



Original Research

Corporate Risk-Taking and Cash Holdings Adjustment Speed: The Moderating Role of CEO Tenure

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ABSTRACT

The motivations driving cash holdings have a profound influence on corporate decision-making and performance. Exploring the dynamics between risk-taking behaviour, cash reserves, and their adjustment pace provides valuable insights into effective financial resource management. This study examines the impact of corporate risk-taking on the adjustment speed of cash holdings, with a focus on the moderating effect of CEO tenure. A sample of 151 firms listed on the Tehran Stock Exchange from 2011 to 2023 (1,963 firm-year observations) was analysed using multiple regression and the Generalized Method of Moments (GMM) estimator. Results indicate that the adjustment speed of cash holdings is 49.5%. A significant negative relationship exists between corporate risk-taking and the speed of cash holdings adjustment, suggesting that elevated risk-taking decelerates the alignment of cash reserves with optimal levels. Moreover, the findings highlight the moderating role of CEO tenure in the relationship between corporate risk-taking and the speed of cash holdings adjustment; in other words, in firms with longer-tenured CEOs, the negative association between corporate risk-taking and cash holdings adjustment speed is weaker than in firms with shorter-tenured CEOs. These findings suggest that risk-taking hinders swift cash adjustment, necessitating a precise determination of optimal cash levels to prevent liquidity shortages in high-risk scenarios. Additionally, the experience of long-tenured CEOs appears to facilitate better liquidity management, aligning corporate interests with strategic financial goals.

1 Introduction

In recent years, corporate cash reserves have exhibited a consistent upward trend globally [25]. It is widely acknowledged that firms with substantial cash reserves are better insulated against financial distress, enhancing their stability [19]. Consequently, proficient liquidity management has emerged as a pivotal concern, as inadequate liquidity can heighten bankruptcy risks. Regardless of firm size, maintaining sufficient liquidity is essential to avoid reliance on costly external financing for operational and investment needs. Yung and Long (2022) emphasize that analyzing the dynamic aspects of cash management, including optimal cash reserve levels and their adjustment pace, is crucial for

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understanding liquidity strategies [58]. Firms must strive to maintain optimal cash levels to balance the benefits and costs associated with holding cash [47], and managers are tasked with swiftly correcting deviations from these levels. Jiang et al. (2017) note that adjustments toward optimal cash levels are gradual and costly, potentially slowing the adjustment process [40]. Therefore, identifying factors that influence the pace of cash holdings adjustment is vital for corporate leaders, given its significance in achieving financial equilibrium. One critical factor is corporate risk-taking [7]. Prior studies highlight that cash reserves are shaped by diverse dimensions of corporate risk [21, 57]. These studies present conflicting findings, which can be interpreted through two lenses. The precautionary motive suggests a positive linkage between corporate risk-taking and cash holdings, as managers leverage cash reserves to seize investment opportunities or shield against economic downturns. In contrast, the agency theory perspective posits a negative relationship, where excessive risk-taking may foster overconfidence, leading managers to pursue unprofitable ventures [44]. However, evidence remains mixed on whether managerial cash-holding strategies enhance or erode firm value. On the one hand, managers often favor substantial cash reserves as a safeguard to mitigate firm risk and enhance flexibility in investment decisions, particularly when profitable opportunities arise [46]. Conversely, discrepancies in risk appetites between managers and shareholders may lead to agency conflicts, where managers hoard more cash than shareholders deem optimal.

This risk-averse behavior is a prevalent agency issue, as entrenched managers may prioritize cash retention over shareholder payouts, especially when investment prospects are suboptimal [12]. As a result, managerial risk-taking can disrupt the alignment of cash holdings with their optimal levels. The role of corporate attributes, particularly managerial traits, in shaping cash holdings and their adjustment pace merits thorough exploration. Recent studies indicate that competent and experienced managers significantly enhance financial outcomes and mitigate information asymmetries with shareholders [28]. Thus, examining how managers with distinct characteristics navigate cash assets and correct deviations from optimal cash levels is essential. Prior research suggests that CEO tenure influences corporate risk-taking, shaping CEOs' risk preferences [43]. It is reasonable to hypothesize that CEO tenure moderates the impact of risk-taking on cash-holding strategies and their adjustment dynamics. According to upper echelons theory, the attributes of top executives, such as CEOs, shape their perceptions and responses to evolving business environments, influencing strategic decisions [32]. Consequently, the interplay between corporate risk-taking and the speed of cash holdings adjustment is likely moderated by CEO characteristics, particularly tenure. Long-tenured CEOs typically enjoy greater autonomy and job security, reducing the likelihood of dismissal [27]. Such CEOs possess enhanced capacity to pursue their strategic priorities and face less pressure to demonstrate short-term performance. When navigating high-risk scenarios, they may adopt conservative cash-holding policies, such as retaining excess cash, to buffer against potential adverse impacts, which can potentially slow the adjustment speed of cash holdings. This study aims to investigate the linkage between corporate risk-taking and the adjustment speed of cash holdings, with a focus on the moderating role of CEO tenure. In emerging markets like Iran, characterized by underdeveloped financial systems and unique economic challenges, these issues assume heightened importance.

Understanding the determinants of cash-holding policies, including liquidity dynamics and adjustment speed, is critical in such contexts [17]. The findings of this study will contribute to the existing literature on risk-taking, cash reserve levels, adjustment speed, and corporate governance, particularly CEO characteristics. Additionally, the results offer practical insights for managers, investors, and regulators.

Managers can better comprehend the factors influencing the pace of cash adjustment toward optimal levels and evaluate the liquidity implications of risk-taking decisions. Investors can gain insights into the effects of corporate risk-taking on cash adjustment speed and the moderating role of governance factors, such as CEO tenure, informing their decisions on board elections and investments. The emphasis on CEO characteristics, particularly tenure, and its impact on liquidity strategies and risk-taking, represents the innovation of this study. This is especially valuable in emerging markets, where managerial behavior may be influenced by specific cultural and economic factors.

2 Theoretical and Empirical Background

2.1 Corporate Risk-Taking and Cash Holdings Adjustment Speed

Theoretical perspectives on cash holdings encompass transactional, precautionary, agency, opportunity-seeking, and speculative motives [56]. The transactional advantage of cash lies in its ability to reduce reliance on expensive external financing, serving as a cost-effective capital source [41]. Conversely, precautionary motives drive managers to hold cash to capitalize on profitable projects or stabilize operations during cash flow volatility [46]. While cash reserves are vital for seizing investment opportunities and mitigating economic uncertainties, concerns arise that excessive cash holdings may generate significant agency costs, as managers may divert resources to unprofitable initiatives [39], which can trigger adverse market responses. Cash holdings provide a lens for examining managerial motives tied to corporate risk-taking, as decisions to accumulate excess cash are often discretionary and subject to limited external scrutiny [13]. Research indicates that firms hold cash for risk-related purposes, with some studies focusing on risks associated with senior management, including CEOs. This managerial risk preference aligns with agency theory, which posits that risk-averse managers, whose wealth is tied to the firm, prioritize conservative financial strategies. Tong (2010) identified a negative association between CEO risk incentives and cash holdings [55]. Reducing agency conflicts associated with risk-taking enhances CEOs' risk tolerance, enabling bolder corporate policies. Consequently, firms with higher CEO risk incentives maintain lower cash reserves to curb managerial entrenchment, as these CEOs are incentivized to pursue value-enhancing risk-taking [55]. Country-level studies have explored the nexus between economic risks and cash holdings. Hunjra et al. (2022) found that inflation volatility negatively impacts cash holdings, while interest rate fluctuations have a positive effect [38]. Lozano and Yaman (2020) analyzed the 2008 European financial crisis, noting its adverse effect on cash-holding policies during 2009 [45]. Generally, heightened liquidity risk necessitates larger cash reserves, whereas elevated debt repayment risk correlates with lower cash holdings [30].

Aflatooni et al. (2022) compared cash adjustment speeds during economic booms and recessions, confirming an optimal cash-holding ratio for Iranian firms with faster adjustments during booms [5]. Systemic risk, defined as market-wide risks immune to diversification, also influences cash holdings. Two perspectives exist: low systemic risk reduces cash holdings due to a lower correlation with aggregate shocks, leading to cash flow shortages [11], while high systemic risk incentivizes cash accumulation as an alternative to leverage reduction [3]. Banks are more likely to extend credit to firms with lower systemic risk, prompting high-risk firms to hold more cash [2]. Underinvestment may drive increased cash holdings. Acharya et al. (2007) noted that firms with high investment opportunities allocate cash flows to debt reduction to bolster debt capacity [1], while firms with limited future investment prospects prioritize cash over debt repayment. Haushalter et al. (2007) showed that firms

with high investment opportunities hold more cash to mitigate predation risks, such as mergers, particularly during economic downturns [35]. Firm-level risks, such as financial constraints, further explain cash-holding behaviors. Almeida et al. (2004) demonstrated that financially constrained firms hoard cash to safeguard future investments, retaining substantial reserves as a hedge against downturns [9]. Cash holdings increase with the likelihood of financial distress [57]. Firms with volatile cash flows and high external financing costs tend to hold more cash for precautionary reasons [34]. Denis and Sibilkov (2010) argued that firms with lower liquidity constraints hold less cash due to reduced internal cash flow generation [23]. Hugonnier et al. (2015) noted that capital supply constraints compel firms to hold more cash to mitigate default risks [37]. However, some evidence suggests that financially constrained firms hold less cash than their unconstrained counterparts [10]. Hoang et al. (2022) examined the impact of COVID-19 exposure on cash holdings across 16 economies, finding that firms with higher exposure stockpiled more cash, with a burnout effect during the peak exposure period. This effect was more pronounced in larger firms and those with smaller cash reserves, varying by cultural factors [36].

Aflatooni et al. (2024) reported that during the COVID-19 pandemic, Iranian firms doubled their cash ratios, with a 40% increase in adjustment speed [4]. Given the sensitivity of cash holdings to various risk dimensions, firms with elevated risk-taking exhibit distinct cash-holding patterns. The precautionary motive suggests that high-risk firms maintain larger cash reserves to exploit investment opportunities and mitigate liquidity risks. Conversely, agency theory posits that high-risk firms hold less cash to limit managerial entrenchment and ensure efficient allocation of resources. Excessive cash may shield firms from external pressures, fostering managerial complacency or overconfidence [48]. Recent studies, such as Al-Hamshari et al. (2024), found a negative relationship between risk-taking and cash holdings, particularly in distressed firms [8]. Das et al. (2024) reported that economic uncertainty and inflation risk positively correlate with cash holdings in the U.S. [22]. Al-Hamshari et al. (2023) noted that firms with strong risk-taking motives hold less cash, while those in countries with robust investor protections hold more, with protections mitigating the adverse effect of risk-taking [7]. The findings of some researchers showed that there is a significant relation between the stock market uncertainty changes in an economic boom and the investment risk in general, which is not significant in terms of the economic turnaround. The Investment risk during both economic boom and recession is decreased by the unexpected increase in profit of each share and propagation of positive news. Although the risk is increased by the spread of negative forecasts in relation to shares [59]. The researchers' findings show that risk premium was a determining factor in explaining changes in investors' expected rate of return, and that there was a conditional relationship between the Downside Beta and expected return. Therefore, to explain the relationship between risk and return, one must pay attention to the market direction [60].

Based on these insights, the first hypothesis is proposed:

Hypothesis 1: There is a significant relationship between corporate risk-taking and the adjustment speed of cash holdings.

2.2 The Moderating Role of CEO Tenure in the Relationship Between Corporate Risk-Taking and Cash Holdings Adjustment Speed

According to upper echelons theory, unique managerial characteristics, such as experience, values, perceptions, and other personal attributes, influence organizational outcomes [32]. Recent studies have explored how these traits influence corporate decisions. For instance, Liu et al. (2020) examined the impact of CFO gender on earnings management [42]. Managerial ability is a critical factor affecting financial strategies, yet few studies have analyzed its impact on cash holdings. This study hypothesizes that the ability of CEOs influences the pace of adjustment in cash holdings. Managers play a pivotal role in assessing the trade-offs of holding cash [44]. Cho et al. (2018) found that firms with high-ability CEOs adjust their cash holdings to optimal levels more quickly than those with less capable CEOs [18]. High-ability CEOs recognize the costs of liquidity shortages and proactively secure additional cash [46]. They minimize transaction and opportunity costs by addressing financial constraints swiftly. When firms hold excess cash, high-ability CEOs optimize shareholder value by distributing surplus funds [18]. This aligns with agency theory, which suggests that excess cash may be squandered on value-reducing investments by self-interested managers [39]. High-ability CEOs maintain robust networks with lenders and suppliers, ensuring access to financing during critical periods. Bonsall, Holzman, and Miller (2018) noted that firms with high-ability CEOs secure better credit ratings and lower loan rates, reducing the need for rapid cash adjustments in low-cash scenarios [15]. With excess cash, these CEOs invest in projects with positive net present value [29]. Cho et al. (2018) identified a negative relationship between CEO ability and cash adjustment speed, particularly for firms with excess cash, with minimal impact on firms below target levels [18]. These findings suggest that high-ability CEOs invest surplus cash in value-enhancing projects, reducing the urgency to eliminate excess reserves. Stetsyuk et al. (2024) investigated the impact of CEO characteristics, including gender, age, and education, on risk-taking during periods of economic policy uncertainty. Older CEOs exhibited lower risk-taking, while more educated CEOs reduced risk only during uncertainty [53]. Liu (2024) found that litigation risk increases cash holdings, with a stronger effect in firms with long-tenured CEOs [43]. Cid and Lopez (2023) examined six CEO traits, finding that longer tenure initially reduces risk but later increases it due to the acquisition of industry knowledge and overconfidence [20]. Chireka and Moloi (2023) reported an optimal cash-holding level with a 75.6% adjustment speed, slower in firms with capable managers [17].

Cho et al. (2018) confirmed a negative relationship between managerial ability and adjustment speed, particularly for excess cash [18]. Moreover, CEO tenure shapes risk-taking and cash management strategies by influencing strategic decision-making. Hambrick and Fukutomi (1991) suggest that long-tenured CEOs often prioritize stability, slowing cash adjustments to maintain liquidity buffers against risks [33]. Conversely, Simsek (2007) notes that experienced CEOs may leverage their expertise to take calculated risks, potentially accelerating cash deployment in high-risk contexts [52]. These findings highlight tenure's moderating role in linking risk-taking to cash holdings adjustment speed. Based on these findings, the second hypothesis is proposed:

Hypothesis 2: CEO tenure moderates the relationship between corporate risk-taking and the adjustment speed of cash holdings.

Table 1 provides a summary of prior research, organized chronologically:

Table 1: A summary of the Empirical Research Background

Author(s)	Year	Findings
Al-Hamshari et al.	2024	Negative relationship between risk-taking and cash holdings, particularly in financially distressed firms.
Aflatooni et al.	2024	During the COVID-19 pandemic, Iranian firms doubled their cash ratios, with a 40% increase in adjustment speed.
Stetsyuk et al.	2024	Older CEOs exhibit lower risk-taking; more educated CEOs reduce risk during economic policy uncertainty.
Liu	2024	Litigation risk increases cash holdings, with a stronger effect in firms with long-tenured CEOs.
Chireka and Moloi	2023	Optimal cash-holding level with a 75.6% adjustment speed; firms with capable managers have slower adjustment speeds.
Cid and Lopez	2023	Longer CEO tenure initially reduces risk but later increases it due to industry knowledge and overconfidence.
Al-Hamshari et al.	2023	Firms with strong risk-taking motives hold less cash; robust investor protections mitigate the adverse effect of risk-taking.
Aflatooni et al.	2022	Iranian firms exhibit faster cash adjustment speeds during economic booms compared to recessions.
Cho et al.	2018	High-ability CEOs adjust cash holdings to optimal levels faster, especially in firms with excess cash. A negative relationship exists between CEO ability and cash adjustment speed in firms with excess cash.
Bonsall, Holzman, and Miller	2018	Firms with high-ability CEOs secure better credit ratings and lower loan rates, reducing the need for rapid cash adjustments.
Tong	2010	Negative relationship between CEO risk incentives and cash holdings; reducing agency conflicts increases CEO risk-taking.
Simsek	2007	Experienced CEOs leverage expertise for calculated risks, potentially accelerating cash deployment.
Hambrick and Fukutomi	1991	Long-tenured CEOs prioritize stability, slowing cash adjustments to maintain liquidity buffers against risks.

3 Methodology

To test the research hypotheses, multiple regression analysis with panel data was employed. The population of the study consists of companies listed on the Tehran Stock Exchange from 2011 to 2023, with fiscal years ending in March (Esfand) and no changes in fiscal year during the study period. Companies active in financial industries, such as insurance, banking, holding companies, and similar sectors, were excluded. Only firms with available data for calculating the research variables were included. After applying these restrictions, a sample of 151 eligible companies was selected, resulting in 1,963 firm-year observations. Data were extracted from financial statements published on the Codal website and the Rahavard Novin software. Following data extraction and variable computation, data analysis was conducted using Microsoft Excel 2016 and EViews version 10. Following Al-Hamshari et al. (2023), the first hypothesis was tested using Model (1) [7]:

$$Cash_{i,t+1} = \alpha_0 + (1 - \lambda)Cash_{i,t} + \beta_2 CRT_{i,t} + \beta_3 CRT_{i,t} \times Cash_{i,t} + (\lambda\psi)Z_{i,t} + \vartheta_{i,t+1} \quad (1)$$

In Model (1), the regression coefficient of interest for evaluating the first hypothesis is β_3 , which must be statistically significant (assessed using the t-Student test). If β_3 is positive, the relationship between corporate risk-taking and the adjustment speed of cash holdings is negative, and vice versa.

To test the second hypothesis, Model (1) was modified by incorporating the CEO tenure variable and its interaction with the independent variable, resulting in Model (2):

$$\begin{aligned} Cash_{i,t+1} = & \alpha_0 + (1 - \lambda)Cash_{i,t} + \beta_2 CRT_{i,t} + \beta_3 CRT_{i,t} \times Cash_{i,t} + \beta_4 CEO - Ten_{i,t} \\ & + \beta_5 Cash_{i,t} \times CEO - Ten_{i,t} + \beta_6 CRT_{i,t} \times CEO - Ten_{i,t} \\ & + \beta_7 Cash_{i,t} \times CRT_{i,t} \times CEO - Ten_{i,t} + (\lambda\psi)Z_{i,t} + \vartheta_{i,t+1} \end{aligned} \quad (2)$$

In Model (2), the regression coefficient of interest for evaluating the second hypothesis is β_7 , which must be statistically significant. If β_7 is positive, the relationship between corporate risk-taking and the adjustment speed of cash holdings is stronger in firms with longer-tenured CEOs compared to those with shorter-tenured CEOs.

3.1 Measurement of Research Variables

Independent Variable: Corporate Risk-Taking (CRT): Following prior studies such as Ahmad and Azhari (2021), Bhuiyan et al. (2021), Habib and Hasan (2017), and Al-Hamshari et al. (2023), corporate risk-taking is measured based on the standard deviation of return on assets (ROA) over the past three years compared to the industry average [6, 14, 31, 7]. Specifically, if the standard deviation of a firm's ROA over the past three years exceeds the industry's standard deviation of ROA for the same year, the variable takes a value of 1; otherwise, it is assigned a value of 0. As a complementary and alternative approach, the standard deviation of ROA over a five-year period is also used to measure risk-taking. The standard deviation of ROA is commonly employed as a general indicator of corporate risk-taking, with higher values reflecting greater risk-taking relative to industry peers [7].

Dependent Variable: Adjustment Speed of Cash Holdings: The adjustment speed refers to the rate at which firms adjust their cash holdings toward an optimal (target) level, indicating how much cash should be accumulated to maximize firm value and how firms address deviations from this optimal level [26]. The adjustment speed coefficient represents the proportion of the gap between the previous year's cash holdings and the optimal cash level that is closed in the current year [4].

To measure the adjustment speed of cash holdings, following prior studies such as Bates et al. and Orlova & Rao, Model (3) was estimated with controls for year and industry effects [12, 50]. The fitted values from this model represent the optimal cash holding level, while the absolute residuals indicate the deviation of cash holdings from the optimal level [4].

$$Cash_{i,t+1} = \omega + \psi Z_{i,t} + \zeta_{i,t+1} \quad (3)$$

In Model (3), the dependent variable, Cash, is defined, following Orlova & Rao (2018), as the ratio of cash to total assets [50]. The vector (Z) includes explanatory variables for the cash ratio, comprising, MTB (Growth Opportunities)- Tobin's Q, calculated as the sum of the market value of equity and the book value of total liabilities divided by the book value of total assets. Firms with higher growth opportunities hold more cash to fund future investments [49]. SIZE (Firm Size)- The natural logarithm of total assets. Larger firms tend to hold less cash due to economies of scale in liquidity management [12]. CF (Operating Cash Flow)- The ratio of operating cash flow to total assets. Higher operating cash flows reduce the need for cash holdings, as firms can rely on internal funds [24]. NWC (Net Working Capital)- The ratio of non-cash current assets minus current liabilities to total assets. Net working capital serves as a substitute for cash, reducing cash holdings [12]. CapEx (Capital Expenditures)- The ratio of changes in gross fixed assets to total assets. Higher capital expenditures increase cash needs to support investment activities [49]. LEV (Leverage Ratio)- Total liabilities divided by total assets. Higher

leverage increases financial constraints, leading to higher cash holdings for precautionary motives [9]. ICFV (Industry Cash Flow Volatility)- The median standard deviation of the operating cash flow to total assets ratio over the past three years at the industry level. Greater industry cash flow volatility increases precautionary cash holdings [34]. Divd (Dividend Distribution)- A binary variable taking the value of 1 for firms distributing cash dividends and 0 otherwise. Dividend-paying firms hold less cash due to signaling financial stability [16]. Following domestic and international studies such as Orlova & Rao (2018) and Aflatooni et al. (2024), the adjustment speed of cash holdings was measured using a one-stage partial adjustment approach, as specified in Model (4) [4, 50]:

$$Cash_{i,t+1} - Cash_{i,t} = \lambda(Cash_{i,t+1}^* - Cash_{i,t}) + \zeta_{i,t+1} \quad (4)$$

In Model (4), $Cash_{i,t+1}^* - Cash_{i,t}$ represents the deviation from the optimal cash holding level that the firm must correct, and $Cash_{i,t+1} - Cash_{i,t}$ is the portion of this deviation corrected within one period. Thus, λ denotes the fraction of the gap between actual and optimal cash holdings closed within a period, defining the adjustment speed. $Cash_{i,t+1}^*$ is the target cash ratio derived from Model (3). Substituting this value into Model (4) and performing algebraic manipulations yields Model (5), used to measure adjustment speed:

$$Cash_{i,t+1} = \alpha + (1 - \lambda)Cash_{i,t} + (\lambda\psi)Z_{i,t} + \vartheta_{i,t+1} \quad (5)$$

In Model (5), the adjustment speed is calculated as one minus the regression coefficient of the cash holdings variable $Cash_{i,t}$ within the model.

Moderating Variable: CEO Tenure (CEO-TEN): CEO tenure is a characteristic that reflects the number of years an individual has served as the CEO of a company. Following Peni (2014), CEO tenure is measured as the total number of years a CEO has held the position in a given firm [51]. This variable is defined as a binary indicator, taking a value of 1 if the CEO's tenure exceeds the industry average for the firm's sector, and 0 otherwise. Notably, if an individual is reappointed as CEO after a prior term, the years of previous tenure are included in the calculation.

4 Findings

Table 2: Descriptive Statistics of Variables

Variable	Symbol	Mean	Max	Min	Standard Deviation
Capital Expenditures	CapEx	0.099	7.14	-0.34	0.347
Cash Holdings	Cash	0.083	0.821	0.002	0.100
CEO Tenure	CEO-Tenure	3.829	25	1	3.84
Cash Flow	CF	0.139	0.827	-0.385	0.143
Corporate Risk-Taking	CRT	0.068	0.414	0.001	0.057
Dividend Distribution	Divd	0.796	1	0	0.467
Industry Cash Flow Volatility	ICFV	0.012	0.341	-0.079	0.060
Leverage	Lev	0.538	2.08	0.02	0.225
Net Working Capital	NWC	0.100	0.819	-1.346	0.217
Tobin's Q	Qtobin	2.635	32.70	0.176	2.437
Return on Assets	ROA	0.164	0.765	-0.400	0.161
Firm Size	Size	15.18	21.90	10.35	1.87

The mean capital expenditures, scaled by total assets at the beginning of the period, is 0.099, indicating an average fixed asset growth rate of approximately 10%. The negative minimum value suggests that some firms divested fixed assets during the year without replacing them with new ones. The average cash holdings ratio is approximately 8%, which is lower compared to developed markets such as the United States. The mean operating cash flow is about 14% of total assets. The average CEO tenure is 3.83 years (approximately 1,398 days), with a maximum of 25 years, though such long tenures are rare. Corporate risk-taking exhibits a mean of 7%, considered relatively low. Industry cash flow volatility averages around 1%, also low. The mean leverage ratio is approximately 54%, indicating that, on average, 54% of assets are financed through debt, with the remaining 46% financed through equity. The maximum leverage exceeding 1, observed in a few cases, results from the negative book value of equity. The average dividend distribution rate is 79%, implying that at least 79 out of 100 observations distributed cash dividends, a high proportion. The mean net working capital is 10% of total assets, with a negative minimum indicating that current liabilities exceeded non-cash current assets in some cases. Tobin's Q, as an indicator of growth opportunities, has a mean of 2.63, suggesting the presence of growth prospects. The stationarity of the research variables was tested using the Levin, Lin, and Chu test. The results are presented in Table 3:

Table 3: Results of Stationarity Tests for Research Variables

Variable	Levin, Lin, and Chu Statistics	Significance	Result
CapEx	-20	0.000	Stationary
Cash	-18	0.000	Stationary
CEO-Tenure	-13	0.000	Stationary
CF	-26	0.000	Stationary
CRT	-16	0.000	Stationary
Divd	-4	0.000	Stationary
ICFV	-24	0.000	Stationary
Lev	-13	0.000	Stationary
NWC	-13	0.000	Stationary
Qtobin	-19	0.002	Stationary
Size	-14	0.000	Stationary

The results of the Levin, Lin, and Chu stationarity test, shown in Table 3, indicate that all research variables are stationary. Consequently, no cointegration tests were required.

To examine classical assumptions, the Wiggins-Pooy test (for heteroskedasticity) and the Arellano-Bond test (for serial autocorrelation) were employed. Additionally, the Variance Inflation Factor (VIF) was calculated to assess multicollinearity among explanatory variables, with results reported in the hypothesis testing tables. The Arellano-Bond test for serial autocorrelation, conducted at the first and second lags, is also presented alongside the final estimation results.

Table 4: Results of Heteroskedasticity Test

Test	Model	Test Significance	Result
Heteroskedasticity	Model (1)	0.000	Presence of Heteroskedasticity
Heteroskedasticity	Model (2)	0.000	Presence of Heteroskedasticity

The results in Table 4 indicate that both Models (1) and (2) exhibit heteroskedasticity. However, the use of the Generalized Method of Moments (GMM) has mitigated this issue. Prior to fitting Models (1)

and (2) for hypothesis testing, Model (3) was estimated to calculate the adjustment speed of cash holdings without considering risk-taking or other factors. The results are presented in Table 5:

Table 5: Results of Fitting Model (3) – Calculation of Cash Adjustment Speed

Variable	Regression Coefficient	Standard Error	T-Statistic	T-Statistic Significance	VIF Statistic
Cash t	0.50527	0.019	26.56	0.0000	1.16
Qtobin	-0.000084	0.0004	-0.19	0.8464	1.09
Size	0.00947	0.005	1.84	0.0675	1.07
CF	0.12944	0.012	10.27	0.0000	1.04
NWC	-0.16143	0.015	-10.11	0.0000	1.47
CapEx	-0.02222	0.004	-4.67	0.0000	1.11
Lev	-0.09236	0.013	-7.06	0.0000	1.72
ICFV	0.18790	0.026	7.22	0.0000	1.23
Divd	-0.00318	0.0015	-2.00	0.0468	1.03
Intercept	0.01530	0.003	4.99	0.0000	-
Sargan Statistic	82.21	Sargan Statistic Significance	0.073		
Arellano-Bond Lag 1 Significance	0.0000	Arellano-Bond Lag 2 Significance	0.5156		
Year Effects	Controlled				
Industry Effects	Controlled				

The results indicate that, given the insignificance of the Sargan statistic and the absence of serial autocorrelation at the second lag, the adjustment speed of cash holdings (without incorporating other factors) for the sampled firms is 49.5%. This is calculated by subtracting the regression coefficient of the cash variable (0.50527) from 1.

4.1 Fitting Model (1) and Testing the First Hypothesis

The first hypothesis was tested using the results of fitting Model (1), presented in Table 6:

Table 6: Results of Estimating Model (1)

Variable	Regression Coefficient	Standard Error	T-Statistic	T-Statistic Significance	VIF Statistic
Cash t	0.242	0.015	15.72	0.0000	1.10
CRT	-0.297	0.016	-18.49	0.0000	1.19
Cash t * CRT	5.934	0.143	41.31	0.0000	2.69
Qtobin	0.00001	0.0003	0.04	0.9668	1.09
Size	0.0047	0.002	2.14	0.0340	1.36
CF	0.063	0.008	7.70	0.0000	1.07
NWC	-0.0477	0.008	-5.80	0.0000	1.44
CapEx	-0.0065	0.001	-3.67	0.0003	1.10
Lev	-0.0073	0.008	-0.87	0.3859	1.67
ICFV	-0.0264	0.013	-1.95	0.0533	1.23
Divd	-0.0017	0.001	-1.79	0.0756	1.05
Intercept	-0.0107	0.002	-5.70	0.0000	-
Sargan Statistic	67.58	Sargan Statistic Significance	0.388		
Arellano-Bond Lag 1 Significance	0.0000	Arellano-Bond Lag 2 Significance	0.1236		
Year Effects	Controlled				
Industry Effects	Controlled				

The results of fitting Model (1) indicate that the Sargan statistic is insignificant ($p = 0.388$), suggesting that the instruments used are appropriate. The Arellano-Bond test for serial autocorrelation shows autocorrelation at the first lag (a necessary condition) and no autocorrelation at the second lag (another necessary condition), confirming the validity of the results. Additionally, the Variance Inflation Factor (VIF) values, all of which are below 5, indicate that there is no severe multicollinearity among the explanatory variables. The first hypothesis posits that there is a significant relationship between corporate risk-taking and the adjustment speed of cash holdings. Given that the t-statistical significance for the interaction term of cash holdings and corporate risk-taking is 0.0000, it can be concluded that the relationship is statistically significant, as the p-value is below the test's significance levels (5% and even 1%). Consequently, the null hypothesis of no relationship is rejected, and the alternative hypothesis, which does not reject the relationship, is accepted. Since the regression coefficient of the interaction term is positive, the relationship between corporate risk-taking and the adjustment speed of cash holdings is negative, meaning that increased risk-taking reduces the adjustment speed of cash holdings.

4.2 Fitting Model (2) and Testing the Second Hypothesis

The second hypothesis was tested using the results of fitting Model (2), presented in Table 7:

Table 7: Results of Estimating Model (2)

Variable	Regression Coefficient	Standard Error	T-Statistic	Significance	VIF Statistic
Cash t	0.1184	0.009	12.47	0.0000	1.13
CRT	-0.3546	0.016	-21.16	0.0000	1.18
Cash t * CRT	7.879	0.089	88.63	0.0000	2.66
CEO-Tenure	-0.0065	0.0004	-16.29	0.0000	1.09
Cash t * CEO-Tenure	0.1644	0.004	39.35	0.0000	1.57
CRT * CEO-Tenure	0.0650	0.0038	17.04	0.0000	2.05
Cash t * CRT * CEO-Tenure	-1.5228	0.034	-44.05	0.0000	3.41
QTobin	0.00004	0.0002	0.21	0.8304	1.07
Size	0.00006	0.0017	0.04	0.9695	1.33
CF	0.0348	0.0046	7.52	0.0000	1.06
NWC	-0.0221	0.0055	-3.99	0.0001	1.42
CapEx	-0.0025	0.0009	-2.62	0.0096	1.10
Lev	-0.0019	0.0045	-0.44	0.6625	1.65
ICFV	0.0124	0.0089	1.39	0.1642	1.22
Divd	-0.00018	0.0007	-0.23	0.8151	1.03
Intercept	-0.00548	0.0014	-3.71	0.0003	-
Sargan Statistic	57.20	Sargan Statistic Significance	0.743		
Arellano-Bond Lag 1 Significance	0.0000	Arellano-Bond Lag 2 Significance	0.1324		
Year Effects	Controlled				
Industry Effects	Controlled				

The results of fitting Model (2), as shown in Table 7, indicate that the Sargan statistic is insignificant ($p = 0.743$), confirming the appropriateness of the instruments used. The Arellano-Bond test for serial autocorrelation reveals autocorrelation at the first lag (a necessary condition) and no autocorrelation at the second lag (another necessary condition), validating the results. Furthermore, the VIF values indicate that there is no severe multicollinearity among the explanatory variables. The second hypothesis posits that CEO tenure moderates the relationship between corporate risk-taking and the adjustment speed of cash holdings. Given that the t-statistical significance for the interaction term of cash holdings, corporate risk-taking, and CEO tenure (Cash $t-1$ * CRT * CEO-Tenure) is 0.0000, it can be concluded that CEO tenure significantly moderates the relationship between cash holdings and corporate risk-taking. The p-value is below the test's significance levels (5% and even 1%), leading to the rejection of the null hypothesis of no relationship and acceptance of the alternative hypothesis. Since the regression coefficient of the interaction term is negative, the relationship between corporate risk-taking and the adjustment speed of cash holdings is weaker in firms with longer-tenured CEOs compared to those with shorter-tenured CEOs. This implies that when β_7 is negative (-1.5228), the negative relationship between corporate risk-taking and the adjustment speed of cash holdings in firms with longer-tenured CEOs is attenuated, or in other words, the magnitude of this negative relationship is reduced.

5 Discussion and Conclusions

This study examines the impact of corporate risk-taking on the speed of cash holdings adjustment, with a particular focus on the moderating role of CEO tenure, using data from 151 firms listed on the Tehran Stock Exchange between 2011 and 2023. The findings for the first hypothesis confirm that higher corporate risk-taking significantly slows the adjustment of cash holdings toward optimal levels, primarily due to increased uncertainty in cash flows. This result is consistent with Al-Hamshari et al. (2024), who identified a negative relationship between risk-taking and cash holdings [8]. The result of the first hypothesis, aligns with agency theory. According to agency theory, there is a negative relationship between corporate risk-taking and cash holdings, as high risk-taking may lead to managerial overconfidence, pushing them toward unprofitable projects [44]. In the second hypothesis, given the negative and statistically significant coefficient of the three-way interaction term, the results indicate that longer CEO tenure mitigates the negative effect of corporate risk-taking on the speed of cash holdings adjustment (i.e., it reduces the magnitude of the negative relationship between corporate risk-taking and cash adjustment speed). This finding suggests that more experienced CEOs, by leveraging their accumulated knowledge, possess greater ability to manage liquidity in high-risk environments. The result of testing the second hypothesis is consistent with Upper Echelons Theory, which posits that the characteristics of top executives, such as CEO tenure, shape their perceptions and responses to the business environment and, consequently, influence strategic decisions including liquidity management [32]. These findings are also in line with prior research by Chireka and Moloi (2023) and Cho et al. (2018) [17, 18], demonstrating that seasoned CEOs mitigate agency conflicts and enhance strategic liquidity decisions, thereby contributing to the literature on cash management in emerging markets such as Iran. From a practical perspective, firms should strategically determine optimal cash reserves to mitigate liquidity risks associated with risk-taking activities. Corporate boards may benefit from retaining experienced CEOs to strengthen liquidity management frameworks. Investors can leverage insights into risk-taking

and CEO tenure to assess a firm's financial stability and governance quality. Regulators are encouraged to promote policies that ensure adequate liquidity in risk-intensive environments. Based on the results of testing the first hypothesis, it is suggested that companies design liquidity management policies to determine optimal liquidity levels considering the level of corporate risk-taking. This may involve precise modeling of liquidity needs based on forecasts of future cash flows and operational and financial risks. Additionally, boards of directors, risk committees, and audit committees should implement stronger oversight mechanisms, such as periodic reviews of liquidity policies and assessments of the impact of risk-taking decisions on cash flows, to evaluate managers' decisions regarding liquidity and risk-taking. Based on the results of testing the second hypothesis regarding the impact of risk-taking and CEO tenure on liquidity management, companies can organize training sessions or informational reports for investors to familiarize them with the impact of these factors on the company's financial structure and stability. This helps investors better assess the role of CEO experience and risk-taking policies in selecting board members or making investment decisions. The study's limitations include its focus on Tehran Stock Exchange firms, which may restrict generalizability, the use of annual data, and the exclusive emphasis on CEO tenure as a moderating factor. Future research could investigate additional drivers of cash adjustment speed, such as financial policies, firm lifecycle stages, or other CEO characteristics, including educational background and board composition. This research provides unique insights into the Iranian market, laying the groundwork for further studies on liquidity management in emerging economies.

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