



Applied-Research Paper

Cash Holding Adjustment Speed: The Role of Managerial Ability and Moderating Role of Political Connections in Tehran Stock Exchange

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ABSTRACT

Optimal cash is an amount of cash that balances benefits of cash holding; and the speed of cash holding adjustment is called the rate of actual cash response to the optimal cash. The question of how fast companies compensate for excess or inadequate cash to the optimum level in terms of how closely they hold cash flow and maximize company value has been an important topic of interest for academics and managers in recent years; and they have examined factors affecting the speed of cash holding adjustment. Since company managers play important roles in firm's key decisions such as cash holding, the present study investigated the impact of managerial ability as an important management feature on the speed of cash holding adjustment to an optimal cash flow and study as well as the moderating effect of political connection. To this end, data of on companies during 2013 to 2018 were analyzed using econometric software (Eviews), multivariate linear regression. Results of statistical tests indicated that the managerial ability decreased the speed of cash holding adjustment to an optimal level if the cash rate of a company is higher than its optimal level. Furthermore, In companies with political connections, the negative relationship between managerial ability and the speed of adjusting cash holdings towards the optimal level is higher than other companies.

1 Introduction

Cash is recognized as a vital source of profitability in each economic entity such that maintaining the balance between cash on hand and cash needs lies at the heart of the most influential factors contributing to the economic health of each entity, which attracts the inflow of cash via ordinary operations and financing, thereby consuming it to implement its operations, pay dividends, repay liabilities and develop its activities. The inflows and outflows of cash balancing available cash and cash needs is an important economic health indicator in any for-profit unit [28]. According to the agency theory, the way of consuming the internal cash and managers' willingness to spend or hold cash due to conflicts of interest between managers and owners is controversial [40]. Cash holding has its own costs; and its excessive

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holding can lead to increased management powers and creation of agency costs that may harm shareholders. On the other hand, failure to hold cash can lead to financing constraints and loss of investment opportunities [13]. The optimal cash holding has the highest value for companies [6] and the cash deficit and surplus due to its related costs can lead to additional costs for companies [26]. On this basis, the way of achieving the optimal cash flow is an important issue that is considered as speed of achieving the cash flow adjustment and refers to the speed at which companies adjust their existing cash to target cash [25]. Opler et al. [39] believe that companies often hold an optimal level of cash and adjust it to a target level whenever there is a deviation between optimal and actual levels of cash holdings. Dittmar and Duchin [22] also found that companies often fill between 21 to 46 percent of the gap between optimal and actual levels of their annual cash holdings. Jiang and Lie [31] also believe that companies usually manage to recover 31% of the deviation from their optimal cash holding levels; and speed of this adjustment is much higher in periods when their cash holdings are higher than the optimal level. Cash holding adjustment requires estimating the optimal level of cash holding, identifying the actual level of deviation from the optimal level of cash holding, accumulating cash or spending it in investments, and redistributing dividends.

These activities force managers to review the company's current financial status and forecast future cash flows [17]. The speed of cash holding adjustment can be attributed in some way to managerial ability, as some studies have indicated that managerial high ability increases their ability to predict [8, 9, 31] that ultimately results in lower financial distress, higher future performance, and corporate value [2,7,15, 16,21,27]. There are two different viewpoints on the impact of managerial ability on speed of cash holding adjustment. The first view states that when a company's cash is below the optimal level, then more capable managers are able to easily identify the company's liquidity problem, and thus avoid external financing costs, thereby speeding up the cash holding adjustment to an optimal level. Moreover, more capable managers of companies, which have higher cash holdings than the optimal levels, are more likely to identify the marginal value of cash holdings and the potential value loss of companies due to the problem in free cash flow compared to other managers; hence, they may be faster than other managers in filling gap between the optimal and actual levels of cash holdings [17]. Based on the above cases, it is expected that there is a significant positive relationship between managerial ability and speed of cash holding adjustment. The second view suggests that a decrease in cash holding leads to damages to shareholders' wealth in companies that have more capable managers because they can easily manage the low cash holding problem by effective management of liquidity and interacting with lenders and suppliers. Furthermore, if more capable managers are more empowered to identify investment opportunities than managers with less ability, higher cash holding rate than optimal rate may be used as an advantage for timely investment [17].

Accordingly, it is expected that there is a significant negative relationship between managerial ability and speed of cash holding adjustment. On one hand, this relationship may be different from other companies in companies with political connections. Because having political connections reduces the prudent incentive to hold cash due to easy access to foreign financing and cash. On the other hand, they should keep more cash for the agency problems that such companies face. According to the above views, the relationship between managerial ability and speed of cash holding adjustment and moderating role of political connections is an empirical issue that has been overlooked in most domestic studies; and there is a gap in accounting literature for research on this field. It was an impetus for the present study. The present study helps the previous literature in several specific ways: we extend the recent literature on the relationship between managerial ability and cash holding adjustment speed [17] by introducing political connections as a moderating variable in this context. The extant literature claims

that managerial ability has important implications for cash holding adjustment speed. However, the association between managerial ability and cash holding adjustment speed is not ex ante clear in the context of political connected firms versus non-political connected firms. Therefore, our study considers political connections as a moderating variable while examining the relationship between managerial ability and cash holding adjustment speed. To the best of our knowledge, this is the first time that political connections has been examined as a moderator in the association between managerial ability and cash holding adjustment speed.

An empirical evidence suggests a link between managerial ability and cash holding adjustment speed in developed economies [17]. However, there is a paucity of evidence regarding the validity of this relationship for firms operating in developing economies. Also, The present study adds to the growing literature that examines the determinants of corporate cash holding adjustment speed, and by examining the relationship between managerial ability and political connections with cash holding adjustment speed, shows us a more comprehensive understanding of cash resources. Eventually, Research findings, while extending existing theoretical literature on cash management decisions, can help Iranian capital market investors and legislators better understand the impact of managerial ability on speed of cash holding adjustment and guide their decision making.

2 Theoretical Principles and Development of Research Hypothesis

2.1 Managerial Ability and Cash Holding Adjustment Speed

Some studies have provided evidence on the impact of managerial ability on the firm performance [2,26,20,25]. Agarwal et al. [2] believe that companies with capable managers have lower capital costs, more stable profits, greater profitability, and higher market value. Chemmanur and Paeglis [16] believe that high managerial capability increases firm performance after initial stock offering because more capable managers are able to select better projects using initial stock earnings. Furthermore, Goodman et al. [27] state that high quality of manager's forecast increases the effectiveness of investment. Given that capable managers always make better forecasts [8, 9] increasing the accuracy of predicting the financial crisis [32], it can be concluded that there is a positive relationship between managerial ability and firm performance as a result of capable managerial ability to make desirable investment decisions. There are two different viewpoints on the impact of managerial ability on speed of cash holding adjustment: first, the managerial higher ability accelerates the speed of cash holding adjustment to an optimal level. Companies with low cash holdings are more likely to have problems with liquidity than other companies due to the debt repayment and paying suppliers' wages.

Reducing cash holding increases the likelihood of a company need to use costly external financing to finance its investments [39]. Therefore, if the corporate cash holdings are below optimal levels, then more capable managers are able to identify possible risks, thereby taking quicker measures to resolve the problem of cash shortages and ultimately preventing potential bankruptcy or costly external financing. The same expectations exist for companies with higher cash holdings than the optimal level. The agency theory indicates that excessive cash holdings never lead to higher shareholder wealth because managers with different motivations of corporate goals always seek to hold cash rather than distributing cash among shareholders. In addition, large amounts of held cash are usually spent on projects with negative net values, resulting in earnings for managers rather than maximizing the shareholders' wealth [30,37,38]. Therefore, more capable managers maximize shareholder wealth through distributing it among shareholders. Furthermore, the second view suggests that there is a negative relationship between managerial ability and speed of cash flow adjustment to an optimal level. Despite the fact that

cash holding reductions seem to be a right choice for companies with middle managers, there is no risk to companies with capable managers because they are more likely to counteract lower cash holding by effective management of liquidity and working with lenders and suppliers, leading to the reduction of their incentives to increase cash holdings. For instance, Bonsall et al. [11] found that there was a positive and significant relationship between managerial ability and firm's creditability.

De Franco et al. [19] also believed that managerial high ability led to the reduction of costs of bank loans. Furthermore, since more capable managers made more effective investment decisions [16,27], then, if more capable managers temporarily hold cash in order to access growth opportunities in a timely manner, exceeding the cash holding from the optimal level will not result in any decrease in shareholder wealth [17]. Therefore, it cannot be ignored that firms with more capable managers have lower speed of cash holding adjustment to the optimization. According to the above cases, the relationship between the managerial ability and speed of cash holding adjustment is an empirical issue that is tested according to the following hypotheses:

H_1 : There is a significant relationship between managerial ability and adjustment speed of cash holdings towards the target.

2.2 The Moderating Effect of Political Connections

In developed and developing economies, political connections are widespread and have been observed in many European, Asian, and Latin American countries. It is less likely to face financing constraints if the company has a political affiliation because the resources needed to invest are not limited to in-company liquidity. Therefore, they use foreign resources better and more easily. In other words, there is easily a shortage when the company faces financial constraints due to political affiliation and the willingness of banks to lend to political companies, provide resources and thus reduce the effect of financial constraints [4]. As the cash is held for precautionary reasons to protect against future cash flow shocks, political connections may change corporate liquidity strategies [34]. Researchers have differing views on the impact of political affiliation on corporate cash holdings. Some researchers believe that the political relationship is negatively related to the level of cash. Faccio [23] found that in developed countries, companies with political connections hold less cash because of their political support and agency relationships.

In developing countries, Al-Najjar [5] found that companies with significant political support retain fewer funds because they gain government support during critical financial periods. Caprio et al. [14] also stated that there is a negative relationship between political connection and liquidity maintenance. On the contrary, studies have shown that political association is positively related to cash assets. For instance, Kusnadi et al. [33] found out that managers of companies with political connections in emerging markets, as well as companies in countries with poor legal protection for corrupt investors, tended to hold more cash than non-political companies. Companies with political connections suffer from serious agency problems and therefore managers have more money in their favor [34]. The ability of managers is a decisive and fundamental factor in making cash adjustment decisions, however, the ability of managers working in companies with political connections is significantly different from other companies, as the easy access of companies with political connections to financial resources and cash, as well as the problems of representation and opportunism of their managers affect the motivation of the speed in cash adjustment. Therefore, it is predicted that a significant relationship between the ability of managers and the speed of cash adjustment (both positive and negative) will be affected by companies

with political connections. Hence, according to the mentioned subjects, the second hypothesis is expressed as follows:

H_2 : The relationship between the managerial ability in companies with political connections and adjustment speed of cash holdings towards the target is different from other companies

Table 1: Sample Selection Procedure and Industry Distribution

Panel A: sample selection process				Total sample		
All observations that were members of the stock exchange until the end of 2018.				2106		
Less: They are not listed on the stock exchange since the beginning of 2013.				(408)		
Less: Their financial years ends in March.				(354)		
Less: They had no change of activity or financial year.				(210)		
Less: They are members of investment and financial intermediation companies.				(180)		
Number of selected statistical sample				954		
Panel B: Sample distribution according to industry and politically connected firms (PC) and non-politically connected firms (NPC)						
SEO Industry classification	All firms		PC firms		NPC firms	
	N	%	N	%	N	%
Metal ores	42	0.04	30	0.71	12	0.29
Car	168	0.18	78	0.46	90	0.54
Drug	144	0.15	102	0.71	42	0.29
Cement	102	0.11	42	0.41	60	0.59
Chemical Products	90	0.09	48	0.53	42	0.47
Food	78	0.08	24	0.31	54	0.69
Energy (Oil & Gas)	36	0.04	36	1.00	0	0.00
Steel	108	0.11	72	0.67	36	0.33
Tile	48	0.05	6	0.13	42	0.88
Non-metallic ores	36	0.04	0	0.00	36	1.00
Rubber and plastic	42	0.04	12	0.29	30	0.71
Machinery	60	0.06	30	0.50	30	0.50
total	954	1.00	480	0.50	474	0.50

3 Research Method

3.1 Data Collection

Data of the present research were extracted from financial statements and explanatory notes along with financial statements of the companies listed on the Tehran Stock Exchange available on Codal website, the Stock Exchange website, and Rahavard Novin software. The statistical population consisted of companies listed on the Tehran Stock Exchange during 2013 to 2018; and the research samples were companies with the following set of conditions:

- 1- Companies listed on the Tehran Stock Exchange before 2011.

- 2- Their fiscal year ends in March in order to increase comparability.
- 3- They had to change in business or financial year during the period.
- 4- They are not among investment and financial intermediation companies.

After applying the above limitations, 159 companies (954 observation) were selected as statistical samples.

3.2 Model Specifications and Variables

Following prior studies, we first estimate the target level of cash holding, which is determined by the benefits and costs of cash reserves [10,17,31,35,39].

$$\text{Cash}_{i,t} = \beta_0 + \beta_1 \text{Size}_{i,t-1} + \beta_2 \text{Tobin's } Q_{i,t-1} + \beta_3 \text{Ind CF risk}_{i,t-1} + \beta_4 \text{CFO}_{i,t-1} + \beta_5 \text{WS}_{i,t-1} + \beta_6 \text{Capex}_{i,t-1} + \beta_7 \text{Lev}_{i,t-1} + \beta_8 \text{R\&D}_{i,t-1} + \beta_9 \text{Div}_{i,t-1} + \beta_{10} \text{Age}_{i,t-1} + \text{Industry} + \text{Year} + \varepsilon_{i,t} \quad (1)$$

where, Cash = Cash and equivalents scaled by lagged total assets; Size = The natural logarithm of total assets; Tobin's Q = Book value of total assets minus book value of equity plus market value of equity, all scaled by total assets; Ind CF risk = The mean of the standard deviations of cash flow scaled by total assets over 3 years for firms in the same industry, CFO = EBITDA minus interest, taxes, and common dividends, all scaled by lagged total assets; WC = Net working capital minus cash and equivalents scaled by lagged total assets; Capex = Capital expenditure scaled by lagged total assets; Lev = The ratio of total debt scaled by total assets; R&D = The ratio of R&D expenses on lagged total assets; Div = An indicator variable equal to one for firms paying a common dividend, zero otherwise; Age = Firm age

We estimate Equation (1) for each year to address the possibility that there is a structural change in relative importance of cash holding determinants over time to gauge the adjustment speed of cash holding towards the target (Cash*) using the partial adjustment model. The target level of cash holding is based on the estimated coefficients from Equation (1).

$$\text{Cash}_{i,t} - \text{Cash}_{i,t-1} = \gamma_0 + \gamma_1 (\text{Cash}_{i,t-1} - \text{Cash}_{i,t}^*) + \gamma_2 \text{Size}_{i,t-1} + \gamma_3 \text{Tobin's } Q_{i,t-1} + \gamma_4 \text{Ind CF risk}_{i,t-1} + \gamma_5 \text{CFO}_{i,t-1} + \gamma_6 \text{WS}_{i,t-1} + \gamma_7 \text{Capex}_{i,t-1} + \gamma_8 \text{Lev}_{i,t-1} + \gamma_9 \text{R\&D}_{i,t-1} + \gamma_{10} \text{Div}_{i,t-1} + \gamma_{11} \text{Age}_{i,t-1} + \text{Industry} + \text{Year} + \varepsilon_{i,t} \quad (2)$$

In Equation (2), the coefficient on the deviation of actual cash holdings from the target, γ_1 , captures average adjustment speed of cash holdings towards the target. The examination of the relation between managerial ability and the adjustment speed of cash holdings towards the target requires the interaction between the deviation and managerial ability (MA). We use the following Equation (3) to investigate the effect of managerial ability on cash adjustment speed.

$$\text{Cash}_{i,t} - \text{Cash}_{i,t-1} = \gamma_0 + \gamma_1 (\text{Cash}_{i,t-1} - \text{Cash}_{i,t}^*) + \gamma_2 (\text{Cash}_{i,t-1} - \text{Cash}_{i,t}^*) * \text{MA}_{i,t-1} + \gamma_3 \text{MA}_{i,t-1} + \gamma_4 \text{Size}_{i,t-1} + \gamma_5 \text{Tobin's } Q_{i,t-1} + \gamma_6 \text{Ind CF risk}_{i,t-1} + \gamma_7 \text{CFO}_{i,t-1} + \gamma_8 \text{WS}_{i,t-1} + \gamma_9 \text{Capex}_{i,t-1} + \gamma_{10} \text{Lev}_{i,t-1} + \gamma_{11} \text{R\&D}_{i,t-1} + \gamma_{12} \text{Div}_{i,t-1} + \gamma_{13} \text{Age}_{i,t-1} + \text{Industry} + \text{Year} + \varepsilon_{i,t} \quad (3)$$

MA is an empirical construct of managerial ability introduced by Demerjian et al. [21]. If more able managers adjust firms' cash holdings towards the target level more swiftly, we will observe significantly negative coefficients on the interaction between cash deviation and managerial ability, which is γ_2 . In contrast, the coefficient on γ_2 will be significantly positive if managerial ability is negatively

associated with the adjustment speed of cash holdings towards the target. In Equation (3), we additionally control for variables that are used to construct the optimal level of cash holdings in Equation (1). To address the variations in cash holdings across time and industries, we also include indicator variables for year and industry. Also, to test the second hypothesis, Model (3) is estimated in two groups of companies with political connections and companies without political connections.

Managerial Ability (MA): In the present study, the managerial ability was an independent variable that was assessed using a model by Demerjian et al. [21] In the model, the managerial ability was calculated by measuring the firm's efficiency and then inserting it into the multivariate linear regression as a dependent variable and controlling the intrinsic characteristics of firm. Demerjian et al. [21] used the data envelopment analysis (DEA) model to measure firm efficiency. Data envelopment analysis model is a statistical model that is used to measure system performance using input and output data according to the Equation (4):

$$MAX_v\phi = \frac{Sales_{it}}{v_1COGS_{it} + v_2SG\&A_{it} + v_3NETPPE_{it} + v_4OPLEAS_{it} + v_5R\&D_{it} + v_6GWILL_{it} + v_7INTAN_{it}} \quad (4)$$

Where, $Sales_{it}$ is the revenue of sale in company i per year t ; $COGS_{it}$: Cost of goods sold of company i per year t ; $SG\&A_{it}$: Selling, general and administrative expense (SG&A) of company i per year t ; $NETPPE_{it}$: Net tangible fixed assets of company i per year t ; $OPLEAS_{it}$: Ops Lease of company i per year t ; $R\&D_{it}$: Research and development cost of company i per year t ; $GWILL_{it}$: Goodwill purchased by the company i per year t ; $INTAN_{it}$: Net intangible assets of company i per year t ; and $MAX_v\phi$: The maximum efficiency of company i per year t . It should be noted that since R&D costs and ops lease information were not identified in financial statements of companies listed on the Tehran Stock Exchange, their effects were removed from the model [36,44]. In the model, a specific coefficient (v) was considered for each input variable because effects of all input variables on output (sale) were not the same. The value calculated for the firm's efficiency ranged from zero to 1.

Companies with an efficiency score of 1 were highly efficient, and those with an efficiency score of less than 1 were below the efficiency threshold and needed to achieve efficiency by reducing costs or increasing revenues. The purpose of calculating a firm's efficiency is to measure managerial ability, and since inherent characteristics of a firm are also involved in efficiency calculations, the managerial ability cannot be properly measured because it is more or less than the real value under the influence of the characteristics. In order to control effects of intrinsic characteristics of companies, Demerjian et al. [21] divided the the firm's efficiency into two separate parts, namely the efficiency based on the firm's intrinsic characteristics, and managerial ability. They did it by controlling five intrinsic characteristics of companies (firm size; Company market share; Company cash flow; Age of accepting company on stock exchange; and foreign sales). Each of the above five variables, as inherent characteristics of companies, can help management make better decisions or act in reverse, limiting the managerial ability. After removing inherent characteristics of companies, the remaining rate indicates the managerial ability. The above five characteristics are controlled in the following model by Demerjian et al. [21]:

$$FE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 MS_{it} + \beta_3 CF_{it} + \beta_4 AGE_{it} + \beta_5 FC_{it} + \varepsilon_{it} \quad (5)$$

Where, FE_{it} : Total efficiency of firm i per year t , calculated according to the equation (4); $SIZE_{it}$: Size of company that is equal to a natural logarithm of total assets of company i per year t ; MS_{it} : Market share of company, equivalent to ratio of sales of company i per year t to total industry sales; CF_{it} : A

virtual variable that is equal to 1 if company's operating cash flow of company i per year t is positive, otherwise zero; AGE_{it} : Age of accepting company on stock exchange which is measured through a natural logarithm of number of years when company is listed on the stock exchange; FC_{it} : it is a virtual variable which is equal to 1 if the company i per year t has foreign sales (exports), otherwise it is zero; and remainder of the model (ε_{it}) also indicates the extent of managerial ability in company i per year t [12,29].

Political Connections (PC): The moderator variable used in the current study is called political connections (PC) which, following Rezaei and Weysihsar [42] and Rezazadeh and Mohammadi [43], includes companies with political connections that were determined through multi-criteria decision making model by TOPSIS method and entropy weighting method. To distinguish between companies with political connections and those without political connections, the variables of political cost [25] are used as follows:

The value of the stock market: The higher the stock market value, the greater the company's relationship with the stock exchange organization, which is a part of the Ministry of Economic Affairs and Finance.

Book value for assets: The higher the book value for assets, the greater the company's relationship with the Ministry of Economic Affairs and Finance.

Income tax: The higher the income tax, the greater the company's relationship with the Ministry of Economic Affairs and Finance.

The number of employees: The more employees, the greater the company's relationship with the Ministry of Labor and Social Affairs.

Total export sales: The higher the total export sales, the greater the company's relationship with the Ministry of Commerce.

Paid insurance: The more the employer's share and unemployment insurance, the greater the company's relationship with the Ministry of Labor and Welfare.

The higher ranking of companies from the above set of factors indicates the wider connections and politicization of companies. The decision matrix used for the separation of companies with political connections and those without political connections in the TOPSIS method is shown in Table 2. In this matrix, the index that has uniform incremental utility (positive aspect) is called the profit index, and the index that has uniform decreasing utility (negative aspect) is called the cost index. In the study, according to Table 2, the distinguishing indicators for companies with extensive political interactions with the government have increasing desirability (positive aspect). Therefore, they are considered as profit index. Besides, as the indices are not equally important to the decision maker, the weights of the indices were first obtained based on the Shannon entropy method and then entered into the TOPSIS algorithm. First, the decision matrix is formed according to Table 2 to calculate the weight of the indicators. In the table, $X_{i,j}$ is the value of the indicators corresponding to each option. To execute the entropy technique process, $P_{i,j}$ is first calculated as follows:

$$P_{i,j} = \frac{X_{i,j}}{\sum_{i=1}^m X_{i,j}}; \forall_{i,j} \quad (6)$$

Table 2: Decision Matrix Used for the Separation of Companies With political Connections and Those Without Political Connections

Corporate segregation variables Companies in each year	The value of the stock market	Book value for assets	Income tax	The number of employees	Total export sales	Paid insurance
X ₁	X ₁₁	X ₁₂	...	...	...	X _{1m}
X ₂	X ₂₁	X ₂₂	...	...	...	X _{2m}
⋮	⋮	⋮	⋮	⋮	⋮	⋮
X _n	X _{n1}	X _{n2}	...	...	...	X _{nm}

The second step includes calculating the uncertainty index. To this end, first, a value called $E_{i,j}$ is calculated as relation 4. Then there is the uncertainty or degree of deviation d_i , which indicates how much useful information the indicator provides to the decision maker. The uncertainty is calculated using Equation 5.

$$E_j = -K \sum_{i=1}^m (P_{i,j} * \ln P_{i,j}); \forall_{i,j} . K; K = \frac{1}{\ln m} \quad (7)$$

$$d_j = 1 - E_j; \forall_j \quad (8)$$

Eventually, the weight of the indicators is calculated according to the following equation.

$$W_j = \frac{d_j}{\sum_{i=1}^n d_j} \quad (9)$$

If the decision maker has already considered a certain weight λ_j for the index, the new weight W_j' is calculated as follows.

$$W_j' = \frac{\lambda_j w_j}{\sum_{i=1}^n \lambda_j w_j} \quad (10)$$

The normalized decision matrix is calculated in the first step for TOPSIS ranking; A normal balanced decision is obtained in the second step of the matrix. The positive ideal solution and the negative ideal solution is determined in the third step; The fourth step includes providing the distance of each option to the positive and negative ideals; In the fifth step, the relative proximity of the option to the ideal solution is determined, and in the sixth step, the options are ranked. After ranking, the sample companies were divided into two categories. The higher ranked category was considered as having political affiliation and was assigned 1 (80 companies) and the lower ranked category was identified as having no political affiliation and was assigned zero (79 companies). The options were ranked in order of preference and based on proximity to the ideal solutions. An ideal option is an option that is relatively closer to the ideal solutions [43].

4 Empirical Results

4.1 Contemporaneous Determinants of Cash Holdings

We examined the ratio of cash to various factors, which were usual for determining a firm's cash holding level, in order to obtain the optimal cash flow (objective). In the Table 4, the determinants of cash assets (consistent with prior research by Opler et al. [39]; Bates et al. [10]; Dittmar & Duchin [22]; Cho et al. [17] include firm size, Q Tobin, liquidity risk in industry, cash flow, net working capital, capital costs, financial leverage, R&D costs, virtual dividend variable, and firm's age. The values predicted from the regression of Equation (1) were used as the ratio of firm cash to target. Results of Table 4 indicate that small or young companies hold more cash. Furthermore, greater growth opportunities and cfo of companies lead to more cash holding. In addition, companies with high capital expenditures, high leverage, and high dividend have less cash balances.

Table 4: Contemporaneous Determinants of Cash holdings

Variables	Coefficient	Std. Error	t-Statistic	Prob
Size	-0.034	0.009	-3.833	0.000
Tobin's Q	0.220	0.065	3.364	0.001
Ind CF risk	0.061	0.095	0.643	0.520
CFO	0.044	0.006	7.524	0.000
WS	-0.655	0.437	-1.498	0.135
Capex	-0.033	0.006	-5.201	0.000
Lev	-0.010	0.006	-1.730	0.084
R&D	0.005	0.003	1.540	0.124
Div	-0.017	0.003	-6.848	0.000
Age	-1.299	0.414	-3.137	0.002
Constant	-0.003	0.014	-0.198	0.843
Industry effects			Yes	
Year effects			Yes	
F-statistic			136.815	
Prob(F-statistic)			0.000	
Adjusted R ²			0.187	
Durbin-Watson			1.746	
Observations			954	

4.2 Descriptive Statistics

Table 3 presents the descriptive statistics of research variables. As shown in the table, the mean cash equals 0.117, indicating that about 11 percent of assets of companies listed on the Tehran Stock Exchange constitute short-term investment and cash. Furthermore, about 57 percent of assets of the companies constitute debt, and 76 percent of the sample companies pay earnings in cash. The average age

of companies is 17 years.

Table 3: Descriptive Statistics

Variables	Obs.	Minimum	Maximum	Mean	Median	Std. Deviation
Cash	954	0.001	0.421	0.117	0.120	0.055
Cash*	954	0.001	0.313	0.091	0.082	0.051
MA	954	-0.552	0.348	-0.001	-0.017	0.172
PC	954	0	1	0.503	1	0.500
Size	954	10.493	19.374	14.474	14.167	1.620
Tobin's Q	954	0.664	6.473	1.733	1.511	0.731
Ind CF risk	954	0.040	0.111	0.079	0.081	0.015
CFO	954	-0.790	0.740	0.127	0.103	0.169
WS	954	-0.945	0.819	0.061	0.074	0.229
Capex	954	0.000	1.291	0.064	0.021	0.137
Lev	954	0.013	1.805	0.592	0.591	0.242
R&D	954	0.000	0.046	0.000	0.000	0.002
Div	954	0.000	1.000	0.764	1.000	0.425
Age	954	3.000	50.000	17.282	17.000	8.056

4.3 Managerial Ability and Cash Holding Adjustments

The first hypothesis examined the relationship between capable managers and slower or faster speed of adjusting than cash sources. For review, we considered the interactive effect of managerial ability with cash deviation from the target cash flow and estimated the regression model (3). The cash adjustment from previous year to current year was the dependent variable. Table (5) presents results of research hypothesis. Values of F-statistics in the table indicate the overall significance of regression models fitted at a 5% error level. Durbin-Watson statistics also indicated the lack of autocorrelation problem among the residuals. As shown in the table above, the t-statistics coefficient of interactive effect (Deviation from target cash* MA) was positive in the model and significant at a 5% error level, indicating that managerial ability decreased the speed of cash holding adjustment to an optimal level. Accordingly, the research hypothesis was accepted at a 5% error level.

Table 5: The Association Between Managerial Ability and Cash Adjustment Speeds

Variables	Coefficient	Std. Error	t-Statistic	Prob
Deviation from target cash	-0.702	0.032	-21.830	0.000
Deviation from target cash* MA t-1	0.891	0.155	5.740	0.000
MA t-1	0.049	0.023	2.127	0.034
Size	-0.001	0.001	-1.683	0.093
Tobin's Q	0.001	0.002	0.638	0.524

Table 5: The Association Between Managerial Ability and Cash Adjustment Speeds

Variables	Coefficient	Std. Error	t-Statistic	Prob
Ind CF risk	0.371	0.110	3.390	0.001
CFO	0.021	0.011	1.930	0.054
WS	-0.006	0.007	-0.882	0.378
Capex	-0.023	0.007	-3.154	0.002
Lev	-0.004	0.007	-0.590	0.556
R&D	-1.157	0.472	-2.452	0.014
Div	-0.001	0.007	-0.138	0.890
Age	0.007	0.003	2.566	0.011
Constant	-0.045	0.015	-2.911	0.004
Industry effects	Yes			
Year effects	Yes			
F-statistic	55.987			
Prob(F-statistic)	0.000			
Adjusted R ²	0.301			
Durbin-Watson	2.059			
Observations	954			

4.4 Political Connections, Managerial Ability and Cash Holding Adjustments

The second hypothesis in the current study examines the moderating effect of political connections on the relationship between capable managers and the cash holding adjusting speed. The regression model (3) has been estimated in two groups of companies with political connections and companies without political connections. The results of testing the second hypothesis of the research are shown in Table (6). As could be seen in the table, the estimation coefficient and t-statistic of the interactive effect of the managerial ability and deviate from the optimal level (Deviation from target cash * MA) were not significant in companies without political connections, however, it is significant and positive in companies with political connections at 5% error level. It shows that the negative relationship between the managerial ability and the cash holdings adjusting speed towards the optimal level in companies with political connections is more than other companies. Accordingly, the second hypothesis of the research is accepted at the level of 5% error.

Table 6: The Effect of Political Connections on The Association Between Managerial Ability and Cash Adjustment Speeds

Variables	cash ratio > target cash ratio			cash ratio < target cash ratio		
	Coefficient	Std. Error	Prob.	Coefficient	Std. Error	Prob
Deviation from target cash	-0.654	0.322	0.043	-0.976	0.166	0.000
Deviation from target cash* MA t-1	0.737	0.269	0.006	0.001	0.001	0.259

Table 6: The Effect of Political Connections on The Association Between Managerial Ability and Cash Adjustment Speeds

Variables	cash ratio > target cash ratio			cash ratio < target cash ratio		
	Coefficient	Std. Error	Prob.	Coefficient	Std. Error	Prob
MA t-1	0.293	0.135	0.030	0.150	0.073	0.039
Size	-0.218	0.095	0.022	-0.013	0.005	0.012
Tobin's Q	0.002	0.003	0.508	0.001	0.001	0.562
Ind CF risk	0.029	0.012	0.017	0.022	0.003	0.000
CFO	1.330	0.489	0.007	0.406	0.232	0.081
WS	-0.021	0.016	0.188	-0.010	0.083	0.900
Capex	-0.313	0.062	0.000	-0.036	0.017	0.039
Lev	-0.002	0.009	0.861	-0.008	0.011	0.470
R&D	-0.125	0.015	0.000	-0.021	0.008	0.007
Div	-0.002	0.004	0.621	-0.004	0.006	0.574
Age	0.254	0.145	0.080	1.167	0.474	0.014
Constant	-0.009	0.003	0.001	-0.025	0.014	0.065
Industry effects	Yes			Yes		
Year effects	Yes			Yes		
F-statistic	33.776			56.512		
Prob(F-statistic)	0.000			0.000		
Adjusted R2	0.331			0.323		
Durbin-Watson	2.171			2.137		
Observations	480			474		

4.5 Robustness Test

The relationship between managerial ability and speed of cash holding adjustment was re-examined for further investigation, so that we divided the cash holding adjustment rate into two groups, first, companies with more cash than the target cash, and second, companies whose cash was less than the target cash. It allowed us to examine whether the effect of managerial ability on speed of cash holding adjustment was asymmetric depending on amount of company cash compared to the target cash.

Results of Table 7 indicate that when the cash level of a company is higher than the optimal level, capable managers reduce the cash holding adjustment to target, but when the cash level is below the optimal level, the managerial ability has no effect on speed of cash holding adjustment.

Table 7: The Association Between Managerial Ability and Cash Adjustment Speeds: The Cash Ratio Above or Below The Target Cash Ratio

Variables	cash ratio > target cash ratio			cash ratio < target cash ratio		
	Coefficient	Std. Error	Prob.	Coefficient	Std. Error	Prob
Deviation from target cash	-0.117	0.019	0.000	-0.533	0.069	0.000
Deviation from target cash* MA t-1	0.048	0.022	0.026	0.013	0.013	0.343
MA t-1	0.362	0.139	0.010	1.227	0.344	0.000
Size	-0.003	0.001	0.000	-0.002	0.002	0.247
Tobin's Q	0.010	0.002	0.000	0.000	0.003	0.875
Ind CF risk	0.309	0.097	0.001	0.527	0.248	0.035
CFO	0.062	0.011	0.000	0.055	0.027	0.040
WS	-0.025	0.006	0.000	-0.026	0.016	0.104
Capex	-0.027	0.005	0.000	-0.001	0.026	0.963
Lev	-0.003	0.005	0.591	-0.011	0.018	0.524
R&D	-1.393	0.327	0.000	-0.138	2.464	0.955
Div	-0.003	0.006	0.547	-0.017	0.018	0.356
Age	0.027	0.023	0.248	0.008	0.014	0.588
Constant	-0.047	0.014	0.001	-0.026	0.033	0.429
Industry effects	Yes			Yes		
Year effects	Yes			Yes		
F-statistic	34.981			5.967		
Prob(F-statistic)	0.000			0.000		
Adjusted R2	0.289			0.221		
Durbin-Watson	2.049			2.225		
Observations	610			344		

5 Conclusion

Cash is an important source of value in any for-profit unit. The major advantage of cash holding is to enhance the firm's ability based on valuable investment opportunities and avoiding expensive foreign financing. Cash holding rate of a company is an important part of its financial strategy; and the optimal cash management requires taking the best measures for cash holding. Since companies with financial deficits or cash surpluses face many problems due to improper cash management, the assessment of deviation level of cash holding from the target level, the speed of cash adjustment to a target level, and corporate factors affecting the speed are subjects of significant adjustment for managers [18]. Therefore, various studies have investigated factors affecting speed of cash holding adjustment to an optimal level of companies and indicated that managerial characteristics, especially managerial ability, is one of these

factors. Therefore, the present study examined the relationship between managerial ability and speed of cash holding adjustment by companies with respect to the moderating role of political connections. The study was important since it was among the first domestic studies on this issue; hence, it can contribute to the development of accounting and financial literature in developing countries, including Iran's emerging capital market. Results of the first hypothesis test indicated that higher managerial ability was associated with lower speed of adjustment of cash resources than a target level. Furthermore, results of the supplementary test indicated that the negative effect of managerial ability on cash holding adjustment rate was related to companies with higher cash than optimal level; and higher managerial ability had no effect on speed of cash holding adjustment if the firm's cash was below the optimal level. In fact, the results indicated that when the firm's cash was more than the optimal cash, given that capable managers could make more effective investment decisions, they temporarily did cash holdings for timely access to growth opportunities and decreased speed of cash holding adjustment to an optimal cash flow. Furthermore, when the firm's cash was less than the optimal cash, any adjustment required a reduction in amount of investment and action to increase the new capital, leading to the creation of adjustment costs for the current and future years as companies would need new capital and external financing for investment in the following years.

Therefore, when the firm's cash was lower than the optimal cash flow; and cash holding adjustment to an optimal level had a high cost for the firm, capable managers had no impact on speed of cash holding adjustment as they made more effective investment decisions. Results of the present study were consistent with findings of a research by Cho et al. [17] indicating a negative relationship between managerial ability and speed of cash holding adjustment to an optimal level, especially in companies with larger cash than the optimal cash. The results of testing for the second hypothesis showed that the negative relationship between the ability of managers and the speed of adjusting cash holding to the optimal level is much less in companies with political connections. Political connections lead to the gaining of easy access to external financing, and companies with political connections have more resources than their counterparts and finance easier in times of crisis. Political connections provide companies with access to cash, and accordingly, strengthening political relationships may reduce the incentive to be cautious about cash. In addition, companies with political connections have no restrictions even in times of financial distress and are less inclined to adjust their cash holdings. Therefore, the negative relationship between the ability of managers and the speed of adjusting cash holding to the optimal level in companies with political connections is less than companies without political connections. Based on findings of the present study, capital market investors and analysts are suggested paying attention to managerial ability in addition to financial variables in making investment decisions, and considering it as an effective factor in speed of firms' cash holding adjustment in decision making models. Given the research results indicating the importance of managerial ability, the Tehran Stock Exchange is suggested ranking companies and managers of companies listed on the Stock Exchange according to managerial ability in order to create a competitive environment among managers.

Given the calculation of optimal cash flow and the difficulty of calculating the variable for most stockholders and stock exchange participants, the Tehran Stock Exchange is also suggested disclosing a separate report of firm's optimal cash flow to provide easy access for stockholders and stock market participants, so that investors can take into consideration the company's cash deviation from the optimal cash in their decisions. There are conditions beyond the researchers' control in the process of conducting scientific studies, but they can potentially affect the research results. A major limitation of the present study was the failure to identify some information such as goodwill purchased as well as ops lease

information in financial statements of companies listed on the Tehran Stock Exchange, leading to the adjustment of Demerjian et al.'s model [21] for measuring the managerial ability. Furthermore, future researchers are suggested examining the impact of managerial personality traits such as the managerial overconfidence and myopia on speed of cash holding adjustment of companies.

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