Research on the relationship between institutional investor heterogeneity and corporate environmental responsibility

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Abstract: Taking Shanghai and shenzhen a-share listed companies from 2010 to 2016 as samples, this paper empirically studies the impact of institutional investor ownership on corporate environmental responsibility. The heterogeneity of pressure-sensitive institutional investors and pressure-resistant institutional investors is distinguished, and the influence of marketization process on institutional investors' participation in corporate environmental responsibility is further discussed. The results show that the total shareholding of institutional investors is negatively correlated with the level of corporate environmental responsibility. Compared with pressure-resistant institutional investors, pressure-sensitive institutional investors' shareholding is more detrimental to enterprises' undertaking of environmental responsibilities. The faster the marketization process in the region, the more the negative effect of pressure-resistant institutional investors on corporate environmental responsibility will be weakened, while there is no significant regulating effect on the relationship between pressure-sensitive institutional investors and corporate environmental responsibility.

1. Research background
With the increasingly prominent environmental problems, the public’s attention to environmental protection has been increasing, and more and more attention has been paid to the environmental responsibility of enterprises. As an important resource for the survival and development of enterprises, stakeholders have also played a certain supervisory role in the development of enterprises. Institutional investors, as one of the stakeholders, they always pay attention to corporate governance. So what impact will institutional investors have on corporate environmental responsibility? Foreign scholar brickey(1988) believes that institutional investors should be considered for their heterogeneity. Then what impact will different types of institutional investors have on corporate environmental responsibility? This paper draws on the practice of brickey to divide institutional investors into pressure-sensitive and pressure-reducing models. The 2010-2016 China A-share listed companies are used as samples to empirically test their impact on corporate environmental responsibility, and the property rights and market. The process factors are introduced into their correlation research to explore the nature of different property rights and the changes in their relevance under the marketization process [1]. The rest of the paper is structured as follows: the second part is the theoretical analysis and research hypothesis, the third part is the study design, the fourth part is the empirical result analysis, and the fifth part is the conclusions and implications.

2. Theoretical analysis and research hypothesis
Institutional investors tend to have the behavioral characteristics of "voting with feet", and dispersed ownership will make it difficult for them to make joint actions to influence corporate decisions, so
they often have little motivation to analyze and supervise corporate decisions and can only adopt free-rider strategy in corporate governance (Black, 1990). Institutional investors have a highly diversified portfolio, which will reduce their ability to process information and increase the corresponding supervision cost. If the company's decision-making failure is caused by their opposition, it will often generate considerable operational and financial risks, so institutional investors should avoid this muddy water (Parthiban, 1996). Institutional investors usually have an interest relationship with the corporate management in some aspects. Through such an interest relationship, the management robs institutional investors to vote for the decision-making behaviors of the corporate management, and institutional investors also become their "accomplices" (Heard, 1987). At the same time, if institutional investors appear too activism tendency of supervision, which is not conducive to their access to management and access to some soft information that is not open to the market, as a result, institutional investors generally have little public confrontation with corporate management, they often through privately negotiated agreement to complete decision (Black, 1992). Enterprise environmental responsibility usually consume large amounts of economic cost, both for the management of the technology for energy conservation and emissions reduction, pollution or environmental protection consciousness of employees training consumes a lot of manpower material resources, to the enterprise production bring huge load, even lead to some main business stopped working, so as to influence the development of enterprises. Executives more focus on the short-term interests of the enterprise, if the interests of shareholders are sacrificed because of environmental protection, this is not conducive to their own work, and most institutional investors have short-sighted behavior. They will be for the maximum profit of short-term pressure on corporate management so as to not go to the implementation of environmental responsibility of decision making.

Different types of institutional investors have different investment strategies and supervisory characteristics for corporate governance, with different orientations and motivations, as well as environmental responsibility commitments. This article uses Brickley's approach to divide institutional investors into pressure-sensitive institutional investors and pressure-tolerant institutional investors. Pressure-sensitive institutional investors often have business and investment relationships with corporate management. They prefer the principle of seeking private benefits to the management to obtain short-term economic benefits and even put pressure on them. The pressure-resisting institutional investors are different. They have no other business links with the company. They can better resist the pressure of management, pay more attention to the long-term value of the company, and can play a certain supervisory role for the management. Environmental issues are related to the long-term interests of enterprises, which will make pressure-resistant institutional investors begin to pay attention to environmental responsibility, but considering that pressure-resistant institutional investors also need certain investment income as a guarantee, if the enterprise undertakes environmental responsibility, the enterprise will be short-term. Facing the recession crisis, it also creates a feeling of uncertainty in the future, which also makes it difficult to supervise the management's decision-making. Therefore, we make the following assumptions:

Hypothesis 1: Institutional investors have a negative impact on environmental responsibility.

Hypothesis 2: Compared with pressure-resistant investors, pressure-sensitive investors have a greater and significant negative impact on environmental responsibility.

The external environment under different marketization processes will influence the supervision behavior of different institutional investors. Marketization represents the degree of market development. According to the report of marketization index of China's provinces (2016) compiled by fan gang et al., the marketization index can be used to measure the marketization process in the region where the company is located. In areas with a high marketization index, the rule of law environment is relatively advanced. Such a high-level rule of law environment will carry out basic requirements and norms for enterprise environmental protection. At the same time, this judicial system can effectively protect the supervision behavior of institutional investors, reduce the supervision cost of institutional investors, and strengthen the enthusiasm of institutional investors for supervision (Chen deping et al., 2013) [2]. In addition, the market information transmission speed is often faster in regions with higher
market index. If institutional investors and enterprise management collude to gain benefits without focusing on environmental protection, such information transmission strengthens the public's ability to know, and may affect the reputation of enterprises and the investment behavior of institutional investors. At this time, in order to prevent the loss of their own interests, institutional investors of the enterprise begin to strengthen supervision over the management, or choose to abandon the investment in the company under external pressure. This originally hesitant type pressure resisting institutional investors have a more clear direction and goals to conduct effective supervision of management or choose to give up investment, lose funding is not a good news for managers, this encourages managers to coordinate with them to make decisions that are conducive to corporate environmental responsibility. Nevertheless, these changes do not seem to work for the pressure-sensitive institutional investors, who are indifferent to them. With a short-term interest in mind, they will not give up their immediate profits because of the pressure from the external environment and actively protect the corporate environment. Therefore, we propose the following hypothesis:

Hypothesis 3: The marketization process has a regulating effect on the relationship between institutional investors and environmental responsibility, but it is not significant enough.

Hypothesis 4: For pressure-sensitive investors, the marketization process has no significant influence on the relationship between them and environmental responsibility.

Hypothesis 5: Pressure-resistant institutional investors interact with the marketization process to influence environmental responsibility. When the marketization process is rapid, the negative impact between pressure-resistant institutional investors and environmental responsibility is weakened.

3. Study design

3.1. Sample selection and data sources

Based on China's a-share listed companies from 2010 to 2016 for the selected object, this article draw lessons from hong-you lu (2017) approach, the environmental responsibility score in HeXun corporate social responsibility score is used to measure the performance of corporate environmental responsibility, however, considering that HeXun does not rate some enterprises, etc, this paper eliminated the environmental responsibility score of 0, only select businesses with a score greater than 0 so that we can fully reflect the level of corporate environmental responsibility. In addition, the Institutional ownership data comes from wind database, control variables mainly comes from the csmar database, marketization index comes from the report of marketization index of China's provinces (2016), the report includes 2008-2014 score data, considering the regional marketization index changed little in recent years, we estimates the data for 2015 and 2016 based on the marketization index fittings of previous years. Finally, we obtained 2870 observations of 774 companies in 18 industries in 30 provinces and municipalities in 7 years.

3.2. Definition of main variables

3.2.1. Corporate environmental responsibility

This article uses the third party HeXun environmental responsibility scores in social responsibility of listed companies as a measure of corporate environmental responsibility experts respectively from the environmental protection consciousness, environmental management system certification, environmental protection investment amount, saving energy and emission species number five aspects to rate, a systematic comprehensive performance of enterprise environmental responsibility level. Because companies that do not disclose environmental information and do not accept the score do not represent their poor environmental responsibility level, this paper only selects companies with positive scores for empirical analysis.

3.2.2. Institutional investors

In this paper, the shareholding data of institutional investors are obtained from the wind database, in
the wind database, institutional investors will be divided into investment funds, securities firms, insurance companies, pension funds, qualified foreign investors and other institutional investors, other institutional investors are mainly include general legal persons, trust companies, banks, trust company, their shareholding ratio is very low. Therefore, this paper adopts the method of he Dan (2018) to classify institutional investors such as social security funds, qualified foreign investors and other institutional investors as pressure-resistant institutional investors, and investment funds, securities companies and insurance companies as pressure-sensitive institutional investors [6].

3.2.3. Measurement of marketization process
we measure the marketization process with the marketization index of the region where the specific sample is located, and construct dummy variables. When the marketization index is greater than the median of the marketization index of the year, it is 1; otherwise, it is 0.

3.2.4. Control variables
Considering other possible influencing factors, according to previous studies of scholars, this paper introduced factors such as asset-liability ratio, return on total assets, growth ability, enterprise size, enterprise age, proportion of independent directors, number of board meetings, book-to-market ratio, ownership concentration and CEO duality as control variables.

3.3. Empirical model
For hypothesis 1, model 1 is built in this paper:
\[
C_{er} = \alpha_0 + \alpha_{ins} + \sum \text{Controls} + \epsilon
\]  
(1)

For hypothesis 2, model 2 and model 3 are constructed in this paper:
\[
C_{er} = \beta_0 + \beta_{insse} + \sum \text{Controls} + \epsilon
\]
(2)
\[
C_{er} = \beta_0 + \beta_{insse} + \sum \text{Controls} + \epsilon
\]
(3)

In order to verify hypothesis 3 to 5, this paper introduces the process of marketization of moderator variables and constructs models 4, 5 and 6:
\[
C_{er} = \varphi_0 + \varphi_{Ins} + \varphi_{Market} + \varphi_{Market} \ast Ins + \sum \text{Controls} + \epsilon
\]
(4)
\[
C_{er} = \lambda_0 + \lambda_{Insse} + \lambda_{Market} + \lambda_{Market} \ast Insse + \sum \text{Controls} + \epsilon
\]
(5)
\[
C_{er} = \eta_0 + \eta_{Insre} + \eta_{Market} + \eta_{Market} \ast Insre + \sum \text{Controls} + \epsilon
\]
(6)

4. Empirical results analysis
In table 2, we got the test result of model 1, 2, 3. The relationship between the institutional investors holding and the level of environmental responsibility between correlation under 1% significance level, coefficient is 0.021, shows that institutional investors holding ratio is higher, the lower the level of corporate environmental responsibility. Institutional investors are mostly unable to resist the temptation of short-term economic interests. At the same time, they tend to be lazy in terms of supervision, which encourages the enterprise management to pursue short-term investment rather than inject capital into environmental protection, which verifies hypothesis 1. The correlation coefficient between stress-sensitive institutional investor shareholding and corporate environmental responsibility is -0.029, which is significant at 1% confidence level, indicating that stress-sensitive institutional investor shareholding has a relatively obvious negative impact on corporate environmental responsibility. The coefficient of the listed pressure-resistant investors' commitment to corporate environmental responsibility is -0.012, with little and insignificant influence. This proves the pressure sensitive institutional investors powerful short-sighted behaviour, they often acted in collusion with management consultation, even for their own short-term interests and put pressure on management to investment of capital recovery faster in daily operation, and pressure resistance type of institutional investors on management has strong resistance, they pay more attention to the long-term value of the
enterprise, but the uncertainty of the benefits brought by environmental responsibility and the basic investment income demand make them choose not to move. The results of model 2 and 3 are consistent with our hypothesis 2 (Due to limited space, the coefficient of control variable is not shown).

Table 1 Variable regression coefficients of model 1, 2 and 3

| VARIABLES | (1) | (2) | (3) |
|-----------|-----|-----|-----|
| Ins       | -0.021*** |     |     |
| Insse     |     | -0.016*** |     |
| Insre     |     |     | -0.012 |
| Year      | Control | Control | Control |
| Indus     | Control | Control | Control |
| Adj R-squared | 0.071 | 0.065 | 0.065 |
| F         | 13.73 | 12.73 | 12.65 |

Note: ***, *** and * represent the significance levels of 1%, 5% and 10% respectively.

Table 2 shows the test results for models 4, 5, and 6, respectively. From the results of Model 4, we can see that the coefficient of interaction between institutional investors and the marketization index of the region where the enterprise is located is 0.015, and it is significant at the 10% confidence level, which reflects the marketization process for institutional investors and the corporate environment. The responsibility relationship has a certain degree of adjustment effect, the more market-oriented the process, the weaker the negative impact of institutional investors' shareholding on the level of corporate environmental responsibility, Hypothesis 3 can be proved. In areas with more developed marketization, a sound and standardized rule of law system can effectively restrain the free-riding behavior of institutional investors. The lack of environmental awareness of enterprises is not allowed under the legal environment. Therefore, the environmental supervision behavior of institutional investors has been urged strongly, while the market competition is fierce, the signal of poor environmental responsibility will be transmitted to all sectors of society, which is not conducive to the protection of corporate reputation, institutional investors have to be forced to strengthen supervision, which is in the pressure of resisting reputation Institutional investors have a more obvious manifestation. In model 6, the coefficient of interaction between the investor-holding and market-oriented index of the pressure-resisting institutional investor is positive and significant at 5%, indicating that the faster the marketization process, the superior rule of law environment can effectively protect its supervision behavior. This made the overwhelming pressure of resisting institutional investors more confident and motivated to monitor corporate environmental protection behavior, and Hypothesis 5 was also effectively verified. The results of model 5 show the coefficient of the interaction term between the pressure-sensitive institutional investors and the marketization index, which is small and insignificant, which is consistent with the description that the marketization process in our hypothesis 4 will not have any regulating effect on the environmental responsibility bearing effect of the pressure-sensitive institutional investors.

Table 2 Variable regression coefficients of model 4, 5 and 6

| VARIABLES | (4) | (5) | (6) |
|-----------|-----|-----|-----|
| Ins*market | 0.015* |     |     |
| Insse*market |     | 0.000 |     |
| Insre*market |     |     | 0.010** |
| Year      | Control | Control | Control |
| Indus     | Control | Control | Control |
| Obs       | 2870 | 2870 | 2.870 |
| Adj R-squared | 0.073 | 0.067 | 0.067 |
| F         | 12.73 | 11.69 | 11.70 |
5. Conclusions and implications
This paper draws the following conclusions through empirical research:

(1) institutional investors’ shareholding has a negative impact on enterprises' undertaking of environmental responsibility. Compared with pressure-resistant institutional investors, pressure-sensitive institutional investors have a more prominent negative impact.

(2) the marketization process has weakened the negative effect of institutional investor ownership on corporate environmental responsibility. But this does not apply to pressure-sensitive institutional investors.

Environmental protection is the responsibility that every enterprise must fulfill. Based on the research conclusions of this paper and the reality of China's capital market and corporate environmental protection, this paper puts forward the following policy suggestions:

(1) China should appropriately control the development speed of institutional investors, adjust the proportion of institutional investors and improve the capital market structure. We will encourage pressure-resistant institutional investors to invest, and increase their willingness and ability to take on environmental responsibilities. To improve the pressure-sensitive type and investors’ investment intention, and guide them to establish the concept of combining long-term and short-term investment so as to obtain great long-term value. And improve the media supervision mechanism, supervision of management behavior, promote enterprises to better assume environmental responsibility.

(2) we should make full use of the advantages of market economy, accelerate the marketization process, improve the supervision and regulation of institutional investors, optimize their governance environment, and enhance the discourse power of institutional investors in corporate governance. And implementation of laws and regulations related to environment, restrain the behavior of enterprise management not to fulfill the environmental responsibility. It is required to regularly disclose the information on the environmental responsibility of the enterprise, and reward and criticize the enterprises with excellent environmental performance and unsatisfactory results, thereby reducing the supervision cost of institutional investors to a certain extent, and promoting the improvement of the supervision mechanism of institutional investors in China.

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