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**Article**

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## TOP MANAGEMENT TEAM CHARACTERISTICS, OVERCONFIDENCE, AND FINANCIAL ASSET ALLOCATION

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### Abstract

The large-scale allocation of financial assets by enterprises indicates economic financialization at the micro-level. Scholars have extensively discussed its influencing factors, but most are based on the traditional assumption of “rational people.” The annual data of listed companies in China for the period 2008 to 2020 was used to explore how the characteristics of the top management team (TMT) affect a company’s financial asset allocation, considering that “people are imperfectly rational and heterogeneous” as a research perspective. The mediating effect and the influence of overconfidence on TMT’s characteristics affecting financial asset allocation were analyzed through a mediation model, a two-way fixed effects model, and the Logit method. Results reveal that TMT’s characteristics, such as gender, age, tenure, education, finance, and overseas experience, have a differentiated influence on financial asset allocation. The transmission mechanism of overconfidence in this process is more complicated, with a partial mediating effect and a suppressing effect. Conclusions provide managerial implications for the government, companies, and executives in carrying out collaborative operations and jointly promoting the financial services for the entity.

**Keywords:** top management team, overconfidence, financial assets

**JEL Classification:** D22, G41, M12, M21

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## Introduction

Given the declining profit rate of entity economy and the higher returns of virtual economy, “hotter” virtual economy and “colder” entity economy have become common in the current world economic development, and the phenomenon of economic financialization has become prominent (Wang et al., 2017). Driven by the inherent nature of capital-chasing profits, entity companies invest a large amount of money in financial assets or investment real estate to obtain high returns. The proportion of financial assets in corporate assets continues to increase and financial channels have become the dominant mode of profit accumulation (Zhang and Zhang, 2016). The executives are the core of a corporation. The top management team (TMT) has a powerful influence on the formulation and execution of corporate strategies, has the right to make strategic decisions and control corporate operation, is responsible for economic benefits, and can adjust corporate strategy and resource allocation following environmental changes (Mihalache et al., 2014).

Executives play a pivotal role in corporate production, investment, and other activities, and they will inevitably have a greater impact on the scale and structure of financial asset allocation. Existing research has conducted a lot of useful explorations of intrinsic motivation and economic consequences of financial asset allocation. However, relatively little attention has been paid to financial asset allocation factors. Few studies have investigated how executives influence financial asset allocation on the basis of a single executive’s perspective, such as the chairman or general manager, and most studies are based on the traditional assumption of “rational people.” However, according to Upper Echelons Theory and Behavioral Finance Theory, corporate executives have individual differences and cognitive biases, not homogeneous and completely rational. Differentiated individual characteristics affect corporate executives’ emotional cognition, personal philosophy, and value judgment and further affect corporate financial asset allocation decisions (Wang, 2016).

To fill the research gaps highlighted above, this study treats TMT as a corporate decision-making group, regards executives as incompletely rational people with heterogeneous characteristics, and explores the influence effect and transmission mechanism of TMT characteristics, such as gender, age, tenure, education, finance, and overseas experience, on corporate financial asset allocation decisions. TMT is the maker and implementer of corporate strategic decisions and plays a key role in major strategic decisions, such as corporate investment. However, TMT members have diverse individual characteristics and usually show imperfectly rational behaviors, such as overconfidence. This phenomenon has triggered a series of thoughts such as the following: What is the relationship among TMT characteristics, overconfidence, and financial asset allocation? What are the factors contributing to the overconfidence of corporate executives? Will the individual characteristics of corporate executives have an impact on overconfidence? Will corporate decisions on financial asset allocation be more radical because of TMT’s overconfidence? What role does overconfidence play in the process of TMT characteristics affecting corporate financial asset allocation?

Therefore, this study uses the data from China’s non-financial and non-real estate listed companies in 2008-2020 to explore the above questions through empirical research. The possible contributions of this study are presented as follows: (1) This study breaks the research assumption of “rational people” in traditional economics and discusses the influencing factors of corporate financial asset allocation based on the perspective of “people are imperfectly rational and heterogeneous.” (2) This study refines TMT characteristics into

two aspects: homogeneity and heterogeneity. It investigates its influence on financial asset allocation and mechanism and further deepens the relevant pre-factor theories affecting corporate financial asset allocation. (3) Based on the perspective of executives' irrational behavior, this study regards overconfidence as a mediating variable and transmission channel in the process of TMT characteristics affecting corporate financial asset allocation decisions.

The remainder of this study is organized as follows. Section 1 presents the literature review and theoretical analysis of the relationship between TMT characteristics, overconfidence, and corporate financial asset allocation. Research hypotheses are also proposed. Section 2 presents the research design of this study, including data sources, variable definitions, and model construction, and conducts a descriptive statistical analysis. Section 3 analyzes the empirical results, studies the influence of TMT characteristics on financial asset allocation, and discusses the mediating effect and the mechanism of overconfidence using the "three-step test" of mediation. Finally, the empirical results are tested for robustness. Section 4 further analyzes the possible causes of the empirical results. Section 5 presents the conclusions, managerial implications, research limitations, and future directions.

## **1. Literature Review and Hypothetical Development**

### **1.1 TMT gender characteristics, overconfidence, and financial asset allocation**

Given the significant differences in emotional cognition and psychological tolerance between male and female executives, executives of different genders have substantial differences in information processing capabilities and overconfidence performance, further affecting corporate investment decisions. When processing information, male executives have high selectivity and cash flow sensitivity. Therefore, they are fully confident in their investment decisions and are more willing to hold assets with high risks and high returns (He et al., 2011). However, female executives usually deal with information comprehensively (Graham et al., 2002; Lu et al., 2020a) and prefer to maintain the current industry status (Doan and Iskandar-Datta, 2020). Higher-risk companies are generally more inclined to appoint female CEOs (Martin et al., 2009). The gender differences of the executives cause significant differences in their internal investment psychological tendencies and external investment transaction behaviors, which is comprehensively reflected in whether they are more confident in resource allocation decisions. Male executives usually show more self-confidence than female executives in investment behavior, even if this self-confidence is not based on a stronger understanding of the market. Based on the above analysis, the following hypotheses are proposed.

- H1a: TMT with more male executives is more likely to show overconfidence and make more radical financial asset allocation decisions.
- H1b: Gender heterogeneity is positively correlated with overconfidence, making corporate financial asset allocation decisions more positive.

### **1.2 TMT age characteristics, overconfidence, and financial asset allocation**

Young executives have strong cognition, innovation, and adaptability, can quickly analyze comprehensive information and accept new things, hence, they have stronger self-confidence in the face of a complex, volatile, and competitive market environment (Neely et al., 2020;

Lu et al., 2020b). Young executives are more inclined to strategic change and risk decision-making (Wiersema and Bantel, 1992), can quickly seize strategic opportunities to seize market opportunities (Sun et al., 2006), and are also more proactive in investment strategies. However, with the increase of age, their physical strength, memory, and logical reasoning ability gradually decline, and their environmental adaptability and information sensitivity are getting lower and lower. The higher the average age, the more TMT tends to rely on accumulated experience, regarding financial security and career stability as more important (Serfling, 2014), and formulate a more conservative corporate strategy (Wang, 2016). However, dissidents believe that older executives have rich professional and practical experience, have clearer judgments and understandings of corporate risk decision-making, and have more mature considerations in risk-taking (Flood et al., 1997). The greater the age heterogeneity of TMT, the less frequent technical exchanges and cooperation among members, reducing the internal cohesion of TMT, increasing emotional conflicts between team members (Del Carmen Triana et al., 2019), and even causing team divisions. It negatively impacts organizational decision-making and performance and inhibits the formulation and execution of financial asset allocation decisions. The following hypotheses are proposed based on the above analysis and combined with China's reality.

- H2a: TMT with older average age is more likely to show overconfidence and makes more radical financial asset allocation decisions.

- H2b: Age heterogeneity is negatively correlated with overconfidence, making corporate financial asset allocation decisions more negative.

### 1.3 TMT tenure characteristics, overconfidence, and financial asset allocation

The longer the average tenure, the more stable the TMT. The members are more likely to form common cognitive and similar skills, enhancing organizational cohesion (Richard et al., 2019) and executives' ability to recognize the enterprise's internal resources and external environment (Ensley et al., 2002). With longer average tenure, forming strong social cohesion and decision-making consistency (Al-Matari, 2019) becomes easier, improving TMT's self-confidence in the success of strategic decision-making and making it more willing to allocate financial assets with higher returns. With a short average tenure of TMT, insufficient communication between members leads to the incomplete collection and unreasonable integration of information and increases the probability of strategic decision errors and corporate bankruptcy (Hambrick and Aveni, 1992). TMT with higher tenure heterogeneity has more diversified social network relationships and organizational experience (Neely et al., 2020), increases the opportunity to break the original management model of the enterprise (You et al., 2020), and easily forms diverse information collection channels and multi-angle information interpretation (Finkelstein et al., 2009). Therefore, TMT with a higher average age is not conducive to forming a unified decision, suppressing the self-confidence of TMT, and leading to more negative financial asset allocation (Carpenter, 2002). Based on the above analysis, the following hypotheses are proposed.

- H3a: TMT with a longer average tenure is more likely to show overconfidence and makes more radical financial asset allocation decisions.

- H3b: Tenure heterogeneity is negatively correlated with overconfidence, making corporate financial asset allocation decisions more negative.

#### 1.4 TMT education characteristics, overconfidence, and financial asset allocation

The educational background affects executives' cognitive and professional skills. According to the relevant information decision-making theory, higher education levels indicate that executives have strong learning and cognitive abilities (Liu et al., 2018), the ability to obtain and distinguish information (Barker and Mueller, 2002), and the ability to adapt to the environment (He et al., 2011). TMT with a good educational background is more self-confident; more inclined to adopt management, technological, and organizational innovation (Lee et al., 2021); and more willing to allocate high-return financial assets (Jiang et al., 2009). Heterogeneous educational backgrounds can provide diversified information. Although it is beneficial to improve the quality of strategic decision-making and corporate performance, its positive impact must be built on the appropriate discussion mechanism within TMT (Díaz-Fernández et al., 2020). Otherwise, TMT with greater educational heterogeneity is prone to internal conflicts, which is not only detrimental to the formation of team self-confidence, but also to the formulation and implementation of corporate investment strategies (He and Yang, 2010), thereby reducing the enterprise's business performance (Amason et al., 2006). Based on the above analysis, the following hypotheses are proposed.

- H4a: TMT with higher average education is more likely to show overconfidence and makes more radical financial asset allocation decisions.
- H4b: Educational heterogeneity is negatively correlated with overconfidence, making corporate financial asset allocation decisions more negative.

#### 1.5 TMT finance characteristics, overconfidence, and financial asset allocation

Executives' financial experience has a significant impact on the company's management, financial, and investment decisions. Based on social network theory, Gao et al. (2019) found that rich financial network relationships make TMT more confident in the financial field, accelerate the dynamic adjustment of capital structure, reduce financing constraints, and further increase the company's debt to asset ratio. CEOs with financial experience are more confident in their financial investment decisions and are more willing to allocate financial assets proactively rather than operating assets (Du et al., 2019; Dai and Pan, 2019). The purpose is not long-term defensive savings but short-term speculative arbitrage. That is, the richer the financial experience of the TMT members is, the more diversified the investment and financial management knowledge the TMT has, the more accurate their judgments on the economic situation will be, and the more radical their investment decisions in financial asset allocation will be. Based on the above analysis, the following hypotheses are proposed.

- H5a: A TMT with richer financial experience is more likely to show overconfidence and makes more radical financial asset allocation decisions.
- H5b: Financial experience heterogeneity is negatively correlated with overconfidence, making corporate financial asset allocation decisions more negative.

#### 1.6 TMT's overseas experience characteristics, overconfidence, and financial asset allocation

Few studies have investigated the impact of executives' overseas experience on corporate financial asset allocation. Overseas work and study experience is often an extremely

important life journey in personal growth. Being educated and baptized in different cultures will have a significant impact on an individual’s thinking and values. Good professional background, rich work experience, and international vision formed by multicultural education and baptism are the superior characteristics of executives with overseas experience, making executives with an overseas experience more confident in their behavioral styles. Therefore, this study believes that executives with overseas experience may be more aggressive in making investment decisions and are more willing to obtain financial benefits through high-value financial asset allocation. Based on the above analysis, the following hypotheses are proposed.

- H6a: TMT with richer overseas experience is more likely to show overconfidence and makes more radical financial asset allocation decisions.
- H6b: Overseas experience heterogeneity is negatively correlated with overconfidence, making corporate financial asset allocation decisions more negative.

**2. Methodology**

**2.1. Variables**

*Financial asset allocation (FAA)* is the dependent variable in this study. Referring to the method of Dai and Pan (2019), the financial asset density (*Fin\_D*) and the financial asset growth rate (*Fin\_G*) are selected to measure the financial asset allocation of listed companies. *Fin\_D* refers to the ratio of financial assets allocated by listed companies to total assets. *Fin\_G* is equal to the difference between the two adjacent financial assets after normalization with total assets, used to reflect the growth rate of financial assets allocated by listed companies. According to the company’s balance sheet and drawing on the practices of Demir (2009) and Du et al. (2019), the financial assets in this study include financial assets held for trading, derivative financial assets, net short-term investment, net interest receivable, net dividends receivable, net financial assets acquired, net available-for-sale financial assets, net held-to-maturity investments, net long-term equity investments, net long-term debt investments, and net investment real estates.

*TMT characteristics (TMTC)* are the main independent variable in this study, including gender (*Gender*), age (*Age*), tenure (*Tenure*), education (*Edu*), financial experience (*Fin*), and overseas experience (*Osea*). Each characteristics index is further subdivided into two aspects: homogeneous and heterogeneous, which are marked with A and H before the characteristics index, respectively (Table no.1).

**Table no.1. Definition and description of TMT characteristics variables**

Variables	Subvariable	Variable description and measurement method
<i>Gender</i>	<i>Agender</i>	<i>Agender</i> represents TMT gender homogeneity, measured by ratio of male executives to TMT size. $Agender = (\sum Gender) / n$ . when TMT member’s gender is male, <i>Gender</i> is 1, and otherwise 0.
	<i>Hgender</i>	<i>Hgender</i> represents TMT gender heterogeneity, measured by Herfindahl-Hirschman Index (HHI). $HHI = 1 - \sum P_i^2$ . $P_i$ is the ratios of executive of gender <i>i</i> to TMT size. The closer <i>HHI</i> value is to 1, the higher TMT gender heterogeneity; otherwise, the lower it is.

Variables	Subvariable	Variable description and measurement method
Age	<i>Aage</i>	<i>Aage</i> represents TMT age homogeneity, measured by TMT average age.
	<i>Hage</i>	<i>Hage</i> represents TMT age heterogeneity, measured by age standard deviation coefficient of TMT. The larger the value, the higher TMT age heterogeneity, and vice versa.
Tenure	<i>Atenure</i>	<i>Atenure</i> represents TMT tenure homogeneity, measured by average tenure month of TMT.
	<i>Htenure</i>	<i>Htenure</i> represents TMT tenure heterogeneity, measured by tenure standard deviation of TMT. The larger the value, the higher TMT tenure heterogeneity, and vice versa.
Edu	<i>Aedu</i>	<i>Aedu</i> represents TMT educational homogeneity, measured by average educational level of TMT. Corresponding to high school and below, junior college, undergraduate, master, and Ph.D., Edu is 1-5 respectively.
	<i>Hedu</i>	<i>Hedu</i> represents TMT education heterogeneity, measured by <i>HHI</i> . $HHI = 1 - \sum P_i^2$ . $P_i$ is the ratios of executive of education $i$ to TMT size. The closer <i>HHI</i> value is to 1, the higher TMT education heterogeneity; otherwise, the lower it is.
Fin	<i>Afin</i>	<i>Afin</i> represents TMT financial homogeneity, measured by the ratio of executive with financial experience to TMT size. $Afin = (\sum Fin) / n$ . If TMT member has financial experience, <i>Fin</i> is 1, otherwise 0. Financial experience means that TMT members have working experience in financial supervision departments and financial institutions. Finance experience means TMT members have working experience in financial supervision departments and financial institutions.
	<i>Hfin</i>	<i>Hfin</i> represents TMT financial heterogeneity, measured by <i>HHI</i> . $HHI = 1 - \sum P_i^2$ . $P_i$ is the ratios of executive members of finance $i$ to TMT size. The closer <i>HHI</i> value is to 1, the higher TMT financial heterogeneity; otherwise, the lower it is.
Osea	<i>Aosea</i>	<i>Aosea</i> represents TMT overseas experience homogeneity, measured by ratio of executive with overseas experience to TMT size. $Aosea = (\sum Osea) / n$ . If TMT member has work experience abroad, <i>Osea</i> is 1, otherwise 0.
	<i>Hosea</i>	<i>Hosea</i> represents TMT overseas experience heterogeneity, measured by <i>HHI</i> . $HHI = 1 - \sum P_i^2$ . $P_i$ is the ratios of executive members with overseas experience $i$ to TMT size. The closer <i>HHI</i> value is to 1, the higher TMT overseas experience heterogeneity; otherwise, the lower it is.

*Overconfidence (OverC)* is another main independent variable and one of the important mediating variables that TMT characteristics affect financial asset allocation. Academia has conducted extensive research on the irrational behavior of executives' overconfidence, but has no consensus on how to measure TMT overconfidence. Existing research has designed many proxy variables to measure whether executives are overconfident, including executive earnings forecast bias (Lin et al., 2005; Chen and Wu, 2014), exercise status of executive stock options (Chen and Xiao, 2011), corporate M&A frequency (Doukas and Petmezas,



2007; Wu et al., 2008), relative ratio of executives compensation (Liu et al., 2018; He et al., 2011), the index of consumer sentiment (Yu et al., 2006), business climate index (Yu et al., 2006), and media’s evaluation to executives (Malmendier and Tate, 2005). However, whether these proxy variables can truly measure executive overconfidence remains to be further explored.

Based on a psychological perspective and fully considering the availability of data, this study used company growth and changes in executive shareholding to jointly judge TMT overconfidence behavior. During the research year, if the company’s growth rate has decreased compared to the previous period, the number of stocks held by TMT remains unchanged or increases, indicating that TMT has overestimated the company’s development prospects. This study judges that TMT has overconfidence. Therefore, the criterion for determining whether TMT is overconfident is as follows.

$$IOS_{i,t} < IOS_{i,t-1} \tag{I}$$

$$HOLD_{i,t} \geq HOLD_{i,t-1} \tag{II}$$

Where:

$IOS_{i,t}$  – represents the company’s growth opportunities in current period, using operating income growth-rate or Tobin’s Q-value in current period to measure.

$IOS_{i,t-1}$  – represents company’s growth opportunities in previous period, using operating income growth-rate or Tobin’s Q-value in previous period to measure.

$HOLD_{i,t}$  – represents number of TMT’s shares held in current period.

$HOLD_{i,t-1}$  – represents number of TMT’s shares held in previous period.

When formula (I) and formula (II) are achieved simultaneously, TMT overconfidence can be judged, and the variable *OverC* is 1. As long as one of the two formulas is not achieved, TMT overconfidence cannot be judged, and the variable *OverC* is 0. In this study, *OverC1* and *OverC2* are used to measure TMT overconfidence. *OverC1* and *OverC2* are company growth opportunities measured using operating income growth rate and Tobin’s Q, respectively.

*Control variables.* Referring to the research results of Custódio and Metzger (2014), Du et al. (2019), and Dai and Pan (2019), control variables in this study include company size (*Size*), financial leverage (*Lev*), capital intensity (*Cap\_Int*), growth (*Growth*), profitability (*ROA*), ownership concentration (*Top*), board size (*Board*), the proportion of independent directors (*Indep*), leadership structure (*Dobual*), and listing period (*Lage*). Fixed-time effects (*Year*) and industry fixed effects (*Ind*) are added to the model to control the impact of industry differences and unobservable time factors on corporate financial decisions. The definition and description of the control variables are shown in Table no.2.

**Table no.2. Definition and description of control variables**

Variables	Variable description and measurement method
<b>Size</b>	<i>Size</i> represents company size, measured by the natural logarithm of total assets.
<b>Lev</b>	<i>Lev</i> represents financial leverage and equals total liabilities divided by total assets.
<b>Cap_Int</b>	<i>Cap_Int</i> represents capital intensity and equals fixed assets divided by total assets.
<b>Growth</b>	<i>Growth</i> represents growth, which is equal to the ratio of main business income in adjacent years minus 1.

Variables	Variable description and measurement method
<b>ROA</b>	<i>ROA</i> represents profitability and is equal to net profit divided by total assets.
<b>Top5</b>	<i>Top5</i> represents the shareholding concentration, measured by the shareholding ratio of the top five shareholders.
<b>Board</b>	<i>Board</i> represents board sizes, measured by the number of board members.
<b>Indep</b>	<i>Indep</i> represents the proportion of independent directors, measured by the proportion of independent directors to the board.
<b>Dobual</b>	<i>Dobual</i> represents leadership structure. If the chairman and general manager are the same person, <i>Dobual</i> is 1, otherwise 0.
<b>Lage</b>	<i>Lage</i> represents listing period, measured by the difference between current year and listing year.
<b>Year</b>	<i>Year</i> represents time fixed effect.
<b>Ind</b>	<i>Ind</i> represents industry fixed effect.

## 2.2 Model construction

This study refers to the three-step method of the mediating effect (MacKinnon, 2000; Fang et al., 2017) and constructs models (III), (IV), and (V) to explore the mediating effect and mechanism of TMT characteristics affecting financial asset allocation and test the above research hypotheses.

$$FAA_{it} = \alpha_0 + \alpha_1 TMTC_{it} + \sum \theta_j Controls_{jit} + \sum Year + \sum Ind + \varepsilon_{it} \quad (III)$$

$$OverC_{it} = \beta_0 + \beta_1 TMTC_{it} + \sum \theta_j Controls_{jit} + \sum Year + \sum Ind + \varepsilon_{it} \quad (IV)$$

$$FAA_{it} = \lambda_0 + \lambda_1 TMTC_{it} + \lambda_2 OverC_{it} + \sum \theta_j Controls_{jit} + \sum Year + \sum Ind + \varepsilon_{it} \quad (V)$$

Where:

*FAA* – Financial asset allocation, which is measured by *Fin\_D* and *Fin\_G*;

*TMTC* – TMT characteristics, and which detailed description is shown in Table no. 1;

*OverC* – A dummy variable, indicating whether TMT has overconfidence;

*Controls* – A series of control variables in Table no. 2;

*Year* – Time fixed effects;

*Ind* – Industry fixed effects;

$\varepsilon$  – Random error terms.

The mediating effect, the confounding effect, and the suppressing effect are three similar mediation mechanisms. The mediating effect and the confounding effect can reduce the total effect between independent and dependent variables. The suppressing effect can increase the total effect. Specifically, in the above three models, when  $\alpha_1$  and  $\beta_1$  are significant, if  $\lambda_1$  and  $\lambda_2$  are also significant, overconfidence plays a partial mediating effect. If  $\lambda_2$  is significant but  $\lambda_1$  is no longer significant, overconfidence plays a full mediating effect. If  $\lambda_1$  and  $\beta_1 \lambda_2$  are in the opposite direction or  $\alpha_1 < \lambda_1$ , overconfidence plays a suppressing effect.

2.3 Data sources

To explore the relationship between TMT characteristics, overconfidence, and financial asset allocation, this study selects executive data and related financial data from Chinese A-share listed companies from 2008 to 2020 as the research object, and processes the data as follows: (1) Listed companies undergoing special treatments, such as ST and \*ST, and delisted companies during the sampling period are deleted. (2) Samples with missing main variables during the sampling period are excluded. (3) Considering the particularity of some industries, samples of the financial and real estate industries are removed. (4) To avoid the interference of outliers on the estimated results, all continuous variables are subjected to Winsor processing at the 1% and 99% levels. Eventually, the annual samples data of 21,356 Chinese listed companies in sixteen industries are obtained. Executive data, financial data, and other relevant data from Chinese listed companies came from the CSMAR and Wind databases. Table no. 3 reports the descriptive statistics of the main variables.

Table no.3. Descriptive Statistics of the main Variables

Variable	Obs.	Mean	SD	Min	Median	Max
Fin_D	21356	0.06	0.11	0.00	0.02	1.32
Fin_G	21356	0.01	0.05	-3.04	0.00	0.89
OverC1	21356	0.33	0.47	0.00	0.00	1.00
OverC2	21356	0.35	0.48	0.00	0.00	1.00
Agender	21356	0.85	0.16	0.00	0.88	1.00
Hgender	21356	0.21	0.13	0.00	0.17	1.00
Aage	21356	46.44	3.83	24.00	46.50	64.00
Hage	21356	0.13	0.05	0.00	0.12	0.46
Atenure	21356	41.56	26.20	0.00	36.83	199.00
Htenure	21356	0.48	0.37	0.00	0.48	3.32
Aedu	21356	3.25	0.49	1.25	3.26	5.00
Hedu	21356	0.49	0.16	0.00	0.50	0.80
Afin	21356	0.04	0.10	0.00	0.00	1.00
Hfin	21356	0.19	0.38	0.00	0.00	1.00
Aosea	21356	0.04	0.10	0.00	0.00	1.00
Hosea	21356	0.17	0.36	0.00	0.00	1.00

3. Result Analysis

This study uses the two-way fixed effect model to estimate continuous variables *Fin\_D* and *Fin\_G* and uses the panel-logit model to estimate dummy variables *OverC1* or *OverC2* by considering the differences in nature of dependent variables. In the regression process, this study controls these factors such as corporate governance, company finance, and company characteristics; controls year effect and industry effect; and further corrects all the estimation results using cluster robust standard errors.

3.1 Basic regression analysis

*TMT gender characteristics, overconfidence, and financial asset allocation*

Table no.4 reports the mediating effect and mechanism of overconfidence in TMT gender characteristics affecting financial asset allocation. The influence of variable *Agender* on *Fin\_D* and *Fin\_G* is significantly negative. In contrast, the influence of variable *Hgender* is significantly positive, indicating that the more female executives and the higher the gender

heterogeneity of TMT, the higher the enthusiasm of listed companies to allocate financial assets. The regression coefficients of *OverCI* about *Agender* and *Hgender* are significantly positive, indicating that the more male executives are, the more overconfident TMT is. The probability of TMT overconfidence is elevated by 46% each time the proportion of male executives increased by 1%. When gender heterogeneity increases by 1%, the probability of TMT overconfidence is also elevated by 21% each time. The influence coefficient of *OverCI* about *Fin\_D* and *Fin\_G* is positive and significant at the 1% level. The proportion and growth rate of financial asset allocation are respectively 3.18% and 0.42% higher on average, indicating that overconfident TMT is more aggressive in financial asset allocation. Hypotheses H1b passed validation, whereas H1a failed.

**Table no. 4. TMT gender characteristics, overconfidence, and financial asset allocation**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverCI</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverCI</i>	<i>Fin_S</i>
<b>Agender</b>	-0.77*** (-7.83)	0.46*** (21.43)	-2.24*** (-35.17)	-0.98*** (-25.14)	0.46*** (21.43)	-1.17*** (-31.25)
<b>Hgender</b>	0.84*** (8.10)	0.21*** (9.99)	0.15** (2.33)	0.23*** (6.29)	0.21*** (9.99)	0.14*** (4.10)
<b>OverC1</b>	-	-	3.18*** (91.83)	-	-	0.42*** (20.15)
<b>Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>_cons</b>	4.72*** (10.34)	-1.33*** (-12.10)	8.95*** (30.81)	1.60*** (9.05)	-1.33*** (-12.10)	2.15*** (11.98)
<b>Year</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ind</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>N</b>	21356	21356	21356	21356	21356	21356
<b>F/chi2</b>	311.88	384.40	1501.13	202.93	384.40	249.34

Note: \*\*\*, \*\* and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the *t*-values of the two-sided test are in brackets.

The coefficients of *Agender* on *Fin\_D* and *Fin\_G* are -2.24 and -1.17 and are significant at the 1% level, which is consistent with that before adding variable *OverCI*. However, the indirect effect of *OverCI* ( $0.46 \times 3.18 = 1.46$ ) is positive in the opposite direction to the regression coefficient (-2.24) of *Agender* on *Fin\_D*. Furthermore, the total effects of *Agender* on *Fin\_D* and *Fin\_G* are -0.77 and -0.98, the absolute values are smaller than the absolute values of direct effects (-2.24 and -1.17), and the suppressing effect of overconfidence is 0.65 ( $0.46 \times 3.18 / 2.24$ ) and 0.17 ( $0.46 \times 0.42 / 1.17$ ). From the perspective of gender heterogeneity, TMT overconfidence plays a partial mediating effect on gender characteristics affecting financial asset allocation. Mediating effect of *OverCI* on *Fin\_D* and *Fin\_G* is 0.80 ( $0.21 \times 3.18 / 0.84$ ) and 0.38 ( $0.21 \times 0.42 / 0.23$ ), respectively.

#### *TMT age characteristics, overconfidence, and financial asset allocation*

Table no.5 reports the mediating effect and mechanism of overconfidence in the process of TMT age characteristics affecting financial asset allocation. The influence coefficient of *Aage* on *Fin\_D* is significantly positive, and the effect of *Aage* on *OverCI* is 0.03, which is significant at the 1% level, indicating that the higher the average age, the more overconfident TMT is. *OverCI* on *Fin\_D* has a significant positive effect at the 1% level, which fully indicates that the mediating effect (1.82) of TMT overconfidence is significant. *OverCI* on

*Fin\_G* has a significant positive effect at the 1% level, whereas the coefficient of *Aage* on *Fin\_G* is significantly negative, indicating that TMT overconfidence plays a suppressing effect between age and financial asset growth-rate and the suppressing effect is 0.45. Thus, hypotheses H2a and H2b passed validation.

**Table no. 5. TMT age characteristics, overconfidence, and financial asset allocation**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverC1</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverC1</i>	<i>Fin_S</i>
<b>Aage</b>	0.05*** (13.36)	0.03*** (38.23)	0.04*** (12.62)	-0.02*** (-12.57)	0.03*** (38.23)	-0.03*** (-19.33)
<b>Hage</b>	-0.96*** (-4.52)	-0.26*** (-6.50)	-0.16 (-0.91)	-0.00 (-0.03)	-0.26*** (-6.50)	0.12 (1.29)
<b>OverC1</b>	-	-	3.04*** (65.85)	-	-	0.45*** (16.80)
<b>Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>_cons</b>	3.08*** (6.67)	-1.83*** (-19.15)	8.64*** (24.90)	1.69*** (8.63)	-1.83*** (-19.15)	2.52*** (12.60)
<b>Year</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ind</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>N</b>	21356	21356	21356	21356	21356	21356
<b>F/chi2</b>	302.58	448.44	1123.37	132.22	448.44	162.70

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the *t*-values of the two-sided test are in brackets.

*TMT tenure characteristics, overconfidence, and financial asset allocation*

Table no.6 reports the mediating effect and mechanism of overconfidence in the process of TMT tenure characteristics affecting financial asset allocation. The influence coefficients of *Atenure* on *Fin\_D* and *Fin\_G* are significantly positive, and the effect of *Atenure* on *OverC1* is 0.01 and significant at the 1% level, indicating that TMT with a longer average tenure is more likely to produce overconfidence behavior. *OverC1* on *Fin\_D* and *Fin\_G* has a significant positive effect at the 1% level, indicating that the part mediating effect of TMT overconfidence is significant, and its effect is 1.77 and 0.22, respectively. The influence coefficient of *Htenure* on *OverC1* is -0.01 and significant at the 1% level, indicating that the heterogeneity of TMT tenure significantly inhibits financial asset allocation. Thus, the hypotheses H3a and H3b passed validation.

**Table no. 6. TMT tenure characteristics, overconfidence, and financial asset allocation**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverC1</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverC1</i>	<i>Fin_S</i>
<b>Atenure</b>	0.02*** (47.80)	0.01*** (142.45)	0.01*** (8.61)	0.00*** (16.77)	0.01*** (142.45)	0.01*** (16.58)
<b>Htenure</b>	-0.01 (-0.56)	-0.01*** (-5.17)	-0.03** (-2.31)	0.00 (0.64)	-0.01*** (-5.17)	-0.00 (-0.32)
<b>OverC1</b>	-	-	3.53*** (32.40)	-	-	-0.66*** (-10.84)
<b>Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>_cons</b>	3.42*** (8.70)	-1.31*** (-21.26)	8.06*** (23.11)	0.76*** (4.03)	-1.31*** (-21.26)	-0.11 (-0.49)
<b>Year</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ind</b>	Yes	Yes	Yes	Yes	Yes	Yes

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverCI</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverCI</i>	<i>Fin_S</i>
N	21356	21356	21356	21356	21356	21356
F/chi2	870.98	4674.94	1245.25	167.08	4674.94	167.00

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the *t*-values of the two-sided test are in brackets.

#### TMT education characteristics, overconfidence, and financial asset allocation

Table no.7 reports the mediating effect and mechanism of overconfidence in the process of TMT education characteristics affecting financial asset allocation. The influence coefficients of *Aedu* on *Fin\_D* and *Fin\_G* are significantly positive. The effect of *Aedu* on *OverCI* is 0.10 and significant at the 1% level, indicating that TMT with higher average education is more likely to show overconfidence behavior. *OverCI* on *Fin\_D* and *Fin\_G* has a significant positive effect at the 1% level, indicating that the partial mediating effect of TMT overconfidence is significant, and its effect is 0.18 and 0.02, respectively. The influence coefficient of *Hedu* on *OverCI* is  $-0.04$  and significant at the 1% level, indicating that TMT education heterogeneity significantly inhibits financial asset allocation. Overconfidence plays a partial mediating effect in the process of educational heterogeneity affecting financial asset allocation, and the effect is 0.45. Thus, the hypotheses H4a and H4b are validated.

**Table no. 7. TMT education characteristics, overconfidence, and financial asset allocation**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverCI</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverCI</i>	<i>Fin_S</i>
<b>Aedu</b>	1.31*** (56.71)	0.10*** (14.32)	1.07*** (60.79)	0.34*** (26.60)	0.10*** (14.32)	0.33*** (25.26)
<b>Hedu</b>	$-0.21$ *** ( $-4.12$ )	$-0.04$ *** ( $-2.76$ )	$-0.11$ *** ( $-3.14$ )	$-0.10$ *** ( $-3.81$ )	$-0.04$ *** ( $-2.76$ )	$-0.10$ *** ( $-3.70$ )
<b>OverCI</b>	-	-	2.35*** (75.56)	-	-	0.07*** (2.71)
<b>Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>_cons</b>	1.99*** (5.58)	$-1.02$ *** ( $-9.24$ )	4.38*** (17.72)	0.30* (1.66)	$-1.02$ *** ( $-9.24$ )	0.37** (1.99)
<b>Year</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ind</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>N</b>	21356	21356	21356	21356	21356	21356
<b>F/chi2</b>	629.36	369.75	2095.30	171.68	369.75	166.39

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the *t*-values of the two-sided test are in brackets.

#### TMT finance characteristics, overconfidence, and financial asset allocation

Table no.8 reports the mediating effect and mechanism of overconfidence in the process of TMT finance characteristics affecting financial asset allocation. The influence coefficients of *Afin* on *Fin\_D* and *Fin\_G* are significantly positive. The effect of *Afin* on *OverCI* is 0.14 and significant at the 1% level, indicating that the more members with financial experience, the easier TMT generating overconfidence behavior becomes. *OverCI* has a significant positive effect on *Fin\_D* and *Fin\_G* at the 1% level, and the influence coefficients are 2.67 and 0.14, respectively, which indicates that the partial mediating effect of TMT overconfidence is significant, and its effects are 0.13 and 0.01. The influence coefficient of

*Hfin* on *OverCI* is  $-0.02$  and significant at the 1% level, indicating that TMT financial experience heterogeneity significantly inhibits financial asset allocation and overconfidence plays a partial intermediary effect in the process of financial experience heterogeneity affecting financial asset allocation. Thus, hypotheses H5a and H5b are validated.

**Table no. 8. TMT finance characteristics, overconfidence, and financial asset allocation**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverCI</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverCI</i>	<i>Fin_S</i>
<b>Afin</b>	2.79*** (24.73)	0.14*** (4.23)	2.42*** (28.64)	1.72*** (33.00)	0.14*** (4.23)	1.70*** (32.05)
<b>Hfin</b>	-0.05** (-2.13)	-0.02*** (-3.76)	0.01 (0.66)	-0.00 (-0.12)	-0.02*** (-3.76)	0.00 (0.19)
<b>OverCI</b>	-	-	2.67*** (72.77)	-	-	0.14*** (6.86)
<b>Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>_cons</b>	4.36*** (10.25)	-0.83*** (-7.43)	6.58*** (22.96)	0.78*** (5.11)	-0.83*** (-7.43)	0.90*** (5.80)
<b>Year</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ind</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>N</b>	21356	21356	21356	21356	21356	21356
<b>F/chi2</b>	352.86	341.33	1435.12	236.23	341.33	234.33

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the *t*-values of the two-sided test are in brackets.

*TMT overseas experience characteristics, overconfidence, and financial asset allocation*

Table no.9 reports the mediating effect and mechanism of overconfidence in the process of TMT overseas experience characteristics affecting financial asset allocation. The effect of *Aosea* on *OverCI* is 0.27 and significant at the 1% level, indicating that TMT with overseas backgrounds is more overconfident. *Aosea* on *Fin\_G* had a significant effect before and after adding *OverCI*. The effect of *Aosea* on *Fin\_D* is not significant but significantly positive at the 1% level after controlling for *OverCI*. Overconfidence plays a suppressing impact on the process of overseas experience characteristics affecting financial asset allocation, and its suppressing effect is 1.17 and 0.06. The influence coefficient of *Hosea* on *OverCI* is  $-0.03$  and significant at the 1% level, indicating that overseas experience heterogeneity has an inhibitory effect on TMT overconfidence. However, after controlling for *OverCI*, the effect of *Hosea* on *Fin\_D* and *Fin\_G* is no longer significant, indicating that overconfidence plays a complete mediating role in the process of overseas experience heterogeneity affecting financial asset allocation. Thus, hypotheses H6a and H6b are validated.

**Table no. 9. TMT overseas experience characteristics, overconfidence, and financial asset allocation**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverCI</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverCI</i>	<i>Fin_S</i>
<b>Aosea</b>	-0.09 (-0.67)	-0.27*** (-7.89)	0.64*** (6.16)	1.26*** (20.87)	-0.27*** (-7.89)	1.34*** (22.37)
<b>Hosea</b>	-0.11*** (-3.96)	-0.03*** (-5.28)	-0.01 (-0.68)	-0.02 (-1.64)	-0.03*** (-5.28)	-0.01 (-0.77)
<b>OverCI</b>	-	-	2.78***	-	-	0.28***

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverCI</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverCI</i>	<i>Fin_S</i>
			(67.41)			(12.67)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
_cons	4.64*** (10.17)	-0.86*** (-7.78)	7.01*** (21.79)	1.12*** (6.40)	-0.86*** (-7.78)	1.37*** (7.75)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes
N	21356	21356	21356	21356	21356	21356
F/chi2	280.77	355.49	1131.26	153.24	355.49	175.76

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the *t*-values of the two-sided test are in brackets.

### 3.2 Robustness test

To verify the mechanism of TMT characteristics affecting financial asset allocation through overconfidence, this study redefines overconfidence and uses Tobin's Q-value to measure company growth. During the research year, if the current Tobin's Q-value has declined compared with the previous period but the number of stocks held by TMT remains unchanged or increases, TMT has optimistic expectations for the company's development. Thus, this study determines that TMT has overconfidence and uses the dummy variable *OverC2* for measurement. That is, when  $TobinQ_{i,t} < TobinQ_{i,t-1}$  and  $HOLD_{i,t} \geq HOLD_{i,t-1}$  are realized simultaneously, TMT has overconfidence and retested using two-way fixed effects model. The results of the robustness test are shown in Tables no.10–15. The results show that overconfidence still is an important transmission channel and plays a multi-level mediating effect in the process of TMT characteristics, such as gender, age, tenure, education, finance, and overseas experience traits, affecting financial asset allocation. The results of the robustness test are consistent with the basic regression. All hypotheses except for H1a are verified, indicating that the basic regression results are reliable and stable.

**Table no. 10. TMT gender characteristics, overconfidence, and financial asset allocation (robust test)**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverC2</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverC2</i>	<i>Fin_S</i>
Agender	-0.77*** (-7.83)	0.28*** (12.45)	-1.65*** (-25.33)	-0.98*** (-25.14)	0.28*** (12.45)	-1.07*** (-28.81)
Hgender	0.84*** (8.10)	0.16*** (6.60)	0.34*** (5.34)	0.23*** (6.29)	0.16*** (6.60)	0.18*** (5.26)
OverC2	-	-	3.13*** (73.53)	-	-	0.32*** (13.08)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
_cons	4.72*** (10.34)	-1.38*** (-11.42)	9.04*** (30.21)	1.60*** (9.05)	-1.38*** (-11.42)	2.03*** (11.33)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes
N	21356	21356	21356	21356	21356	21356
F/chi2	311.88	330.86	1184.48	202.93	330.86	212.34

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the *t*-values of the two-sided test are in brackets.



Table no. 11. TMT age characteristics, overconfidence, and financial asset allocation (robust test)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverC2</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverC2</i>	<i>Fin_S</i>
Aage	0.05*** (13.36)	0.05*** (89.19)	-0.23*** (-84.08)	-0.01*** (-6.31)	0.05*** (89.19)	-0.01*** (-5.72)
Hage	-0.96*** (-4.52)	-0.18*** (-6.48)	0.16 (1.56)	0.86*** (15.20)	-0.18*** (-6.48)	0.87*** (15.39)
OverC2	-	-	6.21*** (130.81)	-	-	0.06** (2.35)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
_cons	3.08*** (6.67)	-2.68*** (-41.04)	19.72*** (85.99)	1.15*** (9.51)	-2.68*** (-41.04)	1.32*** (9.02)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes
N	21356	21356	21356	21356	21356	21356
F/chi2	302.58	1124.72	2955.20	144.59	1124.72	139.07

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the t-values of the two-sided test are in brackets.

Table no. 12. TMT tenure characteristics, overconfidence, and financial asset allocation (robust test)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverC2</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverC2</i>	<i>Fin_S</i>
Atenure	0.02*** (47.80)	0.00*** (61.51)	0.01*** (13.85)	0.00*** (16.77)	0.00*** (61.51)	0.00*** (14.69)
Htenure	-0.01 (-0.56)	-0.02*** (-7.66)	0.05*** (4.14)	0.00 (0.64)	-0.02*** (-7.66)	0.00 (0.21)
OverC2	-	-	2.42*** (37.06)	-	-	-0.13*** (-3.38)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
_cons	3.42*** (8.70)	-1.38*** (-13.96)	6.78*** (20.85)	0.76*** (4.03)	-1.38*** (-13.96)	0.58*** (2.93)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes
N	21356	21356	21356	21356	21356	21356
F/chi2	870.98	1212.38	1299.68	167.08	1212.38	160.55

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the t-values of the two-sided test are in brackets.

Table no. 13. TMT education characteristics, overconfidence, and financial asset allocation (robust test)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverC2</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverC2</i>	<i>Fin_S</i>
Aedu	1.31*** (56.71)	0.12*** (15.47)	1.03*** (57.48)	0.34*** (26.60)	0.12*** (15.47)	0.34*** (25.85)
Hedu	-0.21*** (-4.12)	-0.00 (-0.27)	-0.20*** (-5.77)	-0.10*** (-3.81)	-0.00 (-0.27)	-0.10*** (-3.81)
OverC2	-	-	2.47*** (65.86)	-	-	0.03 (1.21)
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverC2</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverC2</i>	<i>Fin_S</i>
_cons	1.99*** (5.58)	-1.29*** (-10.89)	5.17*** (20.22)	0.30* (1.66)	-1.29*** (-10.89)	0.34* (1.85)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes
N	21356	21356	21356	21356	21356	21356
F/chi2	629.36	331.95	1382.17	171.68	331.95	163.62

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the *t*-values of the two-sided test are in brackets.

**Table no. 14. TMT finance characteristics, overconfidence, and financial asset allocation (robust test)**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverC2</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverC2</i>	<i>Fin_S</i>
Afin	2.79*** (24.73)	0.27*** (8.60)	2.05*** (24.45)	1.72*** (33.00)	0.27*** (8.60)	1.71*** (32.69)
Hfin	-0.05** (-2.13)	-0.02*** (-3.14)	0.00 (0.07)	-0.00 (-0.12)	-0.02*** (-3.14)	-0.00 (-0.04)
OverC2	-	-	2.76*** (63.23)	-	-	0.04** (1.98)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
_cons	4.36*** (10.25)	-1.08*** (-9.02)	7.33*** (24.27)	0.78*** (5.11)	-1.08*** (-9.02)	0.83*** (5.34)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes
N	21356	21356	21356	21356	21356	21356
F/chi2	352.86	316.83	1061.16	236.23	316.83	226.22

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the *t*-values of the two-sided test are in brackets.

**Table no. 15. TMT overseas experience characteristics, overconfidence, and financial asset allocation (robust test)**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Fin_D</i>	<i>OverC2</i>	<i>Fin_D</i>	<i>Fin_S</i>	<i>OverC2</i>	<i>Fin_S</i>
Aosea	-0.09 (-0.67)	-0.06* (-1.94)	0.10 (1.02)	1.26*** (20.87)	-0.06* (-1.94)	1.28*** (21.39)
Hosea	-0.11*** (-3.96)	-0.03*** (-4.43)	-0.02 (-1.14)	-0.02 (-1.64)	-0.03*** (-4.43)	-0.01 (-1.06)
OverC2	-	-	2.92*** (62.65)	-	-	0.22*** (8.46)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
_cons	4.64*** (10.17)	-1.06*** (-8.74)	7.75*** (23.87)	1.12*** (6.40)	-1.06*** (-8.74)	1.36*** (7.62)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes
N	21356	21356	21356	21356	21356	21356
F/chi2	280.77	314.15	926.23	153.24	314.15	158.30

Note: \*\*\*, \*\*, and \* represent the significance levels of 1%, 5%, and 10%, respectively, and the *t*-values of the two-sided test are in brackets.

#### 4. Discussions

This study explores whether overconfidence plays a mediating effect and transmission mechanism in the process of TMT characteristics affecting financial asset allocation. The details are as follows.

First, the results in Tables no.4 and no.10 show that gender homogeneity and heterogeneity, respectively, promote and inhibit financial asset allocation. TMT with higher gender heterogeneity weakens financial asset investment decisions made by male executives and inhibits the proportion of financial asset allocation. The unverified hypothesis H1a is contrary to the research conclusion of Doan and Iskandar-Datta (2020), whereas the verification of hypothesis H1b is consistent with the conclusion of He et al. (2011). A possible reason is that, when the gender heterogeneity of TMT increases gradually, female executives with good education and rich management and financial experience usually have a higher status in TMT, which inhibits male executives' overconfidence in investment decisions.

Second, the TMT age positively affects the financial asset density but negatively affects the financial assets growth rate. The results in Tables no.5 and no.11 are similar to those of Wang (2016) and Neely et al. (2020). Thus, the hypotheses H2a and H2b are verified. Possible reasons are that TMT's average age of Chinese listed companies is only 46 years old, and their careers are on the rising stage. With increasing age, executives, whether male or female, have accumulated rich social experience and business management experience, which has enhanced TMT's self-confidence in the investment field and its enthusiasm to allocate financial assets, but aging executives have also reinforced its conservativeness. The increased age heterogeneity reduces internal communication and cooperation among TMT members, and internal emotional conflict suppresses executives' overconfidence, inhibiting the density and growth rate of financial asset allocation and making executives prefer to hold lower-risk financial assets in investment decisions.

Third, the regression results in Tables no.6 and no.12 show that overconfidence plays a partial mediating effect in the process of TMT tenure affecting financial asset allocation. The longer the average tenure is, the more overconfident TMT and the stronger the willingness to allocate financial assets. The conclusion is similar to that of You et al. (2020), and hypotheses H3a and H3b are verified. The possible reasons are that: for TMT with longer average tenure, common cognitive and similar skills are easily formed among members, and the interior of TMT is more stable. Smooth communication and strong collaboration enhance the company's overall efficiency, promoting executives' overconfidence and making consensus on financial and asset allocation decisions easier for TMT.

Fourth, the results in Tables no. 7 and no. 13 show that TMT with higher average education levels are more overconfident, and their strong investment willingness increases the proportion of holding financial assets. This conclusion is consistent with Jiang et al. (2009) and Díaz-Fernández et al. (2020), and the hypotheses H4a and H4b are verified. The possible reasons are that: TMT with a higher average education level has a stronger ability to obtain information, integrate information, and de-noise information, which enhance TMT's ability to foresee and promote TMT more confident and proactive in financial asset investment decisions. However, greater educational heterogeneity easily leads to greater differences in environmental judgment and risk identification for TMT. Divergence in investment strategies can easily suspend financial investment plans, reduce TMT's self-confidence, and inhibit the enthusiasm for allocating financial assets.

Fifth, the results in Tables no. 8 and no. 14 show that the more members with financial experience, the more likely TMT becomes overconfident and makes more aggressive financial investment decisions. The heterogeneity of the financial experience significantly inhibits financial asset allocation. The conclusions are consistent with Du et al. (2019), and the hypotheses H5a and H5b are verified. The possible reasons are that executives with financial experience are more sensitive to the financial market, have stronger information processing capabilities and capital operation capabilities, are more familiar with various financial assets and investment strategies, better understand government regulatory policies and regulatory trends, and are good at using their network to reduce financing constraints and capital occupation. These advantages enhance TMT's self-confidence and make them more willing to allocate financial assets to reduce operational risks. However, the heterogeneity of financial experience reduces the capabilities mentioned above of TMT and further inhibits their confidence and enthusiasm in allocating financial assets.

Sixth, the results in Tables no. 9 and no. 15 show that whether overconfidence plays a suppressing effect or a mediating effect in the process of overseas experience affecting financial asset allocation, TMT with overseas experience is still more active in financial asset allocation decisions. This discovery is new in this study, and hypotheses H6a and H6b are verified. The possible reasons are that executives with overseas study and work experience can better control financial market risks and have complete confidence in expected returns of financial assets. However, differences in cultural and financial market conditions may weaken their investment confidence, temporarily suppressing the positive impact of TMT overconfidence on financial asset investment decisions. However, investment behavior solidified by foreign investment philosophy will eventually appear in executives with overseas experience. After gradually understanding the domestic financial market environment, their confidence in financial investment will eventually be stimulated. In the environment of an industry downturn and financial prosperity, the best choice for the company is to actively allocate financial assets.

### **Conclusions and Implications**

An empirical test was conducted by using the 2008-2020 annual data of Chinese listed companies and the mediating effect model. It was explored whether overconfidence plays a mediating effect and a transmission mechanism in the process of TMT characteristics affecting financial asset allocation. The conclusions are as follows: (1) TMT with a higher proportion of male executives is more likely to be overconfident, but greater gender heterogeneity inhibits the overconfidence of male executives and further inhibits financial asset allocation. (2) The influence of TMT age on financial asset allocation presents the features of complexity and contradiction. TMT with a higher average age has accumulated rich experience in business management, but large age differences are also likely to cause emotional conflicts within TMT. Therefore, the mutually exclusive effects of age characteristics lead to TMT's preference to allocate low-risk financial assets. (3) With a longer average tenure, higher educational level, and financial and overseas experience, TMT shows more overconfidence and stronger willingness to allocate financial assets.

*Managerial implications*

This study helps understand the relationship among TMT characteristics, overconfidence, and financial asset allocation. The research conclusion can provide some intellectual support for the government, enterprises, and executives to operate collaboratively and jointly promote financial services for the entity economy. (1) To prevent the excessive financialization of entity enterprises, the government should make the market mechanism play a decisive role in resource allocation, actively expand corporate financing channels, allow the company to allocate financial assets appropriately, strengthen financial supervision, and establish a long-term early warning mechanism and prevention system for financial risk management. (2) To optimize TMT structure and improve corporate governance capabilities, the company should allocate executive members with diverse characteristics to allow diversified investment decisions to achieve a reasonable allocation of corporate assets. (3) Executives should also frequently review past experiences and lessons, abandon inertial thinking, analyze, and clarify existing cognitions, become alert to irrational behaviors in investment decisions, and avoid blind investment behaviors caused by overconfidence.

*Research limitations and future directions*

Although this study has drawn some research conclusions of theoretical value and practical significance, it still has limitations. For example, ignoring the data of non-listed companies, not selecting financial asset return index, and not controlling macroeconomic factors, may lead to certain deviations in the estimated results. Future research must comprehensively collect data, optimize the selection of indicators, control macroeconomic variables, and further enrich and improve existing research conclusions.

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