Institutional Investors' Corporate Site Visits and Heterogeneous Innovative Investment

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ABSTRACT

Institutional investors' site visits have gained increasing attention as a means of communication with listed companies. However, their impact on decision-making remains unclear, particularly in innovative investment. To address this gap, this study evaluates the influence of institutional investors' site visits on heterogeneous innovative investment in Chinese firms listed on the main board of the Shenzhen Stock Exchange. Specifically, we examine the effect of site visits on R&D expenses, measuring corporate innovation. Our findings reveal a significantly positive relationship between institutional investors' site visits and corporate innovation. Additionally, these visits significantly promote a company's investment in exploratory innovation in the subsequent year, while their impact on exploitative innovative investment is insignificant. Furthermore, our analysis demonstrates that the promotion effect of institutional site visits on heterogeneous innovative investment is more pronounced in companies with non-state-owned property and poor corporate governance. This paper contributes to the literature by shedding light on institutional investors' site visits to acquire information and influence corporate innovative investment, particularly in different innovation activities. Moreover, it provides new insights into encouraging private enterprises and those with lower governance levels to improve innovation investment, thereby enhancing their core competitiveness.

Keywords: Institutional investors' site visits, Heterogeneous innovative investment, Property rights, Corporate governance

1. Introduction

In today's fiercely competitive market, managing a firm's knowledge assets is as crucial as managing its finances, as modern enterprises increasingly vie for market share by creating and utilizing knowledge Fields [1]. Corporate innovation has garnered significant attention as a vital activity for knowledge creation and utilization. Engagement in innovative activities enables companies to revitalize their operations, generate new revenue streams, and enhance shareholder value [2]. Furthermore, creative activities can help companies alleviate competitive pressures from technological advancements and the global market, enabling them to identify market opportunities ahead of competitors and capture market share [3]. However, compared to standard business operations, innovation activities necessitate substantial investment and entail higher uncertainty.

Holmstrom argues that innovation involves a high probability of failure due to its long, distinctive, and unpredictable process [4]. Delays in innovation investment can impact market sentiment and, consequently, corporate operations. Therefore, investment decisions in corporate innovation are influenced by internal factors, such as financial performance, and external factors, such as market performance.

Institutional investors are a crucial communication channel between listed companies and the market. Their size and resources afford them significant influence over various aspects of listed companies, including operations and financial strategies. Consequently, institutional investors' site visits may influence listed companies' decisions on innovation investment. We posit that institutional investors' site visits may impact these decisions in two ways. Firstly, such visits can alleviate information asymmetry between the market and the company. By engaging in face-to-face communication with company managers, institutional investors can obtain valuable information about the company's innovative activities, thus increasing investor confidence, reducing focus on short-term interests, and guiding attention toward the company's long-term value [5,6]. This acquired information enables investors to understand better and tolerate short-term failures, thereby improving managers' incentives to innovate [7]. Secondly, professional institutional investors can advise company executives effectively, offering industry insights and suggestions on innovative investment.

As we delve into the temporal dimension, investment in innovation activities can be categorized into short-term and long-term responses, aligning with exploitative and exploratory innovation. The uncertainties inherent in a company's exploratory and exploitative innovation processes differ, as do the potential profits they yield. Exploratory innovation, characterized by lengthy cycles and high risks, can lead to significant market share capture and subsequently impact a company's performance upon successful implementation. Conversely, the risks and benefits associated with exploitative innovation are more conservative. Utterback [8] emphasizes the critical role of management in balancing support for new and established innovations. Hoskisson et al. [9] highlight those different types of corporate innovation present distinct strategic opportunities for the firm, exploring the company's choice between internal and external innovation strategies. Whether institutional investors' visits influence listed companies' short-term or long-term innovation investment decisions remains to be determined.

To address these considerations, our research will focus on Chinese firms listed on the main board of the SZSE. First, we will investigate the impact of institutional investors' site visits on the innovation investment decisions of listed companies, examining whether these visits influence short-term (exploitative) or long-term (exploratory) innovation investment decisions. Given the unique characteristics of Chinese companies, we will also assess the effects of company property and governance on the relationship between institutional visits and heterogeneous innovative investment. Our assessment of institutional investors' site visits on heterogeneous innovative investments will be measured through R&D expenses. Our findings reveal a significantly positive relationship between institutional investors' site visits and corporate innovation, consistent with Jiang and Yuan's results [7].

Furthermore, these visits significantly promote companies' investment in exploratory innovation in the subsequent year. In contrast, their impact on exploitative innovative investment in the following year is insignificant. Notably, our analysis indicates that the promotional effect of institutional site

visits on heterogeneous innovative investment is particularly pronounced in companies with non-state-owned property and poor governance.

This study contributes to the literature in several ways. First, it sheds new light on institutional investors and innovative corporate investment by examining the importance of institutional investors' corporate site visits as a crucial information acquisition channel. Second, it extends the literature on heterogeneous innovative investment, focusing on corporate innovation investment, particularly in different innovation activities, as opposed to the traditional emphasis on innovative output such as patents [7,10,11,12,13]. Finally, our findings suggest that institutional investors' visits offer new possibilities for encouraging private enterprises and those with low governance levels to enhance innovation investment, presenting a novel approach to bolstering the core competitiveness of small and medium-sized enterprises.

2. Literature Review and Hypothesis Development

2.1 Literature Review

2.1.1. Literature on heterogeneous innovative investment

Corporate innovation involves commercial research and development aimed at addressing product obsolescence, a critical challenge for modern enterprises due to the accelerating pace of technological change [4]. To maintain market position, enterprises have increasingly prioritized innovation as essential for economic growth and productivity improvement. Empirical studies have demonstrated the positive and significant long-term impact of R&D expenditure on economic growth in developed and developing countries. Moreover, R&D stimulates innovation and technology transfer. However, corporate innovation is a complex, lengthy, and unpredictable process with a high probability of failure [4].

Regarding innovative investment measurements, Rana and Rudra use various indicators such as patents, R&D expenditure, researchers in R&D activities, high-technology exports, and scientific and technical journal articles [14]. Previous literature has classified innovation investment into exploratory and exploitative innovation, each with distinct effects. March highlights the substantial differences between these two types of innovation [15]. Gao and Hsu find that public firms' patents rely more on existing knowledge and are more exploitative, while private firms' patents are more exploratory [16]. Yan also categorizes innovative investment into exploratory and exploitative, exploring the impact of individual relational capital [17]. Furthermore, other studies have explored innovative investment from perspectives such as public R&D and private R&D, core-R&D and non-core R&D, and the impact of government's R&D tax credits on private R&D investment and the study of FDI in R&D [18,19].

This paper adopts Jose I. Galan's approach, using R&D as a variable to measure innovative corporate investment, classifying it into research and development components [20]. Research activities and development activities differ in features and prospects. Exploratory innovation involves discovering, creating, and pursuing new knowledge and products, while exploitative innovation refers to improving, implementing, and extending existing knowledge and outcomes [21]. The company's investment in 'Research' activity represents an exploratory innovative investment, leading to a market revolution. In contrast, the 'Development' activity represents exploitative innovation, aiming to

enhance the original product portfolio. Exploratory innovation is time-consuming and uncertain but significantly improves corporate performance upon success, while exploitative innovation is shorter and safer, with a relatively smaller contribution to corporate performance.

2.1.2. Literature on institutional investors' corporate site visits (CVs)

Corporate site visits, involving investors' field trips to corporate headquarters and operational environments, play a pivotal role in gathering information about a company [22]. These visits allow investors to observe firms' operations and engage in discussions with managers, thereby bridging the information gap between external investors and firm managers and enhancing the company's transparency [23]. Research by Han and Kong demonstrates that analysts conducting private interactions with company management gain informational advantages [24]. At the same time, Cheng finds that analysts conducting visits exhibit higher forecasting accuracy than their counterparts [6]. Consequently, conducting corporate site visits often enables investors to understand a company's value better.

While all investors have the prerogative to request site visits to listed firms, individual investors seldom undertake such visits due to the associated efforts and expenses [7]. In contrast, institutional investors, known for their professionalism, are more inclined to conduct comprehensive and reliable site visits. Subsequently, institutional investors communicate their findings to external investors through reports or market operations. The Shenzhen Stock Exchange's 2009 requirement for listed companies to disclose their investor reception recordings in regular reports has contributed to the availability of site visit information to the public, addressing the dearth of data on institutional investors' corporate site visits. Furthermore, the 2012 mandate for listed companies to disclose their investor relations activity records on the SZSE website has standardized the disclosure of investors' activities, amplifying attention to investor research activities across various sectors. As a result, academic interest in topics related to listed companies on China's SZSE has surged.

A substantial body of literature has explored the impact of corporate site visits on the market. Cheng and Du [5] reveal a significant association between site visits and market reactions using Shenzhen-listed companies as a dataset. Gao et al. [25] corroborate this, highlighting the influence of institutional investors' site visits on market responses by analyzing the bad-news-hoarding intensifying effect and the bad-news-hoarding constraining effect of these visits. Qi et al. [26] found through their analysis of the impact of different types of investors on corporate innovation that institutional investors, aiming to achieve long-term returns, will fully leverage their advantages in expertise and information acquisition, combining the experience of their expert teams and private information to advise and encourage business operators to engage in research and development innovation. Additionally, research has delved into the impact of investor days as a new disclosure medium between management and investors [27] and the advantages of private meetings between management and investors in enhancing informational benefits [28]. Drawing on Jiang and Yuan [7], this article examines the impact of institutional investors' corporate site visits on corporate investment in innovation from the perspective of the surveyed company.

2.2. Hypothesis Development

Corporate innovation is inherently uncertain, as it involves exploring new and untested

approaches that may only sometimes yield immediate success. In pursuing short-term gains, executives may be inclined to forgo corporate innovation. Graham et al. [29] surveyed 401 financial executives, revealing that 78% of respondents were willing to sacrifice economic value for a smooth return. Meanwhile, 55% prioritized expected returns over long-term positive net present value plans. Encouraging enterprises to innovate necessitates investor tolerance for current returns in anticipation of future gains [30]. Manso [31] contends that an optimal incentive scheme to motivate innovation should include substantial tolerance for early failure and rewards for long-term success. Guiding investors to focus on long-term and intrinsic value can foster corporate innovation, and institutional investors' site visits serve this purpose. Based on the theory of contracts, if the information asymmetry between investors and companies is reduced, the management activities of the operators become more transparent and open to investors, leading to the formation of a contractual spirit between the operators and shareholders, thereby strengthening mutual trust. Based on the interpreted information, investors can see the contribution and efforts of the operators in innovative activities, enabling effective evaluation of the operators. This helps avoid attributing the occasional nature of innovation benefits to the inaction of the operators and fosters a greater tolerance for the results of innovation failure, thereby stimulating the innovative drive of the operators.

Furthermore, to mitigate financial constraints, investment in research and development (R&D) is a critical driver of companies' long-term viability [32]. When there is information asymmetry, external stakeholders struggle to evaluate innovative projects' potential investment value accurately. Consequently, companies encounter significant financial restrictions and work to secure essential funding for innovation [33]. Post site visits, institutional investors convey signals to the market through analytical reports or transaction behaviors, indicating that the surveyed companies' innovative R&D will yield long-term intrinsic value, which contributes to alleviating the company's financial constraints and enabling it to sustain its innovation endeavors. This assertion is supported by existing research. For instance, Panayides and Ellul [34] suggest that analysts enhance market quality through communication with insiders on firms' information. At the same time, Yu finds that financial analysts reduce information asymmetry and serve as external monitors for firms, independent of other firm characteristics.

In summary, institutional investors' site visits may facilitate increased company investment in R&D by mitigating excessive focus on short-term performance. This forms the basis for the first testable hypothesis (H1A). Specifically, 'Research' activities require external understanding to motivate continued corporate investment due to their higher uncertainty and potential for failure. Therefore, we propose the hypothesis (H1B) that institutional investors' site visits notably promote company investment in exploratory innovation. In contrast, as an exploitative innovation, investment in 'Development' is less affected by external factors. As Hirshleifer [35] discovered, rational managers prefer 'Development' in R&D over riskier but more promising innovation projects, as it is often more reliable. This leads to the formulation of H1C.

H1A: Institutional investors' site visits will promote companies' total innovative investment.
H1B: Institutional investors' site visits will promote companies' exploratory innovative investment.
H1C: Institutional investors' site visits will not promote companies' exploitative innovative investments.

The emphasis corporate executives place on institutional investors' site visits significantly influences the effectiveness of such visits. Proactive managers who arrange site visits are more forthcoming in addressing researchers' inquiries and providing comprehensive insights into the company's situation. Existing literature suggests that managers of state-owned enterprises often pay less attention to the company's strategy and lack initiative in communicating the company's operational conditions and future development. Crain and Zardkoohi [36] use examples from U.S. water companies to demonstrate significantly higher operating costs in publicly owned water companies.

The inefficiency of state-owned enterprises primarily stems from managerial constraints, leading operators to prioritize political influence. Shleifer and Vishny [37] highlight that officials often prioritize their political interests over social or economic performance, resulting in inefficiencies due to political pressure. This low level of self-control in state-owned companies leads to less emphasis on long-term strategies, reduces innovation focus, and limits the incentive to communicate R&D information to investors. Lioukas [38] suggests a negative relationship between perceived state control intensity and enterprise innovativeness. Additionally, Lin finds that companies providing CEOs with substantial equity and performance pay are more inclined to invest in R&D [39]. Based on this analysis and the hypothesis of H1A, we propose the following hypotheses:

H2A: Institutional investors' site visits to state-owned enterprises negatively impact total corporate innovative investment.

H2B: Institutional investors' site visits to state-owned enterprises negatively impact corporate investment in exploratory innovation.

H2C: The positive impact of institutional investors' site visits on corporate investment in exploitative innovation shows no significant difference between state-owned and non-state-owned enterprises.

Furthermore, the corporate governance level is another factor likely to influence the promotion of institutional investors' site visits on corporate innovation. The primary purpose of corporate governance is to ensure that the suppliers of finance to corporations can be repaid and obtain returns [40]. Innovative activities may encounter random setbacks, requiring considerable time for cost recovery. These characteristics dissuade companies with weaker corporate governance from engaging in innovation. However, institutional investors can closely observe managers' behavior and firms' operations during site visits, thereby enhancing monitoring and improving managers' incentive to innovate [7]. Therefore, for companies with weaker governance, site visits can bolster managers' confidence and encourage innovation, particularly in exploratory endeavors. Conversely, companies with stronger governance are more likely to innovate due to stable income and are less influenced by outside investors. These analyses lead to the following testable hypotheses (H3):

H3A: Innovative investment in companies with weaker governance will be more promoted by institutional investors' site visits.

H3B: Exploratory innovative investment in companies with weaker governance will be more promoted by institutional investors' site visits.

H3C: The relationship between exploitative innovative investment and corporate governance shows no significant association.

3. Methodology

3.1. Sample and Data

Our study encompasses all listed companies on Shenzhen A-shares from 2012 to 2017 as

samples. The six-year R&D data of these companies are collected as variables for innovative investment, with R&D investment categorized into research phase (R) and development phase (D) investments based on the "Accounting Standards for Business Enterprises". Data on institutional investors' site visits are manually collected and compiled from the 'Investor Relations Activity Record' disclosed in the company's annual report, encompassing site visits, specific target research, and performance description meetings. Other relevant financial data are sourced from CSMAR and Wind databases.

After removing financial companies, insolvent companies, and those without any R&D investment over the six years, the retained sample comprises 2,082 companies. To mitigate the impact of extreme values, all continuous variables are minorized at the 1% and 99% levels. Industry and year dummies are added to control for industry and year-fixed effects. Additionally, to avoid the impact of aggregation effects on standard errors at the company level, our analysis is based on standard errors clustered by firm.

3.2. Variables Definition

3.2.1. Corporate heterogeneous innovative investment

In line with Xiao Hailian et al. [41], this study measures corporate heterogeneous innovative investments using different stages of R&D expenditures. The research phase (R) expense represents the company's exploratory innovative investment, the development phase (D) expenditure signifies the company's exploitative innovative investment, and the total R&D expenditure reflects the total innovative investment. The regression analysis utilizes the natural logarithms of these innovative investments. To address zero values, one is added to the original amount when calculating the natural logarithm (Ln(RD+1), Ln(R+1), Ln(D+1)).

3.2.2. Institutional investors' site visits

The institutional investors' corporate site visits (CV) measure the number of institutional investors' site visits received by a company on the Shenzhen A-shares market in a given year, encompassing on-site visits, specific target surveys, performance briefings, investor meetings, and exchanges. The natural logarithm of the statistical data (Ln(CV+1)) is used for regression.

3.2.3. Control variables

Following Jiang and Yuan [7], a series of control variables affecting corporate heterogeneous innovative investment are included in our regressions. These variables cover the company's basic status (Size, Age, PPE), financial status (Lev, Roa, Octa), and corporate governance (Ins, First, Soe, Mhold). Tobinq represents the company's future investment opportunities. Ins and Year are variables that control the industry and year-fixed effects in the regression. The definitions of these variables are presented in the following table.

Table 1. Control variables and their definitions

Control variables	Definition
Size	Natural logarithm of firm's book value of assets
Lev	Total debt over total assets
Roa	Net income over total assets

Control variables	Definition
Tobinq	(Market value of equity at the end of year + book value of debt) / book value of assets
Octa	Net cash flow from operations over total assets
PPE	Fixed assets divided by total assets
Ins	Sum of shareholdings of institutional investors
First	Shareholding ratio of the largest shareholder
Age	Natural logarithm of one plus the number of years that firm has been listed on a stock exchange
Soe	Dummy variable, taking the value of 1 for state-owned enterprises and 0 for non-state-owned enterprises
Mhold	The sum of shares held by all directors, supervisors, and senior managers divided by the total shares
Ind	The dummy variables used to control industry fixed effects which are classified based on the CSRC's industry classifications issued in 2012.
Year	The dummy variables used to control year fixed effects

Source: By authors.

3.3. Empirical Models

To examine Hypothesis 1, we establish three regression equations utilizing total innovative investment (Ln(RD+1)), exploratory innovative investment (Ln(R+1)), and exploitative innovative investment (Ln(D+1)) as dependent variables, with institutional investors' site visits (Ln(CV+1)) as the independent variable, alongside other control variables mentioned earlier. We estimate the following models:

$$H1A: Ln(RD+1) = \beta 0 + \beta 1 * Ln(CV+1) + control\ variables$$
$$H1B: Ln(R+1) = \beta 0 + \beta 1 * Ln(CV+1) + control\ variables$$
$$H1C: Ln(D+1) = \beta 0 + \beta 1 * Ln(CV+1) + control\ variables$$

Here, i indexes the firm, and t indexes time. Notably, the variable of innovative investment uses the period (t+1), which is one year behind all other variables at period t. We hypothesize that institutional investors' site visits have contributed to varying degrees of total and heterogeneous innovative investments. Accordingly, it is expected that the coefficients β1 in the above models, representing the relationship between various types of innovative investments and CVs, are positive and of different magnitudes.

4. Empirical Results and Discussion

4.1. Descriptive Statistics and Correlation Analysis

Table 2 illustrates a relatively even distribution of company samples each year, with approximately 60% of the total sample being site-visited by institutional investors annually. This proportion remains stable over time. Descriptive statistics in Table 3 reveal that, on average, institutional investors' site visits per company per year were approximately 4 times in the full sample and about 6 times in the visited sample. These statistics underscore the commonality and value of institutional investors' site visits in listed companies, bolstering the persuasive power of utilizing this sample to explore the impact of site visits on heterogeneous innovative investment.

Table 4 reports the descriptive statistics of the variables used in our analyses. The mean value of the total innovative investment (Ln(RD+1)) is 14.3959, closely aligned with the mean value of exploration innovative investment (Ln(R+1)) at 14.1700, while significantly differing from the average value of exploitative innovative investment (Ln(D+1)) at 3.6712. This suggests that exploration-based innovative investment accounts for a relatively large proportion of the company's heterogeneous innovative investment. The substantial standard deviations of the various types of innovative investment indicate wide variations and significant fluctuations in each company's innovative input, thereby underscoring the significance of analyzing their influencing factors.

The correlation coefficients in Table 5 indicate that there is no serious multicollinearity in the model, with Ln(CV+1) exhibiting significant positive correlations with Ln(RD+1), Ln(R+1), and Ln(D+1) at the 1% level. This preliminary verification supports Hypothesis 1, indicating that institutional investors' site visits can promote company investment in heterogeneous innovation. Furthermore, the high correlation (0.976) between Ln(RD+1) and Ln(R+1), along with the positive and significant correlation at the 1% level, suggests that exploration innovative investment has a substantial impact on total innovative investment and aligns with its directional changes. Conversely, the correlation between exploitative and total innovative investment is smaller, aligning with the initial hypothesis (H1) that the impacts of site visits on heterogeneous innovative investment differ. Moreover, the Variance Inflation Factor (VIF) values, as shown in Table 6, are all much smaller than 10, confirming the absence of multicollinearity.

Table 2. Sample distribution

Year	Number of samples	Number of companies site visited by institutional investors	Proportion
2012	324	210	64.81%
2013	333	198	59.46%
2014	331	212	64.05%
2015	331	213	64.35%
2016	329	204	62.01%
2017	434	270	62.21%

Source: By authors.

Table 3. Descriptive statistics of CVs

Sample	Mean	Std dev	25th pctl.	Median	75th pctl.
Full sample	3.9731	7.5049	0	1	5
Site-visited sample	6.3444	8.6543	2	4	8

Source: By authors.

Table 4. Descriptive statistics for the other variables

Variables	N	Mean	Std dev	25th pctl.	Median	75th pctl.
Ln(RD+1)	2082	14.3959	7.0678	14.4998	17.3285	18.7090
Ln(R+1)	2082	14.1700	7.1558	14.3909	17.1746	18.5790
Ln(D+1)	2082	3.6712	6.9792	0.0000	0.0000	0.0000

Ln(CV+1)	2082	1.0110	1.0068	0.0000	0.6931	1.7918
Size	2082	22.4827	1.4285	21.6458	22.4385	23.3489
Lev	2082	0.5110	0.2063	0.3534	0.5264	0.6714
Tobinq	2082	3.9557	32.3849	1.2514	1.6943	2.6849
Octa	2082	0.0856	2.3648	0.0034	0.0302	0.0610
Roa	2082	0.0837	2.3648	0.0080	0.0240	0.0500
PPE	2082	0.2404	0.1905	0.0900	0.1937	0.3528
Ins	2082	0.4315	0.1992	0.2874	0.4247	0.5728
First	2082	0.3293	0.1527	0.2137	0.3000	0.4231
Age	2082	2.9142	0.2189	2.8332	2.9444	3.0445
Soe	2082	0.6078	0.4882	0.0000	1.0000	1.0000
Mhold	2082	0.0112	0.0600	0.0000	0.0000	0.0007

Source: By authors.

Table 5. The correlation coefficients

	LnRD	LnR	LnD	LnCV	Size	Lev	Roa	Tobinq	Octa	PPE	Ins	First	Age	Soe
LnR	0.978	-												
LnD	0.315	0.254	-											
LnCV	0.248	0.243	0.136	-										
Size	0.231	0.220	0.113	0.465	-									
Lev	-0.043	-0.054	-0.033	0.064	0.333	-								
Roa	0.075	0.077	0.013	0.215	0.111	-0.311	-							
Tobinq	-0.115	-0.111	-0.041	-0.168	-0.549	-0.227	-0.00	-						
Octa	0.079	0.086	0.012	0.148	0.031	-0.329	0.735	0.024	-					
PPE	0.056	0.069	-0.106	-0.023	0.099	0.041	-0.133	-0.144	0.091	-				
Ins	0.092	0.098	-0.039	0.299	0.359	0.031	0.207	-0.132	0.150	0.013	-			
First	0.003	0.007	-0.120	0.153	0.309	0.135	0.069	-0.176	0.052	0.102	0.455	-		
Age	-0.112	-0.108	-0.025	-0.080	-0.044	-0.126	0.032	0.146	0.003	-0.134	0.022	-0.087	-	
Soe	0.171	0.179	0.039	0.168	0.271	0.096	-0.060	-0.266	0.032	0.234	0.200	0.176	-0.102	-
Mhold	-0.006	-0.032	0.082	0.007	-0.014	-0.075	0.071	0.081	0.027	-0.086	-0.090	-0.109	0.027	-0.232

Source: By authors.

Table 6. VIF value

Variable	VIF	1/VIF
Roa	5.420	0.184
Octa	5.260	0.190
Size	2.200	0.454
Tobinq	1.600	0.625
Ins	1.490	0.671
Lev	1.380	0.724
First	1.360	0.736
Ln(CV+1)	1.350	0.741
SOE	1.290	0.776
PPE	1.260	0.791
AGE	1.100	0.912
Mhold	1.080	0.922
Mean	VIF	2.070

Source: By authors.

4.2. Main Regression Results

To verify Hypothesis 1, we conducted multiple regression analyses, adding other variables influencing the company's heterogeneous innovative investment. The results in Table 7, columns (1), (4), and (7) present the regression outcomes for the three models of total innovative investment, exploration-based innovative investment, and exploitative innovative investment with respect to institutional investors' site visits (CVs). Column (1) reports a significant positive coefficient (0.569) between institutional investors' site visits and total innovative investment, indicating that such visits promote companies' investment in innovation. Similarly, the positive and significant correlation between CVs and exploratory innovative investment in column (4) suggests that institutional investors' site visits significantly impact the company's exploration-based innovative investment. Notably, the Ln(R+1) (0.606) coefficient indicates that a one-standard-deviation increase in institutional investors' site visits is associated with an 8.53% increase in corporate exploratory innovative investment, ceteris paribus. However, the results in column (7) indicate that while the coefficient of CVs and exploitative innovative investment is positive, it is not significant, suggesting that institutional investors' site visits have not significantly contributed to corporate exploitative innovative investment. These findings align with Hypothesis 1.

In the hypothetical model, we measured corporate heterogeneous innovative investment one year behind CVs and other independent variables to mitigate potential selection issues where institutional investors might choose to visit companies expected to increase innovation. Despite this correction, potential endogeneity issues remain. To address this, we employed two-stage Least Squares regression (2SLS) on three models using two instrumental variables (Analyst) and (Trans) to correct for potential endogeneity between institutional investors' site visits and corporate heterogeneous innovative investment. Both variables are expected to correlate with site visits but not heterogeneous innovative investment. The results of the 2SLS analysis, presented in columns (2), (3), (5), (6), (8), and (9) of Table 7, indicate that the instrumental variables are significantly positively correlated with

CVs and are not weak instruments, as evidenced by the overidentification test (Sargan statistic). The second-stage regression results in columns (3) and (6) show that the coefficients of Ln(CV+1) are significantly positive at the 1% level, reinforcing the findings in columns (1) and (4). However, the coefficient of Ln(CV+1) in the 2SLS analysis in column (9) is insignificant, indicating that institutional investors' site visits are positively related to corporate total innovative investment and the exploratory component, even after controlling for potential endogeneity concerns. Nevertheless, after controlling for endogeneity, CVs still have no significant impact on corporate exploitative innovative investment. The significantly positive coefficient of Size supports He and Tian's argument [10], while the positive and significant coefficient of Soe is consistent with the findings of Jiang and Yuan [7].

Table7. Main regression results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	2SLS		OLS	2SLS		OLS	2SLS	
	Model1	First	Second	Model2	First	Second	Model3	First	Second
VARIABLES	F.Ln(RD+1)	Ln(CV+1)	F.Ln(RD+1)	F.Ln(R+1)	Ln(CV+1)	F.Ln(R+1)	F.Ln(D+1)	Ln(CV+1)	F.Ln(D+1)
Ln(CV+1)	0.569***		1.560***	0.606***		1.548***	0.167		1.073
	(0.171)		(0.516)	(0.174)		(0.517)	(0.196)		(0.865)
Size	1.307***	0.151***	0.747***	1.291***	0.151***	0.713***	0.701**	0.151***	0.793
	(0.265)	(0.0427)	(0.272)	(0.265)	(0.0427)	(0.270)	(0.317)	(0.0427)	(0.483)
Lev	-1.036	0.107	-1.401	-1.509	0.107	-1.699	-0.920	0.107	-1.345
	(1.185)	(0.153)	(1.083)	(1.183)	(0.153)	(1.081)	(1.253)	(0.153)	(1.650)
Roa	-2.056	-1.240	-4.076	-1.888	-1.240	-3.142	-5.317	-1.240	-18.121
	(10.494)	(1.106)	(10.780)	(10.306)	(1.106)	(10.619)	(8.605)	(1.106)	(12.155)
Tobinq	0.044	0.00615	-0.108	0.064	0.00615	-0.108	0.098	0.00615	0.074
	(0.107)	(0.0115)	(0.097)	(0.097)	(0.0115)	(0.093)	(0.099)	(0.0115)	(0.124)
Octa	5.332	1.038	6.497	5.495	1.038	5.903	4.014	1.038	15.417
	(11.020)	(1.030)	(12.449)	(10.830)	(1.030)	(12.232)	(8.532)	(1.030)	(11.212)
PPE	-1.393	-0.576***	-1.650	-1.198	-0.576***	-1.259	-0.094	-0.576***	-5.957***
	(1.421)	(0.192)	(1.346)	(1.419)	(0.192)	(1.337)	(1.523)	(0.192)	(2.213)
INS	-0.101	0.248	-0.526	-0.058	0.248	-0.474	0.582	0.248	-1.371
	(0.943)	(0.163)	(1.166)	(0.949)	(0.163)	(1.162)	(1.051)	(0.163)	(1.658)
First	-1.786	-0.178	-1.133	-1.718	-0.178	-0.977	-5.639**	-0.178	-6.260***
	(1.776)	(0.240)	(1.691)	(1.787)	(0.240)	(1.688)	(2.195)	(0.240)	(2.236)
AGE	0.534	-0.0470	0.452	0.337	-0.0470	0.620	-1.601	-0.0470	-1.806
	(1.604)	(0.271)	(1.446)	(1.599)	(0.271)	(1.457)	(2.656)	(0.271)	(2.934)
SOE	0.815*	0.0587	0.911**	0.931*	0.0587	0.999**	0.595	0.0587	0.548
	(0.480)	(0.0687)	(0.459)	(0.483)	(0.0687)	(0.460)	(0.684)	(0.0687)	(0.785)
Mhold	0.165	-0.112	-0.563	-2.539	-0.112	-3.856	14.096**	-0.112	13.992*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	2SLS		OLS	2SLS		OLS	2SLS	
	Model1	First	Second	Model2	First	Second	Model3	First	Second
VARIABLES	F.Ln(RD+1)	Ln(CV+1)	F.Ln(RD+1)	F.Ln(R+1)	Ln(CV+1)	F.Ln(R+1)	F.Ln(D+1)	Ln(CV+1)	F.Ln(D+1)
	(4.477)	(0.671)	(5.219)	(4.956)	(0.671)	(5.149)	(6.515)	(0.671)	(7.190)
Analyst		0.354***			0.354***			0.354***	
		(0.0335)			(0.0335)			(0.0335)	
Trans		0.145***			0.145***			0.145***	
		(0.0419)			(0.0419)			(0.0419)	
Constant	-14.037*	-2.790**	-2.456	-13.520*	-2.790**	-2.549	-2.401	-2.790**	-2.588
	(7.636)	(1.140)	(7.709)	(7.730)	(1.140)	(7.721)	(10.977)	(1.140)	(13.716)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580
R-squared	0.3126	0.376	0.309	0.313	0.376	0.311	0.068	0.376	0.110

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: By authors.

4.3. Robustness Tests (Dummy Variable for Institutional Investors' Corporate Site Visits)

To address potential measurement errors in institutional investors' corporate site visits, we re-estimate the models of Hypothesis 1 using a dummy variable to measure CVs, which is set to one if institutional investors make more than one site visit and zero otherwise. This approach also helps eliminate informative effects present in continuous CVs. The estimations presented in Table 8 involve two regression methods, OLS and 2SLS, yielding results similar to those in Table 7. The robustness test further confirms that institutional investors' corporate site visits have varying effects on heterogeneous corporate innovative investment, significantly promoting total and exploratory innovative investment while demonstrating no significant impact on investment in exploitative innovation.

Table8. Robustness tests

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	2SLS	OLS	2SLS	OLS	2SLS
VARIABLES	F.Ln(RD+1)	F.Ln(RD+1)	F.Ln(R+1)	F.Ln(R+1)	F.Ln(D+1)	F.Ln(D+1)
CVif	0.993***	3.766***	1.021***	3.738***	0.348	2.615
	(0.337)	(1.248)	(0.340)	(1.256)	(0.319)	(2.084)
Size	1.366***	0.859***	1.360***	0.824***	0.700**	0.867*
	(0.269)	(0.257)	(0.270)	(0.256)	(0.314)	(0.444)
Lev	-0.934	-1.229	-1.407	-1.528	-0.869	-1.224
	(1.199)	(1.120)	(1.199)	(1.120)	(1.256)	(1.678)
Roa	-2.296	-6.871	-2.115	-5.916	-5.388	-20.073*
	(10.392)	(10.890)	(10.204)	(10.736)	(8.592)	(12.122)
Tobinq	0.055	-0.054	0.077	-0.054	0.099	0.112
	(0.107)	(0.094)	(0.096)	(0.090)	(0.098)	(0.122)
Octa	5.897	9.568	6.087	8.950	4.152	17.541
	(10.917)	(12.531)	(10.724)	(12.315)	(8.524)	(11.184)
PPE	-1.500	-1.677	-1.314	-1.287	-0.128	-5.970***
	(1.426)	(1.364)	(1.421)	(1.351)	(1.523)	(2.206)
Ins	0.000	-0.508	0.062	-0.456	0.593	-1.365
	(0.917)	(1.176)	(0.924)	(1.171)	(1.035)	(1.673)
First	-1.765	-1.253	-1.708	-1.095	-5.585**	-6.340***
	(1.779)	(1.712)	(1.791)	(1.708)	(2.204)	(2.241)
Age	0.459	0.323	0.255	0.492	-1.637	-1.894
	(1.606)	(1.471)	(1.603)	(1.487)	(2.658)	(2.963)
Soe	0.831*	0.924**	0.947*	1.012**	0.603	0.556
	(0.481)	(0.470)	(0.485)	(0.472)	(0.687)	(0.788)
Mhold	-0.308	-2.373	-3.020	-5.651	13.970**	12.733*
	(4.427)	(5.506)	(4.922)	(5.528)	(6.489)	(7.227)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	OLS F.Ln(RD+1)	2SLS F.Ln(RD+1)	OLS F.Ln(R+1)	2SLS F.Ln(R+1)	OLS F.Ln(D+1)	2SLS F.Ln(D+1)
Constant	-15.302** (7.805)	-5.653 (7.627)	-14.974* (7.930)	-5.724 (7.656)	-2.415 (10.932)	-4.747 (13.282)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,580	1,580	1,580	1,580	1,580	1,580
R-squared	0.3104	0.2880	0.3104	0.288	0.0667	0.099

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: By authors.

4.4. Effect of Corporate Property

To test Hypothesis 2, we introduce the interaction term of Soe and Ln(CV+1) into the models, resulting in the following regression equation:

H2A:$Ln(RD+1)_{i,t+1} = \alpha + \beta_{1.1}Ln(CV+1)_{i,t} + \beta_{1.2}Soe * Ln(CV+1)_{i,t} + \beta_{1.3}Soe + \gamma * ControlVariables_{i,t} + \varepsilon_{i,t}$

H2B:$Ln(R+1)_{i,t+1} = \alpha + \beta_{2.1}Ln(CV+1)_{i,t} + \beta_{2.2}Soe * Ln(CV+1)_{i,t} + \beta_{2.3}Soe + \gamma * ControlVariables_{i,t} + \varepsilon_{i,t}$

H2C:$Ln(D+1)_{i,t+1} = \alpha + \beta_{3.1}Ln(CV+1)_{i,t} + \beta_{3.2}Soe * Ln(CV+1)_{i,t} + \beta_{3.3}Soe + \gamma * ControlVariables_{i,t} + \varepsilon_{i,t}$

The results in Table 9 indicate that Ln(CV+1) and Soe are significantly positive in the H2A and H2B models, aligning with the previous findings. Furthermore, the coefficients of the interaction terms are all significantly negative at the 5% level, suggesting that state-owned enterprises weaken the positive impact of CVs on the company's total innovative investment and exploration-based innovative investment. Notably, the coefficient of the interaction term is not significant for exploitative innovation. These findings support Hypothesis 2.

Table 9. Effects of corporate property

VARIABLES	(1) F.Ln(RD+1)	(2) F.Ln(R+1)	(1) F.Ln(D+1)
Ln(CV+1)	3.049***	2.960***	1.684
	(1.117)	(1.121)	(1.858)
Soe	3.335***	3.296***	1.548
	(1.182)	(1.171)	(1.822)
Soe*Ln(CV+1)	-2.423**	-2.296**	-0.999
	(1.023)	(1.026)	(1.733)
Size	0.837***	0.799***	0.831*
	(0.253)	(0.254)	(0.444)
Lev	-1.687	-1.969*	-1.463
	(1.076)	(1.075)	(1.629)
Roa	-6.493	-5.433	-19.115
	(10.667)	(10.556)	(12.066)
Tobinq	-0.052	-0.055	0.098
	(0.093)	(0.090)	(0.122)
Octa	9.034	8.307	16.465
	(12.186)	(12.009)	(11.066)
PPE	-2.117	-1.702	-6.152***
	(1.352)	(1.337)	(2.120)
Ins	-0.724	-0.662	-1.450
	(1.169)	(1.167)	(1.688)
First	-1.459	-1.286	-6.395***
	(1.682)	(1.689)	(2.216)
Age	0.557	0.720	-1.763
	(1.433)	(1.454)	(2.956)

VARIABLES	(1) F.Ln(RD+1)	(2) F.Ln(R+1)	(1) F.Ln(D+1)
Mhold	-1.927	-5.149	13.431*
	(5.403)	(5.397)	(7.378)
Constant	-6.234	-6.130	-4.164
	(7.320)	(7.370)	(12.985)
Year	Yes	Yes	Yes
Ind	Yes	Yes	Yes
Observations	1,580	1,580	1,580
R-squared	0.304	0.304	0.109

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: By authors.

4.5. Effect of Corporate Governance

To measure the level of corporate governance, this paper refers to Shi Donghui's Nankai management review method to build a corporate governance index [42]. Based on the score, we assign a value of one to CGI for companies above the average score, indicating a higher level of corporate governance, and zero to other companies, reflecting relatively poorer governance. We then interact with the level of corporate governance with $Ln_{(CV+1)}$ to obtain the following models:

H3A: $Ln(RD+1)_{i,t+1} = \alpha + \beta_{1.1} Ln(CV+1)_{i,t} + \beta_{1.2} Cgi + \beta_{1.3} Cgi * Ln(CV+1)_{i,t} + \gamma * ControlVariables_{i,t} + \varepsilon_{i,t}$

H3B: $Ln(R+1)_{i,t+1} = \alpha + \beta_{2.1} Ln(CV+1)_{i,t} + \beta_{2.2} Cgi + \beta_{2.3} Cgi * Ln(CV+1)_{i,t} + \gamma * ControlVariables_{i,t} + \varepsilon_{i,t}$

H3C: $Ln(D+1)_{i,t+1} = \alpha + \beta_{3.1} Ln(CV+1)_{i,t} + \beta_{3.2} Cgi + \beta_{3.3} Cgi * Ln(CV+1)_{i,t} + \gamma * ControlVariables_{i,t} + \varepsilon_{i,t}$

As shown in Table 10, among the three regression models, the coefficient of interaction terms in the total innovative investment model and the exploratory innovative investment model are both significantly negative at the 10% level. This suggests that institutional investors visiting companies with lower corporate governance levels are more likely to invest in total innovation and exploratory innovation, a phenomenon not observed in the models of exploitative innovative investment. These results are consistent with Hypothesis 3.

Table 10. Effects of corporate governance

VARIABLES	(1) model1 F.Ln(RD+1)	(2) model2 F.Ln(R+1)	(3) model3 F.Ln(D+1)
Ln(CV+1)	2.107***	2.097***	1.486
	(0.811)	(0.813)	(1.321)
Cgi	1.157	1.169	0.872
	(0.808)	(0.807)	(1.314)
Cgi*LnCV	-1.245*	-1.248*	-0.958

	(0.714)	(0.718)	(1.137)
Size	0.748***	0.714***	0.798
	(0.272)	(0.270)	(0.492)
Lev	-1.430	-1.727	-1.370
	(1.081)	(1.079)	(1.637)
Roa	-4.253	-3.344	-18.197
	(10.828)	(10.669)	(12.098)
Tobinq	-0.102	-0.102	0.079
	(0.097)	(0.093)	(0.121)
Octa1	6.049	5.471	15.040
	(12.432)	(12.218)	(11.096)
PPE	-1.304	-0.913	-5.695**
	(1.374)	(1.371)	(2.301)
Ins	-0.763	-0.710	-1.550
	(1.226)	(1.223)	(1.715)
First	-1.357	-1.196	-6.444***
	(1.696)	(1.692)	(2.216)
Age	0.337	0.504	-1.894
	(1.456)	(1.468)	(2.930)
Soe	0.934**	1.023**	0.564
	(0.465)	(0.466)	(0.791)
Mhold	-0.774	-4.084	13.869*
	(5.342)	(5.258)	(7.241)
Constant	-2.481	-2.567	-2.673
	(7.689)	(7.705)	(13.750)
Year	Yes	Yes	Yes
Ind	Yes	Yes	Yes
Observations	1,580	1,580	1,580
R-squared	0.301	0.303	0.109

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: By authors.

5. Conclusions

This study investigates the impact of institutional investors' site visits on heterogeneous SMarket from 2012 to 2017. Our findings reveal that institutional investors' site visits significantly enhance corporate innovation but influence heterogeneous corporate innovative investment differently. Specifically, site visits significantly promote the company's exploratory innovative investment (research activities). In contrast, for exploitative innovation (development activities), the impact of site visits is not substantial. We employ 2SLS regression and the variable substitution method for robustness testing to address endogeneity, reaffirming our conclusions.

Additionally, the positive effects are more pronounced for non-state-owned enterprises. These results suggest that institutional investors' site visits positively impact innovative investment in the subsequent period, particularly in creative research activities, with amplified performance in the private sector. In contrast, the impact on state-owned enterprises is less evident. Furthermore, we find that lower levels of corporate governance correspond to a greater tendency for companies to invest in

exploration-based innovation activities and total innovation activities following site visits.

Based on the results of the study, we can draw several strategic recommendations:

First, actively cooperate with institutional investors and provide more fieldwork opportunities to promote exploratory innovation investments. Firms can offer more fieldwork opportunities by establishing close partnerships with institutional investors to allow them to better understand the firm's innovation capabilities and potential. This helps institutional investors better assess an enterprise's innovation potential and thus more actively support its exploratory innovation investments.

Second, focus on exploratory innovation investments, especially projects that yield returns in the short term. The findings suggest that site visits by institutional investors can significantly boost firms' experimental innovation investments in the following year. Therefore, firms should focus on exploratory innovation investments, especially those projects that can yield returns in the short term. This can better attract the attention of institutional investors and obtain more financial support.

In addition, attention is paid to heterogeneous innovation investments, especially regarding non-state property and imperfect corporate governance. The study results show that institutional fieldwork's facilitating effect on heterogeneous innovation investment is more pronounced in firms with non-state property and poor corporate governance. Therefore, firms should pay special attention to innovation investment in these areas to fully utilize the fieldwork resources of institutional investors and obtain more financial support.

Finally, optimize the corporate governance structure and improve the management of non-state property. The research results show that non-state property and companies with poor corporate governance are more in need of support from institutional investors, which also means that these companies need better governance structures and management levels. Therefore, firms should optimize their corporate governance structure and improve the management level of non-state property to attract more attention and support from institutional investors.

In conclusion, enterprises can make full use of the fieldwork resources of institutional investors by cooperating with them, focusing on exploratory and heterogeneous innovation investment, optimizing the corporate governance structure, and improving the management level of non-state property to promote the development of enterprise innovation.

6. Research Outlook

Our study contributes to the literature on corporate innovation in several ways. Firstly, we examine the effects of institutional investors' site visits, a critical information acquisition activity in the market, on corporate innovation using unique site visit data in China. Secondly, unlike previous studies that primarily focus on innovative output using patents, we concentrate on the company's investment in innovation using R&D expenses and analyze the company's choice of creative activities. Moreover, we analyze heterogeneous innovative assets based on accounting standards and distinguish the input of different innovative activities by the composition of R&D expenses, thereby shedding light on the impact of site visits on managers' strategic selection for innovation. Lastly, we introduce the nature of enterprise equity and governance level as moderating variables, offering new insights for promoting the innovation behavior of private and small and medium-sized enterprises.

Additionally, our findings prove that site visits benefit the visited firms, particularly private companies, and SMEs, thereby extending the limited literature on corporate site visits [6,22].

However, our study has limitations that point to future research directions. Firstly, our sample selection may limit the generalizability of our findings. Future research could expand the sample to include all A-shares companies to verify the universality of institutional investors' visits in promoting innovation investment. Secondly, our study does not delve into the industries of our sample in detail, and future research could explore the effects of different sectors on innovative behavior, potentially combining the results with industrial development more effectively. Lastly, our study focuses solely on Chinese-listed companies, and future research could explore international contexts to draw more broadly applicable conclusions.

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