



## RESEARCH ARTICLE

# Top Management Team Heterogeneity and Team behavior Integration Effects on Private Higher Education Institutional Performance in China

Xiufen Deng<sup>1</sup>, Hazlina Binti Abd Kadir<sup>2\*</sup>, Ooi Boon Keat<sup>3</sup>

<sup>1,2</sup>Graduate School of Management, Postgraduate Centre, Management and Science University, Malaysia

<sup>1</sup>Guangzhou Huashang Vocational College, Guangzhou, China

<sup>2</sup>School of Education and Social Sciences, Postgraduate Centre, Management and Science University, Malaysia.

---

**ARTICLE INFO**


---

**ABSTRACT**

Received: May 25, 2024

Accepted: Aug 11, 2024

---

**Keywords**

Private higher education institutions

Top management team heterogeneity

Team behavioral integration

Risk perception

Organizational performance

This study investigates how heterogeneity among top management team (TMT) influences private higher education institution (HEI) performance in China by analyzing the mediating mechanism of team behavioral integration. Survey data analyzed using PLS-SEM reveals TMT heterogeneity positively impacts performance directly and through enhancing integration. Additionally, the moderating effect of risk perception has not been validated. The insights into multi-layered governance offer a practical contribution by emphasizing the necessity of diversity and collaboration competencies when constituting TMT in private HEIs.

---

**\*Corresponding Author:**

deng\_xiufen@163.com

---

## INTRODUCTION

China's economy is currently undergoing a significant transition from a period of rapid growth to one focused on pursuing high-quality development. The favorable circumstances of economic and social development have created optimal conditions for the advancement of higher education. The latest statistics published by the Ministry of Education in China (2023) indicate that there are currently 764 private higher education institutions (HEIs) in China, representing 25.36% of the total number of higher education institutions (HEIs). Furthermore, 83 private HEIs have been listed both domestically and internationally (Wang, 2022). As a significant element of China's higher education sector, private HEIs are confronted with a multifaceted political and economic milieu, necessitating the urgent development of their adaptive capacity to enhance their viability (Zhang, 2023). The top management team (TMT) plays a pivotal role in the enhancement of corporate performance. The members of the TMT represent the core force of the corporation and are crucial to the corporation's

adaptive capacity, which is essential for coping with the complex internal and external environments (Wang & Ge, 2023). It is of great significance to ascertain whether the TMT of private HEIs are able to seize the critical period of transformation and upgrading of China's economic development, formulate reasonable decisions and programs, and improve the adaptive capacity of private HEIs. This is particularly important for the promotion of the performance of private HEIs.

The performance of an organization is shaped by a multitude of factors, encompassing external environmental conditions and internal governance mechanisms. Each of these aspects exerts a distinct influence on organizational performance, with the organization's managers representing a crucial factor. In the 21st century, human capital is becoming an increasingly important resource for enterprise development. The most representative human capital is top management. In examining the relationship between the TMT and organizational performance, the extant literature has primarily focused on the individual attributes and collective dynamics of the TMT. Related studies have primarily investigated the influence of TMT on enterprises, with a focus on the heterogeneity and stability of these teams (Tang et al., 2022; Wang et al., 2023). In the modern enterprise system, corporate decision-making is a collective process involving numerous top managers. It is therefore becoming increasingly important to examine the impact of the TMT on organizational performance.

A number of studies have demonstrated that the characteristics of the TMT can have a significant impact on the development and behavior of an organization, including its internationalization strategy, innovation performance, green technology innovation, growth performance, strategic change, and internal control quality (Pan et al. 2015; Lin et al. 2018; Li 2019; Li et al. 2020; Cao et al. 2022; Sun et al. 2022; Liu et al. 2023). A substantial body of research has been dedicated to examining the direct and indirect impacts of TMT heterogeneity and diversity on organizational performance. However, few of these studies have explored the relationships and effects that exist between them in depth, beyond the correlations observed. Meanwhile, an individual is a composite of multiple characteristics. Most of the existing studies on TMT heterogeneity focus on a single characteristic separately, such as gender, educational heterogeneity, overseas background heterogeneity, and so forth. However, these studies do not consider the overlapping effects of multiple characteristics (Sun et al., 2022). In light of the aforementioned considerations, this paper seeks to investigate the impact of TMT heterogeneity on organizational performance, as well as the underlying mechanisms, from a behavioral integration perspective. This is achieved through an integration of upper echelon theory and decision theory. This research contributes to the existing body of knowledge by emphasizing the significance of integrating diversity and collaborative dynamics within the TMT of private higher education institutions (HEIs) as a strategy to enhance their organizational performance.

This paper is structured into five distinct parts. Initially, it outlines the research questions and their relevance. Subsequently, it reviews pertinent literature and formulates hypotheses. The methodology, including research design, participant selection, and tool development, is elucidated in the subsequent section. The fourth section reports the findings of this study. Finally, the conclusions, limitations and further study are formulated.

## **Theoretical foundation and conceptual model**

### **Upper Echelons Theory**

In 1982, Hambrick and Mason first proposed the conceptual framework of the Upper Echelons Theory. The Upper Echelons Theory is concerned with the examination of the manner in which the composition, characteristics and interactions of the TMT influence the outcomes of the organization. It is posited that the characteristics of managers and the composition of the management team, including gender, age, tenure, educational background and professional experience, will influence the choice of corporate strategy, the quality of decision-making, the design of organizational structure and the performance of enterprises. The theory posits that the choices made by corporations with

regard to their strategic development are often made in environments that are highly complex. It is therefore argued that a single leader is not sufficient to make a full range of decision-making choices. It is therefore recommended that corporate innovation and strategic research focus on the collective TMT, as this is a more reliable indicator of organizational outcomes. In contrast to implicit factors such as perceptions and values, it is relatively straightforward to quantify and more practical to incorporate exogenous characteristics of TMT members, such as age, race, tenure, educational background, socio-economic base and financial status, into the theoretical framework (Huang & Qin, 2023). Nevertheless, the impact of different demographic characteristics of TMT varies depending on the context. The integration of heterogeneous strengths among TMT is necessary to achieve complementary effects. It can be reasonably deduced that the impact of the TMT on firm performance is contingent upon the effective integration and collaboration of the team.

### **Decision Theory**

The field of decision theory concerns itself with the process of making choices, whereby the likelihood of different factors is quantified and numerical values are assigned to potential outcomes. It explores how individuals choose among different alternatives when faced with uncertainty and unknown conditions. Simon (1948) is credited with proposing the decision theory. In contemporary societies, those responsible for making decisions are confronted with an ever-increasingly complex and dynamic internal and external decision-making environment. The values, attitudes, beliefs and backgrounds of individual decision-makers are subject to certain limitations, which will inevitably have a negative impact on the identification of problems and the formulation of solutions. The advantages of team decision-making are that it can effectively overcome the shortcomings and deficiencies of individual decision-making. This is achieved by focusing on the wisdom of members from different fields, taking advantage of more knowledge, using more information channels, and forming more high-quality feasible solutions to improve the quality of decision-making. The decision-making process within a heterogeneous team is characterized by a dynamic exchange and synthesis of the varied information and knowledge possessed by team members due to their distinct educational backgrounds, experiences, and professional trajectories (Lai, 2022). This diversity enriches the team with a range of perspectives and viewpoints, enhancing the cognitive capacity and broadening the team's understanding of the issues at hand, thereby leading to a more holistic comprehension of the decision-making content.

### **Performance of Private HEIs**

From the perspective of process and outcome, enterprise performance is influenced by a multitude of factors and is the consequence of the enterprise's efforts to achieve a specific goal over a designated period. This outcome is of particular importance in the context of enterprise performance. In China, private higher education institutions (HEIs) are defined as social organizations or individuals that are not state government agencies. They utilize non-state financial funds and are legally permitted to organize educational institutions for the public. Private HEIs exhibit characteristics commonly associated with enterprises. In general, public HEIs tend to focus on the outcomes of their operations and scientific research output, with a reliance on state financial allocations for their operating costs and sources of funding. In addition to the imperative of expanding enrollment to boost revenue, private HEIs must also exercise reasonable control over costs to reduce expenditure. At the same time, they must enhance the caliber of education and management efficiency to enhance their social value and social recognition (He, 2023). Hu (2022) proposes that an all-encompassing assessment framework for private higher education institutions (HEIs) should integrate four principal dimensions: educational outcomes, operational effectiveness, managerial proficiency, and research accomplishments.

### **Top management Team (TMT) Heterogeneity**

The term "top management team (TMT)" denotes the collective of senior executives who occupy the apex of strategic formulation and implementation within a company. This group is entrusted with the orchestration and oversight of the company's overall operations, wielding significant authority in both decision-making and the governance of the firm's management (Finkelstein & Hambrick, 1996). The TMT of private HEIs mainly involves presidents and vice-presidents. In contrast to public HEIs, where the president and vice-president are appointed by the government, the TMT of private HEIs is appointed by the board of directors. In private higher education institutions (HEIs), the presidential team is responsible for implementing the decisions made by the board of directors and for overseeing the daily administration of the school. It is widely acknowledged among academics that TMT heterogeneity encompasses the variance in both demographic attributes and significant cognitive dimensions, including perceptions, values, and experiences, among team members. Jackson et al. (1993) classified TMT heterogeneity into two categories: heterogeneity in terms of easily observable traits (i.e., external) and heterogeneity in terms of deeper traits (i.e., internal). External heterogeneity refers to the more readily available and measurable variability of TMT, including age, gender, ethnicity, educational level, and occupational background. Internal heterogeneity, in contrast, refers to the less readily available and measurable variability of TMT, including personality, values, beliefs, preferences, and attitudes. In this study, TMT heterogeneity is defined as external heterogeneity.

### **Team Behavioral Integration**

Hambrick et al. (1984) delved into the concept of team behavioral integration. Simsek et al. (2005) stated that team behavioral integration is the process by which members resolve conflicts, build consensus, and implement decisions through free and open exchange of information and resources to promote business growth. The concept of behavioral integration within the TMT emphasizes the dynamics of communication and interaction among its members, as well as their level of engagement in the organization's activities. In-depth investigations into TMT behavioral integration provide a more comprehensive understanding of the underlying intricacies within the TMT dynamics. TMT behavioral integration is conducive to proactive communication and sharing among TMT members, forming a common viewpoint and decision-making in solving problems and implementing solutions to achieve leadership effectiveness. Lai (2022) posits that TMT behavioral integration represents the degree of alignment and collaboration among team members, encompassing their communication and exchange, involvement in the decision-making process, and other interactive behaviors. This level of integration is evidenced by collective actions such as information sharing, resource distribution, and engagement in decision-making, as corroborated by Shen (2022).

### **Risk perception**

Slovic (1987) was the first to provide a clear definition of risk perception, defining it as "people's subjective judgement of risk." The degree of risk perception is not only affected by the risk itself, but also varies according to the characteristics of the subject, including the degree of information mastery and the ability to assess the risk (Barron, 1976; Weber & Milliman, 1997; Slovic, 2000; Zeng, 2015; He, 2022). Risk perception is the subjective feeling and intuitive judgement of an individual or a particular group regarding the impact of various objective risks in the outside world, given the limited information and uncertain environment. It is the projection of people's ideological values, symbols, and histories in different cultural contexts (Wang, 2023). Consequently, risk perception is manifested in disparate ways among individuals and groups, and is shaped by the heterogeneity and past experiences of the TMT. At the same time, risk perception affects behavioral choices in disparate ways through disparate pathways, and there is an interaction between the two, which can result in over- or under-assessment of risk and a ripple effect.

### **Top management Team (TMT) Heterogeneity and performance**

The composition of the TMT is closely related to organizational performance. The heterogeneous composition of TMT, encompassing different levels, prior experiences, educational and social backgrounds, can give rise to divergent values among managers, which in turn affects the decision-making process and consequently organizational performance. Empirical research in a variety of settings (Hambrick et al., 1996; Yang et al., 2020; Wang & Ge, 2023; Sieweke et al., 2023) has consistently shown that educational heterogeneity within management teams has a positive impact on firm performance. It is thought that such diversity in team members' personal attributes allows access to a wider range of information sources, thereby fostering cognitive advantages that contribute to the generation of superior ideas and more effective decision-making. Wang and Ge (2023) posit that a management team with cross-functional experience is better equipped to address strategic challenges than a team with a singular functional focus. Top managers who have spent extended periods of time working in different industries, firms, or departments of the same firm will have acquired a range of job skills. This, in turn, affects the discrepancies in the TMT members' interpretation of the external environment and the strategic choices they make (Huang, Fei, & Qin, 2023). Consequently, the study puts forward the following hypothesis.

H1: Top management team (TMT) heterogeneity positively affects organizational performance.

### **Top management Team (TMT) Heterogeneity and Team behavioral integration**

The team human capital heterogeneity suggests that teams comprise individuals with diverse levels of expertise and cognitive abilities. This encompasses professionals from a range of industries or fields within the team. This is perceived and recognized by members, who urge individuals to learn the appropriate skills and expertise, and guide their interactions. Luring et al. (2013) observed that the diverse backgrounds of team members influence their approach to problem-solving. The inclusion of individuals with a wide range of expertise enriches the collective knowledge base, creating a more expansive "pool" of resources. This, in turn, facilitates the rapid identification of the most suitable expertise, access to information, and integration of resources. Consequently, the collective integration capacity of the team is enhanced. Teams based on cognitive differentiation facilitate the utilization of a vast reservoir of knowledge, enabling team members to adopt diverse perspectives and generate novel ideas. By sharing information and expressing their ideas in an authentic manner, team members feel respected within the team, which in turn facilitates the generation of valuable new ideas (Ma & Jiang, 2020; Lai, 2022). Hence, this study proposed the following hypothesis

H2: Top management team (TMT) heterogeneity positively affects team behavioral integration.

### **Team Heterogeneity, Team behavioral integration and organizational performance**

A substantial body of empirical evidence from a range of contexts has demonstrated that the diversity of perspectives within management teams is conducive to more effective firm-level decision-making (Hambrick et al., 1994; Carpenter and Fedrickson, 2001; Song, 2022; Guo, 2021). Within organizations, TMT heterogeneity can play a complementary role in terms of information and resources, and affect organizational performance through team behavioral integration. Meng et al. (2020) validated the substantial positive mediating effect of team behavioral integration on the relationship between TMT diversity and innovation performance, drawing from perspectives on team behavioral integration and the climate for team innovation. A low level of team behavioral integration indicates less communication and sharing of internal information among team members and a low willingness to participate in collective decision-making, thus attenuating organizational performance. With moderate TMT heterogeneity and higher levels of TMT behavioral integration, firm growth is prone to reach better levels (Huang & Qin, 2023). Hence, this study proposed the following hypothesis

H3: Top management team (TMT) behavioral integration positively affects organizational performance.

H4: Top management team (TMT) behavioral integration positively mediates the relationship between top management team (TMT) heterogeneity and organizational performance.

### **Team behavioral integration, risk perception and organizational performance**

Management risk perception is defined as the expectation of risk held by management, which is both professional and forward-looking (He, 2022). Should management anticipate an increase in risk, it may prompt firms to adopt a more conservative approach (Avramov et al., 2014). The greater the sensitivity of a firm's managers to risk and their ability to identify potential risk factors, the more they will be able to assist the firm in developing effective plans to deal with potential threats. However, the perception of risk varies among team members with different levels of education and upbringing. Consequently, it is necessary to increase the frequency and effectiveness of communication among team members in order to improve the efficiency of decision-making. As indicated by Xu and Huang (2021), an elevated perception of risk exerts a greater influence on team members, compelling them to engage in more frequent and substantial communication and interaction with one another. Diversity in teams has been shown to facilitate enhanced cognitive sophistication, enabling teams to contemplate a broader spectrum of information and strategic alternatives. Teams comprising diverse individuals are capable of perceiving their business and competitive landscapes in a more comprehensive, inventive, and multi-dimensional manner. The elevated perception of risk among members of the Top Management Team (TMT) results in more intense interactions, which in turn exert an influence on the performance of the organization (Huang & Qin, 2023). Hence, this study proposed the following hypothesis

H5: Risk perception positively moderates the relationship between Top management team (TMT) behavioral integration and organizational performance.

### **RESEARCH DESIGN AND SAMPLING STRATEGY**

The study employed a cross-sectional research design for two principal reasons. Primarily, this methodology enables the collection of a substantial amount of primary data within a limited timeframe. Furthermore, it circumvents the difficulties associated with reproducing the sample set from previous research. Concurrently, the investigation adopted a quantitative approach to empirically substantiate the proposed hypotheses.

The population comprised members of the TMT of private higher education institutions (HEIs) in south-central China. The data were collected from private HEIs in the Henan and Guangdong provinces, which occupy the first and second places in the south-central region in terms of the number of private HEIs. This study employs the list of private HEIs published by the official website as the sample frame.

In order to ensure the rigor and relevance of the research, specific criteria were established to select participants. A stratified random sampling technique was employed using the available population database to extend an invitation to the study's target demographic. In determining the sample size, the study adhered to the recommendations set forth by Lindhult (2021) and Yüksel (2022), who suggested a minimum threshold of 200 participants to effectively conduct structural equation modelling. The research yielded a total of 420 responses, which exceeded the recommended minimum and thus fulfilled the methodological requirements.

### **Instruments**

This research employed a survey approach to gather data. To test the hypotheses, the study administered a survey employing a structured questionnaire. The constructs measured were based

on existing literature pertinent to this field. The five-point Likert measurement scale is applied to assess the variables.

The heterogeneity of the TMT heterogeneity is measured using a total of eleven items, according to Jehn et al. (1999), Bjornali et al. (2016) and Li (2020). The performance of private HEIs is evaluated in terms of financial aspects, student outcomes, internal processes and development, with a total of six items, in accordance with the components and indicators employed by Liu (2021) and Huang (2022). Team behavioral integration is measured using a total of six items, according to Simsek et al. (2005), Guo (2021) and Lai (2022). Risk perception is measured using a total of seven items, according to Wang (2017) and Xu (2020).

A preliminary test was conducted in private higher education institutions (HEIs) to ascertain whether respondents had a clear understanding of the questions. A questionnaire was distributed to 50 members of the senior management team at 10 private higher education institutions (HEIs). The alpha value for all the constructs was found to be above the threshold of 0.70. The definitive sample was collected via an anonymous questionnaire administered via an online platform.

### **Respondents' profile**

This research employed a frequency analysis to ascertain the demographic characteristics of the survey participants. The findings indicated that a significant majority of the respondents were male, representing 67.86% of the total sample. The age distribution revealed a notable concentration of respondents between the ages of 51 and 60, representing 36.43% of the total sample. This was followed by a similarly substantial proportion of respondents in the 41 to 50 age bracket. Furthermore, 13.81% of the respondents were over the age of 60. The sample spanned a considerable age range, with participants as young as 20 and as experienced as those above 65. In terms of educational attainment, the majority of respondents held a master's degree (46.43%), with bachelor's degrees representing 27.38% and PhDs accounting for 24.29%. Furthermore, over 61.43% of the respondents had held their current position for a minimum of five years, while 30% had served for a period of three years. This suggests that the respondents were not only highly educated but also had considerable experience in their roles. With regard to their positions, over 50% were presidents or vice-presidents, with the remainder being members of the board of directors, thereby providing a comprehensive representation of the private higher education institutions surveyed.

### **Hypotheses testing**

This study utilized Partial Least Squares Structural Equation Modeling (PLS-SEM), executed with the SMART PLS Version 4 software, for data analysis. The choice of PLS-SEM techniques was primarily driven by three factors: (a) the exploratory nature of this study; (b) the presence of formative constructs in the structural model; and (c) the non-normally distributed nature of the sample.

This study includes both formative and reflective models. TMT heterogeneity and organizational performance are formative models. Team behavioral integration and risk perception are reflective models. In the context of reflective models, this research initially sought to ascertain the reliability and validity of the constructs through an analysis of standardized item loadings, composite reliability (CR), average variance extracted (AVE), and Cronbach's alpha coefficients. In the case of formative models, the study proceeded to evaluate the construct validity, ascertain the presence of collinearity using the variance inflation factor (VIF), and review the assigned weights. Prior to undertaking an assessment of the structural model, it was essential to scrutinize the VIF values across all latent variables in order to preclude any concerns related to multicollinearity. Subsequently, the study proceeded to investigate the relationships between the latent variables by estimating the parameters of the structural model.

### Assessing reflective measurement models

The team behavioral integration and risk perception models are reflective measurement models. Reliability assesses the dependability and uniformity of a model, reflecting the extent to which the variability in measurement is due to random error rather than true score variation. In this study, internal consistency reliability was measured using composite reliability and Cronbach's alpha, both of which provide insights into the stability and consistency of the measurement model (Jöreskog, 1971). The findings revealed that composite reliability (CR) scores fell within the range of 0.828 to 0.842, and all Cronbach's alpha values were between 0.824 and 0.839, signifying an acceptable level of reliability. To assess convergent validity, the average variance extracted (AVE) was utilized, and values for team behavioral integration and risk perception surpassed the benchmark of 0.5, indicating that over 50% of the variance in the items was accounted for by the constructs (as shown in Table 1). Additionally, each indicator's loading on its respective construct was higher than its loadings on other constructs, as illustrated in Table 2. The results confirmed strong convergent validity, with factor loadings and AVE values for all items surpassing the acceptable thresholds. Discriminant validity was evaluated using the Fornell-Larcker criterion, and Table 3 displayed the square roots of AVE for each latent variable, all of which were markedly higher than their correlations with other constructs, thereby indicating good discriminant validity. Consequently, the study validated a sufficient degree of discriminant validity for the model in question.

**Table 1. Measuring the reflective measurement model**

Variable	Type	Indicators	Factor loadings	Cronbach's alpha	CR	AVE
Team Behavioral Integration	Reflective	TBI1	0.727	0.839	0.842	0.555
		TBI2	0.758			
		TBI3	0.728			
		TBI4	0.688			
		TBI5	0.753			
		TBI6	0.810			
Risk Perception	Reflective	RP1	0.753	0.824	0.828	0.532
		RP2	0.719			
		RP3	0.716			
		RP4	0.719			
		RP5	0.777			
		RP6	0.690			

**Table 2. Cross Loadings**

	Organizational Performance	Risk Perception	Team Behavioral Integration	Top management Team
RP1	0.294	0.753	0.236	0.200
RP2	0.276	0.719	0.195	0.233
RP3	0.316	0.716	0.252	0.225
RP4	0.305	0.719	0.262	0.178
RP5	0.344	0.776	0.269	0.279
RP6	0.263	0.690	0.195	0.242
TBI1	0.498	0.192	0.726	0.392
TBI2	0.545	0.216	0.759	0.462
TBI3	0.538	0.262	0.729	0.445
TBI4	0.474	0.218	0.690	0.455
TBI5	0.537	0.294	0.753	0.428
TBI6	0.614	0.262	0.808	0.465



**Table 3. Fornell-larcker criterion**

	Risk Perception	Team Integration	Behavioral
Risk Perception	0.729		
Team Integration	0.325	0.745	

### Assessing formative measurement models

The top management team (TMT) heterogeneity and organizational performance are formative models. Formative models can estimate indicator convergent validity by measuring the correlation of the indicator with other variables. This is achieved by the addition of a global measure, with the correlation of the formative indicator with this measure representing the convergent validity (Diamantopoulos, 2005). It is generally accepted that correlations between latent variables should be at least 0.7, and preferably greater than or equal to 0.8, representing good convergent validity of the formative model. The correlation coefficient of the TMT ( $\beta = .918$ ) with its global measurements is greater than 0.8, while the correlation coefficient of organizational performance with its global measurements is 0.873, which is also greater than 0.8.

The VIF results are optimal, as evidenced by their values falling below 3 (Table 4). With regard to the statistical significance and relevance of the indicator weightings, a higher value is indicative of a superior outcome. However, p-values less than 0.05 should not be taken into consideration. As the models in this study include a second-order construct, the analysis employs a two-step approach (Wright et al., 2012).

**Table 4. Measuring the formative measurement model**

latent variable	Indicators	VIF	Weight	T value	P value
First-order					
Social Category Heterogeneity	TMT11	1.261	0.288	4.883	0.000
	TMT12	1.294	0.324	5.617	0.000
	TMT13	1.245	0.241	4.211	0.000
	TMT14	1.352	0.369	6.064	0.000
	TMT15	1.227	0.289	5.060	0.000
Work Experience Heterogeneity	TMT21	1.270	0.303	6.187	0.000
	TMT22	1.430	0.188	3.514	0.000
	TMT23	1.596	0.329	5.972	0.000
	TMT24	1.187	0.369	7.366	0.000
	TMT25	1.138	0.357	6.877	0.000
Organizational Performance	OP1	1.177	0.307	16.033	0.000
	OP2	1.213	0.276	15.409	0.000
	OP3	1.234	0.253	15.448	0.000
	OP4	1.199	0.271	15.481	0.000
	OP5	1.271	0.181	14.582	0.000
	OP6	1.285	0.297	19.849	0.000
Second-order					
TMT	Social Category Heterogeneity	1.560	0.530	39.947	0.000
	Work Experience Heterogeneity	1.560	0.588	36.194	0.000

### Assessing Structural model

Before evaluating the structural model, collinearity was first checked using the VIF. The outer VIF values in this study ranged from 1.099-2.001 and the inner VIF values ranged from 1.341-2.765, indicating that the model does not suffer from serious collinearity problems.

In the evaluation of PLS models, the parameters for assessment can be classified into two categories. The first category encompasses parameters for the evaluation of the explanatory ability of the model, including the coefficient of determination,  $R^2$ . The second category comprises cross-validated ability tests (CVPAT), which evaluate the predictive ability of the model.

The R squared ( $R^2$ ) metric is a pivotal indicator in partial least squares (PLS) path models, providing a means of evaluating the model's efficacy in interpreting internal relationships. Chin (1998) posits that an  $R^2$  value approaching 0.19 is indicative of weak explanatory strength, an  $R^2$  value of approximately 0.33 suggests moderate explanatory power, and an  $R^2$  value of around 0.67 reflects a strong explanatory capacity, effectively accounting for the variance in the dependent variable. The results of the study indicate that TMT heterogeneity accounted for approximately 37% of the variance in team behavioral integration. Furthermore, the combined impact of TMT heterogeneity and team behavioral integration explained approximately 63% of the variance in organizational performance, as detailed in Table 5.

The cross-validated ability test (CVPAT) is employed to ascertain whether the average loss of the PLS-SEM model is demonstrably lower than that of the benchmarks. The difference in average loss values should be demonstrably below zero to substantiate the superior predictive capabilities of the model in comparison to the prediction benchmarks. The results indicate that the average loss difference of the team behavioral integration and organizational performance models is below zero, thereby substantiating the superior predictive capabilities (Table 5).

**Table 5. Assessing the final model (CVPAT and  $R^2$ ).**

	Average difference	loss	R-square	R-square adjusted
Team Behavioral Integration	-0.239		0.374	0.373
Organizational Performance	-0.344		0.632	0.629

Tables 6 and Figure 1 delineate the t values and path coefficients, which are instrumental in scrutinizing the previously posited hypotheses. The examination of the hypotheses is divided into three principal sections. Initially, the direct effects are investigated, followed by an evaluation of the mediating influence exerted by team behavioral integration. Finally, an analysis of the moderating impact of risk perception is conducted. The findings revealed that TMT heterogeneity significantly and positively influences both team behavioral integration ( $\beta = .387$ ,  $t = 9.961$ ,  $p < .001$ ) and organizational performance ( $\beta = .615$ ,  $t = 16.428$ ,  $p < .001$ ), leading to the acceptance of hypotheses H1 and H2. Additionally, the study confirmed a direct positive effect of team behavioral integration on organizational performance ( $\beta = .448$ ,  $t = 10.914$ ,  $p < .001$ ), resulting in the acceptance of H3.

**Table 7. Hypothesis test**

Hypothesis	Relationship	$\beta$	T value	P value	$f^2$	95%CI LL	95%CI UL
H1	TMT H -> OP	0.387	9.961	0.000	0.259	0.313	0.467
H2	TMT H -> TBI	0.615	16.428	0.000	0.609	0.544	0.690
H3	TBI -> OP	0.448	10.914	0.000	0.330	0.360	0.521

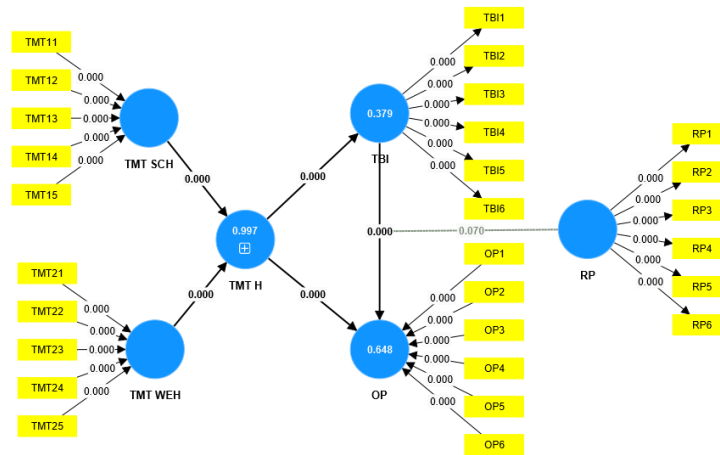


Fig. 1 Bootstrapping results

**Assessing mediation effect**

This research introduced a mediation model with the objective of evaluating the link between TMT heterogeneity and organizational performance, with a particular focus on the role of team behavioral integration. The study employed the Variance Accounted For (VAF) as a metric for gauging the mediating influence. The VAF is an invaluable tool for classifying the nature of mediation, ranging from no mediation to full or partial mediation. A VAF below 20% indicates the absence of a mediation effect, a VAF between 20% and 80% suggests partial mediation, and a VAF above 80% indicates full mediation. As illustrated in Table 8, the VAF for team behavioral integration is 39.43%, thereby supporting the hypothesis that behavioral integration has a partial mediation effect.

Table 8 Mediation effect

Hypothesis	Relationship	$\beta$	t-value	p-value	VAF	Remark
H4	TMTH-> TBI -> OP	0.254	7.891	0.000	0.3943	Partial Mediation

**Assessing the moderating Effects**

Tables 9 and Figure 2 present the t-values and path coefficients, which facilitate the testing of the hypotheses previously proposed. In conjunction with the regression coefficient analysis, the positive predictive effect of risk perception on organizational performance was 0.177 ( $p < 0.000$ ). However, the interaction term consisting of risk perception and team behavioral integration on organizational performance can't be established, with the coefficient of the interaction term being 0.039 ( $p = 0.070$ ). Consequently, H5 is not supported.

Table 9 Moderating effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	P values
Risk Perception -> Organizational Performance	0.177	0.177	0.043	4.070	0.000
Risk Perception x Team Behavioral Integration -> Organizational Performance	0.039	0.038	0.022	1.813	0.070

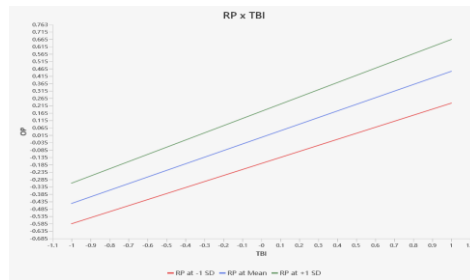


Fig. 2: Simple slope analysis

## CONCLUSION

This study draws on an extensive review of pertinent prior literature to delineate the concepts of TMT heterogeneity, organisational performance, team behavioural integration, and risk perception. The study presents a theoretical model that elucidates the influence mechanism of TMT heterogeneity on organisational performance within the context of private higher education institutions. Additionally, it formulates a series of research hypotheses concerning the interrelationships among the variables under investigation, the majority of which have been empirically validated through an analysis of the data collected from the survey sample.

The positive effect of heterogeneity of TMT in private higher education institutions (HEIs) on organizational performance was verified. Based on the empirical study of the questionnaire survey, it was found that heterogeneity of private HEIs' TMT in terms of team members' social classification and work experience has a significant positive effect on team members' perceived organizational performance. The higher the heterogeneity of the top management team of private HEIs, the higher the cognitive ability and professional skills of team members, and the higher the insight and information processing ability of team members. This is consistent with the findings of Wang et al. (2021). Unlike general enterprises, in private HEIs, TMT members generally have higher academic qualifications and a wider range of specializations. Furthermore, some presidents or vice-presidents have previously held positions at public higher education institutions (HEIs), thereby bringing with them a wealth of experience in education governance. The inclusion of managers with diverse backgrounds on the TMT allows for the consideration of a wider range of factors when making governance decisions, thereby enhancing the effectiveness of these decisions and the potential for profitability.

Empirical evidence has confirmed the beneficial impact of team behavioral integration on organizational performance. The collaborative actions of the TMT facilitate the efficient distribution and synthesis of information, knowledge, and technological resources among team members, while also clarifying the business domains and specific responsibilities of each member. The findings of this study reveal that team behavioral integration significantly and positively influences organizational performance in private higher education institutions (HEIs), with a notable effect size ( $\beta=0.289$ ,  $p<0.000$ ). Aligning with upper echelon theory, team behavioral integration can be conceptualized as encompassing information sharing, cooperative endeavors, and the collective strategic decision-making process. It is suggested that increased levels of team behavioral integration are conducive to the seamless integration of organizational information. In contrast to public higher education institutions (HEIs), the primary strategic objective for private HEIs is to enhance their operational performance (He & Yang, 2023). A school's performance is a key indicator of its potential for growth and expansion. Conversely, subpar performance may pose a risk of closure or acquisition. In private HEIs, the TMT is appointed by the board of directors and is subject to the board's directives. Consequently, the TMT is the pivotal group tasked with enhancing the performance of these institutions. The process of team behavioral integration, which includes team decision-making,

information processing, and coordination and cooperation, exerts a substantial influence on the performance outcomes of private HEIs.

This study reveals the mediating role of team behavioral integration between TMT heterogeneity and organizational performance in private HEIs. The results of the empirical statistical analysis indicate that there is a complementary partial mediation effect of team behavioral integration between TMT heterogeneity ( $\beta = .039$ ,  $t = 2.405$ ,  $p = .016$ ) and organizational performance. This finding provides a useful validation of existing research on the mediating role of team behavioral integration in TMT and organizational performance. Team behavioral integration is a crucial aspect of team functioning, with higher levels of integration leading to stronger team cohesion. In private HEIs, management team heterogeneity can serve a complementary role in terms of cognition, experience and resources. However, this complementary role necessitates the presence of team behavioral integration. A low degree of behavioral integration indicates that members of the TMT of private HEIs rarely communicate and share internal information, participate in the decision-making process with low enthusiasm, and perform poorly. In such circumstances, the impact of TMT heterogeneity on the performance of private HEIs will be diminished. Conversely, members of the TMT of private HEIs can maintain a high level of team behavioral integration if they can deepen cooperation, enhance the exchange of information resources, and improve the quality of decision-making. This finding is consistent with the findings of some scholars (Lai, 2022; Huang & Qin, 2023).

The data analysis did not provide evidence to support the proposed moderating influence of risk perception on the relationship between team behavioral integration and organizational performance. The incorporation of the interaction term between team behavioral integration and risk perception did not result in a notable enhancement in the model's explanatory power. Furthermore, the influence of this interaction term on organizational performance was not statistically significant, with a beta coefficient of 0.039 and a p-value of 0.070. This outcome indicates that risk perception does not exert a notable moderating influence on the relationship between team behavioral integration and organizational performance.

### **Limitations and further study**

This study examines the mechanisms by which TMT in private higher education institutions (HEIs) influence organizational performance and verifies the mediating effect of team behavioral integration. Given the complexity of the research problem, there are still inevitable limitations. These include a) the limitations of cross-sectional studies, b) the deviation of subjective evaluation data from reality in empirical studies, and c) the need to develop the research model, which will require further improvement in future studies. Based on the literature review and the conclusions of this study, the following areas can be targeted for future exploration:

To deepen the investigation of the relationship between TMT and performance in private HEIs. From this study, the relationship presented by the heterogeneous organizational performance of the TMT in private HEIs is also relatively simple and only a linear model. The process of the variables in the model may not be limited to this, and may be more complex and variable. Moreover, this study only explores the heterogeneity of TMT in private HEIs in terms of human capital, without considering values heterogeneity. If values heterogeneity is added, the impact on the performance outcomes of private HEIs may be different, and more in-depth exploration is expected in the future.

Sociology is a discipline that studies the interactions between people. Unlike principal-agent theory, the relationships it studies are not solely the interests between people; they also include various emotional factors in interpersonal interactions. The combination of social network theory and the top echelon theory may provide a novel avenue for future research, with a focus on the impact of management team social network relationships on management team characteristics and organizational performance.

## REFERENCES

- Alexander, I. K., & Hjortsø, C. N. (2019). Sources of complexity in participatory curriculum development: an activity system and stakeholder analysis approach to the analyses of tensions and contradictions. *Higher Education*, 77(2), 301–322. <https://doi.org/10.1007/s10734-018-0274-x>.
- Avramov, D., Li, M., & Wang, H. (2014). Risk shocks, uncertainty shocks, and corporate policies. *Uncertainty Shocks, and Corporate Policies (December 4, 2014)*.
- Barron, F. H. (1976). Polynomial psychophysics of risk for selected business faculty. *Acta Psychologica*, 40(2), 127-137. [https://doi.org/10.1016/0001-6918\(76\)90004-4](https://doi.org/10.1016/0001-6918(76)90004-4).
- Bjornali, E. S., Knockaert, M., & Erikson, T. (2016). The impact of top management team characteristics and board service involvement on team effectiveness in high-tech start-ups. *Long Range Planning*, 49(4), 447-463. <https://doi.org/10.1016/j.lrp.2015.12.014>.
- Carpenter, M. A., & Fredrickson, J. W. (2001). Top management teams, global strategic posture, and the moderating role of uncertainty. *Academy of Management Journal*, 44(3), 533-545. <https://doi.org/10.5465/3069368>.
- Chao, X. F., Liu, X. X., & Lv, B. (2022). Dual Governance Effects of Board Faultlines on Firm Strategic Change - A Dynamic Perspective on Subgroup Embeddedness. *Techno Economics* (10), 175-187.
- Diamantopoulos, A. (2005). The C-OAR-SE procedure for scale development in marketing: a comment. *International Journal of Research in Marketing*, 22(1), 1-9. [https://doi.org/10.1016/S0167-8116\(02\)00097-6](https://doi.org/10.1016/S0167-8116(02)00097-6).
- Finkelstein, S., & Hambrick, D. C. (1990). Top-management-team tenure and organizational outcomes: The moderating role of managerial discretion. *Administrative Science Quarterly*, 484-503.
- Guo, T. J. (2021). *A study on the mechanism of the role of top-management team behavioral integration on corporate innovation performance*. (PHD thesis). Retrieved from Jilin University.
- Guo, T. J. (2021). *A study on the mechanism of the role of top-management team behavioral integration on corporate innovation performance*. (PHD thesis). Retrieved from Jilin University.
- Hambrick, D. C. (1994). Top management groups: A conceptual integration and reconsideration of the "team" label. *Research in Organizational Behavior*, 16, 171-171.
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193-206. <https://doi.org/10.2307/258434>.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: indeed a silver bullet. *The Journal of Marketing Theory and Practice*, 19(2), 139–152. <https://doi.org/10.2753/MTP1069-6679190202>.
- He, Y. (2022). *A Study of Management Risk Perception of Chinese Listed Companies* (PHD thesis). Retrieved from Central University of Finance and Economics, Beijing
- He, Y. S., & Yang, X. (2023). Current and Prospective Research on the Heterogeneity of Top Management Teams on the Performance of Private Higher Education Institutions under Environmental Dynamics. *Proceedings of the Shanghai Sub-Forum of the Smart City Construction Forum 2023*.
- Hu, H. R. (2022). *Research on performance evaluation of private colleges and universities based on Balanced Scorecard*. (Master's thesis). Retrieved from Dongbei University of Finance and Economics.
- Huang, B. X. (2022). The application of balanced scorecard in performance management of private higher education institutions. *Accounting for China's Township Enterprises*, (02), 130-132.
- Huang, F., & Qin, M. (2023). Research on the impact of top-management team behavioral integration mechanism on corporate performance. *Journal of Nanning Normal University (Philosophy and Social Science Edition)*, (03), 71-83.
- Jackson, S. E. (Ed.). (1993). *Diversity in the workplace: Human resources initiatives*. Guilford Press.

- Jehn, K. A., Northcraft, G. B., & Neale, M. A. (1999). Why differences make a difference: A field study of diversity, conflict and performance in workgroups. *Administrative Science Quarterly*, 44(4), 741-763. <https://doi.org/10.2307/2667054>.
- Jöreskog, K. G. (1971). Simultaneous factor analysis in several populations. *Psychometrika*, 36(4), 409-426. <https://doi.org/10.1007/BF02291366>.
- Lai, Y. (2022). *A study of the relationship between team fracture zones, team behavioral integration and team performance*. (Master's thesis). Retrieved from Nanjing University of Science and Technology.
- Lauring, J., & Selmer, J. (2013). Diversity attitudes and group knowledge processing in multicultural organizations. *European Management Journal*, 31(2), 124-136. <https://doi.org/10.1016/j.emj.2012.03.016>.
- Li, N. B. (2019). Impact of top-management team faultlines on corporate green technology innovation in a local context. *Science and Technology Progress and Countermeasures* (17), 142-150.
- Li, T. Z. (2020). *An analytical study of the internal governance structure of private higher education institutions*. (Master's thesis). Retrieved from Hebei University of Geology.
- Li, W. W., Zhang, Y. Y., & Zhu, J. T. (2020). An Empirical Study on the Impact of Top-Management Faultlines on the Growth Performance of Entrepreneurial Firms - The Moderating Effect of Innovation Intensity. *Science and Technology Progress and Countermeasures* (22), 142-151.
- Lin, M., Qi, H. F., & Ju, F. H. (2018). Task faultlines, hybrid equity structure and innovation performance of top-management teams in state-owned enterprises. *Research Management* (08), 26-33.
- Lindhult, E., & Axelsson, K. (2021). The logic and integration of coproductive research approaches. *International Journal of Managing Projects in Business*, 14(1), 13-35. <https://doi.org/10.1108/IJMPB-07-2020-0215>.
- Liu, J. (2021). Research on performance evaluation model of private higher education institutions based on balanced scorecard. *China High-Tech*, (11), 96-97.
- Liu, S., Ruan, J. E., & Chen, X. Y. (2023). *Top-management team faultlines and corporate digital transformation - based on upper echelon theory and behavioral integration perspectives*. *Western Forum*, (06), 17-32.
- Ma, Y. R. & Jiang, S.S. (2020). Team Cognitive Diversity, Knowledge Sharing and Team Innovation Performance - A Moderating Effect Test Based on Inclusive Leadership. *Journal of Hunan University (Social Science Edition)*, (05), 45-51.
- Meng, C. L., Ge, Y. H., & Wang, Q. N. (2020). The effect of TMT vertical pair differences on innovation performance in STI firms - mediation based on behavioral integration and moderation by team innovation climate. *Science, Technology and Management* (03), 20-27.
- Pan, Q. Q., Tang, L. Z., & Wei, H. M. (2015). Top-management faultlines, innovation capability and internationalization strategy - An empirical study based on data from listed companies. *Science and Science and Technology Management* (10), 111-122.
- Shen, S. Q. (2022). *A study of the relationship between contractual and relational governance, team behavioral integration and entrepreneurial performance in entrepreneurial teams*. (Master's thesis). Retrieved from Nanjing University of Science and Technology.
- Sieweke, J., Bostandzic, D., & Smolinski, S. M. (2023). The influence of top management team gender diversity on firm performance during stable periods and economic crises: An instrumental variable analysis. *The Leadership Quarterly*, 101703.
- Simsek, Z., Veiga, J. F., Lubatkin, M. H., & Dino, R. N. (2005). Modeling the multilevel determinants of top management team behavioral integration. *Academy of Management Journal*, 48(1), 69-84. <https://doi.org/10.5465/amj.2005.15993139>.
- Slovic, P., & Peters, E. (2006). Risk perception and affect. *Current directions in psychological science*, 15(6), 322-325. <https://doi.org/10.1111/j.1467-8721.2006.00461.x>.

- Slovic, P., Monahan, J., & Mac Gregor, D. G. (2000). Violence risk assessment and risk communication: The effects of using actual cases, providing instruction, and employing probability versus frequency formats. *Law and human behavior*, 24(3), 271-296.
- Song, Y. (2022). *Mechanisms of cognitive heterogeneity in R&D teams on team behavioral integration*. (Master's thesis). Retrieved from Kunming University of Science and Technology.
- Sun, Y. P., Zhang, Q., Chen, S., Zhang, Y. Y., & Chao, Q. (2022). The effect of top-management team structural characteristics on the quality of corporate internal control: a subgroup-based perspective. *Nankai Management Review* (06), 64-76.
- Tang, X., Gao, X., Zhao, T. Q., & Ding, S. T. (2022). Top-management team heterogeneity and corporate digital transformation. *China Soft Science* (10), 83-98.
- Wang, B. Q. & Ge, Y. H. (2023). Top-management Team Heterogeneity and Diverse Diversification, Innovation Performance - Mediating Effects Based on Adaptive Capacity. *Operations and Management*, 50(08), 22-32.
- Wang, B. Q., & Ge, Y. H. (2023). Top-management Team Heterogeneity and Diverse Diversification, Innovation Performance - Mediating Effects Based on Adaptive Capacity. *Operations & Management* (08) 1-12.
- Wang, B. Y. (2022). *Research on corporate governance of for-profit private universities*. (PHD thesis). Retrieved from East China Normal University.
- Wang, H. J., Lu, Y. S., & Song, T. B. (2023). Change in Stability? Top-management stability and corporate digital transformation. *Research and Development Management* (02), 97-110.
- Wang, J. Y., Kong, L. P., Xue, L.D., & Liang, H. (2021). The Relationship between Multidimensional Heterogeneity of Board Human Capital and Firm Performance. *Finance and Accounting Newsletter*, 12, 24-27.
- Wang, Q. (2017). *A study of the evolutionary mechanism of risk perception in entrepreneurial teams*. (PHD thesis). Retrieved from Wuhan Institute of Technology.
- Wang, Y. (2023). *A study of the impact of risk perception and social trust on farmers' willingness to participate in agricultural insurance*. (Master's thesis). Retrieved from Henan Agricultural University.
- Weber, E. U., & Milliman, R. A. (1997). Perceived risk attitudes: Relating risk perception to risky choice. *Management science*, 43(2), 123-144. <https://doi.org/10.1287/mnsc.43.2.123>.
- Wright, R., Campbell, D., Thatcher, J., & Roberts, N. (2012). Operationalizing multidimensional constructs in structural equation modeling: recommendations for IS research. *Communications of the Association for Information Systems Volume*, 30(23), 367-412.
- Xu, X., & Huang, J. (2020). A Study of Risk Perception and Behavioral Choices of Business Managers in the New Crown Pneumonia Epidemic. *Library Journal* (12), 117-127.
- Xu, X., & Huang, J. (2020). A Study of Risk Perception and Behavioral Choices of Business Managers in the New Crown Pneumonia Epidemic. *Library Journal* (12), 117-127.
- Yang, C., Song, Z. Y., Yang, C. J. & Yin, H. (2020). An empirical study of the relationship between homogeneity and heterogeneity of top-management teams and corporate M&A performance. *Journal of Liaoning Normal University (Natural Science Edition)*, (04), 455-462.
- Yüksel, D., Kazancoglu, Y., & Sarma, P. R. S. (2022). A multiphase acceptance sampling model by attributes to investigate the production interruptions in batch production within tobacco industry. *International Journal of Quality & Reliability Management*, 39(3), 836-858. <https://doi.org/10.1108/IJQRM-03-2021-0078>.
- Zeng, J. G. (2015). Cybersecurity Risk Perception and Asset Pricing in Internet Finance. *Economic Research* (07), 131-145.
- Zhang, J. Y. (2023). An Analysis of the Path of Institutional System Construction of Private HEIs in the Perspective of Governance. *Journal of Yellow River Institute of Science and Technology* (01), 25-29.