



# Heterogeneous Institutional Shareholding, Internal Control and Corporate Social Responsibility: Evidence from Chinese Listed Companies

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**Abstract.** The study analyzes the impact of heterogeneous institutional shareholding on corporate social responsibility (CSR) performance and corporate internal control (IC), and explores the mediating effect of internal control between heterogeneous institutional shareholding and CSR performance. The results show that Pressure-resistant institutional shareholding significantly improves CSR fulfillment degree and the effectiveness of internal control, while Pressure-sensitive institutional shareholding has no significant promoting effect on CSR fulfillment and IC effectiveness. Effective IC has a significant mediating effect between Pressure-sensitive institutional shareholding and CSR fulfillment. Finally, it is suggested that the structure of institutional investors should be optimized, and the shareholding ratio of Securities investment funds, qualified foreign institutional investors (QFII) and Social security funds should be enhanced to improve CSR performance and IC effectiveness. And the mediating effect of IC between institutional ownership and CSR fulfillment should be promoted, to strengthen the consciousness of enterprises to take the initiative to enhance CSR performance.

**Keywords:** Institutional ownership · Heterogeneity · Internal control · Mediation effect · CSR

## 1 Introduction

As China's economic development has entered a new era, enterprises need to fulfill their social responsibilities to achieve stable employment, improved people's livelihood, cultural prosperity and a sound ecological environment. According to the stakeholder theory, CSR activities mean taking the responsibilities for share-holders, suppliers, employees, customers, the government, communities and the environment. Enterprises have gradually increased the awareness of product safety and ecological protection. And CSR fulfillment is a measure to meet challenges and minimize risks, as well as a core resource to achieve differentiation strategy [1–4].

Corporate IC and institutional shareholding are two major systems in China's capital market [5]. As an institutional arrangement, effective IC ensures the operation compliance, asset safety and reliable financial information, improves the operation efficiency and effect, and promotes the realization of development strategy. In China, institutional investors have become an important force in the capital market. Institutional investors have formed a diversified development pattern. In the "Report on Governance Development of Listed Companies in China", China Securities Regulatory Commission [6] pointed out that institutional investors mainly include Securities investment funds, Social security funds, QFII, Securities dealers and Insurance companies, etc.

With reference to the research of Brickley et al., Chen et al., Puspa et al. and Liang, this study classifies Securities investment funds, Social security funds and QFII as Pressure-resistant institutional investors, which have no commercial relationship with the invested companies and have stronger independence by and large [7–10]. And Insurance companies, Securities brokers, financial companies and Non-financial listed companies are classified as Pressure-sensitive institutional investors, which have commercial relations with the invested companies. On this basis, this study analyzes the relations among heterogeneous institutional ownership, IC and CSR, and explores the joint mechanism of internal and external governance on CSR performance. From the perspective of IC effectiveness, this study empirically tests the mediating effect of IC between heterogeneous institutional ownership and CSR performance, to further improve the relevant institutional norms and explore effective pathways to improve CSR performance.

## 2 Literature Review, Theoretical Basis, and Research Hypothesis

### 2.1 Heterogeneous Institutional Shareholding and CSR Performance

As the invested enterprises' major shareholders, institutional investors often have professional investment teams and more capital reserves. However, there is no consensus on institutional investors' role in the capital market. One view is that the short-term profit-seeking behavior of institutions reduces the governance level of investee enterprises. Institutional investors do not fully participate in corporate governance actively, and there are some negative shareholders who "vote with feet" [11]. Institutional investors play an active role as the "crash accelerator" rather than "market stabilizer" [12]. The alternative view is that institutional investors supervise the management and major shareholders, and actively participate in corporate governance by submitting proposals or negotiating with the management [13]. Institutional investors have advantages in information collection and analysis, and can identify opportunistic behaviors of the management, which is conducive to improving corporate financial performance [14, 15]. Compared with the regular announcements issued by enterprises and irregular research reports issued by intermediary agencies, institutional investors play a governance role by obtaining the latest operational information and monitoring the production and operation of enterprises [16, 17].

If institutional investors are considered as a whole, the heterogeneity of institutional types will be covered up [18]. Different types of institutional investors have different behavior characteristics and investment strategies. The rational differentiation of heterogeneous institutional investors is a means to study the effect of institutional governance

[19]. Pressure-resistant institutions actively promote enterprises to fulfill their social responsibilities, while pressure-sensitive institutions often fail to articulate independent opinions on CSR issues [20]. Due to the specific source of funds and strict regulatory control, Pressure-resistant institutions do not have business connection with the invested companies other than investment, and pay more attention to obtaining authentic and reliable information disclosure, to supervise the actual CSR implementation. On the contrary, Pressure-sensitive institutions often have business relationships with the invested companies. Usually, they are unwilling to give up the benefits brought by the business relationships, and take a neutral attitude towards CSR issues, or support the attitude of management and controlling share-holders, then lack the motivation to promote CSR performance. Based on the above analyses, the following research hypothesis is proposed.

**Hypothesis 1.** Pressure-resistant institutional ownership can significantly enhance CSR performance, while Pressure-sensitive institutional ownership has no significant promoting effect on CSR performance.

## 2.2 Heterogeneous Institutional Shareholding and IC Effectiveness

Institutional investors perform the supervision duties by holding listed enterprises' shares [21, 22]. Institutional investors participate in corporate governance by submitting proposals based on their strong abilities of information screening and interpretation. Institutional shareholding reduces the propensity of enterprises to violate regulations and increases the possibility of being inspected [23]. According to the efficient supervision hypothesis, institutional investors, as an important external governance force, exert their governance effect by "voting with hands". Through investigation activities deeply, institutional investors can learn the internal environment, risk assessment, business activities, information and communication, internal supervision and other information, then combine their own advantages in information processing, and integrate the information from other sources, to form an objective evaluation on IC actual operation [24].

Because of different investment objectives, investment concepts and styles, heterogeneous institutions will have different investment styles and governance effects. Heterogeneous institutional investors have different preferences for IC effectiveness [25]. IC is an important part of corporate governance, and IC defects cause internal governance failure. Pressure-resistant institutions focus on the long-term development of enterprises, and are motivated to help enterprises improve corporate governance. However, Pressure-sensitive institutional shareholding has a short-term tendency, and cannot play its role in corporate governance. Only when institutions hold shares stably, can they transform from passive holding to active investment, and actively participate in corporate governance to supervise the behaviors of the management [26], to promote IC effectiveness and enhance the ability to deal with operational risks. Therefore, compared with Pressure-sensitive institutions, the higher the shareholding ratio of Pressure-resistant institutions, the greater the positive impact on IC, which will help to strengthen external supervision and improve IC effectiveness. Based on the above analyses, the following research hypothesis is proposed.

**Hypothesis 2.** Pressure-resistant institutional shareholding can significantly enhance IC effectiveness, while Pressure-sensitive institutional shareholding has no significant promoting effect on IC effectiveness.

### 2.3 Heterogeneous Institutional Shareholding, IC Effectiveness and CSR Performance

Pressure-sensitive institutions have commercial relations with investee companies other than investment, and may participate in corporate governance negatively, in order to maintain such relations. Pressure-resistant institutions are relatively independent investors who supervise the “insiders” and the management, to promote more standardized and effective operation, and then improve IC effectiveness. As an endogenous supervision mechanism, effective IC links enterprises and the market, and alleviates the information asymmetry between enterprises and external investors [27, 28]. Effective IC enhances the quality and efficiency of information communication, forms a good division of responsibilities, and improves the quality of internal governance [29, 30].

Effective IC has a promoting effect on enterprises to effectively fulfill social responsibilities, which can alleviate the conflicts between enterprises and stakeholders, protect stakeholders’ rights and interests, and promote enterprises to maintain a stable development [31]. Enterprises’ favorable development changes the zero-sum game under the “competitive economy” into the position-sum competition under the “collaborative economy”, alleviates the contradiction between stakeholders’ scattered needs and corporate overall interests, and maximizes the return on capital input from stakeholders. Effective IC is helpful to reduce stakeholders’ risk expectation. As a result, the level of protection for stakeholders is enhanced, and CSR performance tends to improve. Meanwhile, considering Hypothesis 2 above, this study forms a mediating path between heterogeneous institutional ownership and CSR performance, that is, effective IC presents a significant mediating effect between Pressure-resistant institutional ownership and CSR performance. Based on the above analyses, the following research hypothesis is proposed.

**Hypothesis 3.** Effective IC has a significant mediating effect in the process of Pressure-resistant institutions promoting CSR performance, but this effect is not reflected between Pressure-sensitive institutional ownership and CSR performance.

## 3 Data Sources and Variable Definition and Model Setting

### 3.1 Data Sources

The listed companies publicly traded in Shanghai and Shenzhen stock markets from 2011 to 2018 are selected as the sample. Where, the data of IC effectiveness are from DIB IC and risk management data-base, other data from CSMAR China Stock Market research database, Wind Information terminal. The data are eliminated according to the following standards: Finance and insurance; ST, \*ST class. Finally, 4856 groups of annual-individual data are obtained as the effective observations. The continuous variables are Winsorized treated with bidirectional 1% quantiles, to avoid the adverse effects of abnormal observations.

### 3.2 Definition of Variables

**Explained Variable.** The real social responsibility of an enterprise to its stakeholders is reflected in the cash actually paid to the stakeholders under the given income conditions [32]. Therefore, with reference to the research of Li et al., the ratio of cash paid by an enterprise for shareholders, creditors, employees, customers, consumers, suppliers, communities and other stakeholders to the average total number of shares in the current period is taken as the specific value of CSR performance (CSRP) [33]. The specific calculation method is shown in Eq. (1).

$$\text{CSR performance (CSRP)} = (\text{Cash paid for dividends or profits} + \text{Cash expenses for business} + \text{Cash paid for interests} + \text{Cash payments to and for employees} + \text{Cash used to pay for goods or services} + \text{Cash for tax payment}) / \text{Average total shares at the beginning and end of the period} \quad (1)$$

**Explanatory Variable.** The shareholding ratio of Pressure-resistant institutions (Resist) and that of Pressure-sensitive institutions (Sensitive) are measured respectively by taking the percentage of their shareholding quantity in the company's circulating A-shares. Resist and Sensitive disclosed in the semi-annual and annual reports are averaged, respectively, to evaluate the annual shareholding status of institutions, and smooth the adverse impact of the difference in the length of institutional shareholding on the conclusions as much as possible.

**Mediating Variable.** This study adopts DIB IC index of listed companies to measure IC effectiveness. The higher the index, the more effective IC.

**Control Variable.** With reference to the research of Puspa et al. [9] and Li et al. [33], Asset-liability ratio, Total asset turnover, Sales growth rate, Comprehensive leverage, Ownership concentration, the proportion of independent directors, Audit opinion, Enterprise size, Executive compensation, Property attribute are taken as the control variables. Also, the annual effect and industry effect are controlled in the regression. Table 1 shows the variable name and description.

### 3.3 Model Setting

With reference to the research of Puspa et al. and Li et al., the following Models 1, 2 and 3 are constructed to test Hypotheses 1, 2 and 3 respectively [9, 33]. To alleviate the endogenous problem caused by reverse causality, the control variables - LEV, TAT, GROWTH, DTL, AUDIT, and LnSALARY are taken as the first-order lags in regression. In Model 2, to maintain the dimensional consistency between the explained variable and explanatory variables, the value of IC is the standardized value of DIB IC index divided by 100, by referring to the research of Chen et al. (2018) [34].

#### Mode 1.

**Table 1.** Variable name and description.

Nature	Symbol	Name	Computing method
Explained variable	CSRP	CSR performance	As shown in Eq. (1)
Explanatory variable	Resist	Pressure-resistant institutional shareholding ratio	Total number of shares held by Pressure-resistant institutions/A-shares in circulation, expressed in percentage
	Sensitive	Pressure-sensitive institutional shareholding ratio	Total number of shares held by Pressure-sensitive institutions/A-shares in circulation, expressed in percentage
Mediating variable	IC	IC effectiveness	DIB · IC index
Control variable	LEV	Asset-liability ratio	Total liabilities/total assets
	TAT	Total asset turnover	Operating income/average total assets; Average total assets equal to the average of total assets at the beginning and end of the period
	GROWTH	Sales growth rate	(Current sales revenue - previous sales revenue)/previous sales revenue
	DTL	Comprehensive leverage	Financial leverage × operating leverage
	ShrZ	Ownership concentration	The shareholding ratio of the largest shareholder to that of the second largest shareholder
	IN_DIRECTOR	The proportion of independent directors	The proportion of independent directors in the board of directors
	AUDIT	Audit opinion	Dummy variable set according to the audit opinion type. The value for the standard unqualified opinion is 1; otherwise 0
	LnASSET	Enterprise scale	The natural logarithm of total assets at the beginning of the year
	LnSALARY	Executive compensation	The natural logarithm of the total annual salaries of directors, supervisors, and executives

*(continued)*

**Table 1.** (continued)

Nature	Symbol	Name	Computing method
	STATE	Property attribute	Dummy variable, the value for state-owned enterprises is 1; otherwise, 0
	YEAR	Year	Annual effect
	IND	Industry	industry effect. In accordance with the “Guidance on Industry Classification of Listed Companies (revised in 2012)”, industry dummy variables are set up according to categories
	$\varepsilon$		Random perturbation term

$$\begin{aligned}
 CSRPI_{i,t} = & \alpha_0 + \alpha_1 Resist_{i,t}(Sensitive_{i,t}) + \alpha_2 LEV_{i,t-1} + \alpha_3 TAT_{i,t-1} + \alpha_4 \\
 & GROWTH_{i,t-1} + \alpha_5 DTL_{i,t-1} + \alpha_6 ShrZ_{i,t} + \alpha_7 IN_{DIRECTOR}_{i,t} + \alpha_8 AUDIT_{i,t-1} + \\
 & \alpha_9 LnASSET_{i,t} + \alpha_{10} LnSALARY_{i,t-1} + \alpha_{11} STATE_{i,t} + \alpha_{12} \sum_t YEAR + \alpha_{13} \\
 & \sum_t IND + \varepsilon_{i,t}
 \end{aligned} \tag{2}$$

**Mode 2.**

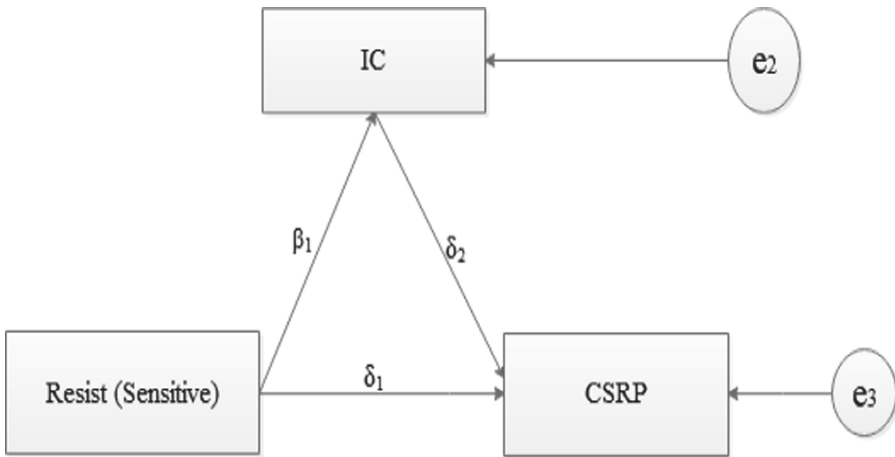
$$\begin{aligned}
 IC_{i,t} = & \beta_0 + \beta_1 Resist_{i,t}(Sensitive_{i,t}) + \\
 & \beta_2 LEV_{i,t-1} + \beta_3 TAT_{i,t-1} + \beta_4 GROWTH_{i,t-1} + \beta_5 DTL_{i,t-1} + \beta_6 ShrZ_{i,t} + \\
 & \beta_7 IN_{DIRECTOR}_{i,t} + \beta_8 AUDIT_{i,t-1} + \beta_9 LnASSET_{i,t} + \beta_{10} LnSALARY_{i,t-1} + \\
 & \beta_{11} STATE_{i,t} + \beta_{12} \sum_t YEAR + \beta_{13} \sum_t IND + \varepsilon_{i,t}
 \end{aligned} \tag{3}$$

**Mode 3.**

$$\begin{aligned}
 CSRPI_{i,t} = & \delta_0 + \delta_1 Resist_{i,t}(Sensitive_{i,t}) + \delta_2 IC_{i,t} + \delta_3 LEV_{i,t-1} + \delta_4 TAT_{i,t-1} + \\
 & \delta_5 GROWTH_{i,t-1} + \delta_6 DTL_{i,t-1} + \delta_7 ShrZ_{i,t} + \delta_8 IN_{DIRECTOR}_{i,t} + \delta_9 AUDIT_{i,t-1} + \\
 & \delta_{10} LnASSET_{i,t} + \delta_{11} LnSALARY_{i,t-1} + \delta_{12} STATE_{i,t} + 13 \sum_t YEAR + \delta_{14} \\
 & \sum_t IND + \varepsilon_{i,t}
 \end{aligned} \tag{4}$$

Also, Models 1, 2 and 3 are adopted to test the possible mediating effect of IC between institutional ownership and CSR performance. The coefficient  $\alpha_1$  in Model 1 is the total effect of Resist (Sensitive) on CSR. In Model 2, the coefficient  $\beta_1$  is the effect of Resist

(Sensitive) on the mediating variable – IC. In Model 3, the coefficient  $\delta_2$  is the effect of IC on CSRP after Resist (Sensitive) is taken into account; and the coefficient  $\delta_1$  is the direct effect of Resist (Sensitive) on CSRP after IC is controlled. With reference to the research of Wen and Ye, the mediating effect of IC between heterogeneous institutional shareholding and CSR performance can be described by the schematic diagram shown in Fig. 1 [35].



**Fig. 1.** Schematic diagram of mediating effect.

## 4 Descriptive Statistics and Correlation

### 4.1 Descriptive Statistics

Table 2 reports the descriptive statistical results. For the explained variables, in models 1 and 3, the mean (standard deviation) of CSRP is 8.211 (10.834), the maximum (minimum) is 73.688 (0.588), showing that CSR performance is uneven and there is a big gap among different enterprises. In model 2, the mean of IC is 6.781, implying that the sample enterprises' IC is generally at a medium effective level. And maximum (minimum) of IC is 8.866 (3.430), the IC effectiveness varies greatly among sample enterprises, and the some enterprises' IC effectiveness needs to be further improved.

For the explanatory variables, the mean (maximum) of Resist is 7.40% (51.34%); and the mean (maximum) of Sensitive is 2.44% (91.80%). In general, the average shareholding ratio of Pressure-resistant institutions is higher than that of Pressure-sensitive institutions, however, the maximum of Pressure-sensitive institutional shareholding ratio is higher than that of Pressure-resistant institutions. Institutional investors are more and more involved in corporate governance, but due to the different nature of various institutions, they cannot be regarded as a homogenous whole. Different institutions have different investment preferences and patterns, which have different impacts on invested enterprises. Meanwhile, the control variables are sufficiently different. In general, the sample is well differentiated, providing a beneficial basis for subsequent regression.

**Table 2.** Descriptive statistics.

Variable	Mean	Median	Maximum	Minimum	Deviation	Observations
CSRP	8.211	4.702	73.688	0.588	10.834	4856
IC	6.781	6.851	8.866	3.430	0.729	4856
Resist	7.396	3.967	51.339	0.000	9.029	4856
Sensitive	2.440	0.512	91.797	0.000	7.117	4856
LEV	41.542	40.951	86.081	4.666	18.808	4856
TAT	0.746	0.638	2.866	0.079	0.469	4856
GROWTH	15.323	11.810	152.917	-47.780	24.875	4856
DTL	1.986	1.476	11.703	0.819	1.624	4856
ShrZ	10.694	4.517	96.065	1.020	16.159	4856
IN_DIRECTOR	0.368	0.333	0.800	0.231	0.054	4856
AUDIT	0.995	1.000	1.000	0.000	0.069	4856
LnASSET	22.461	22.275	26.024	19.867	1.190	4856
LnSALARY	5.227	5.229	6.981	3.450	0.682	4856
STATE	0.463	0.000	1.000	0.000	0.499	4856

## 4.2 Correlation

Table 3 reports the correlations between the variables. In model 1 and 3, the correlation between Resist and CSRP is positive and significant (0.098,  $p < 0.01$ ), and that between Sensitive and CSRP is not significant (0.007,  $p > 0.10$ ). Compared with Pressure-sensitive institutions, Pressure-resistant institutional ownership is more likely to significantly improve CSR performance. In model 2, the correlation between Resist and IC is positive and significant (0.200,  $p < 0.01$ ); and that between Sensitive and IC is positive and significant (0.031,  $p < 0.05$ ). Compared with Pressure-sensitive institutions, Pressure-resistant institutional ownership is more likely to strengthen external supervision to enhance IC effectiveness. In model 3, the correlation between IC and CSRP is positive and significant (0.235,  $p < 0.01$ ). Effective IC is conducive to build an institutional environment to improve CSR performance.

For the control variables, in models 1 and 3, LEV (0.428), TAT (0.674), ShrZ (0.042), LnASSET (0.366), LnSALARY (0.254) and STATE (0.218) are positively and significantly ( $p < 0.01$ ) correlated with CSRP. And GROWTH, IN\_DIRECTOR are positively and significantly correlated with CSRP (0.034,  $p < 0.05$ ; 0.024,  $p < 0.10$ ). In model 2, LEV (0.080), TAT (0.219), GROWTH (0.159), DTL (-0.172), IN\_DIRECTOR (0.053), AUDIT (0.134), LnASSET (0.218), LnSALARY (0.117) and STATE (0.087) are significantly ( $p < 0.01$ ) correlated with IC. And ShrZ is positively and significantly correlated with IC (0.035,  $p < 0.05$ ). These correlations indicate that the selection of control variables is very necessary, which ensure the rationality of models 1, 2 and 3 constructed above.

Table 3. Descriptive statistics.

Variable	CSRP	IC	Resist	Sensitive	LEV	TAT	GROWTH	DTL	ShrZ	IN_DIRECTOR	AUDIT	LnASSET	LnSALARY	STATE
CSRP	1.000													
IC	0.235***	1.000												
Resist	0.098***	0.200***	1.000											
Sensitive	0.007	0.031**	-0.016	1.000										
LEV	0.428***	0.080***	-0.115***	-0.007	1.000									
TAT	0.674***	0.219***	0.090***	-0.043***	0.258***	1.000								
GROWTH	0.034**	0.159***	0.241***	-0.038***	-0.008	0.095***	1.000							
DTL	-0.019	-0.172***	-0.218***	-0.043***	0.316***	-0.068***	-0.149***	1.000						
ShrZ	0.042***	0.035**	-0.164***	0.049***	0.129***	0.041***	-0.093***	0.059***	1.000					
IN_DIRECTOR	0.024**	0.053***	0.032**	-0.025*	0.051***	-0.005	0.015	0.043***	0.014	1.000				
AUDIT	0.020	0.134***	0.005	0.017	-0.016	0.048***	0.012	-0.050***	0.016	-0.015	1.000			
LnASSET	0.366***	0.218***	-0.028*	0.036**	0.524***	0.082***	-0.026*	0.106***	0.047***	0.097***	-0.003	1.000		
LnSALARY	0.254***	0.117***	0.139***	0.022	0.138***	0.1820***	0.0278*	-0.140***	-0.095***	0.058***	0.025*	0.474***	1.000	
STATE	0.218***	0.087***	-0.131***	0.079***	0.265***	0.105***	-0.142***	0.064***	0.233***	0.003	0.040***	0.282***	0.064***	1.000

\*\*\* Significant at 1%; \*\* Significant at 5%; \* Significant at 10%.

Also, it is shown that the maximum of the correlations is 0.524. This maximum exists between LEV and LnASSET, which is less than the threshold of 0.800. This shows that there is no serious multicollinearity in models 1, 2 and 3, which provide a reliable guarantee for subsequent regression.

## 5 Model Regression Analysis

### 5.1 Analyses of Model 1's Regression Results

As shown in Table 4, in columns 2 and 3, the coefficient on Resist is positive and significant (0.045,  $p < 0.01$ ), indicating that Pressure-resistant institutional shareholding significantly improves CSR performance. Pressure-resistant institutions have no potential commercial relationship with the invested enterprises, and can effectively reduce the agency costs by using their own professional knowledge and governance capabilities. Pressure-resistant institutions have the motivation and ability to guide enterprises to actively carry out CSR activities, and safeguard the legitimate rights and interests of stakeholders. However, the coefficient on Sensitive is not significant statistically (0.023,  $p > 0.10$ ), implying that Pressure-sensitive institutional shareholding has not yet improved CSR performance. Pressure-sensitive institutions are unwilling to give up the interests generated by the business relationship with the invested enterprises, so they inevitably adopt a neutral attitude towards CSR issues, or succumb to the attitude of the management and controlling shareholders, and then lack the motivation to continuously promote CSR activities. Hypothesis 1 above is verified.

For the control variables, in columns 2 and 3, the coefficients on L.LEV are positive and significant (0.046,  $p < 0.01$ ; 0.048,  $p < 0.01$ ), showing that creditor governance plays a positive role in promoting enterprises to fulfill social responsibilities. And those on L.TAT are positive and significant (5.683,  $p < 0.01$ ; 5.674,  $p < 0.01$ ). In columns 3, the coefficient on L.GROWTH is positive and significant (0.007,  $p < 0.05$ ). The good asset turnover and sales growth trend are the favorable factors to strengthen CSR performance. While realizing their own development, enterprises should give full attention to strengthening CSR performance, which is conducive to better enhancing enterprise value [36]. In columns 2 and 3, the coefficients on are positive and significant (1.339,  $p < 0.01$ ; 1.070,  $p < 0.05$ ). The larger the scale of enterprises are, the more diversified and complex their product varieties and geographical distribution will be. Therefore, they will face more supervision from stakeholders such as the government, media and social organizations. Furthermore, large-scale enterprises usually pay more attention to CSR performance while pursuing entrepreneur profits. Besides, the coefficient on L.DTL is negative and significant ( $-0.091$ ,  $p < 0.05$ ;  $-0.099$ ,  $p < 0.05$ ), suggesting that the excessive operational risk has an adverse effect on the sustainable operation, which may have a negative effect on CSR performance. And those on STATE is negative and significant  $-0.905$ ,  $p < 0.05$ ;  $-0.895$ ,  $p < 0.05$ ). The possible reason for this situation is that the excessive separation of residual claims and control rights makes the strategic decision-making team of state-owned enterprises lack the corresponding incentive mechanism of property rights [37]. As a result, the management decisions and behaviors may have a short-term tendency, weakening the enthusiasm to improve CSR performance. The coefficients on other control variables are not statistically significant.

**Table 4.** Regression results for models 1, 2 and 3.

Variable	Model 1		Model 2		Model 3	
	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)
Intercept	-29.556** (12.280)	-23.006* (12.200)	9.430*** (1.367)	10.966*** (1.411)	-34.251*** (12.718)	-28.948** (12.739)
Resist	0.045*** (0.013)		0.011*** (0.002)		0.040*** (0.013)	
Sensitive		0.023 (0.052)		-0.008 (0.006)		0.028 (0.051)
IC					0.498*** (0.133)	0.542*** (0.130)
L.LEV	0.046*** (0.012)	0.048*** (0.012)	-0.0002 (0.157)	0.043 (0.158)	0.046*** (0.012)	0.048*** (0.012)
L.TAT	5.683*** (0.860)	5.674*** (0.868)	0.050 (0.091)	0.048 (0.092)	5.658*** (0.861)	5.648*** (0.868)
L.GROWTH	0.005 (0.003)	0.007** (0.003)	0.002*** (0.001)	0.003*** (0.001)	0.004 (0.003)	0.005* (0.003)
L.DTL	-0.091** (0.041)	-0.099** (0.041)	-0.002 (0.009)	-0.004 (0.009)	-0.091*** (0.040)	-0.097** (0.041)
ShrZ	0.005 (0.012)	0.003 (0.012)	-0.001 (0.001)	-0.002 (0.001)	0.006 (0.012)	0.004 (0.012)
IN_DIRECTOR	3.038 (2.342)	3.087 (2.349)	-0.637 (0.462)	-0.641 (0.461)	3.355 (2.367)	3.435 (2.375)
L.AUDIT	-0.443 (0.676)	-0.412 (0.668)	0.359 (0.279)	0.366 (0.281)	-0.621 (0.693)	-0.611 (0.689)
LnASSET	1.339*** (0.485)	1.070** (0.479)	-0.077 (0.058)	-0.139** (0.060)	1.378*** (0.486)	1.146** (0.484)
L.LnSALARY	-0.135 (0.298)	-0.117 (0.304)	-0.001 (0.045)	0.006 (0.045)	-0.134 (0.297)	-0.120 (0.302)
STATE	-0.905** (0.389)	-0.895** (0.378)	0.095 (0.143)	0.081 (0.141)	-0.952** (0.378)	-0.939** (0.373)
YEAR/IND	YES	YES	YES	YES	YES	YES
Observation data	4249	4249	4249	4249	4249	4249
Within_R <sup>2</sup>	0.157	0.151	0.126	0.116	0.165	0.161
F_Statistics	25.91***	24.78***	20.01***	18.25***	26.43***	25.61***

\*\*\* Significant at 1%; \*\* Significant at 5%; \* Significant at 10%

Robust standard errors in brackets are clustered at corporate level.

## 5.2 Analyses of Model 2's Regression Results

In columns 4 and 5, the coefficient on Resist is positive and significant (0.011,  $p < 0.01$ ), indicating that Pressure-resistant institutional shareholding can restrain IC defects, and improve IC effectiveness. Pressure-resistant institutions are important participants in corporate governance, and play an active supervisory role on the management, which is conducive to improving corporate internal governance and reducing operation risk. However, the coefficient on Sensitive is not significant statistically ( $-0.008$ ,  $p > 0.10$ ). There is a commercial interest relationship between Pressure-sensitive institutions and invested enterprises other than investment, which makes them lack the motivation to continuously promote IC effectiveness. Hypothesis 2 above is verified.

For the control variables, in columns 4 and 5, the coefficients on L.GROWTH are positive and significant (0.002,  $p < 0.01$ ; 0.003,  $p < 0.01$ ). When the development trend of enterprises is good, they have a higher level of governance, which strengthens IC construction process. Besides, in column 5, the coefficient on LnASSET is negative and significant ( $-0.139$ ,  $p < 0.05$ ). In general, the control chain of large-scale enterprises is longer, which is easy to cause serious insider control, and thus adversely affect IC effectiveness. The coefficients on other control variables are not statistically significant.

## 5.3 Analyses of Model 3's Regression Results

In columns 6 and 7, the coefficient on Resist is positive and significant (0.040,  $p < 0.01$ ); that on Sensitive is not significant statistically ( $-0.028$ ,  $p > 0.10$ ). Compared with Pressure-sensitive institutions, Pressure-resistant institutions urge senior executives to attach importance to the long-term development, and enhance CSR fulfillment through the strategic decision-making. And the coefficients on IC are positive and significant (0.498,  $p < 0.01$ ; 0.542,  $p < 0.01$ ), showing that effective IC is an important means to safeguard the legitimate rights and interests of stakeholders. Therefore, effective IC has a significant mediating effect between institutional shareholding and CSR performance, which is only reflected between Pressure-resistant institutional shareholding and CSR fulfillment, but not for Pressure-sensitive institutional shareholding. Hypothesis 3 is verified. Compared with Pressure-sensitive institutions, Pressure-resistant institutions urge enterprises to build an effective IC system, to actively pay attention to the expectations and demands of different stakeholders in addition to economic interests, and then fully improve CSR performance. With reference to Wen and Ye, the non-parametric percentile Bootstrap (1000) method for deviation correction is adopted [35]. Furthermore, the confidence interval of  $\beta_1 \times \delta_2$  in 95% confidence is estimated to be [0.007, 0.016]. Where,  $\beta_1 \times \delta_2$  is the product of the effects of Resist on IC and IC on CSRP. Also, the effect magnitude of the mediating effect is about 12.17% (i.e.  $\beta_1 \times \delta_2 / \alpha_1 = 0.011 \times 0.498 / 0.045$ ).

For the control variables, the coefficient on L.LEV, L.TAT, L.GROWTH, L.DTL, LnASSET and STATE are statistically significant, and the conclusions on are consistent with those from model 1.

## 6 Robustness Test

### 6.1 Analysis Based on Propensity Score Matching (PSM) Sample

This study set dummy variables - DResist and DSensitive as the explained variables of logistic regression. When Pressure-resistant (Pressure-sensitive) institutional shareholding ratio is greater than the corresponding industry - annual median, DResist (DSensitive) is 1; otherwise, DResist (DSensitive) is 0. Meanwhile, LEV, TAT, GROWTH, DTL, ShrZ, IN\_DIRECTOR, AUDIT, LnASSET, LnSALARY, STATE, industry and annual dummy variables are selected as covariates to screen out the treatment group and control group. Different from the matching of a single index, PSM condenses multiple features into a “tendency score” value”, and promotes the overall matching of multiple features, to obtain the same or similar paired sample in the main feature variables, to reduce the adverse impact of other possible interference factors on the conclusions. Based on Models 4 and 5, the propensity scores are calculated. Then, 2098 and 2095 pairs of paired observations are obtained for DResist and DSensitive, according to the nearest neighbor matching principle of one-to-one correspondence. On this basis, the regressions on Models 1, 2 and 3 are conducted again according to PSM sample. Table 5 reports the regression results.

**Table 5.** Table captions should be placed above the tables

Variable	Model 1		Model 2		Model 3	
	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)
Intercept	-29.865** (12.370)	26.511** (12.670)	9.556*** (1.389)	11.285*** (1.481)	36.637*** (12.887)	33.000** (13.138)
Resist	0.046*** (0.013)		0.011*** (0.002)		0.038*** (0.013)	
Sensitive		0.023 (0.052)		-0.008 (0.006)		0.028 (0.051)
IC					0.515*** (0.138)	0.582*** (0.135)
YEAR/IND	YES	YES	YES	YES	YES	YES
Observation data	4164	4141	4164	4141	4137	4151
Within_R2	0.152	0.148	0.129	0.119	0.163	0.159
F_Statistics	24.36***	23.50***	20.18***	18.14***	25.23***	24.68***

\*\*\* Significant at 1%; \*\* Significant at 5%; \* Significant at 10%

### Mode 4

$$\begin{aligned}
 DResist_{i,t} = & \gamma_0 + \gamma_1 LEV_{i,t-1} + \gamma_2 TAT_{i,t-1} + \gamma_3 GROWTH_{i,t-1} + \gamma_4 DTL_{i,t-1} + \gamma_5 ShrZ_{i,t} + \\
 & \gamma_6 INDIRECTOR_{i,t} + \gamma_7 AUDIT_{i,t-1} + \gamma_8 LnASSET_{i,t} + \gamma_9 LnSALARY_{i,t-1} + \gamma_{10} STATE_{i,t} + \\
 & \sum_{\gamma_{11}} \overline{YEAR} \sum_{\gamma_{12}} \sum_t IND + \epsilon_{i,t}
 \end{aligned} \tag{5}$$

**Mode 5.**

$$\begin{aligned}
 DSensitive_{i,t} = & \lambda_0 + \lambda_1 LEV_{i,t-1} + \lambda_2 TAT_{i,t-1} + \lambda_3 GROWTH_{i,t-1} + \lambda_4 DTL_{i,t-1} + \lambda_5 ShrZ_{i,t} + \\
 & + \lambda_6 INDIRECTOR_{i,t} + \lambda_7 AUDIT_{i,t-1} + \lambda_8 LnASSET_{i,t} + \lambda_9 LnSALARY_{i,t-1} + \lambda_{10} STATE_{i,t} + \\
 & \sum_t \overline{YEAR} \sum_t \sum_{i,\lambda,12} IND + \epsilon_{i,t}
 \end{aligned} \tag{6}$$

In Models 1, 2 and 3, the coefficients on Resist are positive and significant (0.046,  $p < 0.01$ ; 0.011,  $p < 0.01$ ; 0.038,  $p < 0.01$ ); those on Sensitive are not statistically significant (0.023,  $p > 0.10$ ; -0.008,  $p > 0.10$ ; 0.028,  $p > 0.10$ ). Pressure-resistant institutional ownership can significantly improve CSR performance and IC effectiveness, while Pressure-sensitive institutional ownership has no significant promoting effect on CSR performance and IC effectiveness. Hypotheses 1 and 2 are verified again. In Model 3, the coefficients on IC are positive and significant (0.515,  $p < 0.01$ ; 0.582,  $p < 0.01$ ). Effective IC supervises the management to improve CSR performance. Based on these results, this study believes that effective IC has a significant mediating effect between Pressure-resistant institutional ownership and CSR performance. The size of the mediating effect is about 12.31% ( $\beta_1 \times \delta_2/\alpha_1 = 0.011 \times 0.515/0.046$ ). However, this mediating effect is not reflected for Pressure-sensitive institutional ownership. Hypothesis 3 is verified again.

Robust standard errors in brackets are clustered at corporate level.

**6.2 Tests Based on Heckman Two-Stage Regression**

Institutional investors can choose to increase or decrease the shares of listed enterprises according to CSR performance. In order to weaken the adverse effects of such “self-selection”, with reference to Dhaliwal et al. and Dai, Heckman’s two-stage regression is adopted for re-analysis [38, 39].

In the first stage, the Probit regression models (Models 6 and 7) are constructed, and the inverse Mills ratio (IMR) is estimated. In Models 6 and 7, DResist and DSensitive have the same meanings as in Sect. 6.1. As the institutional shareholding ratio in the previous period obviously affects that in the current period, but may have a weak impact on CSR activities in the current period, the first-order lags of Resist and Sensitive are introduced respectively in Models 6 and 7. Meanwhile, with reference to Hu and Yang and Li et al., “Whether CSI 300 share” (HS) is added as an instrumental variable

for institutional shareholding ratio [40, 41]. The CSI 300 index provides authoritative investment guidance for investors to track and select portfolios. The stocks selected for the CSI 300 index tend to have higher levels of ownership by institutional investors. On this basis, the exclusion restriction of the Heckman model can be met. In the second stage, the IMRs estimated in the first stage are added into the original models to test the impact of institutional ownership on CSR performance. Table 6 reports the test results of the Heckman two-stage regression.

**Table 6.** Model 1–Model 3 Heckman two-stage model verification results.

Variable	Model 1		Model 2		Model 3	
	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)	Coef. (S.E.)
Intercept	−50.924*** (5.702)	−51.281*** (6.017)	−1.321*** (0.494)	1.463*** (0.524)	−48.896*** (5.662)	−53.633*** (5.969)
Resist	0.098*** (0.024)		0.011*** (0.002)		0.081*** (0.024)	
Sensitive		−0.008 (0.021)		0.001 (0.002)		−0.009 (0.021)
IC					1.534*** (0.251)	1.608*** (0.248)
L.LEV	0.118*** (0.013)	0.123*** (0.013)	−0.003** (0.001)	−0.002* (0.001)	0.122*** (0.013)	0.127*** (0.013)
L.Resist	0.137*** (0.005)		0.137*** (0.005)		0.137*** (0.005)	
L.Sensitive		0.390*** (0.016)		0.390*** (0.016)		0.390*** (0.016)
HS	0.353*** (0.089)	0.213*** (0.077)	0.353*** (0.089)	0.213*** (0.077)	0.353*** (0.089)	0.213*** (0.077)
IMR	0.028 (0.471)	−0.693 (0.472)	0.130*** (0.041)	0.033 (0.041)	−0.171 (0.468)	−0.746*** (0.468)
YEAR/IND	YES	YES	YES	YES	YES	YES
observations data	4249	4249	4249	4249	4249	4249
Wald_chi2	3528.81***	3293.92***	732.14***	642.74***	3628.87***	3400.49***

\*\*\* Significant at 1%; \*\* Significant at 5%; \* Significant at 10%

## Mode 6.

$$\begin{aligned}
 DResist_{i,t} = & \theta_0 + \theta_1 LEV_{i,t-1} + \theta_2 TAT_{i,t-1} + \theta_3 GROWTH_{i,t-1} + \theta_4 DTL_{i,t-1} + \theta_5 ShrZ_{i,t} + \\
 & \theta_6 IN_{DIRECTOR}_{i,t} + \theta_7 AUDIT_{i,t-1} + \theta_8 LnASSET_{i,t} + \theta_9 LnSALARY_{i,t-1} + \theta_{10} STATE_{i,t} + \\
 & \theta_{11} Resist_{i,t-1} + \theta_{12} HSi_{i,t} + \theta_{13} \sum_t YEAR \sum_t \sum_t IND_t + \epsilon_{i,t}
 \end{aligned}
 \tag{7}$$

**Mode 7.**

$$\begin{aligned}
 DSensitive_{i,t} = & \zeta_0 + \zeta_1 LEV_{i,t-1} + \zeta_2 TAT_{i,t-1} + \zeta_3 GROWTH_{i,t-1} + \zeta_4 DTL_{i,t-1} + \zeta_5 ShrZ_{i,t} + \zeta_6 IN_{DIRECTOR}_{i,t} + \zeta_7 AUDIT_{i,t-1} + \zeta_8 LnAS - \\
 & \sum_t YEAR \\
 SET_{i,t} + & \zeta_{10} STATE_{i,t} + \zeta_{11} Sensitive_{i,t-1} + \zeta_{12} HSi_{i,t-1} + \zeta_{13} \\
 & \sum_{\zeta_{14}} \sum_t IND + \epsilon_{i,t}
 \end{aligned}
 \tag{8}$$

As shown in Table 6, the coefficients on L.Resist, L.Sensitive and HS are the first-stage results, which are statistically significant ( $p < 0.01$ ), implying that the variables introduced in the sample selection regression are valid. The coefficients on the remaining variables are the results in the second stage. In column 4 and 7, the coefficients on IMR are statistically significant ( $0.130, p < 0.01$ ;  $-0.746, p < 0.01$ ), indicating that there is a certain degree of “self-selection” problem in the sample. The Heckman two-stage model can effectively weaken the regression bias caused by the “self-selection” problem.

For the second-stage regression, in Models 1, 2 and 3, the coefficients on Resist are positive and significant ( $0.098, p < 0.01$ ;  $0.011, p < 0.01$ ;  $0.081, p < 0.01$ ); those on Sensitive are not statistically significant ( $-0.008, p > 0.10$ ;  $0.001, p > 0.10$ ;  $-0.009, p > 0.10$ ). In Model 3, the coefficients on IC are positive and significant ( $1.534, p < 0.01$ ;  $1.608, p < 0.01$ ). Again, these results indicate that compared with Pressure-sensitive institutions, Pressure-resistant institutional shareholding improve CSR performance and IC effectiveness, and effective IC prestens a significant mediating effect between Pressure-resistant institutional ownership and CSR performance.

## 7 Conclusions and Suggestions

### 7.1 Conclusions

This study analyzes the impacts of heterogeneous institutional ownership on CSR performance and IC effectiveness, and the mediating effect of IC between institutional ownership and CSR performance, to provide empirical evidence for institutional investors to participate in corporate governance and improve CSR performance. The results show that Pressure-resistant institutional shareholding significantly improves CSR performance and IC effectiveness. However, Pressure-sensitive institutional ownership has no significant promoting effect on CSR performance and IC effectiveness. Effective IC has a

significant mediating effect between Pressure-resistant institutional ownership and CSR performance, but this effect is not reflected between Pressure-sensitive institutional ownership and CSR performance. Compared with Pressure-sensitive institutions, Pressure-resistant institutions supervise corporate IC construction, to feed-back the expectations and demands of stakeholders in addition to economic interests, and improve CSR performance. This study provides new evidence for interpreting the role of heterogeneous institutional shareholding, and is helpful for the regulators to monitor the standardization of institutional shareholding behaviors.

## 7.2 Suggestions

While “developing institutional investors beyond normal conditions,” the regulators should focus on promoting institutional investors to play the role of stabilizing the capital market. In order to better guide institutional investors to improve CSR performance, it is necessary to optimize the structure of institutional investors, expand the ranks of institutional investors engaged in long-term value investment, increase the shareholding ratio of Securities investment funds, QFII and Social security funds, and enhance their abilities to improve CSR performance and enhance IC effectiveness. Meanwhile, the regulatory authorities guide Insurance companies, Securities brokers, Financial companies and other Pressure-sensitive institutional investors to establish a long-term shareholding concept, to build an incentive mechanism for institutional investors to hold shares for a long time. A Reasonable incentive mechanism should be designed to guide listed companies to improve equity structure, to improve CSR performance, and promote the healthy and sustainable development of the national economy.

The regulators should take measures to encourage enterprises to further enhance IC effectiveness, and promote the positive effect of IC in improving CSR performance and stabilizing the capital market. Meanwhile, the regulators encourage institutional investors to take the initiative to participate in corporate business decisions, and enhance the transparency of internal business decisions and information disclosure. IC construction is a long-term systematic process. Institutional investors supervise enterprises to improve IC construction, optimize the quality of IC information disclosure, promote the design of IC to be more reasonable, more effective operation, and safeguard the legitimate rights and interests of stakeholders. By enhancing IC effectiveness, enterprises can reduce the risk expectation of stakeholders, promote the mediating effect of IC between institutional shareholding and CSR performance, and enhance the consciousness of improving CSR performance.

## References

1. Wang, L., Juslin, H.: Corporate social responsibility in the Chinese forest industry: understanding multiple stakeholder perceptions. *Corp. Soc. Responsib. Environ. Manag.* **20**(3), 129–145 (2013)
2. Cheng, B., Ioannou, I., Serafeim, G.: Corporate social responsibility and access to finance. *Strateg. Manag. J.* **35**(1), 1–23 (2014)
3. Singh, K., Misra, M.: Linking corporate social responsibility (CSR) and organizational performance: the moderating effect of corporate reputation. *Eur. Res. Manage. Bus. Econ.* **27**, 100139 (2021)

4. Bhattacharya, A., Good, V., Sardashti, H., Peloza, J.: Beyond warm glow: the risk-mitigating effect of corporate social responsibility (CSR). *J. Bus. Ethics* **171**(2), 317–336 (2021)
5. Zhang, D.X., Li, Z.H.: Research on the impact of institutional investors on the performance of their holding companies – based on the perspective of institutional investors’ self-protection. *J. Manage. Sci.* **20**(5), 82–101 (2017)
6. Commission, C.S.R.: Report on the Development of Corporate Governance in China. China Finance Press, Beijing (2010)
7. Brickley, J.A., Lease, R.C., Smith, C.W.: Ownership structure and voting on antitakeover amendments. *J. Financ. Econ.* **20**(1), 267–291 (1988)
8. Chen, X., Harford, J., Li, K.: Monitoring: which institutions matter? *J. Financ. Econ.* **86**(2), 279–305 (2007)
9. Puspa, M., George, T., Shireenjit, K. J.: Institutional investors in Australia: do they play a homogenous monitoring role? *Pacific-Basin Finan. J.* **40**(B), 266–288 (2007)
10. Liang, S.K.: Does institutional investor ownership affect the company & apos; cost stickiness? *Manage. World* **34**(12), 133–148 (2018)
11. Helwege, J., Intintoli, V.J., Zhang, A.: Voting with their feet or activism? Institutional investors’ impact on CEO turnover. *J. Corp. Finan.* **18**(1), 22–37 (2012)
12. Tian, L.H., Wang, K.D.: The “cover-up effect” of social responsibility information disclosure and the risk of the collapse of listed companies: DID - PSM analysis from China stock market. *Manage. World* **33**(11), 146–157 (2017)
13. Jeffrey, L.C., Fang, X.H.: Institutional investor stability and crash risk: Monitoring versus short-termism. *J. Bank. Finance* **37**(8), 3047–3063 (2013)
14. Elyasiani, E., Jia, J.: Distribution of institutional ownership and corporate firm performance. *J. Bank. Finance* **34**(3), 606–620 (2010)
15. Bajo, E., Barbi, M., Bigelli, M., Hillier, D.: The role of institutional investors in public-to-private transactions. *J. Bank. Finance* **37**(11), 4327–4336 (2013)
16. Nofsinger, J.R., Sulaeman, J., Varma, A.: Institutional investors and corporate social responsibility. *J. Corp. Finan.* **58**, 700–725 (2019)
17. Dyck, A., Lins, K.V., Roth, L., Wagner, H.F.: Do institutional investors drive corporate social responsibility? International evidence. *J. Financ. Econ.* **131**(3), 693–714 (2019)
18. Bushee, B.J.: The influence of institutional investors on myopic r&d investment behavior. *Account. Rev.* **73**(3), 305–333 (1998)
19. Attig, N., Cleary, S., Ghoul, S.E., Guedhami, O.: Institutional investment horizons and the cost of equity capital. *Financ. Manage.* **42**(2), 441–477 (2013)
20. Hofman, P.S., Moon, J., Wu, B.: Corporate social responsibility under authoritarian capitalism: dynamics and prospects of state-led and society-driven CSR. *Bus. Soc.* **56**(5), 651–671 (2017)
21. McCahery, J. A., Sautner, Z., Starks, L.T.: Behind the scenes: the corporate governance preferences of institutional investors. *J. Finan.* **71**(6), 2905–2932 (2016).
22. Ward, C.W.R., Yin, C., Zeng, Y.Q.: Institutional investor monitoring motivation and the marginal value of cash. *J. Corp. Finan.* **48**(2), 49–75 (2018)
23. Lu, Y., Zhu, Y.J., Hu, X.Y.: Empirical study on institutional investors & apos; shareholding and listed companies & apos; violations. *Nankai Manage. Rev.* **21**(1), 13–23 (2012)
24. Bushee, B.J., Jung, M.J., Miller, G.S.: Do investors benefit from selective access to management? *J. Finan. Rep.* **2**(1), 31–61 (2017)
25. Deng, D.Q., Wen, S.B., Pan, L.N., Liu, H.T.: Quality of internal control, heterogeneity of institutional investors and shareholding decision: an empirical study based on self selection model. *Manage. Rev.* **26**(10), 76–89 (2014)
26. Niu, J.B., Wu, C., Li, S.N.: Types of institutional investors, equity characteristics and voluntary information disclosure. *Manage. Rev.* **25**(3), 48–59 (2013)
27. Altamuro, J., Beatty, A.: How does internal control regulation affect financial reporting? *J. Account. Econ.* **49**(1), 58–74 (2010)

28. Mitra, S., Jaggi, B., Hossain, M.: Internal control weaknesses and accounting conservatism: evidence from the post-Sarbanes-Oxley period. *J. Acc. Audit. Financ.* **28**(2), 152–191 (2013)
29. Hoitash, U., Hoitash, R., Bedard, J.C.: Corporate governance and internal control over financial reporting: a comparison of regulatory regimes. *Acc. Rev.* **84**(3), 839–867 (2009)
30. Goh, B.W.: Audit committees, board of directors, and remediation of material weaknesses in internal control. *Contemp. Account. Res.* **26**(2), 549–579 (2009)
31. Ntim, C.G., Soobaroyen, T.: Corporate governance and performance in socially responsible corporations: newempirical insights from a neo-institutional framework. *Corp. Governance Int. Rev.* **21**(5), 468–494 (2013)
32. Chen, Y.Q., Ma, L.L.: Empirical analysis on the market response of social responsibility accounting information of listed companies in China. *Acc. Res.* **26**(11), 18–25 (2005)
33. Li X, Zheng C M, Liu G, Muhammad S S. The Effectiveness of Internal Control and Corporate Social Responsibility: Evid. *Chinese Capital Mark. Sustain.* **10**(11), 4006 (2018).
34. Chen, H., Na, C.H., YuTian, M.Z., Han, X.F.: Internal control and R&D subsidy performance. *Manage. World* **34**(12), 149–164 (2018)
35. Wen, Z.L., Ye, B.J.: Mediating effect analysis: method and model development. *Prog. Psychol. Sci.* **22**(2), 731–745 (2014)
36. Chen, G.X., Tang, S.Y.: Research on the relationship between corporate internal governance and social responsibility – empirical experience from executive compensation and ownership structure. *Hum. J.* **42**(12), 32–41 (2016)
37. Li, B., Guo, J.E., Su, K.: Enterprise risk taking: is a daughter inferior to a man? *Anal. Based CEO Gender. Forecast* **36**(3), 21–27 (2017)
38. Dhaliwal, D.S., Li, O.Z., Tsang, A., Yang, Y.G.: Voluntary nonfinancial disclosure and the cost of equity capital: the initiation of corporate social responsibility reporting. *Account. Rev.* **86**(1), 59–100 (2011)
39. Dai, Y.H.: Institutional investors, ownership nature and cost of equity capital. *Financ. Res.* **40**(9), 143–159 (2018)
40. Hu, M., Yang, J.: Can analyst coverage reduce the incidence of fraud? *Evid. China Appl. Econ. Lett.* **21**(9), 605–608 (2014)
41. Li, C.T., Song, M., Zhang, X.: Analyst tracking and earnings management: evidence from Chinese listed companies. *Finan. Res.* **36**(7), 124–139 (2014)