

The Impact of Analyst Coverage on Corporate Innovation Output: Evidence from Chinese A-Share Listed Firms

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Abstract. This study investigates the relationship between analyst coverage and firms' innovation performance using a sample of Chinese A-share listed companies from 2010 to 2022. Drawing on information asymmetry theory and agency theory, this paper constructs a two-way fixed effects model to examine how external analyst attention is associated with different types of corporate innovation outcomes. The empirical findings indicate that analyst coverage is positively related to both strategic innovation (utility and design patents) and substantive innovation (invention patents). Notably, the effect is more pronounced for high-quality innovative output, suggesting that analyst attention may play a governance role in encouraging firms to engage in more value-creating innovation activities rather than short-term, low-quality patenting strategies. Overall, the results imply that analysts function not only as information intermediaries but also as external monitors that alleviate financing constraints and improve innovation efficiency. This study contributes to the literature on capital market intermediaries and corporate innovation and provides evidence supporting the role of financial information environments in fostering real economic innovation.

Keywords: Analyst coverage, Corporate innovation, Information asymmetry, Financing constraints, Fixed effects model

1. Introduction

Innovation has become a central driver of sustainable economic growth and firm competitiveness. The head of the company needs to raise external funds and maintain good corporate governance for innovation. Innovation activities are long-cycle, high-risk and have severe information asymmetry; as a result, they face financing constraints and agency problems and are often unable to attract R&D investment and innovation output. As intermediaries for various reasons, securities analysts are responsible for collecting, analysing and disseminating corporate information in the capital market. They can reduce information asymmetry for investors and listed companies, change management behavior through a monitoring effect, and thus affect corporate innovation [1]. In recent years, as China's reform of the capital market has deepened, the analyst industry has also developed rapidly, and both the scope and depth of coverage for listed companies have been continuously expanding. At present, scholars have not been able to confirm that analyst coverage can effectively promote corporate innovation. On the one hand, the information effect hypothesis proposes that analysts reduce information asymmetry and lower external financing costs

by providing funding support for innovation. At the same time, the market pressure hypothesis proposes that under pressure from the market, analysts' earnings forecasts may lead managers to pursue short-termism, reduce long-term R&D investment, and thus fail to meet short-term performance goals [1].

This study aims to clarify the net effect of analyst coverage on corporate innovation and to distinguish its influence on substantive versus strategic innovation outcomes. Using a comprehensive dataset of Chinese listed firms, this paper provides updated empirical evidence on this issue.

2. Literature review and research hypotheses

2.1. Literature review

The first studies have focused on the information effect of analysts. Healy and Palepu believe that the creation of information has increased the efficiency of the capital market in reducing information asymmetry [2]. Later studies have found that analyst coverage reduces a company's cost of equity and debt financing and increases the information content of stock prices [3-5]. Analyst coverage at the level of corporate behaviour has been shown to restrict earnings management, enhance investment efficiency, and promote corporate social responsibility [6-8]. Most previous studies on corporate innovation have focused on either the internal governance structure of the company or the external environment. Recently, scholars have increasingly shifted their attention toward the information environment in capital markets. Fang and others have found that negative media coverage hinders innovation, and analysts are also professional information intermediaries [9]. Some research supports the information-effect hypothesis, and He and Tian have found that increased analyst coverage reduces financing constraints for innovation. Other studies also support the market pressure hypothesis and believe that under earnings forecast pressure, managers reduce R&D investment [10-12].

2.2. Research hypotheses

Based on the information effect hypothesis, analysts, through in-depth investigation and information collection, send signals of the true value of the firm to reduce investors' misjudgments of innovation projects and alleviate financing constraints. At the same time, the analysts will monitor the company to prevent management from engaging in self-enrichment and properly utilise the R&D funds. Therefore, this paper proposes:

H1: Analyst coverage significantly promotes corporate innovation output, and the effect is stronger for high-quality invention patents.

In light of the market pressure hypothesis, analysts' near-term earnings forecasts may compel management to reduce investment in long-term research and development to boost stock prices. Under the quantity-oriented patent evaluation system in China, some enterprises may choose to pursue low-quality, easily obtained "strategic" patents. Therefore, the author puts forward the following alternative hypothesis:

H2: Analyst coverage restricts material alterations in the company but can promote novel forms of strategy.

3. Research design

3.1. Data and sample

Based on the CSMAR (GTA) database, this study constructs a firm-year panel dataset of Chinese listed companies from 2010 to 2022. After cleaning the data and excluding observations with missing control variables, the final sample contains 32,475 observations from 4,327 firms. To mitigate potential endogeneity concerns, all control variables are lagged by one period [13].

3.2. Variable definitions and model specification

Research on how Analyst Coverage Affects Corporate Innovation Output. The two types of dependent variables are substantive innovation (Invention) and strategic innovation (Non_invention) [14]. The concrete construction is as follows: Table 1. The first independent variable is analyst coverage, which is set as the natural logarithm of the number of analyst teams covering the firm plus one [15]. Control variables include firm size, leverage, profitability, growth opportunities, ownership concentration, board size, and firm age.

Table 1. Definitions of the main variables

Variable	Definition	Construction
Invention	Substantive innovation	$\ln(\text{patent applications for invention} + 1)$
Non_invention	Strategic innovation	$\ln(\text{utility} + \text{design patents} + 1)$
Coverage	Analyst coverage	$\ln(\text{number of analyst teams} + 1)$
Size	Firm size	$\ln(\text{total assets, lagged})$
Lev	Leverage	lagged leverage ratio
ROA	Profitability	lagged return on assets
TobinQ	Growth	lagged Tobin's Q
Top1	Ownership concentration	lagged top shareholder ownership
Board	Board size	$\ln(\text{number of directors})$
Age	Firm age	$\ln(\text{current year} - \text{listing year} + 1)$

3.3. Model specification

The baseline regression model is a Two-way Fixed Effects model that controls for both firm fixed effects (Firm FE) and year fixed effects (Year FE) to exclude time-invariant differences among firms and changes in the economy over time. Standard errors are clustered at the level of the firm. The model is given by Equations (1) and (2):

$$Invention_{i,t} = \beta_0 + \beta_1 Coverage_{i,t-1} + \gamma' Controls_{i,t-1} + \mu_i + \delta_t + \varepsilon_{i,t} \quad (1)$$

$$Non_invention_{i,t} = \beta_0 + \beta_1 Coverage_{i,t-1} + \gamma' Controls_{i,t-1} + \mu_i + \delta_t + \varepsilon_{i,t} \quad (2)$$

Where the dependent variables $Invention_{i,t}$, $Non_invention_{i,t}$ are firm's substantive innovation output and strategic innovation output in period t, respectively. $Coverage$ is the analyst coverage, and $Controls$ is the vector of control variables including Size, ROA, Tobin's Q, Top1, Board and

Age. Firm fixed effects capture time-invariant firm characteristics, Year fixed effects control for macroeconomic shocks.

4. Empirical results analysis

The regression results show that analyst coverage is significantly and positively associated with corporate innovation output. After excluding singleton observations with fixed effects, the final estimation sample has 31,921 observations. Although the within R^2 is relatively small, the overall goodness-of-fit (R^2) is 0.4987 for substantive innovation and 0.4657 for strategic innovation; thus, the model has good explanatory ability. Table 2 presents evidence that analyst coverage exhibits a significantly positive relationship with both types of innovation output, while its impact is more pronounced in promoting high-quality invention patents; thus, Hypothesis H1 is supported and the competing Hypothesis H2 is rejected. Therefore, the external governance effect of analysts can curb managerial myopia to some extent and stimulate real innovation by the firm, rather than only driving market-oriented strategic patent manipulation behaviour.

Table 2. Baseline regression results

Variable	Invention	Non_invention
Coverage	0.0278*** (0.0089)	0.0137** (0.0069)
Size	-0.0040 (0.0136)	-0.0109 (0.0102)
Lev	-0.0069 (0.0068)	-0.0045 (0.0038)
ROA	0.0184 (0.0204)	0.0089 (0.0110)
TobinQ	0.0000 (0.0001)	-0.0001 (0.0001)
Top1	0.0002 (0.0013)	0.0003 (0.0008)
Board	-0.0222 (0.0569)	-0.0667* (0.0396)
Age	-0.1244*** (0.0213)	-0.0593*** (0.0163)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Clustered SE	Firm	Firm
Observations	31,921	31,921
Firms	3,773	3,773

Note: Standard errors clustered at the firm level are in parentheses. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

Based on the above empirical results, analysts help spread new information in the capital market and are thus positively correlated with prices. An increase in the number of analysts covering a company may provide more financing for innovation by lowering financing costs, enhance corporate governance, and add external scrutiny. Notably, analysts have a significantly stronger positive effect

on "high-quality" invention patents (substantive innovation) than on strategic innovation; thus, the focus of analyst attention appears more likely to guide firms toward long-term value-oriented high-quality innovation rather than short-term strategic behaviour. In terms of control variables, neither firm size (Size) nor profitability (ROA) were statistically significant; instead, firm age (Age) had a positive impact on substantive innovation but a negative impact on strategic innovation, suggesting that older, more established companies are more likely to undertake fundamental technological breakthroughs, and strategic innovation occurs relatively frequently during the early stages of a company's life cycle.

5. Conclusion

Based on a panel dataset of Chinese listed firms from 2010 to 2022, this paper empirically investigates how analyst attention affects corporate innovation outcomes. Therefore, analysts' focus is likely to promote new-product or new-market creation by enterprises. Both the substantive innovation reflected in invention patents and the strategic innovation represented by utility model and design patents are positively associated with analyst attention. Attention from analysts also positively affects concrete innovations more strongly than it does for structural innovations.

On the basis of the above empirical results, several conclusions can be inferred. First, the regulatory department and the stock exchange should continue to strengthen the system of information disclosure, motivate more analysts to conduct research and analysis of listed companies, use the price discovery and monitoring function of the capital market to incentivize enterprises to increase investment in innovation. Second, the company's management should be aware of the external pressure and incentives created by the attention of analysts, and instead of merely making superficial strategic innovations in response to market demands, should turn the analysts' raised expectations into in-depth innovation goals.

This study also has some deficiencies and offers references for subsequent research. First, this paper only investigates the general impact of analyst attention on corporate innovation output and does not explore the underlying transmission mechanism in detail. In the future, one may build a mediation-moderation system to explore the paths above systematically. Second, this paper fails to carry out sufficient heterogeneity analysis. Firms in different industries (e.g., high-tech vs. traditional manufacturing), different types of ownership (state-owned vs. non-state-owned), and at different stages of their life cycle will have varying incentives and resource endowments for innovation, so the effect of analyst attention will be uneven. Grouped analyses will be carried out in future studies to expand the results. Third, the robustness tests are lacking; that is to say, instrumental variable methods or other sample periods have not been used to verify the original results, and potential endogeneity problems, such as reverse causality, have not been addressed. Quasi-natural experiments or difference-in-differences designs could be used in future research to improve causal inference.

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