

## Board of Directors Diversity and Team behavior Integration Effects on Private Higher Education Institutional Performance in China

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

<sup>1</sup> Graduate School of Management, Postgraduate Centre, Management and Science University, 40100, Malaysia.

<sup>2</sup> Guangzhou Huashang Vocational College, 510000, Guangzhou, China

<sup>3</sup> School of Education and Social Sciences, Postgraduate Centre, Management and Science University, 40100, Malaysia.

*deng\_xiufen@163.com*

**Abstract.** This study investigates how heterogeneity among board of directors 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 board heterogeneity positively impacts performance directly and through enhancing integration. Additionally, risk perception strengthens the team integration-performance relationship. The multi-layered governance insights contribute practically by spotlighting the need for diversity and collaboration competencies when constituting boards. For scholars, the team-based micro-level perspective explains how varied individual expertise and synergistic conduct drive institutional excellence.

**Keywords:** Private higher education institutions, Board of directors heterogeneity, Organizational performance, Team behavioral integration, Risk perception

## **1. Introduction**

According to the latest statistics from China's Ministry of Education, there are 764 private HEIs in China, accounting for 25.36 per cent of the total number of HEIs in China. The total number of students in private HEIs has reached 9,248,900. With the increasing number of private HEIs, the competition is becoming more and more intense. In this context, the building of the governance team and the mechanisms of its role are of particular importance. Compared with team homogeneity, team differences in knowledge, skills, information, and cognitive perspectives help organizations to quickly identify market opportunities and respond innovatively to environmental changes (He, 2023).

Regarding the current situation of the board of directors in Chinese private higher education institutions (HEIs), its members are primarily sourced from individuals with investor interests. The government and alumni have limited influence due to their minimal contribution of resources to the institution. In private HEIs with hierarchical systems, the representation of teachers and students on the board is even more limited (Wang et al., 2021). The composition of the board of directors in private HEIs has resulted in a serious imbalance in stakeholder representation. As typical multi-stakeholder organizations, it is crucial to have a reasonable composition of the board of directors to ensure the benign and sustainable development of these institutions (Li, 2022).

With the increasing specialization of the division of labor in society, scholars have further discovered that organizational development requires competencies and knowledge that can no longer be provided by one individual alone. Qin (2013) argued that team behavioral integration is key to the process of team functioning, and that the higher the level of integration, the better the team's collective creativity can be, and confirmed the mediating role of team behavioral integration in the relationship between team cognitive ability and creativity. Wang (2015) argues that team behavioral integration, which affects communication between team members, motivates them to actively participate in innovation management, deepens cooperation and facilitates innovative decision-making. Team behavioral integration is the development and sublimation of the human capital structure of the team, while the study of the mechanism of team behavioral integration is a deeper exploration of the process of team operation.

There are two dominant perspectives on the role of team heterogeneity in relation to organizational performance: (a) the social categorization theory perspective. In a decentralized situation, the diversity of perceptions, values and information available to team members is uneven, leading to a tendency for companies to opt for a compromise approach to decision-making. Heterogeneity among team members not only affects the frequency and effect of communication among members, but also affects the degree of team behavioral integration among members, and the smaller the heterogeneity of the team, the more it helps to improve the efficiency of decision-making and promotes the improvement of corporate performance. (b) Decision theory perspective. This perspective argues that strategic complexity places increasing demands on the informational decision-making capabilities of the top levels of the firm, which requires senior management personnel with diverse cognitive resources (Michel, 1992). The different background characteristics of the top-management team can bring rich resources, multiple perspectives and diverse knowledge to the team's decision-making, which can help the organization to identify opportunities and assess the feasibility of options in a more comprehensive way, thus enhancing performance (Zhang & Zhou, 2020).

Although scholars are divided on the relationship between board characteristics and firm performance, the results of empirical studies support the objective fact that board heterogeneity significantly affects firm performance (e.g., Peng, 2020; Wang et al. 2021; An, 2021; Hou, 2022). Different human resource characteristics of team members have different advantages, and the impact on firm performance depends on whether the firm can take advantage of the heterogeneity of team members. At the same time, the impact of human capital characteristic variables of top-management team members on firm performance is not simply direct, but more likely to be influenced by some mediating or moderating variables (Guo & Zou, 2020).

The human capital of teams has different advantages, and the impact on enterprise performance is dynamic. Harnessing the heterogeneity of team members is the key to enhancing team creativity and resilience, which can have a positive impact on firm performance (Qin, 2022). The heterogeneity of team human capital can bring out the advantages of enterprise performance, which cannot be separated from the role of team behavioral integration. However, the process by which team human capital heterogeneity transforms into team behavioral integration needs to be further investigated and the understanding of the composition of team diversity needs to be deepened. The interdependencies between team human capital diversity, and how these combinations affect team behavioral integration, and how both affect firm performance, need to be examined.

In a competitive environment, the ability of managers to perceive risk plays an important role. The ability of private HEIs to perceive changes in the environment and to seize opportunities for expansion depends on the ability of top levels to perceive risk. Given the risks and challenges in the external environment, the diversity of industry experience allows managers to capture more favorable information resources for organization, enabling them to identify problems and potential threats more acutely, and then integrate resources in a targeted manner to ensure that the interests of stakeholders are maximized (Xu & Huang, 2020).

This paper contributes to the academic literature in the following ways. First, it extends the existing academic literature on corporate governance, providing empirical insight into the beneficial effects of board heterogeneity in an unexplored context such as private HEI. Furthermore, while the academic community has made significant strides in studying board teams, scholars from various perspectives have empirically demonstrated the impact of board teams on organizational performance. However, the research framework of the behavioral integration mechanism of the board of directors team still lacks consideration of many important factors, and there is a dearth of situational discussion across different industry backgrounds. This study also explores the impact of board members' risk perception on organizational performance in the context of risks and challenges in the external environment.

In summary, the construction of a research framework on the heterogeneity, team behavior integration, risk perception and organizational performance of the board of directors of private HEIs has theoretical and practical significance. This framework can further explain the complexity of the operation process of the board of directors team, promote theoretical systematization, and guide private HEIs to build efficient teams, adapt to environmental changes, and maintain competitiveness. The research aims to answer the following questions: How does board team heterogeneity impact organizational performance? What is the influence of the behavior integration mechanism among board team members on organizational performance? How does the heterogeneity of board team members affect behavioral integration? How does the risk perception of board members affect the relationship between board team behavior integration and organizational performance?

This paper is organized into five sections. The first section mainly describes the research issues and significance. The literature review and hypotheses are presented in the second part. In the third section, research methods, sampling and instrument development are explained. The findings of this study are reported in the fourth part. At last, the conclusions, limitations and implications are formulated.

## **2. Theoretical Foundation and Conceptual Model**

### **2.1. Upper Echelons Theory and Decision Theory**

In 1982, Hambrick and Marson proposed the Upper Echelons Theory. According to this theory, due to the complexity of the internal and external environments, it is impossible for managers to grasp all aspects of business management. The manager's existing cognitive structure and values determine his or her insight and judgement of market information. The theory has served as a catalyst for examining how executives' characteristics and experiences shape their perceptions, choices, and actions in ways that ultimately impact a variety of firm outcomes (e.g., Díaz-Fernández et al., 2020; Liu, 2022). Firms'

strategic development choices often arise in very complex environments where a single leader is insufficient to make comprehensive decision-making choices, so research on governance and strategy should focus on the team, which is more predictive of organizational outcomes (Guo, 2021). Wulan (2021) argued that the psychological structure of the management team in terms of insight, cognitive ability and value orientation determines the quality of strategic decisions and the corresponding performance output. Upper echelon theory extends the theory of leader personal traits, cognition and behavior to leadership teams, suggesting that the demographic characteristics of top levels are strongly linked to managers' perceptions and can influence team decision-making processes and outcome.

Herbert A. Simon (1948) proposed the decision theory. Decision theory is making decisions based on assigning probabilities to various factors and numerical consequences to the outcome. It explores how individuals choose among different alternatives when faced with uncertainty and unknown conditions. In decision theory, the role of human beings is to identify, filter and select effective information, eliminate and filter invalid and useless information, and lay the foundation for decision-making. Members come from different backgrounds and each has different professional experience accumulated over the years, and they may differ in the way they select information and the means by which they process it. However, it makes the information resources richer and the sources of decision-making information channels diversified, which ensures the scientific quality of decision-making. The study found that when information discrepancies were anticipated, individuals were more likely to discuss the information and incorporate it into decision making (Rink, 2010).

## **2.2. Board of directors Heterogeneity**

The board of directors is the strategic decision maker of the organization and determines the direction in which the organization's strategy develops and operates, and the key to its impact on the organizational performance is its ability to bring in important resources that facilitate the development of the organization's strategy. Jackson et al. (1992) state that team heterogeneity is divided into two categories: one based on demographic background characteristics, such as the race, nationality and age of the team members; and the other based on the manager's own intrinsic characteristics, such as personality differences, values, psychological behavior, etc. Board heterogeneity is based on the characteristics of board members and reflects the differentiation of important characteristics (e.g., age, gender, tenure, level of education, occupational background, etc.) among members (Hou, 2022).

## **2.3. Team Behavioral Integration**

Team behavioral integration was first proposed in 1994 in top-management teams, explored by Hambrick et al. (1984). 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. Shen (2022) stated that team behavioral integration is a desirable concept explaining that team members work collaboratively and integrate their performance to accomplish tasks. Team behavioral integration is an extremely positive and desirable team characteristic that allows members to better manage complex and changing organizational and strategic issues. Lai (2022) stated that team behavioral integration refers to the sharing of perceptions and value judgments among team members, an entire interactive process that highlights the integrity of the team.

## **2.4. Performance of Private HEIs**

HEIs are performance-oriented organizations (de Matos Pedro, 2022). Private HEIs have corporate attributes, and research on the performance of private HEIs can be conducted from two aspects: (a) Financial management performance. Bi et al. (2010) analyzed with the help of Malmquist productivity index to study the dynamic efficiency of HEIs regarding inputs. Li et al. (2014) examined the input-output performance of university education funding by constructing a DEA-AHP model. (b) Organizational performance. Performance involves a set of specific indicators and can also be referred

to as the achievement of HEIs performance. Considering the special attributes of private HEIs, scholars have drawn on the balanced scorecard to comprehensively assess the performance of private HEIs (Zhang, 2019; Zhu, 2019; Liu, 2021; Huang, 2022).

### **2.5. Risk perception**

Utility theories in economics and psychology define risk as the product of people's assessment of the severity and probability of negative outcomes (Slovic, 2006), and is not a real risk. Therefore, the risk subjectively perceived by individuals is different from the real risk, the former is a subjective perception of risk, while the latter is a scientific understanding of risk (Xu & Huang, 2020), and there are certain differences between the two. Risk perception is an individual's subjective perception and experience of objective risk (Wang, 2023). Risk perception is affected by a variety of factors such as demographics, information exposure, knowledge level, and risk experience (Zhou, 2023). Risk perception is characterized differently in different individuals and groups, and their perception of risk decreases with familiarity, and is also influenced by the risky decisions they face, the diversity of their team members, and their past experiences.

### **2.6. Board of directors Heterogeneity and performance**

Team heterogeneity contributes positively to organizational development (Guo et al., 2020). According to decision theory, decision-making is a process of information flow and regeneration, and comprehensiveness and diversity of information facilitate optimal decision-making. Xu and Lei (2021) showed that TMT faultlines have a positive effect on firm performance. Zhang and Zhou (2020) stated that the diversity of TMT human capital is a strategic decision-making capital that enables team members to better use their expertise and conduct comprehensive analyses to ensure that goals are achieved. The heterogeneity of the team makes it easy for the organization to share a diversity of perceptions, experiences, and values in the decision-making process, so that the management team can fully consider the requirements of each innovative behavior on the firm's capabilities, and thus find a suitable model for the development of the firm (Lu & Miao, 2018). Management teams with higher heterogeneity contribute significantly to managers' ability to seize opportunities.

The significance of ensuring board heterogeneity has also been demonstrated in the higher education sector. Private school boards are composed of members from diverse professional backgrounds and are typically not specific to any particular sector (Brower & Shrader, 2000). Loh et al. (2020) confirmed that certain board characteristics, such as diversity of board composition and board practices, indirectly affect school performance through their positive association with board effectiveness. Veltri et al. (2022) investigated the association between university boards of directors and performance outcomes and found a significant positive association. Sajadi et al. (2020) used a qualitative approach to investigate how medical university boards can be improved to enhance the overall effectiveness of these institutions. Hence, this study proposed the following hypothesis:

H1: Board of directors heterogeneity positively affects organizational performance.

### **2.7. Board of directors Heterogeneity and Team behavioral integration**

Team human capital heterogeneity implies having knowledgeable and cognitively diverse members within the team, that is, having professionals from different industries or different fields within the team. The research of Bezrukova et al. (2010) confirmed that when team information cognitive faultlines are present in a team, the team members are able to encourage each other, support each other, provide psychic comfort and weaken psychological stress. Teams based on cognitive differentiation create the conditions for team members to draw on a wealth of knowledge that allows them to think from different perspectives and generate new ideas. Yi (2018) verified that there is a significant relationship between board of directors, founder status, shareholding ratio and corporate governance behavioral orientation. Shen (2022) constructed a research model of the relationship between team governance, team

behavioral integration, entrepreneurial performance and team conflict handling style, and the study showed that team governance has a significant positive effect on team behavioral integration.

To the authors' knowledge, few studies have investigated the impact of board heterogeneity on team behavior in private HEI studies. Wang and Liu (2015) analyzed the composition of the board of directors of private HEIs and decision-making mechanisms through text analysis, interviews and questionnaires. The study showed that board heterogeneity has an impact on decision-making efficiency. Hou (2022) applied the structure-conduct-performance paradigm to validate the relationship between board human capital heterogeneity and board behavior using practical logic. However, it is reasonable to assume that board heterogeneity may have a positive influence on team behavior based on broader theoretical support and prevalent empirical evidence from private sector studies (Zhao, 2023; Lai, 2022; Liu, 2021; Rossignoli et al., 2021). Hence, this study proposed the following hypothesis:

H2: Board of directors heterogeneity positively affects team behavioral integration.

## **2.8. Team behavioral integration and organizational performance**

Within organizations, team heterogeneity can play a complementary role in terms of information and resources, but their complementary roles do not form automatically, and team behavioral integration is also required (Yao & Sun, 2010). Collaborative behaviors of team help the team to examine the rationality of their work allocation and reduce decision-making pressure due to disagreement within the members of the team, thus improving performance (Zhang, 2020; Guo, 2021). Liu (2019) used a non-linear test to validate the mediating role of board governance behaviors and found that board governance behaviors and performance showed a non-linear logarithmic relationship. Lai (2022) constructed a research model of the relationship between team faultline, team behavioral integration, team performance and team communication based on the team faultline perspective, and found that team behavioral integration has a significant positive effect on team performance. Hence, this study proposed the following hypothesis:

H3: Team behavioral integration positively affects organizational performance..

## **2.9. Board of directors Heterogeneity, Team behavioral integration and organizational performance**

Within organizations, team heterogeneity can play a complementary role in terms of information and resources, and influence organizational performance through team behavioral integration. Team behavioral integration affects the relationship between team tenure, education level, heterogeneity in educational and occupational backgrounds and performance. A low level of team behavioral integration suggests that there is less communication and sharing of internal information among team members and a low willingness to participate in collective decision-making, thus diminishing firm performance (Ma & Guo, 2010). If team members in an enterprise can take advantage of human capital, strengthen communication and cooperation among members, and maintain the coefficient of team behavioral integration among members at a high level, it is easy to reach a better level of enterprise growth under moderate team heterogeneity and high level of team behavioral integration (Yu, 2020). Hence, this study proposed the following hypothesis:

H4: Team behavioral integration positively mediates the relationship between board of directors heterogeneity and organizational performance..

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

Team members' risk perception plays a role in the relationship between team interaction and cooperation and organizational performance. The stronger the perception of risk among team members, the stronger the interaction among team members, which affects organizational performance. According to Xu & Huang (2020), a greater perception of risk creates greater pressure on team members, which forces them to communicate and interact more frequently and seriously with each other. Team members with strong risk perception are more willing to communicate with other members, share information resources, and

express their personal views with others more urgently. Team members are more willing to listen and adopt the views and opinions of others because they are aware of the seriousness of the problem (Zhang & Gu, 2020). In uncertain environments, managers tend to choose team motivation, and this willingness increases as environmental uncertainty fluctuates more and affects organizational performance (Xu et al., 2021). Hence, this study proposed the following hypothesis:

H5: Risk perception positively moderates the relationship between team behavioral integration and organizational performance.

### **3. Methodology**

#### **3.1. Research design and sampling strategy**

Cross-sectional research approach is applied in this study due to two main reasons. This approach (a) can obtain an adequate amount of primary data within a short span of time; and (b) cross-sectional research can minimize the problem associated with obtaining the same sample used in a previous experiment. Besides, this study adopted a quantitative research approach to test the hypothesis. The next section will discuss the sampling strategy for this study in detail.

The population comprised members of the top levels of private HEIs in south-central China. This study applied a criterion to select the respondents. Due to the availability of the population database, a random sampling was applied to send out an invitation to the target population of this study. In relation to the sample size, according to the guideline suggested by Lindhult (2021) and Yuksel (2022), the minimum sample size should be 200 in order to perform structural equation modelling. This study managed to obtain 420 responses from the targeted population. This number is considered adequate as it met the guidelines.

#### **3.2. Instruments**

This study used the survey method to collect the data and test the hypotheses. In order to verify the hypotheses, this study primarily conducted a survey with a structured questionnaire. All the constructs were adopted from prior studies related to this domain. Two key measurement scales, namely nominal and five-point Likert, were applied to measure the variables.

Board of directors heterogeneity is measured involving social category and professional heterogeneity and work experience heterogeneity, with a total of 11 items, according to Jehn et al. (1999), Bjornali et al. (2016) and Li (2020). Private HEIs' performance is measured involving finance, students, internal processes and development, with a total of 6 items, according to the components and indicators used by Wang (2017) and Xu (2020). Team Behavioral integration is measured involving teamwork, decision-making participation and effective communication, with a total of 6 items, according to Simsek et al. (2005), Guo (2021) and Lai (2022). Risk Perception is measured involving environment, resources, decisions and challenging assignments, with a total of 6 items, according to Wang (2017) and Xu (2020).

To ensure respondents understood the questions, a pre-test was applied in five HEIs. Questionnaire was applied to 50 members of top levels in different 10 private HEIs. Alpha value for all the constructs were more than the threshold of 0.70. The definitive sample was collected via an anonymous questionnaire through an online platform.

#### **3.3. Respondents' profile**

Table 1 presents the respondents' profile for this research. A frequency test was used to comprehend the characteristics of respondents. Results indicated that male respondents were significantly dominating the females, with 67.86 percent respondents being male. 36.43 percent of respondents' ages were between 51 and 60 followed by an age between 41 and 50. Moreover, 13.81 percent of respondents' ages were above 60. In terms of the age distribution among respondents, it was adequately diversified from 20 years to above 65, which truly provides a comprehensive representation of the private HEIs.

More than 46.43 percent of respondents completed their master degree followed by bachelor (27.38%) and PhD (24.29%). Moreover, more than 61.43 percent respondents have five or above years of tenure followed by three years (30.00%). Hence, it is clear that the respondents for this study were well educated and had long tenure to be part of this study.

Table 1. Respondents' profile

Profile	Category	Frequency	Percentage (%)
Gender	Male	285	67.86
	Female	135	32.14
Age	20~30	18	4.29
	31~40	55	13.09
	41~50	136	32.38
	51~60	153	36.43
	60 above	58	13.81
Educational level	High school	0	0
	Vocational college	8	1.90
	Bachelor degree	115	27.38
	Master degree	195	46.43
	PhD	102	24.29
Tenure	1 year	36	8.57
	Within 3 years	126	30.0
	Within 5 years	145	34.53
	Above 5 years	113	26.90

### 3.4. Hypotheses testing

This research used partial least squares structural equation modeling (PLS-SEM) by the SMART PLS Version 4. This research used PLS SEM techniques mainly due to six main reasons: (a) this study is exploratory; (b) this study analyses from a predictive perspective; (c) the structural model in this study is complex; (d) the structural model in this study contains one or more formative constructs; (e) the sample size available for this study is small; and (f) the sample in this study is non-normally distributed.

This study includes both formative and reflective models. Board of directors heterogeneity is formative-formative HCM, and organizational performance is also formative model. Team behavioral integration and risk perception are reflective models. In relation to reflective models, this study first assessed construct reliability and validity by examining standardized loading, composite reliability (CR), average variance extracted (AVE) and Cronbach alpha. In relation to formative models, this study assessed convergent validity, collinearity (VIF) and weight. Before assessing structural model, VIF value should assess to make ensure there is non-existence of multicollinearity issue for all latent variables. After that, this study examined the relationship between latent variables by estimating the structural model. The findings of PLS-SME will be presented in the next sections.

#### Assessing reflective measurement models

Team behavioral integration and risk perception are reflective measurement models. Reliability is mainly used to evaluate the stability and consistency of the model, i.e. the degree of stability and consistency of the measurement model, which can also be interpreted as the magnitude of the degree of variability of the measured values caused by random errors in the measurement process. Internal consistency reliability was assessed using the composite reliability proposed by Jöreskog's (1971) and Cronbach's alpha. The results showed that the composite reliability (CR) were 0.828 and 0.842, and the Cronbach's alpha values were 0.824 and 0.839, indicating a certain degree of reliability. The AVE was used to assess the convergent validity of each construct. The AVE value for each construct exceeded 0.5, indicating that the construct explained at least 50% of the variance of its items (Table 2). More specifically, the factor loading value for each item on their respective variable was higher than 0.60, as

shown in Table 3. Fornell-larcker was used in this study to evaluate the discriminant validity. Table 4 presents the square roots of AVE for all the latent variables and values were considerably higher than its correlation with other constructs. Hence, this study confirmed a satisfactory level of discriminant validity for the proposed model.

Table 2. Measuring the reflective measurement model

Variable	Type	Indicators	Factor loadings	Cronbach's alpha	CR	AVE
Team Behavioral Integration	Reflective	TBI1	0.751	0.839	0.842	0.555
		TBI2	0.717			
		TBI3	0.712			
		TBI4	0.721			
		TBI5	0.781			
		TBI6	0.690			
Risk Perception	Reflective	RP1	0.729	0.824	0.828	0.532
		RP2	0.757			
		RP3	0.727			
		RP4	0.687			
		RP5	0.755			
		RP6	0.810			

Table 3. Cross Loadings

	Organizational Performance	Risk Perception	Team Behavioral Integration	Board of directors
RP1	0.281	<b>0.751</b>	0.236	0.230
RP2	0.263	<b>0.717</b>	0.194	0.181
RP3	0.298	<b>0.712</b>	0.252	0.212
RP4	0.299	<b>0.721</b>	0.262	0.226
RP5	0.345	<b>0.781</b>	0.268	0.292
RP6	0.255	<b>0.690</b>	0.195	0.210
TBI1	0.492	0.193	<b>0.729</b>	0.555
TBI2	0.533	0.217	<b>0.757</b>	0.531
TBI3	0.538	0.263	<b>0.727</b>	0.537
TBI4	0.463	0.218	<b>0.687</b>	0.529
TBI5	0.540	0.294	<b>0.755</b>	0.566
TBI6	0.611	0.262	<b>0.810</b>	0.578

Table 4. Fornell-larcker criterion

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

### Assessing formative measurement models

Board of directors heterogeneity and organizational performance are formative models. Formative models can estimate indicator convergent validity by measuring the correlation of the indicator with other variables, that is, by adding a global measure, and the correlation of the formative indicator with it is the convergent validity (Diamantopoulos, 2005). It is generally accepted that correlations between latent variables should be at least greater than or equal to 0.7, and preferably greater than or equal to

0.8, representing good convergent validity of the formative model. The correlation coefficients of board of directors heterogeneity ( $\beta = .917$ ) with the its global measurements are greater than 0.8 and the correlation coefficients of the organizational performance with its global measurements is 0.873, which is also greater than 0.8.

As there is a second-order construct in both models, this analysis adopts a two-step approach (Wright et al., 2012): (i) only treating the first-order constructs of board of directors heterogeneity and (ii) calculating the models after incorporating the aggregate scores as indicators of second-order constructs. From Table 5 and Fig. 1, it can be seen that the formative model of this study can reasonably reflect the influence of the first-order observed variables on the first-order latent variables and the importance of the first-order latent variables on the second-order latent variables, and the weighting values are greater than 0.2 and reach the significant level.

Table 5. Parameter estimation of formative measurement models

latent variable	Indicators	Weight	T value	P value
First-order				
Social Category and Professional Heterogeneity	BOD11	0.389	7.378	0.000
	BOD12	0.317	6.259	0.000
	BOD13	0.306	6.109	0.000
	BOD14	0.203	4.203	0.000
	BOD15	0.295	5.920	0.000
Work Experience Heterogeneity	BOD21	0.241	4.756	0.000
	BOD22	0.230	4.329	0.000
	BOD23	0.333	6.506	0.000
	BOD24	0.344	7.661	0.000
	BOD25	0.297	5.936	0.000
Organizational Performance	OP1	0.320	7.728	0.000
	OP2	0.313	6.901	0.000
	OP3	0.261	6.158	0.000
	OP4	0.320	7.508	0.000
	OP5	0.335	7.619	0.000
Second-order				
Board of directors	Social Category and Professional Heterogeneity	0.607	11.227	0.000
	Work Experience Heterogeneity	0.519	9.357	0.000

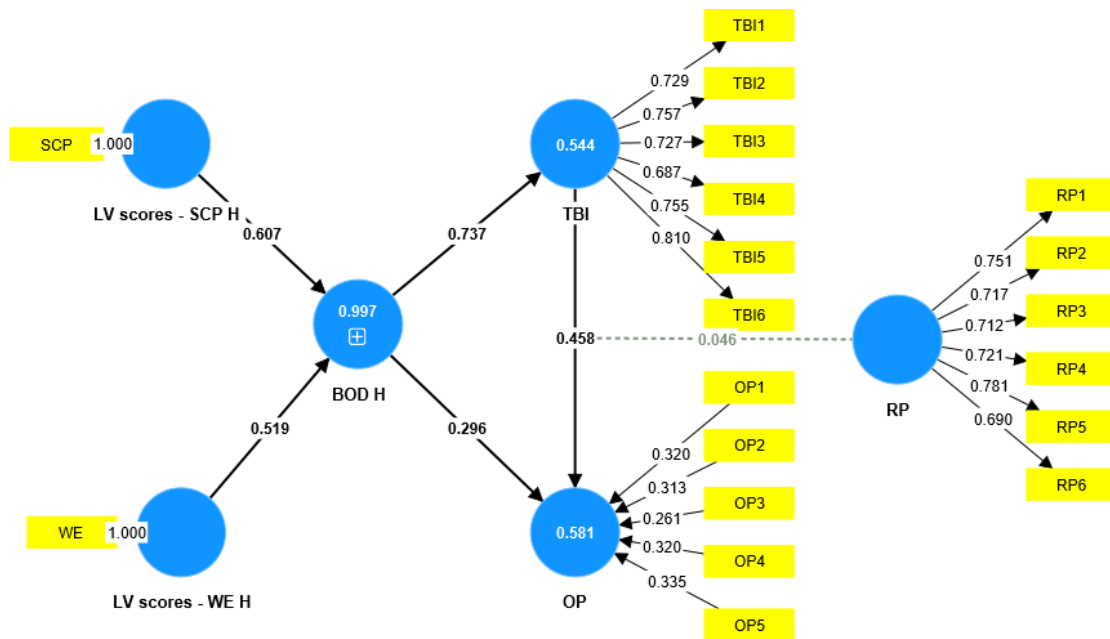


Fig. 1: The Second-order results

**Assessing Structural model**

Before evaluating the structural model, collinearity was first checked using the variance inflation factor (VIF). The outer VIF values in this study ranged from 1.172-2.001, indicating that the model does not suffer from serious collinearity problems.

When evaluating PLS models, the evaluation parameters can be divided into two categories, one is the parameters for evaluating the explanatory ability of the model, including the coefficient of determination R squared for evaluating the explanatory ability of the model. And the cross-validated ability test (CVPAT), which evaluates the predictive ability of the model. R squared (R<sup>2</sup>) is an important parameter used in PLS path models to evaluate the effectiveness of internal relationship interpretation. Based on the results, board of directors heterogeneity explained almost 54 percent of the team behavioral integration, and nearly 58 percent variance in organization performance can be explained by board of directors heterogeneity and team behavioral integration (Table 6).

The cross-validated ability test (CVPAT) tests whether PLS-SEM’s average loss is significantly lower than the average loss of the benchmarks. Therefore, the difference of the average loss values should be significantly below zero to substantiate better predictive capabilities of the model compared to the prediction benchmarks. Based on the results, the average loss difference of team behavioral Integration and organizational performance are below zero, that substantiate better predictive capabilities.

Table 6. Assessing the final model (CVPAT and R<sup>2</sup>).

	Average loss difference	R-square	R-square adjusted
Team Behavioral Integration	-0.358	0.544	0.543
Organizational Performance	-0.329	0.581	0.577

Table 7 and Fig. 2 present the ‘t’ values and path coefficient, which help to test the hypotheses proposed earlier. The hypothesis test is mainly divided into three parts. At the first stage, the direct effect has been analyzed followed by assessing the mediating effect of the team behavioral integration

and assessing the moderating effect of organizational performance. Additionally, this study measures the effect size ( $f^2$ ), which is very insightful to determine the level of contribution from independent and mediating variables to  $R^2$ . Results indicated that board of directors heterogeneity has a significant positive effect on team behavioral integration ( $\beta = .296$ ,  $t = 6.071$ ,  $p < .001$ ) and organizational performance ( $\beta = .737$ ,  $t = 26.276$ ,  $p < .001$ ). Therefore, H1 and H2 were accepted. Results also confirmed that team behavioral integration has a direct effect on the organizational performance ( $\beta = .458$ ,  $t = 10.004$ ,  $p < .001$ ), hence H3 was accepted.

Table 7. Hypothesis test

Hypothesis	Relationship	$\beta$	T value	P value	$f^2$	95%CI	
						LL	UL
H1	BOD H -> OP	0.296	6.071	0.000	0.093	0.205	0.394
H2	BOD H -> TBI	0.737	26.276	0.000	1.191	0.681	0.791
H3	TBI -> OP	0.458	10.004	0.000	0.222	0.362	0.540

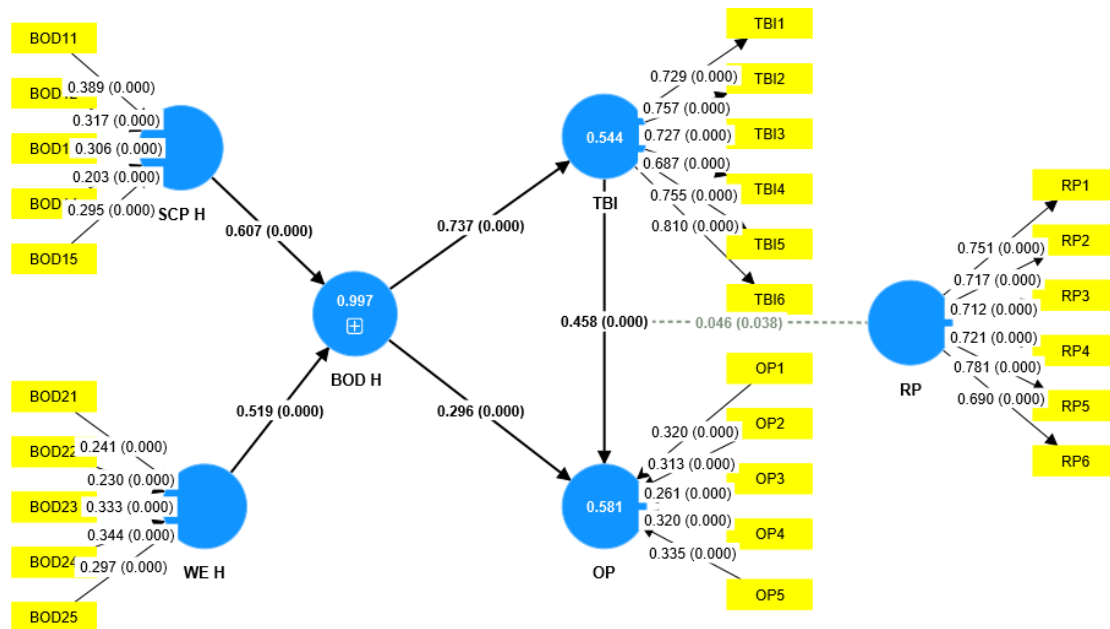


Fig. 2: Path coefficient results

**Assessing mediation effect**

This study proposed a mediation model that mainly assessed the relationship between board of directors heterogeneity and organizational performance by analyzing the team behavioral integration. This study examined the Variance Accounted For (VAF) to assess the mediation effect. Variance Accounted For (VAF) is useful to determine the category of mediating variables, whether full mediation or partial mediation. If the VAF value is below 20% then it is categorized as no mediation, and if the VAF value is between 20% to 80% then it is categorized as partial mediation, however if it is greater than 80% then it is categorized as full mediation. Results are presented in Table 8. Based on the results, the VAF of team behavioral integration is 32.33 percent, hence H4 is supported.

Table 8 Mediation effect

Hypothesis	Relationship	$\beta$	t-value	p-value	VAF	Remark
H4	TMT H-> TBI -> OP	0.205	6.694	0.000	0.3233	Partial Mediation

**Assessing the moderating Effects**

Table 9 and Fig. 3 present the ‘t’ values and path coefficient, which help to test the hypotheses proposed earlier. Combined with the regression coefficient analysis, the positive predictive effect of risk perception on organizational performance was 0.193 (  $p < .001$ ) and the positive moderating effect of the interaction term consisting of risk perception and team behavioral integration on organizational performance was established, with the coefficient of the interaction term being 0.046 ( $p = 0.038$ ), which indicates that the team produces a higher level of organizational performance based on team behavioral integration under the effect of high risk perception. Hence H5 was supported.

Table 9 Moderating effect

	Original sample	Sample mean	Standard deviation	T statistics	P values
Risk Perception -> Organizational Performance	0.193	0.195	0.045	4.330	0.000
Risk Perception x Team Behavioral Integration -> Organizational Performance	0.046	0.044	0.022	2.075	0.038

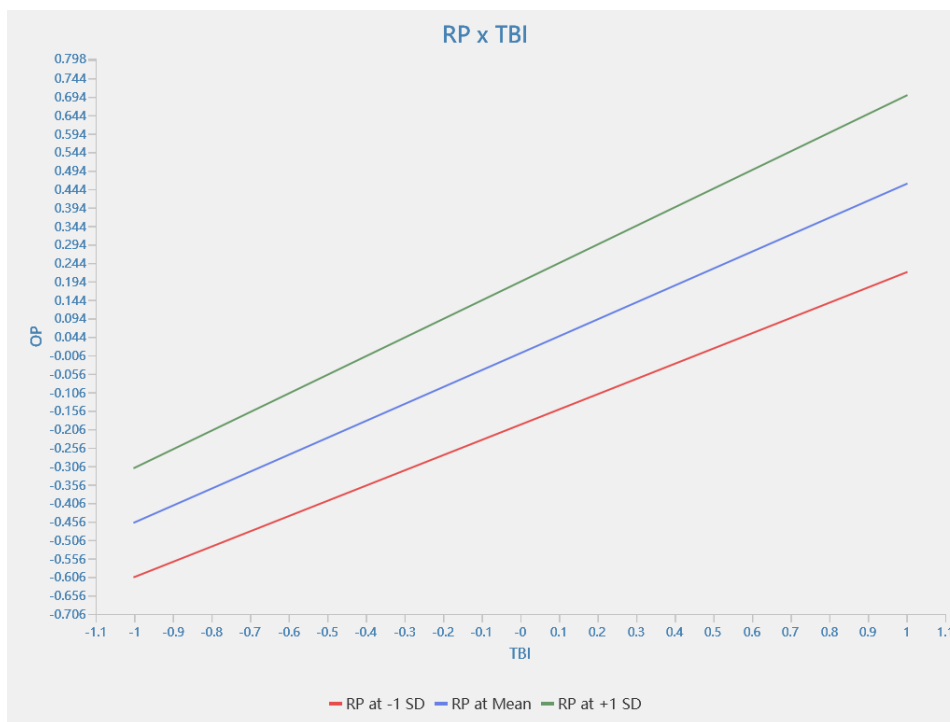


Fig. 3: Simple slope analysis

**Results**

China's public higher education institutions (HEIs) operate under a presidency responsibility system overseen by the party committee. The committee is the highest authority, making decisions on major issues and playing a decisive role in the development of public HEIs. In contrast, the president of China's private HEIs is accountable to the board of directors. Private higher education institutions (HEIs) are governed by a board of directors, which serves as the supreme authority responsible for formulating the development strategy and making decisions on significant matters pertaining to the institution. This study examines the characteristics of board members, governance behaviors, and organizational performance in private HEIs. Table 10 shows that private HEIs perform better when their board

members and higher team have diverse backgrounds and are behaviorally integrated. Specifically, having a diverse background of board members and higher team behavioral integration has a positive impact on the performance of private HEIs.

Table 10. Structural equation model path analysis and hypothesis testing results

Hypothesis	Path relation	Standardized regression coefficient	T value	P value	$f^2$ / VAF/	Label
H1	BOD H -> OP	0.296	6.071	***	0.093(S)	accept
H2	BOD H -> TBI	0.737	26.276	***	1.191(L)	accept
H3	TBI -> OP	0.458	10.004	***	0.222(M)	accept
H4	TMT H-> TBI -> OP	0.205	6.694	***	0.3233	accept
H5	RP x TBI -> OP	0.046	2.075	0.038	—	accept

## 4. Discussions, Theoretical and Practical Implications

### 4.1. Discussions

The human capital of the governance team includes the compositional status of team members in terms of their social categorization, professional background, educational background, functional background, and occupational background, which directly affect the effectiveness of the team members in performing their functions. The higher the team's human capital heterogeneity, the higher the cognitive ability and expertise of team members, and the higher the insight and information processing ability of team members. Wang et al. (2021) stated that top managers from different career fields can provide diversified opinions and recommendations for governance decisions, which is conducive to the company's consideration of multiple factors and potential crises when making decisions, thus improving the effectiveness of corporate governance decisions. Thus, the heterogeneity of human capital leads to a richer hierarchy of people in the team, which is complementary and more conducive to better and more comprehensive decision-making. Different attributes of the decision-making group, its broader representation, decision-making considerations will be more comprehensive, the control of risk is better, and the possibility of profit is also increased.

The heterogeneity of team members' human capital implies that there is a wealth of knowledge and cognitive diversity within the team, representing the presence of experts in various fields. This signal is also positively perceived and recognized by the members, urging individuals to learn the appropriate skills and expertise, leading to interaction and thus positively influencing team behavioral integration. From the information processing perspective, differences in the cognitive attributes of team members create new team constructs. Each individual here thinks from a different perspective, has a different vision and pattern, and the knowledge span between members is large, leading to the enrichment of the team's resource "reserve pool", which also makes it easy for members to quickly locate the expertise of the corresponding individual, obtain information, and integrate resources. In this way, the integration of the team as a whole is improved.

Individual characteristics are reflective of the distinct experiences, skills, and values of board team members, resulting in varying cognitive patterns. Upper echelon theory combines individual traits with team processes from a behavioral integration perspective. It argues that collective interactions within a team facilitate the sharing of information, resources, and decision-making, which in turn promotes team behavioral integration across the team (Wang et al., 2020). The process of building a team involves two main steps: firstly, analyzing the individual traits of team members, and secondly, analyzing the environmental factors to which they are exposed, such as team situational and process variables. Therefore, this study examines the impact of board team heterogeneity on organizational performance.

It considers the governance team members, the team as a whole, and the organization in which the team is located. By doing so, it aims to produce more scientific and comprehensive research results.

This study focuses on two aspects of researching and analyzing the governance team of the board of directors of private HEIs. Firstly, the construction of governance teams from the elements of heterogeneous traits of team members. Efficient teams rely on a diverse membership structure with different knowledge, backgrounds, and skills. Secondly, the dynamics of board governance teams are explored in terms of team behavior. Team behavior is the analysis of the group as a whole. The behavior of the governance team is influenced by both internal needs and external environmental factors. Therefore, the behavior of individual team members collectively determines the overall behavior pattern of the team. To enhance organizational performance, it is essential to fully utilize the internal potential of team members. This is achieved through the role and influence of various complex forces within the team.

Based on Upper Echelon Theory, team behavioral integration is the process of information sharing, collaboration, and strategic decision making. The higher the degree of team behavioral integration, the better the information integration of the organization. The board of directors is the core team that takes responsibility for improving the performance of private HEIs, and the process of team behavioral integration, i.e., team decision-making, processing and handling of information, and coordination and cooperation, has a significant impact on the performance of private HEIs. Team behavioral integration is able to make sense of the objective environment in which it operates, by responding quickly to it in order to compensate for the organization's shortcomings in management. According to Guo (2021), the higher the team behavioral integration, the more quickly the firm can identify opportunities, adjust strategies and decisions, save time costs, and improve the efficiency of strategy execution. The greater the degree of team behavioral integration, the easier it is for their team's work processes to be coordinated, and the team's collaborative behaviors can help team members deepen their use of the existing knowledge base so that it transfers into organizational performance.

The individual characteristics of the governance team form social category and professional heterogeneity and work experience heterogeneity. This heterogeneity will bring multiple knowledge and information, which makes team members pay attention to their own growth, ask for advice from others, and form a good interaction process within the team to improve organizational performance. This will lead to a good interaction process within the team and promote team behavioral integration, which will lead to the improvement of the organizational performance. Team behavioral integration is the key to the team functioning process, and the higher the degree of integration, the stronger the team cohesion. Within organization, management team heterogeneity can play a complementary role in terms of cognition, experience and resources, but this complementary role requires team behavioral integration. A low level of team behavioral integration suggests that team members are less likely to communicate and share information internally, are less enthusiastic about participating in decision-making, and perform poorly. In this case, the effect of governance team heterogeneity on organizational performance will be reduced. The deepening of cooperation, the exchange of information resources and the improvement of the quality of decision-making among the team members can maintain a high level of team behavioral integration among them. With moderate team heterogeneity and higher levels of team behavioral integration, organizational performance is tended to reach higher levels. These findings are similar to that of some scholars (e.g., Qin, 2013; Lai, 2022).

To further explore the range of intervals within which the positive effects of team behavioral integration are played out, this study added the moderating variable of risk perception. The findings suggest that risk perception positively moderates the relationship between governance team behavioral integration and organizational performance. A collaborative governance team not only reaches a consensus on the perceived risk of an event occurring, but also takes advantage of the heterogeneity of the team members to perceive, analyze and evaluate the risk from the members' own knowledge, increasing the likelihood of correctly perceiving the risk and acting in a way that is more beneficial to

the organization. The special attributes of Private HEIs' governance groups exhibit a strong tendency to risk perception, and it is easier for team members to gain agreement on both risk taking and willingness to collaborate. This willingness contributes to the consistency of team members' behavior and moderates the performance of Private HEIs.

#### **4.2. Theoretical implications**

Based on the results of the existing literature, this study constructs a framework of the board of directors heterogeneity, team behavioral integration, risk perception and the organizational performance of private HEIs. Team behavioral integration plays an important role in the strategic development. The relationship between the human capital characteristics of board members in private HEIs and organizational performance should be analyzed at both the team level of integration and the individual level of heterogeneity. Coordination among team members directly and positively affects team effectiveness (Wang, 2023), and team coordination drives greater capitalization of team knowledge assets and ultimately superior organizational performance.

This study provides a more in-depth study of the team of board of directors in private HEIs at the individual level. The study of governance teams should not only consider team-level factors, but also consider the differences of team members at the individual level. The results show that team members' perception of risk plays a positive role in organizational performance as the governance team undergoes behavioral integration. This study can bring more attention to the importance of individual team members' factors and is a more micro-level observation of the study of governance teams in private HEIs.

#### **4.3. Practical implications**

The board of directors of a public HEIs typically comprises government representatives, school management, and staff representatives. The government usually plays a significant role in appointing or recommending board members. In contrast, the board of directors of private HEIs typically comprises investors, presidents, academic experts, and other individuals. The board of directors of private HEIs is mostly composed of members appointed directly by investors, which grants them greater autonomy and independence. This study analyses the governance mechanism of these boards and explores how it operates. The composition of a board of directors is a crucial factor for private HEIs to consider. When selecting members for the governance team, private HEIs should consider their work experience, professionalism, social experience, and social connections to form a team with complementary strengths. Furthermore, private HEIs should exercise caution when selecting their governance team due to the high time and economic costs associated with forming a team. Once established, it is typically difficult to make changes to the team within a short period of time.

To ensure a scientific, reasonable, and well-balanced board of directors, it is important to optimize the composition of private HEIs' boards according to stakeholder theory (Li, 2022). This can be achieved by regulating the composition of the board and limiting the number of representatives from each stakeholder group. Secondly, in order to establish a mature and comprehensive board of directors selection system, it is important to improve the internal composition of the board by increasing the proportion of professionals in education, finance, law, management, and other relevant fields. This will ensure that they have a voice and decision-making power in the board's decision-making process. Finally, the composition of the board should value the participation of alumni, teachers and students.

The integrated model offers guidance to directors, principals, and policymakers on how to combine board competence diversity with fostering collaborative behaviors. In the governance of private HEIs, board members should strive for a shared understanding and integration of actions, and improve the effectiveness of behavioral integration through communication and sharing. Private higher education institutions (HEIs) can improve decision-making quality and operational efficiency by utilizing heterogeneous information sources and diverse decision-making. It is important for private HEIs to focus on the cooperation process of the board team and establish a conducive environment and

institutional mechanism to successfully cope with challenges.

From a policy perspective, there is a need to improve regulations on board governance behavior. Currently, there is a lack of clear and detailed regulations on the decision-making rules and procedures for Chinese private HEIs. A sound board system can regulate the behavior of board members. Firstly, establish reasonable rules of procedure for the board of directors to make clear provisions for the frequency of board meetings and decision-making behavior. To improve decision-making efficiency, it is important to allow each director to express their opinion based on their respective interest group or position. Additionally, it is crucial to establish a positive atmosphere and institutional mechanism for effective communication and exchange among members of the governance team. Private HEIs utilize diverse information sources from various interest groups to improve decision-making quality and operational efficiency. Attention is paid to the cooperation process of the governance team, and this is achieved through the establishment of a conducive environmental atmosphere and a well-developed institutional mechanism.

## 5. Limitations and Further Study

Although this study explored the mechanisms by which the board of directors of private HEIs influence organizational performance, and verifies the mediating effect of team behavioral integration as well as the moderating role of risk perception, some research limitations still inevitably exist in view of the complexity of the research issues, which need to be continued to be improved in future studies. From this study, the relationship presented by the board of directors and organizational performance is also relatively simple and only a linear model. The course of action of the variables in a main effects model may not be limited to this and may be more complex and variable. Moreover, this study only explored the heterogeneity of the board of directors in terms of human capital, without considering values heterogeneity. The impact on organizational performance outcomes may be different if values heterogeneity is included, and a more in-depth exploration is expected in the future.

In addition, more precise measurement of board of directors characteristics and organizational performance can be developed rather than relying only on subjective questionnaire research. So far, the research conditions have made it difficult to obtain precise data on private HEIs in reality, especially such as financial and research outcomes. In this study, a five-point Likert scale was used to assess the latent variables and data were collected by filling out a questionnaire. Despite this study tested convergence of independent and dependent variables, it was not precise enough. Therefore, future research should be based on more objective data.

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