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Cash Holding Decision from Managerial Overconfidence and its Effect on Firm Performance

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ABSTRACT

Managerial overconfidence significantly influences firm performance. The main purpose of this research is how to find the impact of managerial overconfidence along with cash holding decision might be more negatively serious on firm performance. An empirical study is conducted on a sample of 648 firms listed in the Vietnam stock market. The research predicts that the higher the level of managerial overconfidence, the greater the risk and likelihood of loss in firm value, especially with inappropriate cash holding decision. Finally, the empirical results reveal a positive correlation between managerial overconfidence and firm value. However, firms characterized by both managerial overconfidence and low cash holdings tend to exhibit poorer performance compared to others. Those results are satisfied the purpose of the research.
Keywords: cash holdings; corporate finance; managerial overconfidence; overconfident manager; managerial optimism; firm performance; firm value; Vietnam

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ОРИГИНАЛЬНАЯ СТАТЬЯ

Решение о хранении наличных средств, обусловленное чрезмерной самоуверенностью менеджеров, и его влияние на результаты деятельности компании

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АННОТАЦИЯ

Чрезмерная самоуверенность менеджеров оказывает значительное влияние на результаты деятельности компании. Основной **целью** данного исследования является выявление влияния чрезмерной самоуверенности менеджеров, которая в сочетании с решением о хранении наличности может стать негативным фактором для компании. Проведено эмпирическое исследование на выборке из 648 фирм, зарегистрированных на фондовом рынке Вьетнама. Результаты исследования показали, что чем выше уровень самоуверенности менеджеров, тем выше риск и вероятность снижения стоимости компании, особенно при неправильном решении о хранении денежных средств. Также выявлена положительная корреляция между самоуверенностью руководителей и стоимостью компании. Фирмы, для которых характерны как чрезмерная самоуверенность руководителей, так и низкий уровень владения денежными средствами, как правило, демонстрируют более низкие показатели по сравнению с другими. Эти результаты отвечают цели исследования.
Ключевые слова: денежные средства; корпоративные финансы; управленческая самоуверенность; самоуверенный менеджер; управленческий оптимизм; производительность компании; стоимость компании; Вьетнам

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INTRODUCTION

Kim et al. [1] acknowledge the influence of managerial overconfidence on firm performance [2]. Yet, scant attention is given to the correlation between managerial overconfidence and cash holding decisions in affecting firm performance. Notably, research by Dao et al. [3] suggests a negative impact of managerial overconfidence on cash holdings. This study aims to examine the impact of overconfident managers on firm value through their propensity for holding reduced cash reserves, within the context of Vietnam.

Data was gathered from 648 non-financial listed firms, incorporating direct interviews with 123 top managers, alongside information on managers' gender and photo scale from annual reports. The study bridges theoretical and practical realms by exploring how overconfident managers influence firm value and the ramifications of cash holdings on firm performance amidst managerial overconfidence. Results are anticipated to align with existing literature, indicating either improved or deteriorated firm performance under overconfident management. Notably, it's expected that firms with overconfident managers adopting low cash holding policies may exhibit poorer performance.

LITERATURE REVIEW

Overconfidence and Its Impact on Firm Performance

Overconfidence describes people who may misjudge their abilities and skills, overestimate future forecasts, always think they are better than average [4] and make the same mistakes despite previous failures [5]. They also may affect the lives of firms through their management decisions [6]. Jiang et al. [2] mentioned managerial hubris and concluded that it might lead to a decrease in firm profitability due to overinvestment. In contrast, Vitanova [7] showed that managerial overconfidence contributes to increasing the level of firm performance.

Determinant of Firm Performance

Empirical research emphasizes the crucial role of board composition in firm performance [8]. A smaller board correlates with better market valuation [9], while Al-Najjar [10] suggests mixed results regarding board size's impact on profitability and share performance. Zabri et al. [11] found a negative relationship between board size and ROA, with insignificant effects on ROE, aligning with the study of Eisenberg et al. [12]. Regarding ownership concentration, Saona and Martin [13] prove that changes in ownership concentration can help to forecast a change in firm performance; Lozano et al. [14] find that the relationship between ownership concentration and firm performance has a U-shaped form. On the other hand, Vintilă and Gherghina [15] indicate that ownership concentration from the three largest shareholders has a positive impact on firm value.

According to Liu et al. [16], diversification in board gender plays a positive role in firm performance. Furthermore, these authors state that female CEOs have significant impacts on firm performance in legal person-controlled firms but not in state-controlled firms. Besides gender, other CEO characteristics are also considered in investigating firm performance, such as in the paper of Mohamed et al. [17] mentioned age, education background and tenure. Accordingly, manager's age and education level might decrease the shortfall and so enhance the firm's value, while a long tenure of managers might decrease the firm's value.

At the firm-level variables, there are many factors demonstrating a significant impact on firm performance, such as free cash flow, dividend pay-out ratio, investment opportunities [18], insider shareholdings, debt, and corporate control activity [8]. Leverage is shown to have a significant positive impact on firm performance as measured by Tobin Q [15, 19]. However, it is also found to have a negative relationship with firm performance due to the riskiness of debt and debt overhang [20, 21]. In terms of firm size that is measured by sales growth, it is stated that the higher the expectations for sales growth, the more a firm has value [19, 22, 23]. In terms of the variable of liquidity, Ammann et al. [24] show that liquidity, as measured by cash ratio, has a significantly positive impact on firm value. In addition, in the paper of Li et al. [25], liquidity as measured by cash and near cash divided by total assets is also demonstrated as having a positive effect on firm value. For the dividend variable, Jiao [23] shows that when dividend increases, firm value measured by Tobin Q tends to decrease. Some other aspects such as Bourne et al. [26] stated that share price has a significant impact on firm performance.

From the overview of literature review, it is indicated that there is no research examining the relationship between managerial overconfidence and firm performance under the impact of overconfidence on cash holdings. Therefore, this paper fills this gap to make the contribution to the relevant research field.

METHODOLOGY

Sample Selection and Data Sources

The study is conducted on Vietnamese listed firms on the stock exchange market that have enough conditions for necessary and trusted data. Among a total of 648 listed firms (the latest update was at the end of 2016) on the Vietnamese stock exchange market.

There are two types of data in this paper. The first is the data collected from the interviews, which are data from 123 direct interviews with top managers from 123 non-financial listed firms in Vietnam across the whole country. For the second data type, all data of 648 firms were collected in 2016 with the data available from Thomson Reuters EIKON and annual reports. For the last empirical research part, data were also collected from all 648 firms but from an extended period of 2005 to 2016. These data were collected from Thomson Reuters EIKON and hand-collected from annual reports.

Measurement of Manager's Overconfidence and other Variables

After carefully examining all the potential measurements of managerial overconfidence, to avoid bias in the regression results and based on the availability of necessary data, there are three ways to measure managerial overconfidence, namely the visibility of CEO's photos in annual reports, the managers' gender, the third is the use of voice pitch analysis.

Regarding the proxy of voice pitch, it is the same proxy with the same measurement and the same data set that is used in the paper of Dao et al. [27]. For the second proxy for managerial overconfidence, the gender of managers is considered. In fact, the data on managers' gender are available in databases, such as from Thomson Reuters EIKON or companies' annual reports. Therefore, in the first dataset for the first regression model, the gender of managers who were interviewed is used as an alternative measurement for overconfidence. Besides that, the gender of managers is also used in the extended sample size for the total of 648 firms to run the same model but with a larger sample size to retest the empirical results of the first model. Note that the gender of managers for the extended data is the gender of all CEOs from 648 firms, but not other managers' gender. Hence, a dummy variable is used, with 1 for male to represent overconfidence and otherwise 0.

For the third proxy for managerial overconfidence, learning from the paper of Schrand and Zechman [28], the visibility of the CEO's photographs in firms' annual reports is used to measure managerial overconfidence. Accordingly, the size of photographs is given points ranging from 1 to 4, meaning that if there is no CEO's photograph in the annual report, 1 point is given; if the photo is quite small and less than a quarter of a page, the points are 2; if the photo appears bigger than a quarter of a page but less than half of a page, the points are 3; and lastly, if the photo is very big at about at least half of a page, the points are 4. After giving points, it is explained that the higher the points, the more overconfident the manager is. For this data type, photographs of CEOs are examined, but not those of other managers.

To summarise the measurements for managerial overconfidence, there are three proxies, namely voice pitch adjustment, the gender of managers, and the visibility of CEOs' photographs, which are in turn used to measure managerial overconfidence. Therefore, for each proxy for managerial overconfidence, there is an appropriate regression model with a different sample size. The use of different proxies is believed to ensure very consistent and reliable empirical results.

Proxies for Firm Value and Other Control Variables for the Determinants of Firm Value

Firm performance is measured by Tobin Q, which is popularly used to represent this term in many studies [19]. **Cash holdings**, Guney et al. [29], Kling et al. [30], and Dao [3] used cash and cash equivalents relative to total assets and the ratio of cash and short-term investments to total assets. Based on the previous studies given above, cash holding in this study is measured by the ratio of cash and equivalent and short-term investment to the total assets. **LogManager's Age,** Age of interviewees were collected through interviews and annual reports. Age is stated to affect management decisions [31]. As age is a continuous numeric variable, it is converted to logarithmic form to run the model. Manager's age is found to have a positive impact on firm performance [17]. Hence, in this study, it is expected that manager's age also has a positive impact on firm performance in the regression result. **Ownership** concentration, according to Saona and Martin [13, 14, 15] changes in ownership concentration is illustrated as playing an important role in forecasting the change in firm performance. Ownership concentration is normally measured by the percentage of common shares owned by the largest three shareholders in firms [29]. **Board size**, defined as the number of directors on the board of management [32]. A small board of managers is more effective in corporate management than a larger board of management, especially in the decision-making process [9, 11, 12]. The board size is then transferred to a logarithm to get a better fit for the regression model. Therefore, this study expects that the effect of board size on firm performance is negative. **LogAssetMaturity**, in fact, there has been no evidence to confirm the impact of asset maturity on firm performance. However, it is

found that asset maturity plays an important role in corporate management such as on debt maturity [33]. Hence, we also believe that asset maturity might have an impact on firm performance. In this study, we expect the impact of asset maturity on firm performance to be positive because we think that a longer asset maturity indicates more investment opportunities. The variable of asset maturity in this study is transferred to logarithmic form for a better estimation of the regression. *Z-score*, the study uses Altman's *Z-score* as the proxy for financial distress and examines the relationship between these two aspects. *Z-score* is calculated as follows:

$$\textit{Z-score} = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E,$$

where A = Working capital / Total assets; B = Retained earnings / Total assets; C = EBIT / Total Assets; D = = Market value of equity / Book value of total liabilities; E = Sales / Total Assets.

Z-score is used to represent the financial distress of firms. Following its definition, it is known that if the *Z-score* is greater than 3, then the firm is in the "safe zone" and has a very small probability of bankruptcy. If the *Z-score* is between 3 and 1.8, then the firm is indicated to be in the "grey zone" and has a moderate probability of bankruptcy. And finally, if the *Z-score* is below 1.80, then it is believed to be in the "distress zone" and has a very high probability of bankruptcy. Hence, it is predicted that a higher *Z-score* indicates higher firm performance results. ***Dividend,*** dividend paid divided by the profit after, is used as the variable for dividends in this study. In the research of Jiao [23], the dividend is found to have a negative impact on firm performance. Thus, in this research, it is also predicted that the same relationship exists between dividend and firm performance as in the research of Jiao [23]. ***Leverage***, is proven to have a significant impact on firm performance [15, 19, 20, 21, 24]. ***Change in share price***, Bourne et al. [26] stated that share price has a significant impact on firm performance; therefore, this study attempts to examine whether or not there is an existing relationship between firm value and change in the share price. The predicted sign regarding the relationship between change in share price and firm performance is positive. ***Firm size*** is measured by the natural logarithm of gross sales [29], to examine its effect on firm value. It is explained that the higher the expectations for sales growth, the more a firm has value [22]. This study is based on the statement that the higher the expectations for sales growth, the more a firm has value [22], thus expecting that the impact of firm size on firm performance is positive.

MODEL AND REGRESSION RESULTS

Firm Value, Cash Holdings and Overconfident Manager Model

Based on a review of the prior literature and with the main purpose of the study finding out the impact of managerial overconfidence on firm value, we construct the two main regression models as follows:

Model 1:

$$\begin{aligned}\text{Firmvalue}_i = {} & \beta_0 + \beta_1\text{Overconfidence}_j + \beta_2\text{Liquidity}_i + \\ & + \beta_3\text{LogManager's Age}_j + \beta_3\text{OConcentration}_i + \\ & + \beta_4\text{LogBoardsize}_i + \beta_5\text{LogAssetMaturity}_i + \\ & + \beta_6\text{Dividend}_i + + \beta_7\text{Z-}\textit{Score}_i + \beta_8\text{Leverage}_i + \\ & + \beta_9\text{Sharepricechange}_i + + \beta_{10}\text{Firmsize}_i + e_i. \quad (1)\end{aligned}$$

Model 2:

$$\begin{aligned}\text{Firmvalue}_i = {} & \beta_0 + \beta_1\text{Overconfidence}_j + \beta_2\text{LowCash} * \\ & * \text{Overconfidence} + \beta_3\text{Liquidity}_i + \\ & + \beta_4\text{LogManager'sAge}_j + \beta_5\text{OConcentration}_i + \\ & + \beta_6\text{LogBoardsize}_i + \beta_7\text{LogAssetMaturity}_i + \\ & + \beta_8\text{Dividend}_i + \beta_9\textit{ZScore}_i + \beta_{10}\text{Leverage}_i + \\ & + \beta_{11}\text{Sharepricechange}_i + \beta_{12}\text{Firmsize}_i + e_i. \quad (2)\end{aligned}$$

The first model is used to test the role of managerial overconfidence on firm performance in the context of Vietnam. The second model is developed based on the same data type, the same measurement of overconfidence and the regression results of [27] and the results of previous studies mentioned above concluded that overconfident managers have a positive impact on firm performance. This paper wants to test the impact of managerial overconfidence on firm value if those firms with overconfident managers have the policy of holding less cash.

Based on the construction of proxies for the main model of this study, we provide the following table to express the predicted signs of all variables.

Descriptive Statistics

For the sub-sample size model, there are two proxies of overconfidence used including voice pitch, and CEOs' gender. The proxy of CEOs' photos is not employed in this model due to the regression result being insignificant. The insignificant regression results might be due to the small number of samples that makes the regression become insignificant. Because when we attempt an extended sample size, it is very significant for all models. Hence, we ignore the proxy of CEOs' photos for the small sample size but employ this proxy for the extended sample size in the next section.

From the statistics data in *Table 1* and *2*, Overconfidence1 ranges from 0.4 to 0.981, which is equivalent to the maximum value of voice pitch of 250 F_0 in Hz and

the minimum value of voice pitch of 101.94 F_0 in Hz, and the mean value of Overconfidence1 is 0.685 which is equivalent to 145 F_0 in Hz. The standard deviation is 0.143. All the statistics for Overconfidence1 are seen to be reasonable. For Overconfidence2, it is shown that 78.9% of participants are male managers in sub-sample size, but this number increases to 95% in extended sample size, who are believed to be more overconfident than the rest of the managers of the interviews.

For the data of firm value, the mean values are 1.101 and 1.069, the standard deviations is 0.772 and 0.537, and the value is range between 0.281 to 5.602 and 0.182 to 5.602 in the sub-sample size (*Table 1*) and the extended sample size (*Table 2*), respectively.

Table 1

Descriptive Statistics for Sub-Sample Size Firm Performance Model

Variable	Obs	Mean	Std. Dev.	Min	Max
Firmvalue	123	1.101	0.772	0.281	5.603
Overconfidence 1	123	0.685	0.163	0.400	0.981
Overconfidence 2	123	0.789	0.409	0.000	1.000
Liquidity	123	0.135	0.161	0.000	0.788
LogMaAge	123	1.615	0.063	1.477	1.756
OConcentration	123	0.523	0.212	0.059	0.984
LogBoardside	123	0.639	0.170	0.301	0.954
LogAssetsmaturity	123	1.056	0.581	–0.208	2.962
Dividend	123	0.452	0.650	0.000	4.249
Zscore	123	4.027	10.297	–0.589	76.032
Leverage	123	0.902	1.152	0.000	5.538
Changeinshareprice	123	0.245	0.585	–0.721	2.125
Firmsize	123	8.600	0.816	6.558	10.671

Source: Author's calculation by using STATA.

Table 2

Descriptive Statistics for Extended-Sample Size Firm Performance Model

Variable	Obs	Mean	Std. Dev.	Min	Max
Firmvalue	648	1.069	0.537	0.182	5.603
Overconfidence 1	648	0.947	0.224	0.000	1.000
Overconfidence 2	648	1.349	0.796	1.000	4.000
Liquidity	648	0.145	0.161	0.000	0.788
LogMaAge	648	1.680	0.079	1.462	1.756
OConcentration	648	0.529	0.217	0.089	0.984
LogBoardside	648	0.623	0.158	0.301	1.000
LogAssetsmaturity	648	0.993	0.484	–0.144	2.962
Dividend	648	0.558	1.160	0.000	9.792
Zscore	648	3.378	3.630	–0.319	76.032
Leverage	648	0.763	1.074	0.000	6.668
Changeinshareprice	648	0.214	0.592	–0.723	2.389
Firmsize	648	8.665	0.712	6.558	10.670

Source: Author's calculation by using STATA.

Table 3

Correlation Matrix for the Sub-Sample Size Firm Performance Model

	1	2	3	4	5	6	7	8	9	10	11	12
Firmvalue (1)	1.0000											
Overconfidence 1 (2)	0.0582	1.0000										
Overconfidence 2 (3)	0.0607	0.6382	1.0000									
Liquidity (4)	0.2635	−0.0741	−0.1861	1.0000								
LogMaAge (5)	−0.0638	−0.1648	−0.2127	−0.0627	1.0000							
OConcentration (6)	0.0499	−0.1116	0.0116	0.0780	−0.1462	1.0000						
LogBoardside (7)	0.0107	−0.0756	0.1375	−0.0402	−0.0355	0.1936	1.0000					
LogAssetsmaturity (8)	−0.1251	0.1034	−0.0163	−0.0692	−0.1824	0.0917	−0.1452	1.0000				
Dividend (9)	0.0264	−0.2191	−0.2259	0.2978	0.0753	0.0588	0.0049	0.2506	1.0000			
Zscore (10)	0.4194	0.0393	0.0564	0.1099	−0.1402	−0.2154	−0.2489	0.1750	−0.0077	1.0000		
Leverage (11)	−0.1376	−0.0247	0.0499	−0.3470	−0.1649	−0.0185	0.0640	0.0353	−0.1815	−0.2340	1.0000	
Changeinshareprice (12)	0.4161	−0.1309	−0.1563	0.1910	−0.0058	−0.0338	−0.0093	−0.0338	0.0454	0.3007	−0.2413	1.0000
Firmsize (13)	0.2077	−0.1943	−0.1486	0.1189	−0.0225	0.0499	0.5446	−0.0810	0.1632	−0.0796	0.0544	0.1635

Source: Author's calculation by using STATA.
Note: This table reports the Pearson correlations based on the sample of 123 firm observations in 2016. All variables are winsorized at the 1% and 99% percentiles.

Correlation Matrix

Looking at the correlation matrix below (*Table 3*), it is seen that overconfidence positively impacts firm value. It is different from the prediction and the positive relationship is the same for both two proxies of overconfidence. The correlation matrix of the extended sample size is quite similar to the correlation matrix from the sub-sample size; therefore, it is ignored from this section.

Table 4

Regression Results of Managerial Overconfidence and Firm Performance

Variable	GLS	GLS	GLS	GLS
	(1)	(2)	(3)	(4)
	Firm performance			
Overconfidence 1	0.992**			
	(0.45)			
Overconfidence 2		0.460**		0.146**
		(0.20)		(0.07)
Overconfidence 3			0.0456**	
			(0.02)	
Liquidity	0.965	1.211*	0.0733	0.0131
	(0.66)	(0.66)	(0.12)	(0.11)
LogMaAge	0.494	0.646	0.226	0.213
	(1.35)	(1.35)	(0.22)	(0.20)
Oconcentration	0.785**	0.708**	0.290***	0.250***
	(0.34)	(0.34)	(0.08)	(0.07)
LogBoardsize	−0.242	−0.531	0.311***	0.232**
	(0.52)	(0.54)	(0.12)	(0.11)
LogAssetsmaturity	−0.288**	−0.205	−0.0824**	−0.0407
	(0.15)	(0.15)	(0.04)	(0.03)
Dividend	0.0588	0.037	−0.00857	−0.00839
	(0.11)	(0.11)	(0.01)	(0.01)
Zscore	0.0369***	0.0317***	0.0687***	0.0792***
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.0488	0.0276	0.0423**	0.0348**
	(0.07)	(0.07)	(0.02)	(0.02)
Changeinshareprice	0.453***	0.479***	0.270***	0.221***
	(0.14)	(0.14)	(0.03)	(0.03)
Firmsize	0.191*	0.218*	0.046	0.0545**
	(0.11)	(0.12)	(0.03)	(0.03)
Constant	−1.989	−1.946	−0.372	−0.472
	(2.57)	(2.54)	(0.42)	(0.39)
Observations	123	123	648	648
Wald chi 2	66.92***	67.81***	460.64***	487.72***

Source: Author's calculation by using STATA.

Note: The dependent variable is cash holdings levels. The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1% level, respectively. The standard errors in the brackets are robust to heteroscedasticity. The sample firms are classified into three categories (service, manufacturing and merchandise) and industry fixed effects are used in all models. Wald test is for the joint significance of the model.

FINDINGS AND EMPIRICAL RESULTS

Managerial Overconfidence and Firm Value

A total of 4 different models are created by using different proxies of overconfidence and two main types of data. The reason for using different proxies is explained in the previous part, namely that it helps to make the research becomes more reliable. The data type is cross-sectional data, the GLS regression is used to test the hypotheses (*Table 4*).

From this model managerial overconfidence is demonstrated as having a significantly positive relationship with firm value. That means that the more the overconfidence level of the manager, the higher the result in firm value. The results are illustrated as being the same for almost all proxies of overconfidence and with almost all different models with different proxies of some independent variables. Furthermore, the results from the models shown are very appropriate with *Pro* > *chi2* equal 0 and the variable of overconfidence is significant at 5% level for all models.

In fact, to make the regression results more robust, we attempted to check the non-linearity between managerial overconfidence and firm performance to examine whether overconfidence might increase firm value at a certain level of overconfidence, but if the level of overconfidence increases further, the performance of firms might be reduced. However, after checking whether there exists a non-linear relationship between managerial overconfident and firm performance, we found that the relationship between these two terms is linear, meaning that the impact of managerial overconfidence on firm value is definitely positive.

Firm Performance, Cash Holdings and Managerial Overconfidence

The main part of this research focuses on the second hypothesis that is to test the impact of cash holdings under the influence of managerial overconfidence on firm performance. After four models with different overconfidence proxy and two main types of data, three variables were constructed and showed an interesting result that even managerial overconfidence positively impact firm performance, however, firms with managerial overconfidence and low cash holdings negatively affect firm performance. The results are supported by all models as in *Table 5*.

Robustness Check of the Empirical Results

To avoid the bias in the regression results, we check the models with GMM two-stage models to support all results from GLS models and to address the potential endogeneity problem by using firm-level data [34, 35]. All GMM models also reveal similar results with strong evidence (*Table 6*).

The results from the first model are significant at all models, however, it looks a bit weaker than GLS models, specifically at model (9) and (11) in Table 6. Regarding Prob > chi2, the first two models are shown with 0.004 and 0.005, but model (11) and (12) are with 0.000, so the results are very strong (*Table 6*).

For the model testing the impact of low cash holdings and overconfidence on firm performance, we can see stronger results from the role of overconfidence on firm performance. All of them help to strengthen the results from the model of managerial overconfidence and firm performance. For the model of low cash holdings with overconfidence, they also showed very significantly negative results in all models in the relationship with firm performance (*Table 7*).

DISCUSSION

It is strongly believed that there is a positive relationship between managerial overconfidence and firm value, whereby almost all models indicate the same findings. Actually, this conclusion is different from some papers in the literature reviews, where it is believed that managerial overconfidence may lead to failed decisions, causing unexpected outcomes or wrong predictions for the company and thus is predicted to have negative impacts on firm value, like in the papers of Jiang et al. [2].

As for the economic significance of the cross-sectional results for firm performance levels in *Table 5*, we provide the following calculations (for model 1): one standard deviation increase in managerial overconfidence using the definition of *Overconfidence1* leads to an increase in firm performance levels by 0.1617 units [= 0.163*0.992] or 16.17 percentage points. This is equivalent to a reduction of 14.69% [= 0.1617/1.101] relative to the mean value of cash holdings. The other economic significance calculations as per the mean value of the dependent variables for the models 2 to 4 are 17.17%, 3.36% and 3.27%, respectively.[1]

Further, the net effect is positive in model 5 (0.72 = = −0.540 + 1.260), model 6 (0.221 = −0.396 + 0.617), model 7 (0.0154 = −0.0507 + 0.0661), and model 8 (0.0668 = −0.0922 + 0.159). These net effects can support the conjecture that, as firms, the effect of overconfidence in general on firm performance is still higher than the effect of low cash holdings. So, firms with overconfidence seem to affect firm value positively in general, but firm performance might be lower in firms with overconfidence and lower cash holdings. From the results of all regression models, we can say that managerial overconfidence

[1] One standard deviation increases in managerial overconfidence using the definition of Overconfidence1 leads to an increase in firm performance levels by 0.189 units [= 0.41*0.460]; 0.037 units [= 0.224*0.164]; 0.036 units [= 0.796*0.0456].

Table 5

Regression Results of Managerial Overconfidence with Less Cash Holdings and Firm Performance

Variable	GLS	GLS	GLS	GLS
	(5)	(6)	(7)	(8)
	Firm performance			
Overconfidence 1	1.260***			
	(0.48)			
Overconfidence 2		0.617***		0.195***
		(0.21)		(0.07)
Overconfidence 3			0.0661***	
			(0.02)	
LowCash*Overconfidence 1	−0.540*			
	(0.29)			
LowCash*Overconfidence 2		−0.396*		−0.0922**
		(0.21)		(0.04)
LowCash*Overconfidence 3			−0.0507*	
			(0.03)	
Liquidity	0.00187	0.317	−0.0764	−0.176
	(0.86)	(0.81)	(0.14)	(0.14)
LogMaAge	0.619	0.522	0.198	0.188
	(1.35)	(1.33)	(0.22)	(0.20)
Oconcentration	0.644*	0.668**	0.281***	0.244***
	(0.34)	(0.33)	(0.08)	(0.07)
LogBoardsize	−0.227	−0.444	0.296**	0.210*
	(0.52)	(0.53)	(0.12)	(0.11)
LogAssetsmaturity	−0.362***	−0.248*	−0.0832**	−0.0402
	(0.14)	(0.14)	(0.04)	(0.03)
Dividend	0.0621	0.0573	−0.00912	−0.00831
	(0.11)	(0.11)	(0.01)	(0.01)
Zscore	0.0452***	0.0343***	0.0695***	0.0801***
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.108	0.0599	0.0453***	0.0402***
	(0.07)	(0.07)	(0.02)	(0.02)
Changeinshareprice	0.446***	0.508***	0.267***	0.216***
	(0.14)	(0.14)	(0.03)	(0.03)
Firmsize	0.198*	0.182	0.0421	0.0513**
	(0.11)	(0.11)	(0.03)	(0.03)
Constant	−2.421	−1.353	−0.255	−0.368
	(2.54)	(2.52)	(0.42)	(0.39)
Observations	123	123	648	648
Wald chi 2	65.86***	74.01***	467.46***	496.95***

Source: Author's calculation by using STATA.

Note: The dependent variable is cash holdings levels. The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1% level, respectively. The standard errors in the brackets are robust to heteroscedasticity. The sample firms are classified into three categories (service, manufacturing and merchandise) and industry fixed effects are used in all models. Wald test is for the joint significance of the model.

Table 6

GMM Regression Results of Managerial Overconfidence and Firm Performance

Variable	GMM	GMM	GMM	GMM
	(9)	(10)	(11)	(12)
	Firm performance			
Overconfidence 1	1.758*			
	(1.02)			
Overconfidence 2		0.986**		0.152**
		(0.49)		(0.07)
Overconfidence 3			0.0476*	
			(0.03)	
Liquidity	0.397	0.944	−0.773***	−0.633**
	(1.07)	(1.14)	(0.28)	(0.26)
LogMaAge	0.532	1.054	0.0112	0.18
	(1.90)	(2.01)	(0.29)	(0.24)
Oconcentration	0.843*	0.725	0.267**	0.207**
	(0.51)	(0.48)	(0.12)	(0.09)
LogBoardsize	0.0127	−0.633	0.527***	0.370***
	(0.87)	(0.91)	(0.20)	(0.12)
LogAssetsmaturity	−0.135	0.0244	−0.0227	0.05
	(0.22)	(0.21)	(0.08)	(0.05)
Dividend	0.136	0.107	−0.0121	−0.0122
	(0.22)	(0.18)	(0.01)	(0.01)
Zscore	−0.000991	−0.0109	0.169***	0.161***
	(0.02)	(0.02)	(0.02)	(0.02)
Leverage	0.161	0.119	0.113***	0.0819***
	(0.13)	(0.12)	(0.02)	(0.02)
Changeinshareprice	2.249***	2.270***	0.197***	0.158***
	(0.77)	(0.76)	(0.05)	(0.04)
Firmsize	−0.063	0.0142	0.0331	0.0598**
	(0.23)	(0.21)	(0.05)	(0.03)
Constant	−0.85	−1.498	−0.354	−0.846*
	(4.18)	(4.23)	(0.57)	(0.45)
Observations	123	123	648	648
Wald chi 2	30.7***	29.6***	245.19***	223.31***

Source: Author's calculation by using STATA.

Note: The dependent variable is cash holdings levels. The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1% level, respectively. The standard errors in the brackets are robust to heteroscedasticity. The sample firms are classified into three categories (service, manufacturing and merchandise) and industry fixed effects are used in all models. Wald test is for the joint significance of the model.

Table 7

GMM Regression Results of Managerial Overconfidence with Less Cash Holdings and Firm Performance

Variables	GMM (13)	GMM (14)	GMM (15)	GMM (16)
	Firm performance			
Overconfidence 1	2.263**			
	(1.12)			
Overconfidence 2		1.259**		0.221***
		(0.52)		(0.08)
Overconfidence 3			0.0779**	
			(0.03)	
LowCash*Overconfidence 1	−1.052*			
	(0.55)			
LowCash*Overconfidence 2		−0.703*		−0.130**
		(0.36)		(0.05)
LowCash*Overconfidence 3			−0.0758**	
			(0.03)	
Liquidity	−1.676	−0.638	−0.993***	−0.879***
	(1.58)	(1.32)	(0.32)	(0.32)
LogMaAge	0.773	0.829	−0.0281	0.145
	(1.98)	(2.01)	(0.29)	(0.24)
Oconcentration	0.549	0.653	0.255**	0.201**
	(0.51)	(0.49)	(0.12)	(0.09)
LogBoardsize	0.0659	−0.476	0.504**	0.334***
	(0.82)	(0.88)	(0.20)	(0.12)
LogAssetsmaturity	−0.333	−0.0549	−0.0286	0.0438
	(0.25)	(0.21)	(0.08)	(0.05)
Dividend	0.158	0.142	−0.0127	−0.0119
	(0.19)	(0.16)	(0.01)	(0.01)
Zscore	0.0134	−0.00579	0.169***	0.160***
	(0.01)	(0.01)	(0.02)	(0.02)
Leverage	0.296*	0.175	0.116***	0.0880***
	(0.16)	(0.13)	(0.02)	(0.02)
Changeinshareprice	2.301***	2.296***	0.193***	0.152***
	(0.74)	(0.70)	(0.05)	(0.04)
Firmsize	−0.0799	−0.0473	0.0271	0.0542*
	(0.22)	(0.22)	(0.05)	(0.03)
Constant	−1.282	−0.451	−0.171	−0.68
	(4.67)	(4.37)	(0.57)	(0.45)
Observations	123	123	648	648
Wald chi 2	27.15***	30.56***	251.16***	228.73***

Source: Author's calculation by using STATA.

Note: The dependent variable is cash holdings levels. The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1% level, respectively. The standard errors in the brackets are robust to heteroscedasticity. The sample firms are classified into three categories (service, manufacturing and merchandise) and industry fixed effects are used in all models. Wald test is for the joint significance of the model.

might play a very important role in the performance results of firms; it might lead to a better performance than their peers. However, surprisingly, if we examine the impact of overconfidence with lower cash holdings on firm performance, the impact seems different, whereby firms with overconfident managers with the low cash policy might negatively affect firm performance.

CONCLUSION

We find a positive relationship between managerial overconfidence and firm value. This finding is seen as very strong and reliable, as almost all different models with different proxies for managerial overconfidence from both the small and extended sample sizes produce similar results. However, in terms of cash holdings, it is shown that firm performance might be worse off for firms with overconfident managers and a low cash holding policy. Further studies can build on our research to extend to other aspects of financial management or use different proxies of all variables to strengthen the results.

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