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The Effect of Managerial Overconfidence on Cash Holdings with the Moderating Role of Product Market Competition in Companies

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ABSTRACT

The main objective of the present study is to examine the effect of managerial overconfidence on cash holdings with the moderating role of product market competition in companies listed on the Tehran Stock Exchange. The statistical population of the study includes companies listed on the Tehran Stock Exchange. Accordingly, a sample of 140 companies, comprising 700 firm-year observations, was selected from the statistical population for the period from 2019 to 2023 by applying certain restrictions. The required data were collected and tested using linear regression. The relationships among the research variables were analyzed using panel data, fixed effects, and the generalized least squares method through EViews 12 software. The results indicate that there is a significant negative relationship between managerial overconfidence and corporate cash holdings, and that product market competition positively moderates the relationship between managerial overconfidence and cash holdings.

Keywords: cash holdings, managerial overconfidence, product market competition.

Introduction

Cash holdings represent one of the most important dimensions of corporate financial policy because cash is simultaneously a liquidity buffer, a strategic resource, and a potential source of agency costs. From the perspective of financial management, firms hold cash to meet operating needs, finance investment opportunities, reduce exposure to external financing frictions, and protect themselves against uncertainty in product, capital, and supply-chain markets. However, excessive or insufficient cash retention can both impose costs on shareholders. When cash holdings are too high, managers may allocate internal funds to inefficient investments, empire-building activities, or projects that do not maximize firm value; when cash holdings are too low, firms may lose flexibility in responding to profitable opportunities, competitive pressures, and unexpected shocks. Recent evidence shows that corporate cash policy is increasingly shaped not only by traditional financial determinants but also by strategic orientation, organizational capital, customer risk, financing constraints, and the uncertainty embedded in supply-chain networks (1-4). Therefore, cash holdings should not be interpreted merely as a passive accounting balance; rather, they reflect managerial judgments about risk, investment timing, financing access, and the competitive environment in which the firm operates.

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In corporate finance and accounting research, the behavioral characteristics of top managers have become central to explaining variations in financial decisions. Classical financial theories often assume that managers make rational decisions based on complete evaluation of risks and returns, but behavioral finance argues that managerial cognition, biases, emotions, and personal traits can systematically influence corporate policies. Managerial overconfidence is one of the most widely studied psychological biases in this area. Overconfident managers tend to overestimate their own abilities, underestimate risks, exaggerate the precision of their private information, and hold overly optimistic expectations about future cash flows and investment returns. As a result, such managers may deviate from optimal financial policies, particularly in decisions related to investment, financing, risk-taking, and liquidity management. Prior studies have shown that managerial overconfidence is related to cash holdings, agency costs, investment efficiency, blockchain firm liquidity policy, and broader patterns of corporate decision-making (5-7). This indicates that cash-holding behavior cannot be fully explained without considering the psychological orientation of managers who control the allocation of internal funds.

The effect of managerial overconfidence on cash holdings is theoretically ambiguous and therefore requires empirical investigation. On the one hand, overconfident managers may prefer to hold higher cash reserves because internal liquidity gives them discretion, reduces dependence on external capital markets, and allows them to finance projects that they believe are undervalued by outside investors. This view is consistent with the agency perspective, according to which managers with strong self-belief may accumulate cash to preserve decision-making autonomy. On the other hand, overconfident managers may hold less cash because they underestimate uncertainty, believe strongly in future operating performance, expect easier access to financing, and allocate available cash more aggressively to investment projects. Therefore, managerial overconfidence may lead either to cash accumulation or cash depletion depending on governance quality, financing conditions, investment opportunities, and external market discipline. The literature has similarly shown that optimistic and biased managers may enhance firm value in certain contexts but may also generate distortions when their confidence is not disciplined by effective monitoring mechanisms (8, 9). Hence, examining the direction and significance of the relationship between managerial overconfidence and cash holdings is important for clarifying how behavioral biases operate in corporate financial management.

Managerial overconfidence is also relevant because it interacts with other executive attributes and strategic behaviors. Research on chief executive officers shows that managerial background, cognitive bias, regulatory focus, narcissism, career horizon, and core self-evaluations can affect risk-taking, firm transformation, internationalization, innovation, and strategic choices (10-13). Similarly, studies have shown that overconfident or psychologically distinctive executives may influence innovation efficiency, R&D smoothing, digital transformation, environmental innovation, and the conversion of innovation into firm value (14-17). These findings are important for cash-holding research because innovation, transformation, and risk-taking decisions are typically cash-intensive and often depend on the availability of internal funds. If overconfident managers believe strongly in their strategic vision, they may use cash more aggressively to support growth, technological change, mergers, international expansion, or operational restructuring. Conversely, they may retain cash to preserve flexibility for future strategic initiatives. Therefore, the behavioral-finance perspective suggests that cash holdings are partly the outcome of managerial cognition rather than merely a response to firm-level financial ratios.

The broader literature on executive heterogeneity further supports the need to examine managerial traits in relation to corporate financial policies. Executive experience, inventor identity, founder status, and marketing or

innovation-related characteristics may shape how managers perceive opportunities and threats (18-20). In addition, studies have linked board and executive characteristics to innovation, enforcement, and firm-level decision-making in environments affected by artificial intelligence and technological change (13). Even seemingly nonfinancial managerial characteristics have been shown to influence corporate decisions, indicating that managerial attributes can shape firm policies through perception, social evaluation, confidence, and stakeholder reactions (21). Such evidence reinforces the upper-echelons argument that corporate outcomes reflect the characteristics and interpretations of top decision-makers. Accordingly, when analyzing cash holdings, it is necessary to move beyond conventional determinants such as firm size, leverage, profitability, growth opportunities, and dividend policy, and to incorporate the psychological structure of decision-making at the managerial level.

Alongside managerial characteristics, product market competition is another important determinant of corporate behavior. Product market competition affects firms through pricing pressure, market-share threats, customer mobility, innovation pressure, operational efficiency demands, and the risk of losing strategic position. In competitive industries, managers face stronger external discipline because inefficient decisions can quickly reduce profitability and market share. Product market competition may therefore operate as an external governance mechanism that restricts managerial discretion and reduces the likelihood of inefficient cash retention or misuse of internal funds. At the same time, intense competition may increase the need for precautionary liquidity because firms must respond rapidly to rival actions, technological changes, customer shifts, and supply-chain disruptions. Research on industry concentration, merger waves, customer change, and competitive networks shows that market structure and customer relationships can influence firm strategy, innovation efficiency, entry timing, and financial constraints (3, 22-24). Therefore, product market competition is not merely an external background condition; it can alter the consequences of managerial decisions and reshape the financial policies through which firms maintain survival and competitiveness.

The moderating role of product market competition is particularly important in the relationship between managerial overconfidence and cash holdings. If product market competition acts as a disciplinary mechanism, it may reduce the ability of overconfident managers to pursue inefficient liquidity policies. In such a case, competitive pressure may weaken the effect of overconfidence on cash holdings by forcing managers to align cash policy with market realities. Conversely, if competition intensifies uncertainty and increases the need for rapid strategic response, overconfident managers may use competitive threats as a justification for greater discretion over internal funds, thereby strengthening the relationship between overconfidence and cash holdings. The direction of moderation is therefore an empirical question. This issue is especially relevant because strategic uniqueness, accounting conservatism, dividend policy, overinvestment, and corporate risk-taking have all been shown to be context-dependent and influenced by market conditions, governance structures, and managerial judgment (1, 25-27). Thus, product market competition may change not only the level of cash holdings but also the behavioral channel through which managerial overconfidence affects liquidity decisions.

In emerging markets, the relationship among managerial overconfidence, cash holdings, and product market competition may be even more complex. Firms in such markets often operate under higher information asymmetry, more volatile financing conditions, weaker investor protection, and greater dependence on internal funds. In these settings, managers may have stronger incentives to rely on internal liquidity, and behavioral biases may have greater consequences for firm value. Moreover, product market competition in emerging economies may vary substantially across industries because some firms operate in highly concentrated markets, while others face

intense domestic and international competition. Evidence from studies on managerial psychological characteristics, supply-chain efficiency, enterprise innovation, and business transformation indicates that executive cognition and market conditions jointly shape organizational outcomes (7, 28, 29). For firms listed on the Tehran Stock Exchange, where financial reporting, ownership structures, market constraints, inflationary pressures, and access to external financing may differ from those in developed markets, examining this relationship can provide important evidence on how behavioral and competitive forces interact in corporate financial policy.

Although the literature has separately examined managerial overconfidence, cash holdings, innovation, risk-taking, and competitive dynamics, there remains a need for studies that integrate behavioral managerial characteristics with product market competition in explaining corporate liquidity policy. Prior studies show that managerial overconfidence can influence cash holdings and investment efficiency, that CEO characteristics affect risk and innovation outcomes, and that customer, industry, and market structures affect financing constraints and strategic decisions (4-6, 16, 22). However, less attention has been given to whether competition in the product market changes the strength or direction of the relationship between managerial overconfidence and cash holdings. This gap is important because ignoring the competitive environment may lead to incomplete conclusions about the financial consequences of managerial bias. A manager's overconfidence may not have the same implications in a protected, concentrated, or low-competition industry as it does in a highly competitive industry where poor liquidity choices can quickly damage performance. Therefore, incorporating product market competition as a moderating variable can deepen understanding of both behavioral corporate finance and strategic financial management.

This study contributes to the literature in several ways. First, it extends research on cash holdings by emphasizing the behavioral foundations of liquidity policy rather than limiting the analysis to conventional financial determinants. Second, it adds to the literature on managerial overconfidence by examining how this bias affects cash retention in an emerging capital market setting. Third, it introduces product market competition as a moderating mechanism, thereby connecting behavioral finance with industrial organization and strategic management. Fourth, the study provides evidence that can be useful for investors, auditors, board members, regulators, and financial analysts who evaluate whether corporate cash policies reflect rational precautionary motives or managerial behavioral bias. Finally, by focusing on listed companies over the 2019–2023 period, the study provides recent empirical insight into the interaction among managerial cognition, competitive pressure, and financial decision-making in the context of the Tehran Stock Exchange.

The aim of this study is to examine the effect of managerial overconfidence on cash holdings and to determine the moderating role of product market competition in this relationship among companies listed on the Tehran Stock Exchange.

Methods and Materials

This study is empirical in nature, falls within the domain of positive accounting research, and is based on actual information reported in companies' financial statements. It is also correlational in terms of its nature and descriptive in terms of data collection method.

In the present study, classified and audited financial data of active companies listed on the Tehran Stock Exchange were used to test the research hypotheses. The reason for selecting this statistical population is that the Tehran Stock Exchange provides relatively comprehensive information on companies' status and their financial and

economic performance trends. It can be stated that it is the only information source through which access to companies' financial information is possible and the research models can be tested.

Sampling refers to selecting a part of the population as a representative or proxy for the whole population. In other words, the set of activities performed to select sample elements is called sampling. This sample should possess all or most of the characteristics of the statistical population so that the results obtained from it can be generalized to the entire population. Various methods are available for sampling in research, and the sample selection process can be carried out in different ways. In practice, it is often preferable to use systematic sampling. In this method, certain conditions are first defined for sample selection, and observations that do not meet these conditions are excluded from the sample. These conditions are determined according to the hypothesis-testing model and the research variables. The reason for using this method and defining such conditions is to homogenize the statistical sample under study with the whole population and to enable the generalization of test results to the statistical population. Considering the research variables, the following criteria were applied in the screening sampling process:

1. Due to the specific nature of investment companies, banks, financial intermediaries, and insurance companies, these companies were excluded from the sample.
2. The fiscal year-end of the selected companies had to be March 19 or March 20 of each year.
3. The selected companies should not have experienced a suspension of stock trading for more than six months during the research period.
4. The financial information, annual reports, and other required data of the companies had to be available for the period under study.

The time period of the present study covers five consecutive years from 2019 to 2023, and companies that met the above-mentioned conditions were selected as the statistical sample.

In studies based on statistical data and information, the first issue that must be clarified is the number of sample members. To determine the number of sample members, a balance must be maintained. A small sample size reduces the generalizability of the results, while a very large sample increases costs and time. Therefore, two limitations exist in determining the number of sample elements: first, the limitation related to the generalizability of test results, and second, the limitation related to cost and time. In financial and accounting research, it is preferable to select the largest possible sample to the extent that available resources allow. As the sample size increases, the research results provide a better representation of the population and become more statistically significant. At a minimum, the sample size should be determined at a level that allows the necessary tests to be conducted according to the research questions. After filtering the companies listed on the stock exchange, 140 companies remained, which constitute the statistical sample size of this study.

Theoretical information, findings of previous studies, and the required research data were accurately collected from secondary sources. The library method was used to collect information on the subject literature, research background, and formulas for extracting the research variables. Statistical data related to the research hypotheses were extracted from companies' financial statements using organizational documents and records. Then, according to the research hypotheses, the data for the variables were calculated based on the obtained information. Since the collected information and data were extracted from audited documents and transformed using formulas commonly applied in the scientific community, it can be claimed that the measurement instrument has reliability. Moreover, because the indices under study were calculated using specific formulas that are regarded as internationally

standardized instruments and, according to the existing literature and theoretical foundations, are specifically designed to measure the relevant attributes, the validity of the measurement instrument can also be confirmed from this perspective. Therefore, the data required for this study were collected through computerized databases, by referring to the library of the Securities and Exchange Organization, using Rahavard Novin software, and consulting the CODAL website, which belongs to the Securities and Exchange Organization. In addition, companies' financial statements, including the balance sheet, statement of cash flows, income statement, notes to the financial statements, and reports on the activities of the board of directors at the end of each fiscal year, were used as the research instruments.

The temporal scope of the study includes five consecutive years from 2019 to 2023, and the research hypotheses were examined using actual data from these years. Based on the research objective, information related to this period was reviewed, and the companies included in the statistical sample were entered into the analyses.

Findings and Results

Table 1 presents the descriptive statistics of the research variables, indicating the descriptive parameters for each variable separately. These parameters mainly include information related to measures of central tendency, such as maximum, minimum, mean, and median, as well as information related to measures of dispersion, such as skewness and kurtosis. The total statistical sample includes 140 companies over five years, comprising 700 observations.

Table 1. Descriptive Statistics of the Variables of the Research Model

Variables	Mean	Median	Maximum	Minimum	Standard Deviation	Skewness	Kurtosis	Observations
Cash holdings	0.082	0.044	0.083	0.000	0.115	2.412	3.921	700
Product market competition	0.071	0.035	0.952	0.000	0.124	3.312	7.435	700
Firm size	14.95	14.72	20.77	9.62	1.691	0.434	3.531	700
Dividend payment	0.000	0.000	0.172	0.000	0.011	2.442	3.845	700

Table 2. Descriptive Statistics of Dichotomous Variables

Variable	Frequency of Code 1	Frequency of Code 0	Total	Percentage of Code 1	Percentage of Code 0	Total Percentage
Managerial overconfidence	239	461	700	34.14	65.86	100
Internal control	314	386	700	44.86	55.14	100
Board duality	475	225	700	67.86	32.14	100
Organizational nature	32	668	700	4.57	95.43	100

Correlation analysis is a tool for determining the type and degree of relationship between one quantitative variable and another quantitative variable. The correlation coefficient is one of the criteria used to determine the correlation between two variables. The correlation coefficient indicates both the intensity and type of relationship, either positive or negative, and is always a value between +1 and -1. A correlation coefficient between 0 and +1 indicates a positive correlation, and the closer this coefficient is to +1, the stronger the correlation. Positive correlation means that as the score of one variable increases, the score of the other variable also increases. A correlation coefficient between 0 and -1 indicates a negative correlation between two variables, and the closer the value is to -1, the stronger the negative correlation. Negative correlation means that as the score of one variable decreases, the score of the other variable increases. The interpretation of the correlation coefficient is as follows:

A coefficient between 0 and 0.29 indicates a weak correlation.

A coefficient between 0.30 and 0.69 indicates a moderate correlation.

A coefficient between 0.70 and 1 indicates a strong correlation.

In the present study, Pearson's correlation coefficient was used to examine correlation and collinearity.

Based on the results presented in Table 3, it was found that there was no very high or very low correlation coefficient, close to +1 or -1, that could affect the regression analysis results. Therefore, no collinearity was observed among the research variables.

Table 3. Pearson Correlation Coefficients of the Independent Variables

	CH	OC	PMC	SIZE	Div	IC	Du	State
CH	1.00							
OC	0.37	1.00						
PMC	0.56	0.34	1.00					
SIZE	0.42	0.24	0.38	1.00				
Div	0.29	0.42	0.29	0.35	1.00			
IC	0.51	0.31	0.43	0.56	0.37	1.00		
Du	0.42	0.54	0.49	0.41	0.53	0.48	1.00	
State	0.31	0.48	0.35	0.34	0.47	0.30	0.51	1.00

To ensure the reliability of the research results, avoid spurious regression relationships, and confirm the significance of the variables, the stationarity test was conducted and the unit root of the research variables was calculated. The presence of non-stationary variables in regression models causes Student's t-test and Fisher's F-test to lack the required validity (Moshki et al., 2018). The Levin, Lin, and Chu test was used to examine the stationarity of the variables. The statistical hypotheses of the unit root test are as follows:

H0: Presence of a unit root.

H1: Absence of a unit root.

The results of the unit root test for the variables are presented in Table 4.

Table 4. Results of the Unit Root Test for the Research Variables

Variable	Levin, Lin, and Chu Statistic	Probability
CH	-12.63148	0.000
OC	-24.8524	0.000
PMC	-36.6324	0.000
SIZE	-14.40973	0.000
Div	-27.7456	0.000
IC	-19.8539	0.000
Du	-16.7416	0.000
State	-31.5387	0.000

The results of the stationarity test indicate that the research variables are stationary at the 5% level. Therefore, the null hypothesis based on the presence of a unit root in the variables is not accepted. Accordingly, it can be argued that the use of the above variables does not lead to spurious results.

Table 5 presents the results obtained from estimating the research model using EViews 12 software through panel data with fixed effects.

Table 5. Results of Testing the First Hypothesis

$$CHit = \beta0 + \beta1OCit + \beta2Sizeit + \beta3Divit + \beta4ICit + \beta5Duit + \beta6Stateit + \varepsilon it$$

Dependent Variable: Cash Holdings (CH)

Variable	Symbol	Estimated Coefficient	Standard Error	t-Statistic	P-value
Managerial overconfidence	OC	-0.261	0.086	-3.036	0.000
Firm size	SIZE	0.015	0.005	2.946	0.002
Dividend payment	Div	0.164	0.032	5.148	0.004
Internal control	IC	0.057	0.016	3.575	0.006
Duality	Du	0.589	0.141	4.176	0.000
Organizational nature	State	0.039	0.013	3.066	0.009
Intercept	C	0.537	0.087	6.171	0.0001

Model Statistic	Value
R-squared	0.59
Adjusted R-squared	0.52
Durbin–Watson statistic	1.96
F-statistic	6.8114
Prob. F-statistic	0.000

Hypothesis 1: Managerial overconfidence affects cash holdings.

As the results presented in Table 5 show, the P-value calculated for managerial overconfidence is lower than the 5% error level, and the estimated coefficient of this variable is negative. Therefore, it can be stated that there is a significant negative relationship between managerial overconfidence and cash holdings. Accordingly, the first hypothesis of this study is accepted.

General interpretation of the model: Considering the adjusted coefficient of determination of 52%, which indicates the good fit of the model and the explanatory power of the variables used, it can be stated that 52% of the changes in the dependent variable are explained by the specified independent variable. Since the Durbin–Watson statistic of this model is close to 2, namely 1.96, it can be concluded that there is no first-order autocorrelation in this model. In addition, the results show that the P-value of the F-test is less than 5%. Since the F-statistic indicates the overall validity of the model, it can be stated that this model is statistically significant at the 95% confidence level and has high validity.

Table 6 presents the results obtained from estimating the research model using EViews 12 software through panel data with fixed effects.

Table 6. Results of Testing the Second Hypothesis

$$CHit = \beta0 + \beta1OCit + \beta2PMCit + \beta3PMC \times OCit + \beta4Sizeit + \beta5Divit + \beta6ICit + \beta7Duit + \beta8Stateit + \varepsilon it$$

Dependent Variable: Cash Holdings (CH)

Variable	Symbol	Estimated Coefficient	Standard Error	t-Statistic	P-value
Managerial overconfidence	OC	-0.241	0.075	-3.215	0.002
Product market competition	PMC	0.384	0.112	3.429	0.004
Managerial overconfidence × Product market competition	OC × PMC	0.174	0.027	6.427	0.000
Firm size	TANG	0.956	0.132	7.241	0.005
Dividend payment	ROA	0.837	0.182	4.603	0.000
Internal control	GROWTH	0.052	0.019	2.751	0.002
Board and CEO duality	MBV	0.161	0.054	2.985	0.003
Organizational nature	LEV	0.505	0.106	4.763	0.007
Intercept	C	0.663	0.124	5.349	0.0001

Model Statistic	Value
R-squared	0.67
Adjusted R-squared	0.64
Durbin–Watson statistic	1.87
F-statistic	5.6357
Prob. F-statistic	0.000

Hypothesis 2: Product market competition moderates the relationship between managerial overconfidence and cash holdings.

As the results presented in Table 6 show, the P-values calculated for product market competition and managerial overconfidence are lower than the 5% error level, and the estimated coefficient of the moderating variable is positive. Therefore, it can be stated that product market competition positively moderates the relationship between managerial overconfidence and cash holdings. Accordingly, the second hypothesis of this study is accepted.

General interpretation of the model: Considering the adjusted coefficient of determination of 64%, which indicates the good fit of the model and the explanatory power of the variables used, it can be stated that 64% of the changes in the dependent variable are explained by the specified independent variable. Since the Durbin–Watson statistic of this model is close to 2, namely 1.87, it can be concluded that there is no first-order autocorrelation in this model. In addition, the results show that the P-value of the F-test is less than 5%. Since the F-statistic indicates the overall validity of the model, it can be stated that this model is statistically significant at the 95% confidence level and has high validity.

Discussion and Conclusion

The results of the present study showed that managerial overconfidence has a significant negative effect on corporate cash holdings. This finding means that, among the sampled companies listed on the Tehran Stock Exchange during 2019–2023, firms managed by overconfident executives tended to maintain lower levels of cash reserves. From a behavioral finance perspective, this result is theoretically meaningful because overconfident managers usually overestimate the accuracy of their judgments, underestimate future risks, and believe that their firms will be able to generate sufficient internal cash flows or obtain external financing when needed. Therefore, rather than preserving cash as a precautionary buffer, such managers may use available liquidity more actively for investment, expansion, innovation, or operational decisions. This interpretation is consistent with prior evidence showing that managerial overconfidence is associated with cash-holding behavior and investment efficiency, suggesting that optimistic executives may alter liquidity policy because they perceive financial and operational risks differently from less overconfident managers (5). The finding also aligns with evidence from blockchain-related firms, where managerial overconfidence and agency costs were shown to influence cash holdings, indicating that managerial bias can directly shape the level of internal liquidity retained by firms (6).

The negative relationship between managerial overconfidence and cash holdings can also be explained through managers' tendency to pursue projects more aggressively when they believe in their own capability to identify profitable opportunities. Overconfident managers may view unused cash as an inefficient idle resource and may prefer to allocate it to growth-oriented decisions, such as innovation, transformation, mergers and acquisitions, and strategic investment. This explanation is consistent with studies suggesting that managerial cognitive bias affects business transformation and firm performance, because biased managers may interpret uncertain strategic opportunities as more controllable and more profitable than they actually are (7). Similarly, evidence on executive overconfidence, digital transformation, and environmental innovation shows that overconfident executives may be more willing to implement ambitious and resource-demanding strategies (17). In this regard, lower cash holdings may not simply indicate weaker liquidity management; rather, they may reflect an active managerial preference for converting cash into strategic actions. However, whether such behavior improves firm value depends on the quality

of investment decisions, governance mechanisms, external monitoring, and the competitive conditions under which firms operate.

The findings are also compatible with the broader upper-echelons literature, which argues that strategic and financial outcomes are shaped by the personal characteristics, psychological tendencies, and cognitive orientations of senior executives. Research on CEO core self-evaluations and risk-taking strategies indicates that executives with strong self-evaluative beliefs may be more willing to engage in risky strategic behavior depending on environmental contingencies (11). Similarly, studies of founder CEOs and overconfidence show that executive identity and psychological traits can influence firm risk, implying that managerial confidence is not a neutral personality attribute but a determinant of corporate policy (19). The present result contributes to this line of reasoning by showing that overconfidence is reflected not only in high-risk investment or innovation decisions but also in routine financial policies such as the retention of cash. Thus, cash holdings can be interpreted as a financial outcome partly rooted in managerial perception, not merely as an accounting response to profitability, leverage, size, or dividend policy.

The negative coefficient of managerial overconfidence is also consistent with the argument that optimistic managers may expect future financing conditions to be favorable and therefore feel less need to accumulate cash. Prior studies have shown that optimistic CEOs may enhance firm value under specific conditions, particularly when their optimism is supported by real growth opportunities, effective monitoring, or strategic fit (8). However, biased managers may also underestimate financing constraints and liquidity shocks, especially when they believe that the market undervalues their firm or that future performance will validate their decisions. This interpretation is further supported by research on biased managers and delegation, which shows that managerial bias can shape organizational decisions and the allocation of authority (9). In the context of cash holdings, overconfident managers may delegate or approve more spending, reduce precautionary reserves, and rely more heavily on anticipated future cash flows. Therefore, the negative relationship observed in this study is consistent with the behavioral view that overconfident managers are less conservative in liquidity preservation.

The results also showed that product market competition positively moderates the relationship between managerial overconfidence and cash holdings. More precisely, the positive interaction coefficient suggests that product market competition weakens or offsets the negative effect of managerial overconfidence on cash holdings. In other words, although overconfident managers generally tend to hold less cash, this tendency becomes less negative when firms operate in more competitive product markets. This result indicates that competition functions as an important contextual condition that reshapes the behavioral consequences of managerial overconfidence. In highly competitive markets, firms face stronger pressure from rivals, customer mobility, pricing threats, innovation requirements, and operational uncertainty. Under such conditions, even overconfident managers may recognize the strategic value of maintaining liquidity to respond quickly to market changes. This finding is consistent with research showing that corporate strategy uniqueness is related to cash holdings, because distinctive strategic positioning may increase the need for financial flexibility (1). It also aligns with studies emphasizing that customer change and social-network conditions can influence enterprise innovation efficiency, implying that competitive and customer-side dynamics affect how firms allocate resources (24).

The moderating effect of product market competition can be interpreted through both governance and strategic flexibility perspectives. From the governance perspective, competitive markets discipline managers because poor liquidity decisions can quickly lead to declining performance, loss of market share, or reduced investor confidence.

Therefore, product market competition may constrain the discretionary behavior of overconfident managers and force them to adopt more cautious financial policies. From the strategic flexibility perspective, intense competition may increase the value of cash because firms need liquid resources to finance rapid responses to rival actions, technological changes, supply-chain disruptions, and customer shifts. Research on industry concentration, firm size, and entry timing in merger waves supports the idea that market structure affects strategic decision-making and competitive behavior (22). Likewise, studies on continuous mergers and acquisitions suggest that firms' external strategic moves are shaped by market dynamics and competitive pressures (23). Therefore, the positive moderation found in this study suggests that competition does not merely discipline managers; it also changes the strategic meaning of cash holdings.

This result is particularly important because it shows that managerial overconfidence does not operate uniformly across all market environments. In less competitive markets, overconfident managers may have greater freedom to reduce cash reserves and allocate liquidity to projects based on optimistic expectations. In more competitive markets, however, the same managerial bias may be constrained by the need to preserve liquidity for survival, innovation, and rapid adaptation. This interpretation is compatible with research showing that managerial overconfidence interacts with innovation and institutional effectiveness, indicating that the outcomes of overconfidence depend on contextual conditions (14). It is also consistent with evidence that overconfident CEOs may transform innovation into firm value when firm-level and environmental conditions support such transformation (16). Therefore, the present study supports a contingency-based understanding of managerial overconfidence: its effect on cash holdings depends partly on whether the external market environment intensifies or reduces the need for financial flexibility.

The moderating role of product market competition may also be connected to financing constraints and customer-related risk. In competitive markets, firms often face greater uncertainty about sales stability, customer loyalty, and future cash flows. Prior research on customer risk and corporate financing constraints shows that customer-side uncertainty can affect firms' access to finance and increase the importance of internal financial resources (3). Similarly, evidence on customers' risk tolerance and suppliers' investment inefficiency indicates that risk transmitted through customer relationships may influence corporate investment behavior (4). Accordingly, when competition increases exposure to customer and revenue volatility, firms may be more likely to retain cash even if their managers are overconfident. In this sense, product market competition can transform cash holdings from a passive liquidity reserve into a strategic insurance mechanism. This explains why the interaction between managerial overconfidence and competition is positive: competition creates external pressures that limit the cash-reducing tendency of overconfident managers.

The findings also relate to the literature on executive traits and operational decision-making. Managerial overconfidence has been shown to influence inventory leanness, supply-chain management efficiency, and operational resource allocation, demonstrating that behavioral bias extends beyond financial reporting and investment decisions into broader managerial systems (28, 30). When markets are competitive, operational flexibility becomes more important, and cash reserves may support inventory decisions, supply-chain resilience, customer responsiveness, and innovation capacity. Furthermore, studies on CEO and CMO characteristics indicate that executive traits affect innovation and stock returns, reinforcing the argument that managerial characteristics influence firm outcomes through strategic resource allocation (20). Therefore, the present finding suggests that the

financial policy of cash holding is part of a larger behavioral-operational system in which managerial confidence, market competition, and resource flexibility are interdependent.

The control variables in the regression models also support the broader interpretation that cash holdings are shaped by firm characteristics and governance conditions. Firm size, dividend payment, internal control, board duality, and organizational nature were significantly associated with cash holdings in the estimated models. These findings indicate that liquidity policy is influenced not only by managerial overconfidence but also by structural and governance-related features. The positive role of firm size may reflect the greater operating scale and strategic complexity of larger firms, while the significance of dividend payment indicates that payout policy is associated with liquidity management. This is consistent with studies showing that corporate dividend policies may display cohort effects and reflect broader financial behavior across firms (26). The role of internal control and governance-related variables is also compatible with prior work on corporate governance and R&D smoothing, which suggests that governance structures can influence how managers allocate resources over time (15). Therefore, the study's findings reinforce the importance of examining behavioral variables together with firm-specific and governance-related determinants.

The results further contribute to the literature on organizational capital, financialization, and strategic investment. Recent evidence suggests that organization capital can influence corporate financialization, meaning that firms' intangible organizational capabilities shape how they allocate resources between operational and financial activities (2). In the present study, the cash-holding decision can likewise be understood as part of a broader allocation problem: whether resources should remain liquid or be redirected toward operating, financial, or strategic uses. Managerial overconfidence may push firms toward more active use of cash, whereas product market competition may increase the need to retain liquidity for flexibility. Similarly, research on pollution control bonds and overinvestment relationships shows that investment behavior is affected by institutional and sectoral conditions (27). Evidence on strategic emphasis and accounting conservatism also suggests that firm strategy influences reporting and financial policy choices (25). Thus, the current findings position cash holdings at the intersection of managerial psychology, organizational strategy, governance, and external market discipline.

The findings can also be interpreted in relation to executive background and decision quality. CEOs with financial backgrounds may affect corporate risk-taking differently because financial expertise changes how managers evaluate uncertainty, financing, and risk exposure (10). Inventor CEOs and executives with innovation-oriented backgrounds may also make different strategic decisions because they may perceive technology and growth opportunities differently (18). Even characteristics such as CEO facial attractiveness have been linked to corporate decisions, suggesting that managerial attributes can influence stakeholder perceptions and internal decision processes (21). In this context, overconfidence represents one of the most consequential managerial attributes because it directly affects how executives evaluate their own judgment and the firm's future prospects. The present study therefore provides evidence that managerial traits are reflected in the liquidity policies of listed firms, while the competitive environment determines the extent to which such traits shape actual financial outcomes.

Overall, the results of this study support the view that cash holdings are not merely determined by conventional financial variables but are also shaped by behavioral and strategic mechanisms. Managerial overconfidence reduces cash holdings, suggesting that overconfident managers are more likely to use internal funds actively and less likely to preserve cash for precautionary purposes. At the same time, product market competition positively moderates this relationship, indicating that competitive pressure weakens the cash-reducing effect of managerial

overconfidence and increases the strategic importance of liquidity. These findings are consistent with prior research showing that managerial cognition, executive characteristics, innovation orientation, market structure, customer risk, and governance conditions all affect corporate decisions (12, 13, 29). Therefore, the central implication of the study is that behavioral corporate finance should be analyzed within the external competitive environment, because managerial bias and market discipline jointly shape financial policy.

The present study has several limitations. First, the sample was restricted to companies listed on the Tehran Stock Exchange during 2019–2023; therefore, the findings may not be directly generalizable to unlisted firms, financial institutions, or companies operating in other institutional environments. Second, the measurement of managerial overconfidence was based on available archival indicators, which may not fully capture the psychological depth of managerial bias. Third, the study focused on product market competition as the moderating variable, while other external conditions such as macroeconomic uncertainty, inflationary pressure, ownership concentration, financing constraints, and regulatory changes may also affect the relationship between managerial overconfidence and cash holdings. Fourth, although the use of panel-data regression with fixed effects improves the robustness of the analysis, causal interpretation should still be made with caution because unobserved managerial, organizational, or industry-specific factors may influence the results.

Future studies are suggested to extend this research in several directions. Researchers can compare listed and unlisted firms to determine whether capital-market visibility changes the effect of managerial overconfidence on cash holdings. Future research may also use alternative measures of managerial overconfidence, such as textual analysis of executive statements, managerial forecasting behavior, investment timing, or option-exercise patterns. In addition, future studies can examine other moderating variables, including corporate governance quality, board independence, institutional ownership, financial constraints, environmental uncertainty, and ownership structure. Comparative studies across countries or industries may also help determine whether the moderating role of product market competition differs across institutional settings. Finally, future research can investigate whether the cash-holding behavior of overconfident managers ultimately improves or weakens firm value, investment efficiency, innovation outcomes, and long-term financial sustainability.

From a practical perspective, the findings suggest that investors, board members, auditors, and policymakers should pay closer attention to managerial behavioral characteristics when evaluating corporate cash policies. Boards of directors should design monitoring mechanisms that prevent overconfident managers from reducing cash reserves excessively or allocating liquidity to inefficient projects. Financial analysts should also consider the competitive environment when interpreting the cash levels of firms, because lower cash holdings may have different implications in highly competitive industries than in protected or concentrated markets. Managers should recognize that confidence can support strategic action, but excessive confidence may weaken precautionary liquidity management. Therefore, firms should develop cash-management policies that balance managerial initiative with financial discipline, competitive flexibility, and long-term sustainability.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adheried in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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