



Board Capital and Strategic Change: The Moderating Effects of Board Independence under a Random Effects Model

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Abstract

In the increasingly complex dynamic environment, board capital provides a new perspective for the board of directors to study corporate strategic change. In this paper, a total of 93 listed companies in the Science and Technology Innovation Board from 2017 to 2019 were selected as samples. Through coding, we use Broo Heterogeneity Index (BHI), industry embedding degree coefficient and SRAP model to measure board capital and strategic change, estimate the impact of board capital on strategic change by using the random effect model of panel data, and explore the relationship between board capital and strategic change under different degrees of board independence. The result shows that board independence moderates the relationship between board capital and strategic change, and fills the theoretical gap of board independence as a boundary condition.

Keywords: Board Capital; Strategic Change; Board Independence

1. INTRODUCTION

At present, China's economy is undergoing fundamental changes and transformation. In this critical period, the turbulence of the international economic situation and the opportunity brought by the shift in the future's focus of the world economy make enterprises face greater opportunities and challenges. The financial capital-oriented corporate governance paradigm is gradually developing to the human-oriented intellectual capital-oriented corporate governance paradigm, and the social network formed by interpersonal resources among enterprises has developed and formed interrelated network relations. Therefore, how to reserve and manage the company's human capital and the social resources derived from it has gradually become the focus of enterprises.

As an important organization and human capital cluster of the enterprise, the board of directors plays a key role in helping the enterprise to bring in foreign capital to inject new vitality into it, and in enabling the company to respond quickly to the rapidly changing competitive environment and make effective strategic decisions. Hillman and Dalziel (2003) introduced the concept of

board capital into strategic management research for the first time, which can be used to measure the ability of the board of directors to provide resources for the company, providing a new interpretation direction for many practical issues[1]. Throughout the existing research, scholars mainly use Resource Dependence Theory and Resource-Based View (RBV) to investigate the issues related to board capital and strategic decision. They believe that although corporate strategic change may be reflected in many aspects and in different forms, the degree will ultimately be reflected in the strategic resource allocation plan. The resources provided by the board of directors are conducive to the company to build external contacts and correctly formulate major strategic changes [2][3]. Research shows that human capital accumulated by educational background, professional knowledge, skills and working experience will have an impact on enterprises to seize the opportunity and make strategic plans [4]. The social capital brought by the personal social network of board members will provide strong support for the enterprise to integrate internal and external resources for strategic implementation [5][6]. However, some scholars have proposed that human capital and social capital are interdependent and cannot

be separated [7][8]. Based on this, Haynes and Hillman (2001) proposed the board capital model, which differentiated different components of board human capital and social capital according to different resources provided by board capital, and examined board capital from the aspects of breadth and depth [9].

However, the absence of incentives in the board is ineffective, unable to use the real use of capital to make effective decisions at the strategic level. In the practice of corporate governance in China, many enterprises with frequent mistakes in strategic decisions and unsatisfactory business performance have a reasonable structure, good configuration and standardized operation of the Board. The study found that the improvement of board governance on corporate strategic performance mainly comes from the construction of organizational structure of the board, and its independence is the most important characteristic [10]. The level of board independence will affect its effectiveness, but the direction of the influence is mixed. The agency theory regards the board as a supervisory body and holds that the improvement of its independence can, to some extent, avoid the opportunistic behavior of the management and improve the efficiency of the use of the board capital [11]. The Resource Dependency Theory regards the board of directors as the resource provider. On the one hand, a board dominated and controlled by "insiders" incentivizes directors to provide resources. On the other hand, when there is a "combination of two roles" of CEO in the board, he plays a leading role in inviting and selecting board members and supports candidates close to him to join the board [12][13]. This relatively close personal relationship can strengthen the mutual trust between the CEO and the director, and promote the two sides to establish a closer and harmonious working relationship. Directors are more willing to provide suggestions and resources, the CEO is more willing to solicit the opinions from board on corporate strategy issues as well [14].

Although existing studies have verified the influence of board capital on strategic decision and the impact of its independence on board capital in different directions, and preliminarily discussed the influence mechanism among variables, there is still a research gap. Firstly, at present, most of the studies on the board in China focus on its structure and characteristics to investigate the relationship between governance mechanism and strategic decision-making, while few of them examine the relationship between the board and strategic issues from the perspective of board capital. Secondly, most scholars only decompose the new construct of board capital into human capital and social capital, and use simple indicators to discuss the relationship with strategic decision making respectively. After Haynes and Hillman (2010) divided board capital into breadth and depth, comprehensive measurement of board capital should be considered from these two dimensions. Thirdly, most

studies examine the board as a supervisory organization from the perspective of agency theory, but lack of sufficient discussion on the advisory function of the board from the perspective of resource dependence theory. From the perspective of resource dependence theory, we try to fill in the existing research gaps by analyzing how the independence of the board affects the role of the board capital in the strategic decision-making, and explore the degree of the board independence to optimize the allocation of corporate resources. The marginal condition is added to the research on the relationship between the capital of the board of directors and strategic decision.

2. A LITERATURE REVIEW AND HYPOTHESES

2.1. Board capital and strategic change

For a long time, the board, as the institutional arrangement to solve the agency problem, is mainly based on its supervisory function. It is found that the size, structure and characteristics of the board have an impact on the implementation of strategic decisions of enterprises [15]. But in practice, even two boards of the similar size or structure can vary widely in terms of strategic orientation or business performance [16]. The concept of "board capital" regards the board as a resource provider, and holds that it is one of the most important human resources of enterprises, and its human capital and social capital can help enterprises to have more resource support when making strategies [17]. This view provides a new interpretation direction in this field. According to the research of Hillman and Dalziel (2003), board capital includes human capital and social capital. With in-depth research, some scholars have questioned the distinction between human capital and social capital of the board [1]. In subsequent studies, Haynes and Hillman (2010) proposed to integrate the human capital and social capital of the board, and came to the conclusion that the board of directors capital should be measured from the breadth and depth [9]. The breadth includes the heterogeneity of the board's educational level, working background, professional background, age and tenure, as well as the status of interconnecting directors and the relationship in other industries. The depth includes the degree to which the board is embedded in the company's industry through its members' interlocking directorships and professional backgrounds.

According to the resource dependence theory, resources can reduce the uncertainty of the market and transaction costs, as well as the dependence on external environment, which is conducive to the survival and development of enterprises. In the past, directors were mostly selected to meet corporate governance standards. They focused on the size of the board to improve decision-making efficiency, the proportion of independent directors to improve the independence, and

the establishment of professional committees to play the role of organizational ties. Few considered the composition of directors to improve the effectiveness of the board from the perspective of board capital. This is especially true in China, where the selection of the board has a strong administrative color, resulting in the unclear relationship between the composition of the board and corporate strategy, innovation, value creation and other aspects. By emphasizing the importance of resources to enterprises, the resource dependence theory contributes another perspective on the function of the board, which can build a bridge for communication and sharing with the external environment for the survival of enterprises. Specifically, as a resource provider, the board has rich knowledge, experience and professional skills, and can provide valuable suggestions and consulting for strategic decisions of enterprises [1]. If a board member has the same working experience in a strategic environment, it can strengthen the right of directors to make strategic decisions [18]. At the same time, working experience plays a positive role in improving the degree of industry embedding of the board, and then urging the company to take strategic actions matching with the mainstream strategies in the industry [19]. Secondly, different personal characteristics of the board bring different strategies, such as diversification [20]. In addition, the board of directors, as a bridge for communication and sharing with the external environment for enterprise survival, can help the company to obtain the commitment and help from external organizations [21]. The company's prestigious board members and strong company association can deliver the reliability and value of the company to the outside, obtain important information and resource support from government organizations, customers and suppliers, and reduce the transaction costs caused by external uncertainty. For example, having certain political resources is conducive to the generation of enterprises' innovative activities [22].

The influence of board capital breadth on strategic change can be studied from the previous heterogeneity theory. Highly heterogeneous boards have a wider range of knowledge, more industry experience and creativity, and more network relationships, so they have more access to the external resources of the enterprise. Many scholars have explored the relationship between board heterogeneity and strategic change. Priem (1999) believes that complex strategic decision-making within an enterprise requires highly heterogeneous management [23]. At the same time, a highly heterogeneous management team can improve the performance of the company in the fierce business competition and enhance the creativity of the company managers [24][25][26]. Golden and Zajac (2001) believe that the more diverse the functional background of the board is, the more strategic change plans the directors can provide for the company, and the more likely strategic change will occur[27]. The study of Miller (1998) shows that highly

heterogeneous boards can enhance the comprehensibility and extensibility of strategic change[28]. With its human and social capital, heterogeneous board can not only design rich corporate strategic options, but also improve the possibility of implementation of the plans, so that the potential strategic options are more easily turned into realistic strategies[1]. Golden and Zajac's study(2001) shows that the heterogeneity of the board is often reflected in the heterogeneity of the experience and professional skills of the directors, which is conducive to the expansion of the strategic choice and decision-making scope of the board, thus conducive to the occurrence of strategic changes[26]. The research suggests that the broader the board, the more likely it is to make strategic changes. Therefore, hypothesis 1 of this paper is proposed:

H1: Board capital breadth has a positive impact on strategic change;

If the capital depth of the board is increased due to industry knowledge, tenure, experience and other factors, then the strategic decisions made by the board can better reflect the mainstream strategic model of the industry. Haynes and Hillman's research (2010) shows that no matter whether the directors are in the industry or serve as interlock directors, their experience is beneficial to improve the understanding of the board on the industry of the company, so as to improve the degree of industry embedding[9]. The more the board is embedded in the industry, the more it can urge the company to take strategic actions that match the mainstream strategies in the industry. It can be seen that the higher the board of directors' capital depth is, the less likely the company is to produce strategic deviation. However, some relevant studies have also shown that the impact of board capital depth on strategic bias (i.e., the change of the strategy now adopted by the firm relative to the strategy previously adopted by the firm) is not significant [1]. The above research shows that if the board is deeply embedded in the industry through industry expertise, industry-related experience, and intra-industry network relationships such as industry chain embeddedness and industry career embeddedness, the strategic decisions of the board will be more consistent with the industry paradigm. Accordingly, hypothesis 2 of this paper is proposed:

H2: Board capital has a negative impact on strategic change;

2.2. Board independence as moderator

Independence is a natural attribute of the board, but most of the literature focuses on the independent director system, and the independence of the board is seldom studied. Wang (2006) believes that the connotation of board independence has four aspects: (1) independent entrusted responsibility subject; (2) the value orientation

of justice;(3) independent judgment and decision-making ability of directors;(4) independent exercise ability of directors [29]. Jensen (1993) believes that an effective organizational model of the board should be to keep the size small, and the rest should be external directors except the CEO who is the only inside director[30]. Scholars who study the supervisory and control functions of the board generally agree that the board should be dominated by independent directors[31][32]. But there are also scholars suggest that whether the CEO holds concurrent posts, the personal knowledge background of board members, and the reputation of independent directors should also be taken as the dimensions to examine the degree of board independence [30][33].

Board independence indirectly affects corporate strategy and value creation through interaction with other governance mechanisms[34]. Management involved in the day-to-day running of the business will have more information. Based on the strategic information transmission model, the board's acquisition of private information depends on the disclosure of management information. When the independence of the board is low, it shows friendly cooperation with the management, which is conducive to the play of the resource providing function of the board [35]. With a low degree of independence, the necessary trust to share strategic information can be established between the management and the directors. The management is more willing to share strategic information with the directors, rather than the "soft information" of financial indicators, which is the key premise to help the directors understand the development status of the company and play their own capital advantages. With the increase of corporate complexity, corporate strategic decisions involve a wider range of faces and face greater uncertainties. More and more complex information is required for decisions. The cost of information search becomes higher and decision-making becomes more difficult. The higher the heterogeneity among the board members, the more helpful it is to expand the strategic choice and decision-making scope of the board, which is conducive to the occurrence of strategic change. However, from the point of information mechanism, when the board members highly embedded in a particular industry, commercial information and resources are exposed by the board is more homogeneous, which further reduces the firm's ability to identify new business opportunities. Meanwhile, the same experience or knowledge based enterprise managers and board's members will influence each other, forming similar views and experience, and then make similar strategic decisions. This reduces the strategic choice of enterprises, and also reduces the ability of enterprises to construct new strategic decision scheme. When the board is highly independent, it shows an antagonistic relationship to the management, which will enhance the supervisory function of the board[36]. With a high degree of independence, the frequency of

information exchange between the management and the board will be reduced, and it will be more difficult for the board to grasp the actions of the management, which will stimulate the supervision of the management and destroy the necessary trust between the two. Moreover, time is a limited resource for directors. When directors think their primary function is oversight, they are often reluctant to provide strategic advice, pay less attention to it, and devote less energy and time to the advisory function. This will lead to an inability to make effective use of the board's capital when making strategic decisions. In addition, excessive oversight by the board will weaken management's perception of board support and promote managers' short-term behavior, resulting in more focus on relatively safe routine projects rather than taking transformative actions. We therefore propose:

H3: Board independence negatively moderates the positive relationship between the breadth of board capital and corporate strategic change;

H4: Board independence negatively moderates the negative relationship between board capital depth and corporate strategic change.

3. RESEARCH METHODOLOGY

3.1. Sample

The data included in the sample are from the data of listed companies on the Science and Technology Innovation Board from 2017 to 2019. There are several reasons for choosing the science and Innovation Board. First, it is a new sector independent of the existing main board market, and few previous studies have focused on executive research in this new sector. Second, science and technology innovation board enterprises are characterized by large investment, long cycle and high risk. They are faced with more obvious market changes, more diversified resources and more need to obtain through multiple channels. The data was collected through Wind database, CSMAR database, Giant Tide information network, the company's official website and other channels. By summarizing the relevant data and eliminating the enterprises with incomplete information and extreme outliers, we focused on 93 sample companies. The data information includes the professional experience, educational background, part-time jobs of directors, as well as the information and data related to the strategic change of the company. At the same time, the information obtained from different channels is compared and verified to ensure the authenticity and reliability of the obtained data.

3.2. Variables and measures

In this paper, the measurement of independent variable board capital refers to Hyaynes and Hillman's research-the board capital is divided into two dimensions:

board capital width and board capital depth[9]. The details are given below. We use the proportion of independent directors to measure the independence of the board of directors[31][32]; The SRAP model was used to measure the strategic change of the dependent variable,

detailed methods are also listed below[38][39]. Control variables were selected based on the research results of some previous papers [27][32]. Table 1 is the specific descriptions of each variable.

TABLE 1 VARIABLE DEFINITIONS

Type	Name	Abbreviation	Measure
dependent variable	Strategic Change	SC	SRAP model
independent variable	Breadth of Board Capital	BOCAPW	Broo Heterogeneity Index(BHI)
	Depth of Board Capital	BOCAPD	The sum of two kinds of embedding degree values
Moderator	Board Independence	BOIND	Number of independent directors divided by number of board members
	Scale	SIZE__E	log of annual total assets
	Value	VALUE	Tobin's Q
	Age	AGE__E	The number of years from the establishment of the enterprise to the research observation period
	Assets Liabilities Ratio	DEBT	Total liabilities divided by total assets
	Board Size	SIZE__B	Number of board members in an enterprise
	Average Board Age	AGE__B	Total age of board members divided by number of board members
Control	Industry	IND	If it belongs to this industry, the value is 1; otherwise, the value is 0
	Year	YEAR	If it belongs to this year, the value is 1; otherwise, the value is 0

3.2.1. Breadth of Board Capital.

It is constructed by fitting three indexes of the functional, occupational and part-time richness of the board capital. The above three indexes are quantified according to the Broo Heterogeneity Index (BHI) to measure the heterogeneity of the board members in functional background, occupational background and social part-time. The BHI was measured as follows:

$$BHI=1-\sum_{i=1}^R p^2 \quad (1)$$

BHI represents the Broo heterogeneity coefficient. "R" represents the number of functional, occupational or social part-time types of board members, and "P" represents the ratio of the number to the size of the board in a given type. The richness of board members' functions, occupations and social part-time jobs can be measured by

the BHI, which is between 0 and 1. The higher the BHI value, the higher the board capital richness; On the contrary, the lower the capital richness of the board of directors.

3.2.1.1. Functional background

Referring to the study of Hillman and Haynes (2010), we divide directors' functional backgrounds into A, B, and C categories, as shown in Table 2. Category A refers to business experts, who have outstanding knowledge and experience in the process of comprehensive management of enterprises; Category B refers to support experts, including legal experts, financial experts, and marketing experts, who play a vital role in the day-to-day operations of the business; Category C includes social influencers who have held important positions in government, schools or various nonprofit organizations.

TABLE 2 CATEGORY DEFINITION OF FUNCTIONAL BACKGROUND

Category	Function	Definition
A	Business expert	Directors with outstanding knowledge and experience in the general management of the enterprise
B	Support expert	Directors with extensive experience in law, finance and marketing
C	Social influencers	Serve as a government official, scholar, or board member in other important positions at non-profit organizations

3.2.1.2. *Occupational background*

Based on the classification method adopted by Hillman and Haynes (2010) and combined with the professional characteristics of directors of listed

companies in China, we exclude the real estate category, and combines the professional background of operation and information system into the categories of production, manufacturing and logistics. Table 3 shows the specific reference standard for the classification of occupational background, which is divided into eight categories, A-H.

TABLE 3 CATEGORY DEFINITION OF OCCUPATIONAL BACKGROUND

Category	Occupation
A	Management/ Administration
B	Finance/Accounting
C	Marketing
D	Law
E	Production/Manufacturing/Logistics
F	R&D/Engineering
G	Human Resource
H	School/Government/Army

3.2.1.3. *Part-time background*

According to the Guidance on Industry Classification of Listed Companies (revised edition 2012) published by China Securities Regulatory Commission, we divide China's listed companies into 19 industries, including mining, manufacturing and construction, and code each industry respectively. The part-time work background of directors was measured according to the following steps: First, through the CSMAR database, we found the information directory of the board of directors. According to the information in the directory, we sorted out the detailed corporate part-time status of each board member and defined the industry category to which the part-time enterprise belonged. Then, according to the industry code of this study, we combed and summarized the code of the concurrent industries of the board members. Finally, we calculate the concurrent heterogeneity of the sample firms by mathematical statistics.

The boundary of the BHI values of the above functional background, occupational background and corporate concurrent position is between 0 and 1. Therefore, the value range of the board capital width fitted by summing the above three variables is between 0 and 3. The closer the fitting value of board capital breadth is to 3, the higher the degree of board's heterogeneity is, that is, the higher the board capital breadth is.

3.2.2. *Depth of Board Capital.*

This measure measures the degree to which board members are embedded in their industry. It includes the industry knowledge, experience and internal and external chain relationships of directors, which are the result of the current and past work experience of the board. The board capital depth consists of two parts: industry chain embeddedness and industry career embeddedness. The specific measurement methods are as follows:

3.2.2.1. *Industry chain embeddedness*

Degree of industry chain embeddedness is measured by the following ratio, that is, the sum of the concurrent directorships held by each member of the board is divided by the sum of the concurrent directorships held by all board members. The concurrent position here should belong to the enterprise in the same industry and the industry classification involved in the above calculation method is the same as the industry code used to calculate the concurrent heterogeneity of enterprises.

When calculating the ratio, it is necessary to first confirm the industry to which the sample enterprise belongs. As the main business of the sample enterprise may change, it may have an impact on the industry division of the sample enterprise. Therefore, for the industry division of the sample enterprise, this study takes the latest industry division of the wind database for the enterprise as a reference.

3.2.2.2. *Industry career embeddedness*

The degree of professional involvement in the industry is measured by the following ratio, that is, the number of board members with working experience divided by the total number of board members. To judge whether the member having the working experience of the company or not, we obtain the personal profiles through the executive Profile module on the company's official website and CSMAR database.

According to the calculation method, the value range of industry chain embeddedness and industry occupation embeddedness is 0 to 1. The sum of the two ratios is the measured value of the board capital depth. Therefore, the value range of the board capital is 0 to 2, which can reflect the degree of the board's embedding in the industry of the company. The higher the value, the higher the degree of the embedding in the relevant industry.

3.2.3. Strategic Change.

Although corporate strategic change may be reflected in many aspects and in different forms, the degree of strategic change will ultimately be reflected in the change of strategic resource allocation [37]. Based on this, this study refers to the research of Hambrick (1991), Triana et al. (2014), and measures the strategic change by confirming the change of strategic resource allocation [38][39]. The specific measurement methods are as follows: First, calculating the six variables, which respectively are the intensity of propaganda (Advertising expenditure divided by revenue), renewal intensity of fixed assets (Net new fixed assets divided by total fixed assets), R&D intensity (R&D expenditure divided by revenue), intensity of non-production expenditure (overheads divided by revenue), inventory level (inventory divided by revenue), financial leverage (debt divided by equity); Second, calculate the industry mean and standard deviation of each variable respectively and normalize the variables of the sample firms according to the calculated industry mean and standard deviation. Then, take the logarithm of the normalized results. Finally, calculate the mean value of the above six variables after standardization to obtain the fitting value of the sample company's strategic change. The larger the

value is, the greater the degree of strategic change is considered; otherwise, the degree is considered to be smaller.

4. RESULTS AND DISCUSSION

In order to ensure the validity and consistency of the model estimation, the data were processed as follows before the empirical analysis: (1) to avoid the influence of outliers, the data was tailed at the 1% level; (2) The independent variables and regulating variables are processed centrally before the interaction term is constructed; (3) Considering that panel data may have problems such as time series, cross-section correlation and heteroscedasticity, the standard error will be underestimated by using the usual panel data estimation method, resulting in biased model estimation results. Therefore, Driscoll-Kraay standard error is adopted in the subsequent panel data model estimation in this study to ensure that the obtained standard error is unbiased, consistent and valid.

Table 4 displays the descriptive statistics and correlations for the different variables. In our models, the highest variance inflation factor is 2.4, which indicates that multicollinearity is not a crucial issue.

TABLE 4 STATISTICS AND CORRELATION OF VARIABLES

Variables	Mea n	Sd	VIF	SC	BOC APW	BOC APD	BOI ND	SIZE_E	VALU E	AGE_ E	DEBT	SIZE_ B	AGE_ B
SC	- 0.061 4	0.276 5	-	1									
BOCAPW	1.706	0.254	1.11	.024**	1								
BOCAPD	0.654	0.634	2.03	-.125 .	-.214 ..	1							
BOIND	0.372	0.132	2.09	-.049	.030 [·]	.075**	1						
SIZE_E	24.55 7	1.967	1.58	-.322 ..	.113	-.086	-.06 3**	1					
VALUE	43.57 1	16.96 0	1.57	.118**	-.065 .	.073 [·]	.045	-.554**	1				
AGE_E	17.53 0	5.612	1.96	-.062	.037	-.027	-.11 3**	.211**	-.028	1			
DEBT	0.195	0.172	1.48	-.189 ..	.191**	-.124 ..	-.07 5 [·]	.642**	-.533 ..	.172**	1		
SIZE_B	9.697	2.290	2.4	-.192 ..	.233**	.067	-.01 3	.523**	-.287 ..	.185**	.394**	1	
AGE_B	50.11 6	8.633	1.19	-.187 ..	.058	-.009	-.10 4**	.531**	-.316 ..	.003	.275**	.301**	1

Notes : *p<0.1, **p<0.05, ***p<0.01

Table 5 shows the empirical results of regression. The data in model 2 show that the correlation between the breadth of the board capital and strategic change is significantly positive at the 5% level (B=0.0041, P<0.05), while the correlation between the depth of the board capital and strategic change does not pass the significance test. Hypothesis 1 is supported, but hypothesis 2 is not

verified. It shows that the breadth of the board capital has an impact on the strategic change of the enterprise. Specifically, the wider the board capital, the higher the degree of strategic change, while the depth of the board capital has no significant impact on the strategic change. Model 3 shows that the interaction term coefficient of board independence and board capital breadth is -0.0012,

which is significant at the 5% level. Model 4 shows that the interaction term coefficient between board independence and board capital depth is 0.0021, which is significant at the 1% level. Combining models 3, 4 and 5, it can be found that hypothesis 3 and 4 are supported, that

is, board independence negatively moderates the positive relationship between board capital breadth and corporate strategic change, and also negatively moderates the negative relationship between board capital depth and corporate strategic change.

TABLE 5 RESULTS OF REGRESSION ANALYSES

Dependent Variable: SC					
Variables	Regression1	Regression2	Regression3	Regression4	Regression5
BOCAPW		0.0041** (2.381)	0.0043*** (3.481)	0.0037** (5.282)	0.0024*** (5.331)
BOCAPD		-0.0021 (-0.382)	-0.0037 (-1.112)	-0.0033* (-2.857)	-0.0061* (-2.764)
BOIND* BOCAPW			-0.0012** (2.679)		-0.0014*** (3.668)
BOIND* BOCAPD				0.0021*** (5.058)	0.0010*** (6.751)
BOIND	0.0234 (1.481)	0.0242 (1.436)	0.0335 (0.382)	0.0163** (2.751)	0.0200* (2.039)
SIZE_E	-0.0129 (-1.004)	-0.0214* (-1.764)	-0.0045** (-2.824)	-0.0015** (-2.734)	-0.0037*** (-4.979)
VALUE	0.0078** (2.550)	0.0079** (2.424)	0.0028* (1.996)	0.0081** (3.457)	0.0021* (2.081)
AGE_E	-0.0013** (-2.561)	-0.0075*** (-3.769)	-0.0008* (-1.907)	-0.0071** (-2.679)	-0.0060** (-2.408)
DEBT	-0.0049*** (-5.759)	-0.0045** (-2.751)	-0.0055** (-2.820)	-0.0807*** (-6.981)	-0.0418** (-3.070)
SIZE_B	0.0021** (2.554)	0.0029* (1.962)	0.0096** (2.676)	0.0085*** (4.023)	0.0025** (2.668)
AGE_B	-0.0373* (-1.986)	-0.0581* (-1.922)	-0.0213** (-2.614)	-0.0220* (-2.053)	-0.0318 (-1.270)
C	0.0240*** (8.572)	0.0458* (1.917)	0.0240** (2.227)	0.0600 (0.650)	0.0122* (2.013)
R²	0.0568	0.0571	0.0653	0.0595	0.0693
N	279	279	279	279	279

In order to ensure the reliability of the research conclusions, we conduct a robustness test by changing the measurement method and the selection method of strategic change indicators. Refer to Weng and Liu's (2014) research, we changed the ratio of the newly added net fixed assets to the total value of fixed assets into the

ratio of the newly added net fixed assets to the sales income, so as to re-measure the index of the renewal rate of fixed assets[40]. After re-regression (the results are shown in Table 6), the research conclusion has not changed substantially, which proves the reliability of the research conclusion to a certain extent.

TABLE 6 ROBUSTNESS CHECKS

Dependent Variable: SC [#]					
Variables	Regression1	Regression2	Regression3	Regression4	Regression5
BOCAPW		0.0012**	0.0026**	0.0012***	0.0008***
BOCAPD		-0.0036	-0.0034	-0.0062*	-0.0066*
BOIND* BOCAPW			-0.0030**		-0.0022***
BOIND* BOCAPD				0.0027***	0.0011***
BOIND	0.0392	0.0399	0.0389	0.0403*	0.0307*

SIZE_E	-0.0004*	-0.0029*	-0.0033***	-0.0009***	-0.0011***
VALUE	0.0168***	0.0161***	0.0176**	0.0164**	0.0166**
AGE_E	-0.0539**	-0.0542***	-0.0543**	-0.0472*	-0.0551*
DEBT	-0.0194***	-0.0200***	-0.0113***	-0.0922***	-0.0745***
SIZE_B	0.0033**	0.0031*	0.0034*	0.0036**	0.0031*
AGE_B	-0.0303*	-0.0345*	-0.0377**	-0.0315*	-0.0443*
C	0.0031***	0.0011**	0.0031**	0.1366*	0.0465*
R ²	0.0553	0.0555	0.0564	0.0611	0.0631
N	279	279	279	279	279

5. CONCLUSIONS

This paper makes an in-depth study on the relationship between board capital, board independence and corporate strategic change. It is found that the board capital width has a significant positive impact on the strategic change of the company, and the board independence has a negative moderating effect. The result indicates that when the board is less independent, directors with diversified capital can be more motivated to provide continuous suggestions and resources for the company to carry out strategic changes. However, there is no significant relationship between the depth of board capital and corporate strategic change. After introducing the interaction term between board independence and capital depth, there is a significant negative relationship between board independence and strategic change, which indicates that there is no direct effect between board independence and strategic change, but an indirect effect. At low independence of the board, the higher the depth of the board capital is, the less likely the strategic change will occur. The possible explanation is that the board capital includes both richness and depth. As resource providers, board members enrich the board capital, so that relevant physical resources can be directly invested into the enterprise, which has a direct positive effect on the strategic change of the enterprise. However, the depth of board capital cannot directly affect the level of corporate governance, and it needs to be combined with the power structure and operating rules of the board of directors.

For a long time, the board, with its supervisory function as the main institutional arrangement to solve the agency problem, has an impact on the implementation of strategic decisions of enterprises in terms of its size, structure and characteristics. From the perspective of resource theory, the board provides various resources for the enterprise to make strategic suggestions and plans for the enterprise in the changing competitive environment. This paper is a supplement to the resource dependence theory. Previous literature has emphasized that the knowledge and skills of directors are very important for performing their governance functions, but some articles studying the impact of board capital on corporate strategic change are still lacking in discussing boundary

issues. This study shows that board independence can be used as a boundary condition to further explore the issues related to board capital and corporate strategy.

There were some limitations in this paper. First, the number of samples in this study is limited due to sample screening conditions and the availability of sample data. In this study, enterprises on the Science and innovation Board are selected as sample enterprises. Although the selected enterprises are mature, with relatively perfect corporate governance and abundant board capital, we can only focus on mature large enterprises due to the nature and number of samples. Future research can explore whether the conclusions can be applied to small and medium-sized enterprises or those with immature governance level. Second, the measurement of the board capital in this study depends on the personal resumes of board members to some extent, so it is subjective to sort them out. The objectivity and accuracy of these variable data need to be further improved through more accurate coding and classification standards.

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