# Research on the Impact of Analyst Tracking Reports on the Quality of Internal Control of Enterprises

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**Abstract: In recent years, with the rapid expansion of the capital market, the status of analysts as a key information intermediary has become more and more prominent, and its tracking and reporting activities have played an important role in corporate governance to a large extent. As the core element of the stable operation of enterprises, the optimization path of relevant aspects has been deeply influenced by academic and practical Focusing on the attention of the industry, this article selects the data of Shanghai and Shenzhen A-share listed companies from 2007 to 2022, and comprehensively uses literature research methods and empirical analysis methods to systematically investigate the impact mechanism of analysts' tracking reports on the quality of internal control of enterprises. This research contributes a new perspective to the functional understanding of information intermediaries in the capital market at the corporate governance level, and also gives useful reference suggestions for enterprises to better optimize internal control construction and regulatory units for the guidance and development of the analyst industry.**

**Keywords: Analyst Tracking Report; Internal Control Quality; Corporate Governance**

## 1. Introduction

In the information intermediary system of the capital market, the value creation function of analyst tracking reports is becoming increasingly prominent. As the cornerstone of the stable operation of the enterprise, the quality of internal control is not only related to the development of the enterprise itself, but also directly affects the efficiency of investor decision-making and market resource allocation [1]. Existing research shows that analysts form multidimensional constraints on enterprises through information interpretation, expectation guidance and governance supervision [2]. However, how their tracking reports specifically affect the internal mechanism of internal control quality is still a theoretical blind spot in current research. At present, domestic research mostly focuses on traditional elements such as audit supervision and internal governance structure [3,4], ignoring the role of information intermediaries in shaping the internal control system of enterprises in a dynamic market environment. Although the quality of internal control has attracted much attention in the field of corporate governance and financial research, most of the existing research focuses on static factors such as the internal governance framework and the external oversight environment [5], and the research on the important external information mechanism of analyst tracking and reporting is not enough.

Therefore, this study selects all listed companies in a specific time period as a sample, focusing on the correlation mechanism between the intensity of analyst tracking and reporting and the correction speed of internal control defects. The purpose is to reveal how analysts drive the improvement of internal control quality of enterprises through reputation constraints and decision intervention effects under the interaction between industry characteristics and regional institutional environments [2], so as to provide an empirical basis for optimizing the information disclosure ecology and improving the corporate governance mechanism. This research not only has important theoretical value, but also contains significant practical significance. For enterprises, it is helpful to deepen their understanding of the importance of the external information environment, timely locate internal control shortcomings with the help of analysts' attention and feedback, and actively optimize internal control processes and regulations [6]. For investors, understanding this

association can more accurately assess the value and potential risks of enterprises and formulate more reasonable investment strategies [6]. For regulators, the research results can provide an empirical basis for optimizing market supervision policies and standardizing analyst industry management, so as to promote the stable and healthy development of the capital market [7].

## 2. Literature Review and Research Hypothesis

### 2.1 Literature Review

Analyst tracking domestic research mainly focuses on the following three aspects: First, analyst tracking and enterprise innovation. Analyst tracking can significantly improve the real innovation output of enterprises [8], indicating that analysts' attention has played a positive role in promoting enterprise innovation [9]. In addition, analysts are concerned that it will aggravate the R&D manipulation of enterprises, but equity incentives can negatively adjust this positive correlation, while compensation incentives have no significant impact. Other studies point out that there is a close relationship between analyst tracking and corporate innovation. Analysts' attention can promote enterprise innovation activities and promote enterprise innovation and development [10]. Second, in terms of analyst tracking and internal quality control. The study pointed out that the stability of the executive team has a significant effect on the quality of internal control of the enterprise. An infrequently changing executive team is of positive significance to maintaining the internal control environment and helps to maintain a good level of internal control [5], and equity incentives play an important role in this relationship. The effect, that is, the heavier the equity incentives received by the executive team, the more obvious the positive impact of their stability [5]. A good internal control environment can help enterprises and institutions carry out efficient information openness and enhance the quality and transparency of external communication. This situation also provides a better premise for professional observers to collect information, thus helping the continuous development and prediction of their tracking activities [6]. Third, in terms of the relationship between analysts tracking and other factors of the enterprise. Wu

Wenruo and Yu Junli [11] proposed that in high-risk industries, analyst tracking will affect the willingness of enterprises to disclose safe production information. Good analyst attention can promote enterprises to disclose safe production information more actively. The application of big data analysis in the APT tracking scenario is also related to analyst tracking. Good analyst attention can provide more reliable data support for big data analysis, thus improving the effect of APT tracking [12].

The domestic research on internal control quality mainly focuses on the following three aspects: the participation of non-state-owned shareholders. The participation of non-state-owned shareholders can significantly improve the quality of internal control of state-owned enterprises [4], which shows that non-state-owned shareholders promote state-owned enterprises to strengthen internal control construction and improve the effectiveness and quality level of internal control by introducing market competition mechanisms and advanced management experience, so as to promote enterprises The overall development of. In terms of product market competition. In the more competitive market environment, the quality of the company's internal control will often be higher. This is a recognized conclusion, especially in those enterprises that are not state-owned [3]. In such a tense competition, in order to increase its strength and compete for a larger proportion of the market share, the company must pay attention to the design and optimization process of the internal control system. The purpose is to improve the efficiency of daily operations and suppress possible risks, and then achieve better control results. In terms of corporate governance structure. The corporate governance structure has a certain impact on the quality of internal control [1]. A good corporate governance structure can provide effective institutional supervision mechanism for internal control, promote enterprises to strengthen internal control and improve their quality and effectiveness, which will affect the financial performance of enterprises. Positive influence. In addition, the media's attention can improve the social supervision of enterprises, and can also have an impact on the quality of internal control of listed companies [7]. The personal endorsement of executives, for example, age, education, work experience and other

backgrounds will also affect the quality of internal control of the enterprise [13]. The background characteristics of executives make them have different management concepts and decision-making abilities, which in turn has an important impact on the quality of internal control of the enterprise. In terms of accounting soundness, there is a close relationship between the quality of internal control and the soundness of accounting [14]. Promoting the realization of accounting soundness can make the financial reports of enterprises more authentic and reliable, and provide a reasonable basis for investors and other stakeholders.

Analysts track foreign literature in terms of accounting estimation intensity, enterprise innovation, corporate governance efficiency and risk management ability. First, the intensity of accounting estimates refers to the degree of evaluation and handling of uncertainties made by enterprises in the process of preparing financial statements. Once this value is increased, it will have a two-way impact on analysts' profit forecast. The study mentioned that the high intensity of accounting estimates may make it more difficult to predict profitability. Analysts will face the pressure of declining accuracy and are prone to greater forecast deviations. However, it is also possible to improve the timeliness of information release due to the improvement of the willingness of management to actively disclose. Special attention should be paid to the fact that if analysts' attention to relevant content increases, their understanding of accounting policy choices will be particularly in-depth. After careful analysis of the basis of management decisions, more accurate performance will be achieved in exploring and identifying key influencing factors, thus helping to provide a reference. The decision-making basis is to grant investors the income value assessment structure to assist in the formulation of judgments. Second, in terms of enterprise innovation, the attention given by analysts has the possibility of reducing information asymmetry, thus providing a certain driving force for enterprise innovation [15], but at the same time, there is also a potential pressure that may be brought to the company, which makes the company's center of gravity excessively short. The inclination of the period and the neglect of the investment in innovation capacity required in the long term will cause an imbalance in innovation ability [15], which not

only reflects that analysts' attention can not only play a supporting role for the company's innovation, but also may have a certain binding effect. Third, in terms of corporate governance efficiency, foreign studies believe that improving analysts' attention to management decision-making behavior can achieve effective supervision and optimize the corporate governance mechanism [16]. As analysts continue to track corporate governance, their professional analysis can It is used by external investors to find defects in corporate governance, so as to promote enterprises to improve the internal control system and adjust the balance of power mechanism, and thus reduce agency costs. Especially when dealing with companies with complex equity structures, analysts deeply explore the company's articles of association, the operation of the board of directors and other relevant governance information, which plays a significant role in promoting the market to efficiently judge the quality of corporate governance [16]. However, if it is too concentrated on this, it may give rise to a defensive governance posture, such as a certain form of governance restructuring to meet market expectations. When this happens, the substantive governance optimization motivation is suppressed. In the family-controlled enterprise environment, this The characteristics seem to be more prominent [16]. Fourth, in terms of risk management ability, the study shows that there is a significant correlation between the intensity of accounting estimates and the risk response strategy of enterprises [17]. When enterprises face major uncertainties, the high intensity of accounting estimates may prompt management to adopt a forward-looking risk assessment model. In this context Analysts will pay more attention to the rationality of enterprise risk exposure measurement. After tracking and analyzing accounting treatment in high-risk areas such as contingent liabilities and financial instrument valuation, they can find the risk transmission path in advance and provide the market with a basis for risk premium adjustment [17]. However, if analysts inquire excessively, it may interfere with the original management steps of the enterprise. The management of the enterprise may choose to give up strategic risk assumptions in order to curb short-term risk outbreaks, especially in highly uncertain industries such as scientific and technological exploration. Similar avoidance

measures may lead to its breakthrough innovation. The development of force is hindered [17].

The foreign literature on internal control quality is reflected in the ability and internal control of internal auditors, the internal quality control and external quality assessment of Bayes, and the ability to detect quality audit quality behavior and fraud. First, in terms of the ability and internal control of internal auditors. Internal auditors have good ability to have a positive impact on internal control and can effectively improve the quality of internal audit, so as to achieve the purpose of preventing fraud in financial statements [18]. By enhancing the quality of internal audit, we can better deal with problems such as possible financial statement fraud, and help ensure the authenticity of enterprise financial information [18]. Second, in Bayesian internal quality control and external quality evaluation. Bayesian internal quality control result management and external quality evaluation bivariable z-score analysis are complementary and can have a synergistic effect in practical applications. [19]. Through specific case studies, the complementary relationship between them and their impact on related business can be presented more intuitively [19]. Third, in terms of audit quality behavior and fraud detection ability. Factors such as professional commitment, moral commitment, internal control points and emotional intelligence will affect the ability to detect fraud by reducing audit quality behavior [20]. These factors play different roles and influence each other. In the audit process, through the control of specific audit quality behaviors, fraud can be better detected and the intrinsic connection between them and the ability to discover fraud can be revealed [20].

In summary, the research of domestic scholars on analyst tracking involves multiple dimensions, covering its correlation with the real innovation output of enterprises, the willingness to disclose safe production information, the company's innovation, and the discussion with internal control defects, product market competition and other aspects. It focuses on the impact of analyst tracking on the real innovation output of enterprises, and tries to reveal its role at the innovation level [8]; at the same time, it analyzes the relationship between analyst tracking, internal control defects and institutional investor shareholding, and expands

the understanding of the connection between various participants in the capital market [2]. These studies reflect the important impact of analyst tracking in China's capital market environment from different aspects, but the research focuses on a specific angle. The comprehensive and comprehensive systematic impact analysis of analyst tracking behavior still needs to be further deepened, and the relevance and integrity between studies can also be further strengthened, so as to It presents the role and mechanism of analysts in the capital market more completely. Foreign research focuses on the intensity of accounting estimates, the relationship between analysts' attention and the characteristics of profit forecasting, and the complex impact of analysts' attention on the company's innovation activities. When analyzing the contradiction between analyst tracking and enterprise innovation ability, it is pointed out that this relationship not only has positive value, but also may have an inhibitory effect. At the same time, it is jointly influenced by a variety of factors, reflecting the pluralistic thinking of the degree of intervention of external analysts. However, most of the existing achievements come from the situation of the mature capital market. As for its applicability and universality under different market frameworks and cultural differences, it is still necessary to verify it in combination with China's own specific conditions, and expand and extend it, so that China's capital market can gain more in the search for relevant theories and practical operations. Strong help, so as to promote the improvement and development of the research process and practical application.

The research perspective on the quality of internal control in China is rich. Starting from aspects such as the participation of non-state-owned shareholders, corporate governance structure, media attention and the background characteristics of executives, its impact on internal control quality and the relationship between internal control quality and accounting robustness are discussed. The role of non-state-owned shareholders in the internal control quality of state-owned enterprises is examined [4], and the impact of the background characteristics of executives on the quality of internal control is analyzed [13]. These studies help to deeply understand the multiple factors affecting the internal control quality of Chinese enterprises. However, almost all the existing

research focuses on a certain influencing factor, and there is a lack of a comprehensive analysis framework that completely integrates all influencing factors. The study of the dynamic changes and comprehensive impact mechanisms of internal control quality in different industries and enterprises of different sizes needs to be further improved. Foreign studies are relatively focused on the complementary role of internal auditors' ability and quality control methods. At the same time, they explore the impact of some special factors on the relationship between the ability to expose fraud and the quality of internal control. Among them, the importance of improving the ability of auditors for internal control and preventing financial fraud has been repeatedly pointed out [18], there are also cases that show that quality control measures complement each other [19]. In terms of technology and concept, this kind of research provides a little direction for enterprises to improve the internal control system, but in fact, due to the differences between the Chinese and foreign legal environment, supervision methods and even the company's operation system, it is very likely that the application of these research results will require some changes or even optimization according to their own circumstances. Only more Only by making some necessary adjustments in combination with the domestic situation can we better adapt to the inherent needs of the internal control of the development of Chinese enterprises and the actual needs of development.

## 2.2 Research Hypotheses

Analysts' tracking reports reflect the improvement of the quality of internal control of enterprises in two aspects. On the one hand, driven by the market supervision function, analysts have improved the motivation to promote the quality of internal control of enterprises; on the other hand, analysts may improve the quality of internal control of enterprises through tracking behavior.

From the perspective of the motives for analysts to perform the function of market supervision, the enterprises followed by analysts face stricter external inspection than those that are not followed. As long as there are defects in internal control or business risks, they may soon be discovered and manifested in the research results or market evaluation summary; This uninterrupted supervision pressure forces enterprise managers to pay attention to the improvement of the internal control system, otherwise it is easy to lead to market reverse evaluation or stock price shock due to out-of-control. The high requirements of the capital market for information efficiency require enterprises to provide accurate and complete financial and operational data, and perfect internal control plays an important role during this period. It can carry out good management in information generation and disclosure links, and reduce the probability of errors and even fraud. It can be seen that under the role of analysts, enterprises can reduce the risk of information exposure and improve the level of overall market trust.

On the other hand, analysts have the natural characteristic of the attribute of "information intermediary" [21]. Their task focuses on alleviating the information gap between investors and enterprises through specialized methods. When enterprises face situations such as the contradiction between the interests of the management and shareholders, it is easy to produce financial operations. Appropriate or inefficient investment will lead to derailment of resource allocation. In the process of comprehensive monitoring of the daily affairs of the enterprise, the high-quality internal control system can further ensure the accuracy of the financial report, and can also restrict the management's self-interested behavior [22]. Analysts want to promote enterprises to improve the internal control system through tracking reports to improve the quality of information, and then provide investors with a more accurate decision-making reference. From the perspective of reducing forecast deviations and enhancing their own reputation, analysts tend to pay more attention to and recommend those enterprises with high internal control levels, and this Market feedback indirectly allows enterprises to consciously strengthen the structure of internal control.

At the same time, when enterprises face problems such as "management opportunism" and "short-term performance pressure", executives may underestimate the attention to long-term risk control to ensure that they can achieve the goals set in the short term, thus bringing about the aggravation of "agent conflict". By constantly following up and evaluating the performance of enterprises, analysts can act as a warning when problems are

found, and promote the management level to build a stricter internal control model, so as to achieve a relative balance of short-term and long-term benefits. The so-called internal control is included in many important components such as the improvement of the corporate governance system, the strengthening of risk management and compliance supervision. Its actual significance lies in restricting the personal behavior of managers, and thus safeguarding the rights and interests of shareholders and other related potential stakeholders.

From the perspective of analysts' tracking reports, the improvement of the quality of internal control of external enterprises contains a certain possibility. Analysts' attention directly makes enterprises bear the burden of transparency. Under this pressure, enterprises are more inclined to enhance their own internal control level to cope with market supervision, so as to make up for the enterprise. Lack of internal governance [23]. Secondly, analyst tracking reports can significantly improve the transparency of enterprise information. An important reason for the agency problem is information asymmetry, and the tracking of analysts can enable the market to effectively obtain and verify the key information of enterprises, so that the degree of company information disclosure can be significantly improved. Finally, analyst tracking reports can form a market-oriented check and balance mechanism. If the equity of the enterprise is relatively scattered or the influence of the controlling shareholders is large, analysts can influence the behavior of investors through research and evaluation, and indirectly restrain the arbitrary behavior of major shareholders or management, so as to make decision-making more scientific.

Based on the above analysis, this paper puts forward the following assumptions:

H1: Analyst tracking reports help to improve the quality of internal control of the enterprise.

## 3. Research and Design

### 3.1 Sample Selection and Data Source

This article selects all listed enterprises of A-shares in Shanghai and Shenzhen from 2007 to 2022 as research objects. And in order to ensure the reliability of the research results, this paper uses Stata17 and Excel to process the collected data, and take the following processing measures for the research samples: (1) Exclude financial industry, PT, ST, *ST company samples , to ensure the comparability of data; (2) eliminate samples with serious omissions to ensure the integrity and continuity of the data; (3) The continuous variable is tailed at the level of 1% to avoid extreme value interference with the analysis results. After data analysis, we obtained 32,879 final sample observations. The internal control data comes from the Dibo internal control database and the CSMAR database. The digital transformation data is captured and manually sorted out by Stata. Other financial data comes from Cathay Pacific. Security database and Wande database. Finally, Excel and Stata 17.0 were used to process and regressive the observations of 32,879 samples.

### 3.2 Definition of Variables

3.2.1 Explained Variables: Internal Control Quality (Dib)

In the existing research field, the quantitative determination of internal control quality is often carried out in the form of questionnaires or building a comprehensive evaluation framework. The internal control evaluation framework that has been widely recognized in the domestic academic community mainly includes three categories. This study adopts the internal control disclosure index of Dibo Company as the country to consider this time. There is a core measurement basis for the internal control level of listed enterprises. This study first uses the DisDib Internal Control Disclosure Index as a key indicator to measure the quality of enterprise internal control. To enhance the reliability of the research findings, the original data in this study were logarithmically processed to derive the LnDib indicator as a supplementary measurement standard. These two indicators are both positive indicators. The larger the value, the higher the quality of the enterprise's internal control.

3.2.2 Explanatory Variables: Analyst Tracking Reports

In our research methodology, the term "analyst coverage" is measured by the number of analysts following a listed company, which serves as a proxy variable. The variable is a continuous variable. The larger the value, the higher the attention of the analysts received by the enterprise. Analyst tracking reports mainly include the following two quantitative forms:

First, the research report released by the research department of a securities company; Second, the rating and forecast of the business situation of the enterprise by institutional investors or independent analysts. The above indicators are all positive indicators. The higher the value, the higher the market attention and information transparency of the enterprise.

3.2.3 Control variables

According to the relevant literature research, this article considers the control variables such as company size, asset-liability ratio, return on assets, operating income growth rate, enterprise establishment years, fixed asset ratio, independent director ratio, institutional investor shareholding ratio, largest shareholder shareholding ratio, etc. The definition of the above control variables is shown in Table 1.

**Table 1. Variable Definition Table**

| Variable Type | Variable Name | Variable Symbol | Variable Description |
|---|---|---|---|
| Dependent Variable | Internal Control Quality | Dib | Internal Control Index of Chinese listed companies |
| Independent Variable | Analyst Following and Coverage | Analyst | The number of analysts following a listed company is used as a proxy variable for "analyst following and coverage" |
| Control Variables | Firm Size | Size | Natural logarithm of the firm's total assets at the end of the year |
| | Leverage Ratio | Lev | Total liabilities at the end of the year / Total assets at the end of the year |
| | Return on Assets | Roa | Net profit / Average total assets |
| | Operating Revenue Growth Rate | Growth | (Current operating revenue - Previous operating revenue) / Previous operating revenue |
| | Firm Age | Firm age | Number of years since the firm's establishment |
| | Fixed Asset Ratio | Fixed | Net fixed assets / Total assets |
| | Independent Director Ratio | Indep | Number of independent directors / Total number of board directors |
| | The proportion of shares held by the largest shareholder | Top1 | Number of shares held by the largest shareholder at the end of the year / Total share capital |
| | The proportion of shares held by institutional investors | Inst | Total shares held by institutional investors / Total share capital of the company |

## 3.3 Model Design

Based on the corresponding theoretical analysis framework, a multivariate linear regression model is constructed, with the internal control quality of the enterprise as the explained variable, and the relevant indicators of analyst tracking and reporting as the core interpretation variables. At the same time, a series of control variables (such as enterprise asset size, asset-liability ratio, operating income growth rate, equity concentration, independent director ratio, industry virtual variables, etc.) are included to control the impact of other factors on the internal control quality of the enterprise. The model is set as follows:

$Dib_{i,t} = \beta_0 + \beta_1 Analyst + \beta_2 ControlVariablesit + Years + Industry + \varepsilon_{i,t}$

This is a multivariate linear regression equation designed to analyze and predict the change of internal control quality ($Dib_{it}$) of the enterprise, and explore the quantitative relationship between the internal control quality of the enterprise and other variables, including analyst tracking and reporting related variables, control variables, year factors and industry factors.

The explained variable (variant) $Dib_{i,t}$: represents the internal control quality of the i enterprise in year t. This is the core variable that this study focuses on. It explains its change through other variables in the model, reflecting the effectiveness and perfection of the operation of the enterprise's internal control system.

Explanatory variable (independent variable): $\beta_0$: is a cross-off term of the equation. It represents the benchmark value of $Dib_{i, t}$ when all independent variables (Analyst, ControlVariablesit, year and industry virtual

variables) are 0. $\beta_1$: is the regression coefficient corresponding to the Analyst variable. Analyst said that the ist enterprise tracked the relevant indicators of the t-year analyst, such as the frequency of tracking reports, the number of people tracked by analysts, etc. $\beta_1$ measures the average change in the quality of internal control of the enterprise for each unit change in the relevant indicators of the analyst's tracking report. If $\beta_1$ is positive, it means that the increase in analyst tracking reports (or positive changes in relevant indicators) will promote the improvement of the quality of internal control in the enterprise; if $\beta_1$ is negative, it means that the increase in analyst tracking reports will reduce the quality of internal control in the enterprise. $\beta_2$: is the regression coefficient corresponding to the ControlVariablesit variable. ControlVariablesit represents a series of control variables of the ist enterprise in year t. These control variables are designed to exclude other factors that may affect the quality of internal control of the enterprise, such as the size of the enterprise affecting the difficulty of implementing internal control, the asset-liability ratio reflecting the financial risks of the enterprise and linking the focus of internal control, and the growth rate of operating income reflects the requirements of internal control of the enterprise development trend. $\beta_2$ represents the average change in the quality of internal control of the enterprise for each unit change of these control variables. Years: is a year virtual variable. It is used to control the impact of time factors such as macroeconomic environment, adjustment of policies and regulations, capital market atmosphere, etc. on the quality of internal control of enterprises in different years. Industry: It is an industry virtual variable. It is used to control the impact of industry factors on the quality of internal control of enterprises. Enterprises in different industries have differences in business process complexity, business risk characteristics, regulatory requirements, etc. These differences will lead to different internal control quality. Error term $\varepsilon i, t$: is a random error term. It includes the impact of other factors not taken into account in the model on the quality of internal control of the enterprise, as well as possible measurement errors. These factors are random and unpredictable, and assume that their mean is 0, and there is no systematic association with independent variables.

## 4. Empirical Analysis

### 4.1 Descriptive Statistics
In order to understand the data characteristics of each variable, this paper conducts descriptive statistics on the main variables through Stata software before conducting hypothesis testing (see Table 2 for the results).

**Table 2. Descriptive Statistical Analysis**

|          | Mean   | Sd     | P50    | Min   | Max    | Count |
|----------|--------|--------|--------|-------|--------|-------|
| Dib      | 648.43 | 125.91 | 669.85 | 0     | 995.36 | 32879 |
| Analyst  | 1.43   | 1.18   | 1.39   | 0     | 4.33   | 32879 |
| Size     | 22.12  | 1.3    | 21.92  | 19.32 | 26.45  | 32879 |
| Lev      | 0.42   | 0.21   | 0.41   | 0.03  | 0.91   | 32879 |
| Roa      | 0.042  | 0.06   | 0.04   | -0.37 | 0.26   | 32879 |
| Fixed    | 0.21   | 0.16   | 0.18   | 0.01  | 0.77   | 32879 |
| Growth   | 0.17   | 0.41   | 0.11   | -0.66 | 4.02   | 32879 |
| Indep    | 37.46  | 5.34   | 35.71  | 25    | 60     | 32879 |
| Top 1    | 34.7   | 14.93  | 32.63  | 8.02  | 75.84  | 32879 |
| Inst     | 46.01  | 25.6   | 47.46  | 0.1   | 121.81 | 32879 |
| Firm age | 2.86   | 0.37   | 2.89   | 0.69  | 3.61   | 32879 |

First of all, the sample mean of the explained variable Internal Control Quality (Dib) is 32879, the standard deviation is 125.91, the minimum value is 0, and the maximum value is 995.36, indicating that there is a large difference in the level of innovation investment of different enterprises.

Secondly, the average value of analyst attention (In analyst attention) of the core explanatory variable logarithm is 1.43, and the standard deviation is 1.18, indicating that the distribution of analyst attention received by listed companies is relatively concentrated.

In terms of control variables, the average size of the company is 22.12 and the standard deviation is 1.30. On the surface, the difference in the size of different enterprises can be relatively controlled; the average of financial leverage (Lev) is 0.42, which shows that the average asset-liability ratio of the sample enterprise is at a reasonable level; the rate of return on assets The average value of (Roa) is 0.04, and the minimum value is -0.37, reflecting the loss phenomenon of some enterprises; the average value of the fixed asset ratio (Fixed) is 0.21, indicating that the proportion of fixed assets of the sample enterprise is generally moderate; the average operating income growth rate (Growth) is 0.17. It shows that the enterprise as a whole has maintained a certain growth trend; the average value of the proportion of independent directors (Indep) is 37.46, which meets the

requirements of the governance standards of listed companies; the average value of the shareholding ratio of the largest shareholder (Top1) is 34.70, and the standard deviation is 14.93, reflecting that different enterprises The difference in equity concentration is obvious; the average shareholding ratio of institutional investors (Inst) is 46.01, indicating that institutional investors play an important role in listed companies; the average company age (Company age) is 2.86, reflecting that sample enterprises generally have a long listing history.

## 4.2 Analysis of Main Regression Results

Through the previous analysis, this study believes that the analyst's tracking report can improve the quality of internal control. In order to demonstrate whether the statement is valid, this paper conducted a regression test and presented the regression analysis results of the impact of analyst attention on the quality of internal control (see Table 3 for regression results).

The data in column (1) shows that without adding control variables, the regression coefficient of analyst attention (ln analyst attention 1) is 21.56, showing a significant positive correlation at the level of 1%. According to column (2), after the control variable is added, the regression system corresponding to the analyst's attention The number became 5.38, and it still maintained significant positive correlation characteristics at the 1% level. In terms of economic significance, in the regression results after including control variables, for every 1% increase in analyst attention, the internal control quality of the enterprise will increase accordingly to a requirement of about 5.38 percentage points, which provides strong supporting evidence for the research hypothesis H1, and reflects that the degree of attention of analysts does give Improve the role of positive assistance to the internal control level of the enterprise.

### Table 3. Analysis of Principal Regression Results

| | (1) | (2) |
|---|---|---|
| | Dib | Dib |
| Analyst | 21.5631*** | 5.3798*** |
| | (25.1309) | (5.8608) |
| Size | | 19.3174*** |
| | | (12.3784) |
| Lev | | -35.5112*** |
| | | (-5.4984) |
| Roa | | 560.5152*** |
| | | (40.9191) |
| Fixed | | -19.7284** |
| | | (-2.4662) |
| Growth | | 14.3496*** |
| | | (9.3878) |
| Indep | | 0.0871 |
| | | (0.5092) |
| Top1 | | 0.4251*** |
| | | (4.1408) |
| Inst | | 0.0439 |
| | | (0.7115) |
| Firm age | | 17.3469* |
| | | (1.95) |
| Year | Yes | Yes |
| Firm | Yes | Yes |
| | (454.0119) | (3.2942) |
| N | 32945 | 32879 |
| adj. R2 | 0.270 | 0.333 |

In addition, the regression coefficient of the enterprise size, that is, Size, is 19.32, which is significantly positively correlated at the 1% level. The phenomenon of better quality performance of large-scale enterprises' internal control is shown. The corresponding coefficient of return on assets (Roa) is 560.52, which is also significantly positively correlated at the 1% level, and the profit is stronger. It is more reasonable for enterprise resources to be used more for internal control construction; when the shareholding ratio of the largest shareholder (Top1) coefficient is 0.43, there is a significant positive correlation tendency at the level of 1%, so the concentration of equity promotes the quality of internal control is effectively proven; and the company's age (Firmage) returns The coefficient reaches 17.35, and there are still significant positive correlation characteristics at the level of 10%, indicating that the internal control mechanism of a longer-term enterprise is relatively complete; as for the regression coefficient of financial leverage (Lev) is -35.52, which shows a significant negative correlation state at this height of 1%, and the surface improves the quality of internal control. It shows the effect of hindering inhibition; the coefficient of fixed assets (Fixed) is -19.73, showing significant negative correlation characteristics at the level of 5%. This situation seems to convey the message that heavy-asset enterprises may face more difficult problems in internal control; and the proportion of independent directors (Indep) and institutional investor shareholding ratio (Inst), the regression

coefficients of both are not significant, so their role in improving the quality of internal control is relatively weak. After the control variables are added to the model, the adjusted R² value is increased from 0.27 to 0.33. In this way, it can be determined that the increased control variables do greatly strengthen the interpretation of the whole model; in addition, the corresponding variance expansion factor (VIF) value of all variables is less than 5, which means that this study There is no particularly serious multiple collinear condition in the model.

Therefore, the transmission mechanism of the impact of analysts' tracking reports on the internal control quality of enterprises is roughly as follows. Once the attention is increased (regression coefficient 5.38***), external supervision seems to have a certain direct improvement effect, and with the further tracking and in-depth research carried out by this concern, it can force the listing The company fills for the potential shortcomings in internal control; the scale effect, that is, the Size coefficient is 19.32***, which forms a synergistic relationship with the attention of analysts, especially in larger enterprises. Such enterprises tend to build a more standardized one when receiving the attention of analysts. The internal management mechanism is used to maintain its own business image from being broken; in addition, under the condition that financial health indicators such as the Roa coefficient is as high as 560.52***, and the Lev coefficient of the leverage ratio structure is displayed as a negative value, the opinions of the professional level will exert certain pressure on the enterprise to promote They improve internal control to mitigate the risk situation that may be caused by creditors. The research results show that the role of market information intermediaries such as analysts is quite important, which plays a great role in improving the quality of internal control of enterprises. This role is reflected not only in supervision and governance, but also in the function of information transmission.

## 4.3 Heterogeneity Analysis
4.3.1 Heterogeneity analysis based on enterprise size
Considering the differences in resource conditions, information transparency and market attention of enterprises of different sizes, the role of analyst tracking on the quality of their

internal control may also be mixed with some differences. In order to verify whether the size of the enterprise will lead to changes in the effect of analyst tracking to promote internal control, 25% of the sample is set here. Enterprises of the lower scale are regarded as small enterprises, and more than 75% of them are classified as large enterprises. Through this dividing line, the classification of enterprises is completed, and regression operations are further implemented for their models.

The results are shown in Table 4: The regression coefficient tracked by analysts in the large enterprise group is 9.42, which is very prominent at the 1% significance level, and the t value reaches 4.73; in the small enterprise group, the analyst tracking regression coefficient is only 2.88, but it is also significant at the 1% significance level, and the t value is 1.20. This phenomenon Perhaps it is related to the better performance of large enterprises in terms of information transparency and corporate governance structure. In this way, the external supervision role of analysts is more likely to be transmitted to the enterprise, which will have a greater positive effect on the quality of their internal control.

**Table 4. Heterogeneity Analysis Based on Enterprise Size**

|  | Large enterprises | Small business |
|---|---|---|
|  | Dib | Dib |
| Analyst | 9.42*** | 2.88*** |
|  | (4.73) | (1.20) |
| size | 31.37 | 48.07 |
|  | (6.60) | (7.16) |
| Control Variable | Yes | Yes |
| Year | Yes | Yes |
| Firm | Yes | Yes |
| N | 8644 | 7021 |
| adj. R2 | 0.43 | 0.29 |

4.3.2 Heterogeneity analysis based on the establishment years of the enterprise
Due to the differences in the maturity of corporate governance, market adaptability and the degree of information accumulation of enterprises with different years of establishment, the impact of analyst tracking reports on the quality of their internal control may also be different. In order to test whether the years of establishment of the enterprise will affect the role of analyst tracking in promoting the quality of internal control, this paper distinguishes the high and low level of the year of establishment of the intermediate enterprise in the sample.

Those above 75% are regarded as mature enterprise groups, and those below 25% are included in the young enterprise group, and then enter the two data respectively. The analysis and testing of the regression method has been carried out.

The results are shown in Table 5: In the enterprise group with a long establishment time, the regression coefficient tracked by analysts reached 4.66, and it was reflected at the 5% significance level, with a t-value of 1.90, while in the enterprise group with a short establishment time, the regression coefficient was -1.95, at 10% significance. It shows statistical significance at the level, and the t value is -1.08. For those enterprises with a long growth period and longer experience, due to the relatively perfect handling of the governance framework and the degree of information exposure, the external supervision of analysts can improve the quality of internal control more effectively; however, for enterprises with a short period of establishment, Perhaps because their governance system is not strong enough, analysts are watching that there may be some adverse effects or effects due to insufficient information disclosure.

**Table 5. Heterogeneity Analysis Based on the Establishment Years of the Enterprise**

|  | Mature enterprises | Young enterprises |
|---|---|---|
|  | Dib | Dib |
| Analyst | 4.66*** | -1.95*** |
|  | (1.90) | (-1.08) |
| Firm age | -370.44 | 22.95 |
|  | (-1.79) | (1.04) |
| Control Variable | Yes | Yes |
| Year | Yes | Yes |
| Firm | Yes | Yes |
| N | 7723 | 6795 |
| adj. R2 | 0.36 | 0.44 |

## 4.4 Endogenous Test

### 4.4.1 Forward-looking adjustment method

In order to deal with the problem caused by the possible two-way causal relationship between the number of analysts and the internal control quality of the enterprise, the article adopts the practice of lagging the dependent variable to carry out a robustness test, advances the internal control quality value to the previous stage, that is, $(ICQ_{i.t+1} - ICQ_{:t})$, and builds a new regression model to investigate the impact of the number of analysts in the current period on the

quality of internal control in the next period, so as to improve the credibility of causal reasoning. The main considerations are as follows: first of all, laging the quality of internal control can better reduce the interference caused by reverse causality, which plays a role in avoiding the current control situation affecting internal decision-making; secondly, the delay in the establishment of a period of time is conducive to more clearly reflecting the actual impact process of analyst tracking on internal construction, because it always takes time for external supervision to transform into real management level improvement. In order to enhance the credibility of causal inference, this study controls a variety of factors that may affect the quality of analyst tracking and future internal control at the same time, including enterprise size, profitability (ROA), growth, financial leverage (Lev) and the largest shareholder shareholding ratio (Top1). Through this time-delay variable design and comprehensive selection of control variables, this study minimizes the endogenous problems caused by omission variable deviation and reverse causality as much as possible, and provides more reliable causal evidence for analyst tracking the impact of the impact of the report on the internal control quality of the enterprise. The regression results (see Table 6 forward-looking adjustment method) show that the number of analysts followers still have a significant positive impact on the quality of internal control in the lagging period, which further supports the robustness and interpretation of the main regression results of this article.

**Table 6. Results of the Forward-Looking Adjustment Method**

|  | Dib |
|---|---|
| Analyst | 4.88*** |
|  | (5.05) |
| Control Variable | Yes |
| Year | Yes |
| Firm | Yes |
| N | 29320 |
| adj. R2 | 0.26 |

### 4.4.2 Tendency Score Matching Method

When analyzing the impact of analysts' tracking reports (number of analysts) on the quality of internal control of enterprises,This study acknowledges that there may be endogenous problems, such as analysts are more inclined to track enterprises with good governance

foundation or transparent information disclosure (self-selection bias), and the improvement of internal control quality may reversely attract More analysts pay attention to (reverse cause and effect). In order to alleviate the endogenous problems caused by sample selection bias, this paper adopts the Propensity Score Matching (PSM) method to test the robustness of the impact of the number of analysts following on the quality of the enterprise's internal control. Specifically, the sample is divided into "high follow-up group" (processing group) and "low-follow-up group" (control group) according to the median number of analyst followers, and the binary processing variable is constructed. The propensity score is estimated based on control variables such as firm size, profitability (ROA), growth, financial leverage (Lev), the largest shareholder's shareholding ratio (Top1) and the number of years of enterprise establishment. One-to-one nearest neighbor matching is adopted, and the caliper is set. The value is 0.01 to ensure the similarity of the matching sample on the covariable. After matching, the balance test was carried out. The results showed that most of the covariables did not differ significantly between the processing group and the control group, indicating that the matching effect was good. Further regression analysis based on the matching sample re-substituted into the main regression model (see the results of the tendency score matching method in Table 7). The results show that the coefficient of analyst tracking is 4.26 (t=2.93), which is significant at the level of 5%, indicating that for every 1% increase in analyst attention, the internal control quality of the enterprise (Dib) Significantly improved by 4.26 units, and the direction of the control variable is in line with the theoretical expectation. After model adjustment, $R^2$ is 0.26, which has good explanatory power. This result confirms that the positive impact of the number of analysts on the quality of internal control of the enterprise is still significant, and verifies the robustness of the principal regression results.

**Table 7. Tendency Score Matching Results**

|  | Dib |
|---|---|
| Analyst | 4.26*** |
|  | (2.93) |
| Control Variable | Yes |
| Year | Yes |
| Firm | Yes |
| N | 12185 |

| adj. R2 | 0.26 |
|---|---|

## 5. Research conclusions

Internal control is the cornerstone of the smooth operation of enterprises. As an important information bridge and external supervisor, analysts are increasingly important in helping enterprises achieve efficient internal control. This article selects all Shanghai and Shenzhen A-share listed enterprises from 2007 to 2022 as samples, relying on entrusted agents and incorrect information. And internal control theory, use empirical methods to explore the situation that analysts track the impact of the internal control volume of the enterprise, and conduct an in-depth analysis of different characteristics and mechanisms of action. After multivariate regression analysis, heterogeneity test and endogenous problem test, a number of important conclusions have emerged:

First of all, analysts' tracking reports have significantly improved the quality of internal control of enterprises. The study shows that the effect of analyst tracking on improving the quality of internal control of enterprises cannot be ignored. The regression coefficient of "analyst attention" has reached 5.38, and shows a significant positive correlation at the level of 1%. This situation shows that the information dissemination and external supervision functions undertaken by analysts are built by the enterprise. The internal control architecture brings positive results. In reality, it can be seen that analysts have increased the transparency of the company's operations and relevant information disclosure by releasing analysis results, making profit forecasts and adjusting ratings, effectively reducing the information imbalance between executives and external investors, thus driving enterprises to be more willing to improve the internal control structure. Practice the action. In addition, the analyst's professional examination ability can capture the potential problem links in the business behavior and the shortcomings of internal control. In this case, it will motivate the enterprise management authorities to repair the defects as soon as possible, so that the overall quality level of internal control will be improved.

Secondly, the impact of analysts tracking reports on the quality of internal control is heterogeneous. Specifically, it depends on the difference in the scale of enterprises. In large enterprises, because the regression coefficient

reaches 9.42, far exceeding the 2.88 of small-scale enterprises, the positive effect of analyst tracking is more significant, which may be closely related to the more complete governance structure and related resource allocation ability of large enterprises, so that they can Better meet the needs of external supervision; for the establishment of enterprises, the effect of internal control improvement of enterprises with a long establishment period is more striking in analyst tracking (the regression coefficient is 4.66). In contrast, the internal control situation of young enterprises may be under the attention of analysts because the lack of internal governance. There is a certain negative effect (the regression coefficient is -1.95). This further reflects that whether corporate governance is mature or not has become a key condition for analyst functions.

Thirdly, analysts track reports to improve the quality of internal control through external supervision and reputation mechanisms. In terms of the external supervision effect, analysts' continuous tracking will put more transparency pressure on the enterprise, which will promote the management to reduce the tendency of opportunistic behavior and improve the implementation of internal control to squeeze into the actual operation level.

Finally, analyst tracking has played a positive role in promoting its internal control. Through continuous observation, these effects are gradually manifested. For example, the risk assessment part of the enterprise shows an optimized state under the more attention of analysts. It has become more accurate in dealing with problems such as financial risk warning, and the level of information and communication has also improved to some extent; in addition, internal Supervision has also been strengthened, such as greatly promoting the audit committee to perform its duties.

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