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Common institutional ownership and innovation efficiency: evidence from Chinese listed companies

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Abstract

Purpose – Common institutional ownership, as external shareholders associated with multiple companies in the same industry, have access to richer sources of information. As the phenomenon of shareholder linkage becomes more and more common in the securities market, it is of great practical significance to clarify the impact of mutual shareholding.

Design/methodology/approach – This paper empirically examines the relationship between common institutional ownership and firms' innovation efficiency, using a sample of all listed companies in China's Shanghai and Shenzhen A-shares from 2010 to 2023.

Findings – It is found that common institutional ownership can generate combined effects that improve corporate innovation efficiency. It is further found that the level of internal control and information environment play a positive moderating role in the above relationship. In addition, common institutional ownership has more significant effects on the innovation efficiency of enterprises with higher agency costs and non-state-owned enterprises.

Originality/value – This paper verifies the positive role of common institutional ownership in the decision-making of Chinese listed firms from the micro perspective of corporate governance, and also provides useful references for other emerging market countries to optimize the governance efficiency of institutional ownership and enhance the innovation capacity of firms.

Keywords Common institutional ownership, Corporate innovation, Internal control, Information environment

Paper type Research article

1. Introduction

Since 2006, institutional investors in China have entered a period of rapid development alongside the continuous improvement of the country's securities market. Recent studies highlight the growing significance of institutional investors as key participants in China's capital market, with a notable impact on the country's stock market (Ni and Jin, 2024). However, the unique multi-segment structure of the Chinese market may lead to significant differences in response patterns [1], characteristics, and mechanisms across various market segments, thereby exacerbating information asymmetry (Chung *et al*., 2013). Consequently, numerous institutional investors often maintain equity positions in several firms operating within the same sector (Yan and Ling, 2025). This strategy, aimed at diversifying risk and

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maximizing returns, has led to the rise of common institutional ownership (He and Huang, 2017). As external shareholders with holdings across several companies operating in the same sector, overlapping institutional owners benefit from broader access to proprietary information, enjoy lower search costs in acquiring such information, and typically possess greater monitoring capabilities and managerial expertise than institutional investors with isolated holdings (Bona-Sanchez *et al*., 2018). More importantly, their investment objective centers on maximizing overall portfolio gains rather than focusing on the outcomes of single enterprises. In cases where firms within the same industry engage in intense competition for limited market share—sometimes generating negative externalities—common institutional owners tend to mitigate such adverse spillovers. They do so by promoting the exchange of private information and scarce resources among their portfolio firms, thereby reducing information asymmetry and strengthening internal corporate governance.

It is worth noting, however, that common institutional ownership may also give rise to collusive alliances, thereby facilitating coordination or reducing competition among firms within the same industry. Previous research suggests that overlapping institutional ownership may enable tacit collusion among competing firms, thereby boosting industry-wide pricing power (Zhu *et al*., 2024). Moreover, common institutional owners, leveraging their informational advantage, might exploit private information for personal gain. Cui *et al*. (2025a, b) and Zhou *et al*. (2025) observe that these owners may have strong incentives to collude with corporate insiders, thereby harming investor interests or diminishing firm value. Evidently, this behavior can deteriorate the firm's information environment and hinder improvements in internal corporate governance. In light of the pervasive occurrence of common institutional ownership across today's market, it is both timely and important to explore its implications for corporate governance.

According to the National Innovation Index Report 2024, China scored 70.1 on the national innovation index, ranking 10th globally. However, this remains lower than leading innovation economies. The fundamental reason lies in the persistent weakness of Chinese firms' indigenous innovation capabilities (Wang *et al*., 2025). Existing studies typically attribute the insufficient innovation capacity of firms to issues rooted in the principal-agent framework. Specifically, within the institutional framework of modern enterprises—characterized by the separation of ownership and managerial control—managers may prioritize personal interests over maximizing shareholder value (Jensen and Meckling, 1976). Given contractual incompleteness, they often display risk aversion toward long-term, high-risk innovation initiatives, influenced by short-term performance pressures and promotion-driven incentives. This risk-averse behavior significantly undermines innovation efficiency. Lee and O'Neill (2003), along with O'Connor and Rafferty (2012), contend that governance mechanisms—especially those addressing agency conflicts—play a critical role in shaping a firm's technological innovation path. Supporting this view, research on Chinese listed firms has also shown that non-state ownership and equity-based incentives can reduce managerial moral hazard, thereby fostering greater engagement in innovative activities (Li *et al*., 2015; Liu *et al*., 2018).

The focus of this study is to examine if common institutional ownership can enhance innovation efficiency by reinforcing governance practices within Chinese companies. The focus on innovation efficiency stems from the fact that, under severe resource constraints, firms must convert limited innovation inputs into tangible outputs (Huang, 2023; Shi *et al*., 2020; Zhou *et al*., 2023). Moreover, driven by pressure from the international market, China's policy orientation has explicitly emphasized improving the overall effectiveness of the innovation system, prioritizing innovation efficiency as a central objective (Cai *et al*., 2020, 2023). From a monitoring cost perspective, common institutional ownership offers distinct advantages over other types of shareholders. These investors typically possess superior access to private information, greater managerial expertise, and extensive industry-specific knowledge, enabling them to identify managerial opportunism in a timely and effective manner (Koch *et al*., 2021). Moreover, firms within the same industry often operate under

comparable business models, environments, and regulatory frameworks. In this context, common institutional owners can promote information sharing across affiliated firms, thereby lowering the marginal cost of monitoring (Ramalingegowda *et al*., 2021). Regarding supervisory intensity, overlapping institutional owners frequently possess stronger influence over corporate decision-making, such as by nominating directors or shaping strategic initiatives (Edmans *et al*., 2019). When managers avoid value-enhancing innovation due to risk aversion or short-term incentives, common institutional owners can express dissent through shareholder meetings or board discussions, and may leverage governance tools—such as exit threats—to influence managerial behavior (He *et al*., 2019). Collectively, these mechanisms underscore the role of common institutional ownership as an effective governance tool for mitigating agency conflicts and strengthening firm-level oversight.

Unfortunately, although studies related to common institutional ownership and internal governance are relatively abundant (Ramalingegowda *et al*., 2021; Kang *et al*., 2016; Hope *et al*., 2017), they are basically focused on developed capital markets with more dispersed shareholdings and a higher degree of marketization. However, the operations of listed companies in China are vulnerable to administrative interference and a dominant one-share shareholding structure is prevalent. Within this distinct market environment, an open question remains: does common institutional ownership continue to function as an effective internal governance mechanism? This question is worth exploring. To explore this issue, this study adopts a principal-agent theory framework and utilizes a sample of Chinese A-share companies listed on the Shanghai and Shenzhen stock exchanges from 2010 to 2023 to examine the impact of common institutional ownership on corporate innovation. It further investigates how this relationship varies across different levels of internal control and information environments. The findings offer a theoretical foundation for assessing the governance role of common institutional ownership in China's capital market, while also underscoring its influence on firms' innovation decisions. Ultimately, the study aims to strengthen the innovation capacity of Chinese enterprises and provide theoretical guidance for sustainable economic development in other emerging economies.

The main contribution lies in extending the understanding of common ownership beyond mature capital markets (Kacperczyk *et al*., 2005; Kang *et al*., 2018). Chinese capital markets are experiencing a crucial stage in institutional transformation, marked by underdeveloped market mechanisms and an imperfect regulatory environment. These institutional shortcomings heighten internal governance challenges among Chinese listed firms, particularly in terms of managerial moral hazard and adverse selection. To address this gap, the present study develops a detailed measurement for shared institutional ownership across three dimensions: (1) the presence of overlapping ownership, (2) the degree of cross-firm linkage among institutional owners, and (3) the ownership concentration among shared institutional investors. By analyzing the governance effects of shared institutional ownership through the lens of horizontal inter-firm linkages, this study provides a novel, context-specific contribution to the existing literature.

2. Theoretical analysis and research hypothesis

2.1 Relevant studies on ownership of common institutions

Prior studies examining shared institutional ownership and corporate governance reveal two competing perspectives. The first view suggests that shared institutional ownership plays a constructive role, primarily through strengthened monitoring mechanisms. As external shareholders holding stakes in several companies within the same sector, overlapping institutional owners focus on maximizing value across the portfolio instead of the outcomes of individual firms (Hansen and Lott, 1996; Saona *et al*., 2025). According to Lee and Masulis (2011), long-term exposure to large public firms enables these owners to accumulate significant supervisory expertise and managerial insight. This information scale effect reduces monitoring costs and improves the detection of managerial opportunism, thereby

strengthening governance effectiveness. Beyond monitoring, common institutional ownership also enhances governance through resource coordination. Intra-industry competition often results in negative externalities that distort firm behavior (He and Huang, 2017). To optimize portfolio performance, common institutional owners facilitate information sharing and coordinated resource allocation among their portfolio firms (Khan *et al*., 2016). This not only mitigates harmful competitive spillovers but also lowers the cost of accessing private information, enabling more efficient decision-making. Furthermore, as influential market participants, common institutional owners often act as investment trendsetters. Their ability and incentive to disclose portfolio firms' operational and financial conditions help reduce disparities in information within the capital market, strengthen individual investors' confidence, and ease financing constraints.

The second line of argument posits that common institutional ownership may exert a detrimental effect on corporate governance (Khan *et al*., 2016). Prior studies have shown that such ownership structures can facilitate anti-competitive behaviors, such as coordinated pricing strategies, thereby enhancing industry-wide market power (Azar *et al*., 2018). Moreover, owing to their strategic positioning within industry networks—an advantage not shared by dispersed minority shareholders—common institutional owners can exploit private information to secure superior returns. Yet, paradoxically, a more transparent information environment may erode this advantage (Park *et al*., 2019). In response, these investors may have incentives to withhold or manipulate firm-level information, for instance through earnings management or selective disclosure. Such practices increase information asymmetry and reduce the quality of financial reporting, ultimately undermining internal governance effectiveness.

In summary, prior research concerning shared institutional ownership has mainly concentrated on developed capital markets and produced conflicting conclusions. This raises a critical question: does shared institutional ownership serve as an effective internal governance mechanism within China's emerging capital market? Given that China's corporate innovation capacity remains markedly lower than that of leading economies—and that Type I agency problems are a major contributor to this inefficiency—this study explores the influence of common institutional ownership on the innovation efficiency of Chinese firms. If such ownership can provide effective governance, it holds the potential to significantly enhance firms' innovation performance.

2.2 Agency problems and theoretical implications for corporate innovation

In modern corporate structures, Type I agency problems emerge from the misalignment of interests and objectives between shareholders and management (Jensen and Meckling, 1976). In settings characterized by contractual incompleteness, managers may pursue personal utility maximization to the detriment of long-term shareholder value. Given that innovation entails long development cycles and substantial uncertainty (Holmstrom, 1989), managers facing short-term performance pressures or career concerns often avoid engaging in high-risk, long-horizon R&D projects. This risk-averse behavior can significantly undermine a firm's innovation capability. Furthermore, information asymmetry theory (Akerlof, 1970) highlights that managers possess superior internal information relative to external shareholders, which exacerbates problems of adverse selection and ethical hazard—both of which can deter innovation efforts. The nature of innovation itself compounds these issues. First, innovation activities are often opaque and their outcomes uncertain, making it difficult for external monitors to observe or evaluate managerial effort effectively (Manso, 2011). Second, even when outcomes are observable, external investors may find it difficult to accurately evaluate the long-term value of innovation projects, which heightens perceived risk and raises the cost of capital. In this context, common institutional ownership has the potential to alleviate agency conflicts that impede innovation efficiency.

Given that China's economy remains in a transitional phase, its capital market is marked by pronounced information asymmetry, which further intensifies agency problems. In developed markets, the equity structure of major publicly traded companies is generally dispersed, enabling institutional investors to act as effective external overseers who alleviate information gaps and curb agency conflicts (Siew *et al*., 2016). By contrast, the Chinese capital market features concentrated ownership, most notably the prevalent "one-shareholder dominance" model. This setup often allows controlling shareholders to conduct related-party dealings that infringe upon the interests of minority shareholders (Cui *et al*., 2025a, b; Yu *et al*., 2025).Most institutional investors in China hold relatively small equity stakes, limiting their ability to appoint directors or influence corporate decision-making. As a result, they are often excluded from access to firm-level private information and unable to exercise meaningful governance oversight. This exacerbates information opacity and weakens the monitoring capacity of institutional investors. Additionally, institutional investors are theoretically expected to curb managerial opportunism by exercising voting rights and participating in strategic decisions (Wang *et al*., 2020). However, the reality of China's regulatory environment—marked by significant administrative intervention—often shifts their behavior toward policy-driven arbitrage. Investment decisions are frequently based on the interpretation of policy signals and tracking of regulatory shifts, rather than long-term value creation. This short-term orientation diverts institutional resources away from sustained governance monitoring and toward opportunistic information processing, ultimately diminishing their disciplinary function in corporate governance.

2.3 Research hypothesis

This paper contends that, compared to conventional institutional investors, common institutional ownership is better positioned to counteract the adverse effects of "one-shareholder dominance" and administrative intervention due to its role as an industry hub. By strengthening monitoring mechanisms, facilitating information sharing, and easing financing constraints through resource integration, shared institutional ownership can more efficiently mitigate agency conflicts involving shareholders and managers. Consequently, it serves as an important driver in improving firms' innovation efficiency. The specific mechanisms through which this effect is realized are outlined as follows:

First, shared institutional ownership may improve firms' innovation efficiency by curbing managerial self-interest through its external governance and monitoring function. On the one hand, common institutional owners possess stronger identification capabilities. Through long-term holdings in multiple large listed firms, they accumulate extensive monitoring experience and develop superior governance expertise (Kacperczyk *et al*., 2005). Since portfolio firms often operate in similar industries and environments, common ownership reduces information acquisition costs and improves oversight efficiency (Edmans *et al*., 2019). Indeed, Kang *et al*. (2018) identify a significant inverse relationship between monitoring costs and the scope of institutional investors' affiliated firm holdings, highlighting the cost-efficiency of shared institutional oversight. Conversely, shared institutional owners exhibit higher monitoring intensity. Compared with isolated institutional investors, they benefit from enhanced access to private information, broader managerial insight, and deeper industry knowledge. These advantages allow them to exert meaningful influence over firms' strategic and investment decisions, often through board representation (Edmans *et al*., 2019). When managerial decisions undermine long-term value—particularly through innovation avoidance—common institutional owners can voice dissent at shareholder meetings or board discussions (He *et al*., 2019), and may even employ governance tools such as exit threats to discipline management (Hope *et al*., 2017). In sum, the broader the industry network governed by common institutional ownership, the more effective their oversight becomes—facilitating the suppression of managerial slack and underinvestment in innovation, thereby improving firm-level innovation outcomes.

Second, common institutional ownership can enhance innovation efficiency by promoting inter-firm resource sharing, alleviating financing constraints, and reducing information asymmetry—mechanisms collectively referred to as the resource effect. By promoting strategic alliances among portfolio firms, common institutional investors enable collaboration and the exchange of proprietary knowledge and critical resources (Xu and Wan, 2015). Within the same industry, firms often compete intensely for market share, sometimes generating negative externalities that distort peers' strategic decisions and inhibit innovation (He and Huang, 2017; Beatty *et al*., 2013). To mitigate such outcomes and optimize portfolio-level returns, common institutional owners actively encourage resource coordination and knowledge sharing (Gao *et al*., 2023). When firms encounter innovation bottlenecks, proprietary information shared through common ownership networks can help avoid redundant R&D investments and direct firms toward more promising technological trajectories. This targeted knowledge flow improves R&D effectiveness and innovation output. Moreover, common institutional ownership helps alleviate information asymmetry, which often constrains access to external financing and discourages innovation. By improving firm-level transparency and information disclosure, these investors not only reduce perceived risk but also enhance individual investors' confidence—ultimately easing financing constraints (Khan *et al*., 2016). As significant market participants, common institutional owners also serve an informational role in the capital market. Firms in their portfolios tend to exhibit greater disclosure willingness and a clearer information environment, which improves the quality of market signals and facilitates more efficient capital allocation. Accordingly, this study proposes the following research hypothesis:

H1. Common institutional ownership positively influences the efficiency of corporate innovation.

Figure 1 shows analytical framework diagram.

3. Research design

3.1 Sample selection and data sources

To mitigate the potential influence of the 2008–2009 global financial crisis on the findings, this study focuses on all firms listed on China's Shanghai and Shenzhen A-share markets from 2010 to 2023, yielding a total of 49,493 firm-year observations. The following procedures are applied to preprocess the raw data: (1) A total of 2,978 firm-year observations pertaining to companies in the financial and insurance sectors were excluded; (2) 2,990 observations related to firms labeled as ST or *ST (special treatment) were removed; (3) 19,113 observations with missing data were eliminated; (4) Following prior studies (Park *et al*., 2019), all continuous variables were winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. Following this processing, a total of 24,412 valid samples were retained. All sample data used in this study are sourced from the CSMAR database.

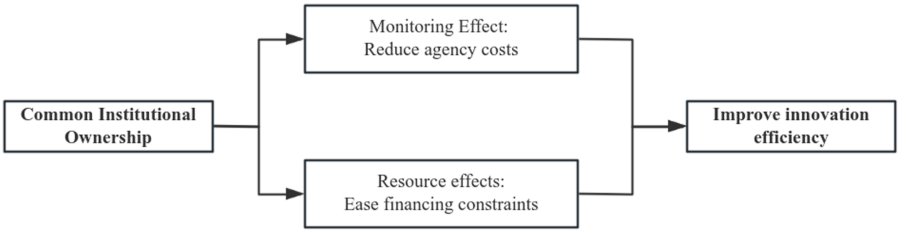

Figure 1. Analytical framework diagram

Two primary considerations underlie the exclusion of financial and insurance firms from the study sample. First, the nature of innovation in these sectors differs fundamentally from that of non-financial, brick-and-mortar enterprises. Innovative activities in financial and insurance firms—such as financial product design and risk-pricing model optimization—are typically regulation-driven and oriented toward risk mitigation or regulatory arbitrage, rather than productivity enhancement through technological advancement. For example, data from the China Banking and Insurance Regulatory Commission (CBIRC) shows that in 2022, 78.3% of R&D expenditure in the financial sector was directed toward upgrading compliance-related technological systems, whereas only 12.6% of such spending in the manufacturing sector was allocated for similar purposes. This stark contrast highlights the non-comparability of innovation content and capital investment intensity between the two sectors. Second, regulatory frameworks in China impose strict limits on institutional ownership, including constraints on shareholding ratios, shareholder qualifications, and voting rights. These institutional restrictions significantly curtail the capacity of common institutional investors to exert governance influence, such as appointing board members or submitting shareholder proposals, thereby undermining the mechanisms central to this study's analytical framework.

To improve sample representativeness, we present the geographic and industry breakdown of the analyzed firms. From a geographical standpoint, the sample encompasses firms from 31 provinces, autonomous regions, and municipalities across China. The five provinces with the highest representation are Guangdong (16.05%), Zhejiang (12.24%), Jiangsu (10.41%), Beijing (9.83%), and Shanghai (7.50%). Collectively, these regions account for over 56% of the total sample, reflecting strong coverage of China's most economically dynamic and industrially developed areas. The detailed provincial distribution of firms is presented in Tab.1.The broad geographic coverage supports the external validity and generalizability of our findings [2].

From an industry perspective, the sample includes companies across 18 major sectors, dominated by the manufacturing industry (66.09%), followed by information transmission, software, and IT services (7.31%), real estate (3.68%), and wholesale and retail trade (4.52%), reflecting the overall industrial structure. The distribution of industry sectors in the sample of this paper, participate in Tab.2 Distribution of companies by industry sector. More importantly, the inferential analysis in this study accounts for industry fixed effects by incorporating industry-specific dummy variables into the regression models. This allows us to account for unobserved heterogeneity across different industry sectors [3].

3.2 Variable definition

(1) Explained variable: Two common indicators of corporate innovation are R&D spending and patent application counts. Nevertheless, patent applications are generally regarded as a superior metric compared to R&D expenditures. This is because patent applications more accurately reflect firms' innovation results, whereas R&D spending merely represents investment levels in innovation activities. For example, prior research—including Seru (2014), Lerner *et al*. (2011) on long-term investment behaviors of U.S. private financial institutions, and Yuan *et al*. (2023) examining innovation among A-share listed companies in China—commonly uses patent application counts as a proxy for firm innovation. Building on this established approach, the present study adopts patent applications as a representative measure of corporate innovation and incorporates two specific indicators: ① Total amount of innovation (lnPatent). Referring to the existing studies (Shang *et al*., 2023; Sun *et al*., 2021), This paper defines the total number of three types of patents filed by enterprises in the year of filing as the total amount of innovation because the year of filing can more accurately portray the time of innovation. To correct for the right-skewed distribution of this variable, total innovation (lnPatent) is ultimately measured using the natural logarithm of the total patent count plus one; ② Innovation quality

(lnPatent1) is proxied by the natural logarithm of one plus the number of invention patent applications filed annually by the firm, as these patents are considered more original in nature.

(2) Explanatory Variables — Common Institutional Ownership (Coz1, Coz2, Coz3): Following the approach of He and Huang (2017) and Khan *et al*. (2016), this study constructs the measure of common institutional ownership across three distinct levels:①Common Institutional Ownership (Dummy Variable):A binary indicator that equals one if two firms share at least one institutional investor, and zero otherwise. (Coz1).②Intensity of Common Institutional Ownership: Measures the extent of ownership linkage between firms, based on the proportion of shared institutional investors relative to total institutional holdings. (Coz2).③Common institutional ownership proportion (Coz3).

From practical experience, the latest revision of the Administrative Measures provides for the abolition of the administrative license approval procedure for the exemption of tender offers, adjustment of the requirements for disclosure of changes in the shareholdings of investors owning over 5% of the equity, simplification of the content of the report on changes in equity, extension of the lock-up period for the shares of the acquirer, and the compaction of the intermediary institutions to be "gatekeepers" of the securities market, among other things. The CIRC issued the "Insurance Funding Rules". The "Measures for the Administration of Insurance Funds Investment in Equity" issued by the CBIRC sets 5% as the trigger condition for the exercise of shareholders' rights by insurers. The above institutional regulation in the Chinese market provides the basis for parameter selection in this study. According to prior studies, Aghion *et al*. (2013) adopt a 5% ownership threshold to differentiate between "active shareholders" and passive investors in examining the link between institutional ownership and innovation. In a similar vein, Bena *et al*. (2017) apply the same 5% cut-off to investigate the governance implications of cross-firm ownership networks.

(3) Control variables. In line with prior studies (Ni and Jin, 2024; Khan *et al*., 2016), this study includes a set of control variables to account for firm-specific and governance-related factors. At the firm level, these variables include firm age, leverage ratio, growth rate, return on net assets (ROE), and the proportion of tangible assets. In terms of corporate governance, the model controls for ownership concentration, property rights classification, separation of the board chair and general manager roles, board independence, and the management's equity holding ratio. Tab.3 presents the primary variables examined in this study [4]:

3.3 Model building

This study employs an ordinary least squares (OLS) regression framework with firm-level clustered robust standard errors to examine the relationship between common institutional ownership and corporate innovation. The estimation model is specified as follows:

$$InPatent/InPatent1 = \alpha_0 + \alpha_1 Coz1/Coz2/Coz3 + \alpha_3 Control + year + ind + k$$

In the above equation, common institutional ownership is represented by Coz1, Coz2, and Coz3, while lnPatent and lnPatent1 serve as measures of firm innovation. Control variables are included as a vector of firm-level characteristics. In addition, all regressions incorporate year and industry fixed effects to account for time-specific and sector-specific heterogeneity.

4. Empirical analysis

4.1 Descriptive statistics

Tab.4 presents the descriptive statistics for the key variables. The mean values of the explanatory variables—total innovation and innovation quality—are 1.794 and 1.266, respectively, indicating that Chinese listed firms, on average, file 1.794 patents annually, of which 1.266 are invention-type patents. The standard deviation for total innovation is 1.707, with observed values ranging from 0 to 6.365, while that of innovation quality is 1.426, ranging from 0 to 5.707. These figures reflect substantial heterogeneity in innovation performance across firms. The average value of the common institutional ownership dummy variable is 0.129, implying that approximately 12.9% of listed companies are jointly held by at least one institutional investor. Moreover, the mean values of the intensity of common institutional linkages and the proportion of shared institutional ownership are 0.098 and 0.031, respectively. This suggests that, on average, 9.8% of a firm's ownership is commonly held with other firms, and 3.1% of equity is held by overlapping institutional investors. As for the control variables, their descriptive statistics align closely with those reported in prior studies; hence, they are not elaborated upon in this paper. The correlation coefficients among the main variables are generally below 0.3 and all VIF values are well below 10, indicating that multicollinearity is not a serious concern in the regression models [5].

4.2 Analysis of regression results

As presented in Table 7, the regression coefficients of Coz1, Coz2, and Coz3 with respect to total innovation output (lnPatent) are 0.331, 0.396, and 0.996, respectively—all statistically significant at the 1% level. These results indicate a robust positive relationship between common institutional ownership and the overall volume of firms' patent applications. Columns (4), (5), and (6) report the regression estimates when the dependent variable is innovation quality (lnPatent1). The coefficients for Coz1, Coz2, and Coz3 are 0.394, 0.481, and 1.175, respectively, all significant at the 1% level, suggesting that common institutional ownership also contributes positively to the quality of innovation, as captured by the number of invention-type patent filings. Notably, the coefficient of Coz3—representing continuous common institutional ownership—is 0.996. This implies that a one standard deviation increase in Coz3 results in a 94.8% increase in the natural logarithm of average total patent filings ($=0.996\times1.707/1.794$), effectively indicating that such an increase nearly doubles firms' innovation output. Overall, these findings provide empirical support for the hypothesis that common institutional ownership enhances both the quantity and quality of corporate innovation. The results highlight the dual role of common institutional investors in facilitating innovation through both resource-sharing mechanisms and strengthened monitoring functions. Additionally, the R^2 values of the regression results in columns (1)–(6) are all above 0.2, indicating that the regression model has a good fit.

4.3 Robustness check

To account for differences in patent types, this study follows the approach of Bianchi *et al.* (2014) by assigning weights of 3:2:1 to invention, utility model, and design patents, respectively. Based on these weights, a revised innovation index is constructed using the natural logarithm of the weighted sum of the three patent types plus one. The regression analysis is then re-estimated using this adjusted measure. The results are presented in Tab.8 [6].

4.4 Heterogeneity analysis

4.4.1 Heterogeneity analysis of agency costs. This paper posits that common institutional ownership enhances firm innovation through the monitoring effect, particularly by strengthening oversight in the presence of agency conflicts. Compared with ordinary

Table 7. Common institutional ownership and corporate innovation

Variables	lnPatent Total amount of innovation (1)	lnPatent (2)	lnPatent (3)	lnPatent1 Quality of Innovation (4)	lnPatent1 (5)	lnPatent1 (6)
Coz1	0.331***			0.394***		
	(9.844)			(13.036)		
Coz2		0.396***			0.481***	
		(9.208)			(12.430)	
Coz3			0.996***			1.175***
			(8.595)			(11.265)
Age	−0.275***	−0.274***	−0.277***	−0.201***	−0.200***	−0.203***
	(-8.353)	(−8.320)	(−8.414)	(−7.181)	(−7.138)	(−7.263)
Lev	0.723***	0.725***	0.734***	0.703***	0.704***	0.716***
	(12.182)	(12.203)	(12.347)	(13.673)	(13.675)	(13.898)
Growth	−0.207***	−0.208***	−0.209***	−0.154***	−0.155***	−0.157***
	(−8.465)	(−8.479)	(−8.534)	(−7.436)	(−7.445)	(−7.518)
Roa	3.030***	3.045***	3.135***	2.342***	2.356***	2.467***
	(15.871)	(15.944)	(16.426)	(14.388)	(14.463)	(15.131)
Tang	−0.102	−0.101	−0.105	−0.254***	−0.253***	−0.257***
	(−1.294)	(−1.286)	(−1.336)	(−3.778)	(−3.771)	(−3.829)
OC	0.220***	0.222***	0.158**	0.071	0.074	−0.002
	(3.224)	(3.243)	(2.308)	(1.216)	(1.256)	(−0.043)
Nopr	0.070***	0.071***	0.068***	0.138***	0.139***	0.136***
	(2.933)	(2.997)	(2.865)	(6.750)	(6.806)	(6.676)
Dual	0.002	0.001	0.003	0.015	0.014	0.016
	(0.082)	(0.039)	(0.137)	(0.767)	(0.710)	(0.838)
lndlr	−0.206	−0.201	−0.193	−0.100	−0.096	−0.083
	(−1.142)	(−1.112)	(−1.066)	(−0.632)	(−0.605)	(−0.526)
MH	0.308***	0.303***	0.291***	0.139***	0.134***	0.119**
	(5.559)	(5.461)	(5.248)	(2.911)	(2.801)	(2.478)
Constant	0.450***	0.441***	0.459***	0.184	0.176	0.193
	(3.210)	(3.145)	(3.268)	(1.539)	(1.467)	(1.614)
Observations	24,412	24,412	24,412	24,412	24,412	24,412
Adj-R^2	0.308	0.308	0.307	0.260	0.260	0.259

Note(s): *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively

institutional investors, common institutional owners exhibit a greater willingness and capacity to monitor. This is because the benefits of monitoring accrue not only to individual firms but also to the broader investment portfolio, making the return on monitoring more substantial for common owners. Moreover, these investors possess superior information-gathering capabilities and identification skills, allowing them to detect managerial opportunism at lower costs. Such advantages make common institutional ownership especially effective in mitigating shareholder–manager agency conflicts. As agency costs increase—typically due to managerial discretion and lack of oversight—common institutional owners are more incentivized to intervene and enforce discipline. By doing so, they encourage managers to shift from self-interested behavior toward innovation-focused strategies, thereby enhancing innovation efficiency. Based on the above reasoning, this study posits that the positive impact of common institutional ownership on innovation efficiency is more pronounced in firms with higher agency costs. Following the approach of Wang *et al.* (2023), agency costs are proxied by the ratio of administrative expenses to operating revenue. The corresponding regression results are reported in Tab.12.

As shown in Tab.12, the regression coefficients in columns (1) and (3) for lnPatent1 are 0.433 and 0.490, respectively, and are both positively significant at the 1% level. In contrast, the coefficients reported in columns (2) and (4) are 0.097 and 0.182, respectively, and are

statistically insignificant. These findings suggest that the positive effect of common institutional ownership on innovation efficiency is more substantial in firms with higher agency costs, thereby providing empirical support for the hypothesis proposed in this study [7].

4.4.2 Heterogeneity analysis of the nature of property rights. Under China's distinctive market economy framework, state-owned enterprises (SOEs) often pursue objectives that extend beyond profit maximization. Their broader mandates include responsibilities related to social stability, employment, and public policy implementation. Consequently, SOEs frequently exhibit non-economic goals that may conflict with innovation-driven strategies. Moreover, due to their political attributes, SOEs are more prone to the "one-shareholder dominance" phenomenon. It is not uncommon for the roles of chairman, general manager, and party secretary to be held concurrently, resulting in a heightened risk of "insider control" and weakened checks and balances (Feng *et al*., 2024). In such institutional settings, common institutional ownership—despite its external governance potential—is less able to exert effective monitoring or facilitate resource coordination in SOEs. In contrast, non-SOE (NSOEs) typically exhibit more dispersed ownership structures, thereby affording common institutional investors greater influence over corporate governance. This enables more effective oversight and alignment of managerial incentives, especially with regard to innovation-oriented initiatives. Building on this perspective, the study hypothesizes that the positive effect of common institutional ownership on innovation efficiency is more pronounced in non-state-owned enterprises (NSOEs) compared to state-owned enterprises (SOEs). To examine this hypothesis, the sample is divided based on ownership structure, and separate regressions are conducted for SOEs and NSOEs. The corresponding results are presented in Tab.13.

As shown in Tab.13, the regression coefficients of Coz1 on lnPatent and lnPatent1 in the SOE subsample (columns 1 and 3) are 0.207 and 0.262, respectively; however, neither is statistically significant. In contrast, for the NSOE subsample (columns 2 and 4), the corresponding coefficients are 0.477 and 0.512, both of which are significantly positive at the 1% level. These results suggest that the effect of common institutional ownership on innovation efficiency is substantially stronger in non-state-owned enterprises, thereby providing empirical support for the hypothesis proposed in this study [8].

5. Conclusions and recommendations

5.1 Conclusions

Utilizing a sample of Chinese A-share listed firms from the Shanghai and Shenzhen stock exchanges spanning the period 2010 to 2023, this study empirically investigates the impact of common institutional ownership on corporate innovation. The results indicate that common institutional ownership significantly enhances innovation efficiency. As shown in Table 7, the baseline regression results demonstrate that all three proxies for common ownership—Coz1, Coz2, and Coz3—are positively and significantly associated with total innovation output (lnPatent) at the 1% significance level, with coefficients of 0.331, 0.396, and 0.996, respectively. Notably, a one standard deviation increase in Coz3 corresponds to a 94.8% rise in the average number of patent applications ($0.996 \times 1.707 / 1.794$), suggesting that shared institutional ownership may nearly double firms' innovation output. A similar pattern emerges when assessing innovation quality (lnPatent1), where the corresponding coefficients are 0.394, 0.481, and 1.175, all significant at the 1% level. These findings confm that common institutional ownership positively influences both the quantity and quality of innovation. Furthermore, the results remain robust across multiple sensitivity analyses, including alternative variable specifications, propensity score matching (PSM), and instrumental variable (IV) tests. The robustness is confirmed in Tab.8 where weighted patent measures yield similar significance (e.g., Coz3 = 1.023***), in Tab.9 where PSM-matched samples yield Coz1 = 0.392*** for lnPatent1, and in Tab.10 where IV-2SLS estimation gives

Coz1 = 3.205*** for lnPatent1. Further analyses examine the moderating roles of internal control quality and the information environment in shaping the relationship between common institutional ownership and corporate innovation. The results reveal that stronger internal control systems and more transparent information environments reinforce the positive influence of shared institutional investors on innovation outcomes. For instance, as reported in Tab.11, even after accounting for exogenous shocks such as the COVID-19 pandemic, the coefficient of Coz1 remains significantly positive at the 1% level. Moreover, its interaction with internal control quality and analyst coverage further strengthens the innovation-enhancing effect. In addition, the study finds that the impact of common institutional ownership is more pronounced in firms with higher agency costs and in non-state-owned enterprises. As shown in Tables 12 and 13, the coefficient of Coz1 is notably stronger in high-agency-cost firms ($\beta = 0.490$***) and NSOEs ($\beta = 0.512$***), while the effects are weaker or statistically insignificant in low-agency-cost firms and SOEs. These findings suggest that the governance function of common institutional investors is particularly effective in contexts where agency problems are more severe. Taken together, the results underscore the important governance role of common institutional ownership in fostering innovation, especially within emerging market settings where innovation efficiency remains relatively constrained.

5.2 Recommendations

Meanwhile, based on the findings of this paper, the following suggestions are made:

(1) For listed enterprises: Given the positive role of common institutional ownership in promoting enterprise innovation, Chinese listed firms are encouraged to actively attract and maintain institutional investors in the capital market. This can strengthen the supervision of managers, compelling them to focus more on innovation activities. However, companies must also manage potential conflicts of interest resulting from the dominance of certain institutions' influence in strategic decisions. It also enhances the channels for acquiring scarce resources, helps avoid unnecessary losses in innovation activities, and assists enterprises in overcoming innovation bottlenecks, thereby promoting enterprise innovation.

(2) For institutional ownership: Common institutional ownership serves as a key driver in shaping firms' innovation decisions and broader strategic behaviors. Therefore, institutional ownership should continuously improve the level of their own teams and actively introduce members with rich experience in corporate governance. In addition, after holding shares in the enterprise, they should take on the responsibilities and obligations of external shareholders by actively engaging in corporate governance and corporate decision-making, and assist the enterprise in making optimal decisions on innovative activities and capital structure decisions.

(3) For market regulators: In light of the empirical findings that common institutional ownership significantly improves innovation efficiency, regulatory bodies may play a proactive role in fostering such ownership structures. Specifically, agencies like the China Securities Regulatory Commission (CSRC) could consider formulating policies that encourage institutional investors to gradually increase their capital allocation toward industries with relatively low levels of institutional participation—particularly in innovation-intensive sectors such as manufacturing and information technology services. This can be achieved through incentive mechanisms—such as tax breaks for long-term holdings, information disclosure optimization, and governance evaluation scoring—while avoiding administrative interference. In addition, regulators can provide a supportive legal environment to protect the rights of institutional investors, which in turn encourages their deeper engagement in corporate governance and innovation oversight.

6. Research limitations

This study has certain limitations in measuring innovation efficiency, primarily due to significant variations in the reliance on and applicability of patent systems across industries. For example, industries such as pharmaceuticals and manufacturing heavily depend on intellectual property protection and therefore engage more frequently in patenting activities. In contrast, other industries make limited use of patents, resulting in innovation outputs that may not be fully captured by patent counts. Moreover, firms may file patents for non-innovative purposes—such as defensive strategies, strategic positioning, or bargaining leverage—leading to the proliferation of "strategic patents" or low-value patents that do not accurately reflect true innovation outcomes. Future research could address this limitation by developing industry-standardized indicators of patent strength, such as patent output per unit of R&D investment, to better assess innovation efficiency.

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Notes

1. The distinctive multi-segment structure of China's capital market is primarily reflected in two aspects. First, *market segmentation***:** Mainland China operates three separate stock exchanges—Shanghai Stock Exchange, Shenzhen Stock Exchange, and Beijing Stock Exchange. Second, *sectoral segmentation***:** Even within the same exchange, listed companies may be categorized into different market segments—such as the Main Board, SME Board, and STAR Market—based on firm size, business nature, and other characteristics.
2. Due to space limitations, the tab.1 "Distribution of the Company's Geographical Provinces" is provided in the Online Supplementary Material Appendix available on the journal's website.
3. Due to space limitations, the tab.2 "Distribution of the Company's Industry Sectors" is provided in the Online Supplementary Material Appendix available on the journal's website.
4. Due to space limitations, the tab.3 "Variable Definitions" is provided in the Online Supplementary Material Appendix available on the journal's website.
5. Due to space limitations, Tab. 4 (Summary statistics for key variables), Tab.5 (Correlation Analysis) and Tab.6 (Multicollinearity Test) are provided in the Online Supplementary Material Appendix available on the journal's website.
6. Due to space limitations, the results of the robustness tests are reported in the Online Supplementary Material Appendix available on the journal's website.
7. Due to space limitations, the results of the heterogeneity analysis are reported in the Online Supplementary Material Appendix available on the journal's website.
8. Due to space limitations, further analyses are reported in the Online Supplementary Material Appendix available on the journal's website.

Supplementary material

The supplementary material for this article can be found online.

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