relationship. Jabbouri and Almustafa (2021) searched for the impact of cash holdings on firm performance in MENA emerging markets by using the data of listed non-financial companies for the period 2004–2018 and reported a significant positive relationship, which is more pronounced in economies with stronger national governance.

Some other studies contend that there is an adverse influence of cash holdings on financial performance (Wang 2002; Luo and Hachiya 2005; Dittmar and Mahrt-Smith 2007; Ameer 2012). Holding excessive cash and other liquid assets might increase agency costs and result in inefficient use of resources, which leads to worse financial performance (Rocca and Cambrea 2019).

Although most of the prior studies reported a linear relationship (positive or negative), some studies found a non-linear linkage between cash holdings and financial performance (Harford et al. 2008). In the USA context, Martínez-Sola et al. (2013) investigated the connection between cash holdings and firm performance in cases of US manufacturing companies by using Tobin's Q as the variable for firm performance and reported a non-linear relationship. Thanh (2019) searched for the optimal level of cash holding by using data from the Vietnam stock exchange and found a non-linear relationship, which confirms the existence of an optimal level of cash holding. A recent study by Alnori (2020) also reported a non-linear relationship with an inverted U shape for non-financial firms in Saudi Arabia, confirming the trade-off theory.

In light of the above-mentioned empirical studies, the present work contributes to the current empirical studies in the following ways: First, several empirical papers examined the association between cash holdings and financial performance, using different approaches and time periods (Pinkowitz et al. 2003; Kalcheva and Lins 2007; Fresard 2010; Palazzo 2012; Debadatta 2017; Ashhari and Faizal 2018; Doan 2020; Wang 2002; Luo and Hachiya 2005; Dittmar and Mahrt-Smith 2007; Ameer 2012). However, most of these studies have ignored the linear and non-linear impact of cash holdings on financial performance in MENA economies. Therefore, this study fills a gap in the empirical literature by examining the linear and non-linear impacts of cash holdings on financial performance in MENA economies.

3. Data and Methodology

3.1. The Sample and Data

The sample used in this study is composed of 536 non-financial firms from 11 countries in the MENA region. The data cover a 15-year period from 2006 to 2020. The earliest year is

lost due to sales growth rate calculations, resulting in a total of 7504 firm-year observations. The sample excludes financial companies because the business characteristics and the financial statement formats of those companies are different than those of non-financial companies. The source of data is the Refinitiv Eikon database (previously known as Thomson Reuters).

Table 1a,b shows the details of the sample, per country and industry breakdowns.

Table 1. (a) Sample per Country. (b) Sample per Industry.

(a)	
Country	No. of Firms
Bahrain	15
Egypt	98
Jordan	75
Kuwait	70
Lebanon	3
Morocco	42
Oman	61
Qatar	22
Saudi Arabia	84
Tunisia	25
United Arab Emirates	41
Total	536
(b)	
Economic Sector Name	No. of Firms
Basic Materials	111
Consumer Cyclicals	86
Consumer Non-Cyclicals	95
Educational Services	12
Energy	25
Healthcare	26
Industrials	80
Real Estate	65
Technology	23
Utilities	13
Total	536

3.2. Variables and Measurements

Table 2 shows the dependent, the independent, and the control variables used in the models and their measurements.

Table 2. Variables.

Variable Type	Variable Name	Measurement
Dependent	ROA	Net Profit/Total Assets
	ROE	Net Profit/Shareholders' Equity
	EBIT Margin	EBIT/Sales Revenue
Independent	Cash Holding	'Cash' and 'Cash Equivalents'/Total Assets
	Cash Holding ²	Square of Cash Holdings
Control	Leverage	Total Debt/Total Assets
	Firm Size	Natural Logarithm of Total Assets
	Sales Growth	Year-over-year change in Sales Revenue
	Tangibility	Property, Plant, Equipment (Net)/Total Assets
	Dividend	Dividend per share/Earnings per share
	GDP Growth Rate	Year-over-year change in the Country's GDP

3.3. Models

We developed two groups of models. The first was used to examine the linear relationship, whereas the second was used to explore the non-linear relationship between financial performance and cash holdings. In each group, three measures of profitability were used, namely the ROA, ROE, and EBIT margin.

In the first group of models, cash holdings is the independent variable; leverage, firm size, sales growth rate, tangibility, dividend pay-out ratio, and GDP growth rate of the firm's country are control variables.

Group 1 Models:

$$ROA_{i,t} = \beta_0 + \beta_1 CH_{i,t} + \beta_2 LEV_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 GROW_{i,t} + \beta_5 TANG_{i,t} + \beta_6 DIV_{i,t} + \beta_7 GDPGR_{i,t} + \beta_8 COUN_i + \beta_9 IND_i + \epsilon_{i,t} \tag{1}$$

$$ROE_{i,t} = \beta_0 + \beta_1 CH_{i,t} + \beta_2 LEV_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 GROW_{i,t} + \beta_5 TANG_{i,t} + \beta_6 DIV_{i,t} + \beta_7 GDPGR_{i,t} + \beta_8 COUN_i + \beta_9 IND_i + \epsilon_{i,t} \tag{2}$$

$$EBITM_{i,t} = \beta_0 + \beta_1 CH_{i,t} + \beta_2 LEV_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 GROW_{i,t} + \beta_5 TANG_{i,t} + \beta_6 DIV_{i,t} + \beta_7 GDPGR_{i,t} + \beta_8 COUN_i + \beta_9 IND_i + \epsilon_{i,t} \tag{3}$$

In the second group, the square of cash holdings is included in the model to reflect a non-linear relationship. In all models, we included country and industry dummy variables.

Group 2 Models:

$$ROA_{i,t} = \beta_0 + \beta_1 CH_{i,t} + \beta_2 CH_{i,t}^2 + \beta_3 LEV_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 GROW_{i,t} + \beta_6 TANG_{i,t} + \beta_7 DIV_{i,t} + \beta_8 GDPGR_{i,t} + \beta_9 COUN_i + \beta_{10} IND_i + \epsilon_{i,t} \tag{4}$$

$$ROE_{i,t} = \beta_0 + \beta_1 CH_{i,t} + \beta_2 CH_{i,t}^2 + \beta_3 LEV_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 GROW_{i,t} + \beta_6 TANG_{i,t} + \beta_7 DIV_{i,t} + \beta_8 GDPGR_{i,t} + \beta_9 COUN_i + \beta_{10} IND_i + \epsilon_{i,t} \tag{5}$$

$$EBITM_{i,t} = \beta_0 + \beta_1 CH_{i,t} + \beta_2 CH_{i,t}^2 + \beta_3 LEV_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 GROW_{i,t} + \beta_6 TANG_{i,t} + \beta_7 DIV_{i,t} + \beta_8 GDPGR_{i,t} + \beta_9 COUN_i + \beta_{10} IND_i + \epsilon_{i,t} \tag{6}$$

3.4. Estimation Method

The dataset used in this study is a balanced panel composed of time series and cross-sectional units. Fixed-effects and random-effects testing models are more suitable for panel

data, as pooled OLS regression results are biased. In the case of pooled OLS, firms’ non-observable individual effects are not observed and controlled, and as a result, heterogeneity may potentially influence measurements of the estimated parameters. Therefore, we employed fixed- and random-effects models in the estimation. Having run them for all models in both groups, we used the Hausman assessment to choose between the two employed models (fixed and random effects).

In the Hausman assessment, the rejection of the null-hypothesis H_0 indicates the absence of a correlation among the independent variables and the unobserved individual effects of the tested firms, which indicates that the fixed-effects model is more suitable. In the opposite case, the “random-effects testing model should be chosen.

4. The Results

This section presents the descriptive statistics and the results of linkage among the selected variables of this study.

4.1. Descriptive Statistics

Table 3 displays the descriptive statistics of the selected variables of this work: the mean, standard deviation, minimum, and maximum values of all of the variables.

Table 3. Descriptive Statistics.

Variable		Mean	Std _{Dev}	Min	Max
ROA	overall	0.045	0.127	−5.816	2.003
	between		0.072	−0.554	0.357
	within		0.105	−5.331	1.892
ROE	overall	0.071	0.436	−10.174	8.014
	between		0.150	−0.753	0.665
	within		0.410	−9.679	7.420
EBITM	overall	0.046	1.128	−33.137	19.082
	between		0.532	−7.601	2.732
	within		0.995	−28.339	16.397
CH	overall	0.119	0.136	0.000	0.998
	between		0.109	0.000	0.775
	within		0.081	−0.288	0.812
CH ²	overall	0.033	0.078	0.000	0.996
	between		0.062	0.000	0.667
	within		0.048	−0.469	0.804
LEV	overall	0.202	0.246	0.000	7.919
	between		0.190	0.000	2.258
	within		0.157	−2.056	5.864
SIZE	overall	18.991	1.788	13.469	25.586
	between		1.755	14.519	25.140
	within		0.349	16.702	21.727

Table 3. Cont.

Variable		Mean	Std _{Dev}	Min	Max
GROWTH	overall	0.164	2.059	−13.691	81.411
	between		0.554	−0.853	6.029
	within		1.984	−17.060	75.547
TANG	overall	0.342	0.251	0.000	0.989
	between		0.234	0.000	0.975
	within		0.092	−0.367	0.956
GDPGR	overall	0.030	0.038	−0.215	0.196
	between		0.014	0.006	0.072
	within		0.035	−0.198	0.154
DPSEPS	overall	0.463	2.432	−81.081	134.650
	between		0.705	−5.646	10.282
	within		2.328	−74.972	124.831

The mean values were 4.5%, 7.1%, and 4.6% for the ROA, ROE, and EBIT margin, respectively. The mean value of cash holdings was 11.9%, implying that the firms in this sample held 11.9% of assets in cash, on average. This is a moderate level of cash holdings and similar to the outcomes of previous empirical studies (Uyar and Kuzey 2014; Arora 2019). The firms were moderately leveraged with a mean value of 20.2%. On average, the tangible fixed assets were composed of 34.2% of the total assets of the sample. The firms had a relatively high payout ratio with a mean value of 46.3%.

4.2. Correlation Matrix

Table 4 displays the pairwise correlation analysis among the variables used in the panel data regressions. The table does not show any high correlations between any two independent variables, confirming the absence of multicollinearity problems.

Table 4. Correlation matrix.

	ROA	ROE	EBITM	CH1	LEV	SIZE	GROWTH	TANG	GDPGR	DIV
ROA	1									
ROE	0.45 ***	1								
EBITM	0.16 ***	0.09	1							
CH1	0.23 ***	0.09 ***	0.02 *	1						
LEV	−0.32 ***	−0.07 ***	−0.02 ***	−0.27 ***	1					
SIZE	0.09 ***	0.05 ***	0.11 ***	−0.10 ***	0.16 ***	1				
GROWTH	−0.07 ***	−0.03 ***	0.04 ***	0.04 ***	−0.00	0.01	1			
TANG	−0.01	−0.02 *	0.01	−0.20 ***	0.07 ***	0.04 ***	−0.02 **	1		
GDPGR	0.13 ***	0.08 ***	0.05 ***	0.02 **	−0.06 ***	−0.05 ***	0.05 ***	0.04 ***	1	
DIV	0.04 ***	0.03 **	0.02 **	0.03 ***	−0.03 ***	0.06 ***	0.00	−0.01	−0.02 **	1

***, **, *: Significant at 1%, 5%, and 10%, respectively.

4.3. Regression Results

Table 5 illustrates the outcomes of the panel data regressions for the models in the first group. These models tested the linear linkage between cash holdings and profitability ratios. The results of the Hausman test for all three models revealed that fixed-effects was the suitable estimator; therefore, Table 5 shows the coefficients and significance levels as per the fixed-effects estimator. The results of F tests confirmed that all models had overall model significance at the 1% level.

Table 5. Regression results for the linear models.

	ROA (1)		ROE (2)		EBITM (3)	
Cash Holdings (CH)	0.159	(0.029) ***	0.123	(0.073) *	0.174	(0.348)
Leverage	−0.144	(0.021) ***	−0.048	(0.104)	0.157	(0.145)
Size	0.028	(0.014) **	0.039	(0.03)	0.102	(0.064) *
Growth	−0.005	(0.005)	−0.006	(0.01)	0.026	(0.015) *
Tangibility	−0.077	(0.019) ***	−0.270	(0.063) ***	−0.497	(0.258) **
GDP growth rate	0.393	(0.075) ***	0.847	(0.213) ***	2.011	(0.505) ***
Dividends	0.143	(0.048) ***	0.320	(0.095) ***	0.028	(0.225)
Constant	−0.458	(0.273) *	−0.624	(0.574)	−1.847	(1.232)
F test	51.90 ****		9.33 ***		2.98 ***	
R ²	0.14		0.05		0.02	
Hausman	151.67 ***		72.54 ***		52.52 ***	
Estimator	FE		FE		FE	

***, **, *: Significant at 1%, 5%, and 10%, respectively. Standards errors are in parentheses.

The first model, which included the ROA as the dependent variable, produced the most robust results. It reports a positive linear link between cash holdings and the ROA ratio, implying that keeping higher levels of cash has a positive effect on a firm's financial performance. Regarding the control variables, leverage and tangibility had a negatively significant effect, whereas firm size, GDP growth rate, and dividends had a positively significant effect. The growth rate was found to be insignificant.

The second model, which used the ROE as the dependent variable, also confirmed that cash holdings have a positive effect on profitability, but the result was significant at the 10% level. GDP growth rate and dividends were found to be positively significant; tangibility was negatively significant. The third model in which the EBIT margin was the dependent variable produced insignificant results for cash holdings.

Table 6 displays the regression outcomes for the second group of models, which included the square of cash holdings as an independent variable. Model 4 in which the ROA is the dependent variable has an overall model significance at the 1% level and confirms the non-linear relationship, and it reveals that cash holdings have a significantly positive effect on profitability. Leverage and tangibility have a negatively significant effect on profitability, whereas GDP growth rate and dividends have a positive effect at the 1% level, firm size is significant at the 10% level, and growth is found to be insignificant.

Model 5 in which ROE is the dependent variable also reported a significantly positive connection between cash holdings and profitability and confirmed a non-linear relationship. Tangibility has a negative effect, while GDP growth rate and dividends have a positive effect at the 1% level. Other independent variables produced insignificant results in this model.

Model 6, in which the EBIT margin is the dependent variable, reported a significant positive effect of cash holdings on profitability at the 10% level. It also reported a non-linear relationship.

In all models in the second group, the square of cash holdings (CH²) has a negative coefficient, which indicates an inverted U-shaped relationship. This implies that there is an optimal level of cash holdings: up to this level, cash holdings have marginal benefits, but beyond this level, marginal costs begin exceeding the benefits.

Table 6. Regression results for the non-linear models.

	ROA (4)		ROE (5)		EBITM (6)	
Cash Holdings (CH)	0.202	(0.042) ***	0.366	(0.157) **	0.915	(0.567) *
CH ²	−0.084	(0.092) *	−0.464	(0.302) **	−1.419	(0.867) *
Leverage	−0.144	(0.021) ***	−0.048	(0.101)	0.155	(0.135)
Size	0.027	(0.015) *	0.038	(0.031)	0.098	(0.065)
Growth	−0.005	(0.006)	−0.006	(0.01)	0.026	(0.016) *
Tangibility	−0.076	(0.019) ***	−0.263	(0.062) ***	−0.479	(0.257) **
GDP growth rate	0.392	(0.075) ***	0.845	(0.213) ***	2.007	(0.504) ***
Dividends	0.141	(0.047) ***	0.313	(0.093) ***	0.006	(0.227)
Constant	−0.456	(0.275) *	−0.612	(0.578)	−1.811	(1.255)
F test	46.35 ***		9.25 ***		3.05 ***	
R ²	0.14		0.06		0.01	
Hausman	164.99 ***		68.93 ***		53.96 ***	
Estimator	FE		FE		FE	

***, **, *: Significant at 1%, 5%, and 10%, respectively. Standards errors are in parentheses.

5. Findings and Discussion

This article aimed to investigate the effect of corporate cash holdings on financial performance. The present work aimed to fill the gap in the empirical literature to the existing literature by presenting empirical evidence on the effect of corporate cash holdings on financial performance in MENA countries in two aspects: linear and non-linear relationships. Regression model results revealed that the fixed-effects testing estimator is suitable for both groups of models. In the first group, all models have overall model significance. Model 1, which includes the ROA as the dependent variable, revealed that cash holdings had a positive significant impact on the firm’s financial performance. This implies that as firms increase their level of cash holdings, this will help improve their financial performance. Model 2, which includes the ROE as the dependent variable, produced similar results but with a weaker significance level. Model 3, which uses the EBIT margin as the dependent variable, produced insignificant results; even though there are some control variables with significant coefficients, the coefficient of cash holdings is not significant. The fact that the ROA and ROE produced significant results whereas the EBIT margin did not might be explained by the difference in the calculations of those ratios. The ROA and ROE use net profit after tax and divide it by total assets and total equity, respectively. Therefore, they show the effects of all operating and non-operating items of income and expenses, while the EBIT margin is an indicator of profitability from operations. The finding of a positive relationship between cash holdings and financial performance is consistent with the findings of previous empirical studies such as [Abushammala and Sulaiman \(2014\)](#) in Jordan, [Yun et al. \(2021\)](#) in China, and [Jabbouri and Almस्ताfa \(2021\)](#) in MENA countries.

The second group of models confirmed the existence of a non-linear linkage between cash holdings and financial performance. The regression results showed that this non-linear relationship has an inverted U-shaped pattern. This finding is consistent with the trade-off theory, implying the existence of an optimal level of “cash holdings”. Cash holdings have a positive effect up to a specific point and it decreases beyond this point. This finding is also consistent with the results of prior studies; for instance, [Thanh \(2019\)](#) in Vietnam and [Alnori \(2020\)](#) in Saudi Arabia, among others. These results showed different significance levels for the profitability ratios; at 1% for the ROA, at 5% for the ROE, and 10% for the EBIT margin. The finding of an inverted U shape has important policy implications for financial management purposes. Both the pros and cons of keeping cash holdings must be considered when developing a policy. Our study used one macroeconomic variable, which is the GDP growth rate, to incorporate the effect of macroeconomic conditions on the cash holdings–financial performance relationship, and the results showed a positively significant effect. This finding implies that macroeconomic conditions should be taken into consideration when designing corporate cash holdings policies.

6. Conclusions and Policy Implications

In this work, we investigated the effect of corporate cash holdings on financial performance. Two groups of models were developed: linear and non-linear models. In both groups, the ROA, ROE, and EBIT margins were used as dependent variables to measure the financial performance. Cash holdings were the main independent variable, together with other control variables. In the non-linear models, the square of cash holdings was added to analyze the non-linear characteristics of the relationship. To the best of the authors' knowledge, this is the first empirical study that aimed to explore the influence of corporate cash holdings on firm performance in MENA countries in two aspects: linear and non-linear relationships.

The present work presents some significant findings and implications for policymakers in non-financial firms to improve their financial performance. In this context, this study shows that cash holdings have a positively significant effect on financial performance, which is measured using the return on assets, return on equity, and EBIT margin. The findings showed that an increased level of cash holdings in the tested firms will promote financial performance. In addition, the findings of this study confirmed the existence of a non-linear linkage between cash holdings and financial performance. The tested results affirmed that the non-linear relationship has an inverted U-shaped pattern.

The findings of this work are in line with trade-off theory, meaning the existence of an optimal level of cash holdings. These findings can be attributed to the fact that cash is the most liquid asset that helps firms reinforce their transaction needs, investment opportunities in the market, and risk provisions. The strong relationship between cash holdings and financial performance highlights the need for corporate managers to consider financial performance in their policy decisions on cash holdings. In addition, this study showed that the GDP growth rate has a powerful influence on the financial performance of the tested firms.

The findings of this work have some implications for improving financial performance. In this context, this study suggests that the policy makers in MENA countries must actively evaluate these policies, such as working capital management and its effect on financial performance. In addition, this study suggests that policymakers in this region must consider macroeconomic conditions when designing corporate cash-holding policies.

The present work faces some limitations such as this study used only 11 MENA region countries due to data availability. In addition, this study only covered the non-financial sector in MENA nations. Therefore, future studies can focus on other regions. In addition, the present work used fixed- and random-effects testing models. Hence, future studies can employ other linear and nonlinear models. Future research may improve the models by including new variables for corporate governance. This might be an interesting venue for research on the level of the cash holdings effect and how it is being affected by agency problems and corporate governance mechanisms. Board composition, independence, CEO duality, and audit committee characteristics could potentially have an impact on the linkage between cash holdings and financial performance. Finally, future empirical studies can examine this relationship before and after the COVID-19 pandemic to address the impact of this pandemic on the cash holdings–financial performance linkage.

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