

Digital Media's Impact on Corporate Innovation in China's Innovation-Driven Strategy

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Abstract. Under China's national development concept of "innovation-driven development strategy", the emergence of digital media sources has overturned the traditional media landscape and information dissemination channels, which will certainly have a significant impact on corporate innovation. In this paper, we use media as a measure of Internet media information reports to examine the intrinsic mechanism of digital media information transmission affecting enterprise innovation. The study finds that digital media information dissemination significantly contributes to corporate innovation. The mechanism analysis shows that the core of digital media information dissemination for corporate innovation lies in the supervisory governance effect. This is demonstrated by the fact that digital media information dissemination helps to improve corporate governance and reduce agency conflicts. Heterogeneity analysis shows that digital media dissemination has a stronger effect on promoting innovation in firms with low information transparency and high opinion pressure, influenced by reputation incentives. This paper contributes to a deep and comprehensive understanding of the role of media in capital markets in the Internet environment and has important policy implications.

Keywords: digital media; enterprise innovation; corporate governance; policy implication

1 Introduction

Nowadays, in the current new media environment of big data, the digitization of media has greatly improved the efficiency of information delivery while also increasing the difficulty of extracting effective information [1]. As an important information medium in the financial market, in addition to "formal media" such as securities trading portals and mainstream financial media, there are also a large number of "informal media" such as micro-blogs and public numbers on the Internet, leading to enhanced interaction of information feedback between individuals. As a result, information on the Internet is mixed and truth and rumors coexist.

Previous studies have found that there are two possible mechanisms of media influence on corporate governance: "monitoring" and "collusion" [2]. On the one hand, the media can influence corporate and investor behavior and improve corporate governance by improving the efficiency of information transmission, i.e., the "effective monitoring hypothesis". On the other hand, the management may also manage public relations through the media, so that

some of the media may deliberately cater to the needs of the company and conceal the misappropriation of the interests of the management or major shareholders due to their interests, i.e., the "collusion hypothesis" [3]. In the digital information age, is the media tool companies use to manipulate information, or is it an external regulator to protect investors' interests by helping them reveal the real situation of companies and guiding them to focus on long-term value and healthy development? In order to clarify this issue, this paper carries out a relevant study.

2 Literature review

In the preliminary research, some literature suggests that media coverage can exert significant market pressure on corporate executives, leading companies to prioritize short-term performance rather than investing in long-term innovation activities [4-6]. In an active stock market, pressure from negative media coverage can also lead companies or managers to be even more short-sighted and thus abandon risky but high-value innovative investments [7]. This tendency is especially evident when the entire media industry is chasing sensational stories as a way to make money in the media, as a short-term downturn in a company's performance becomes perfect fodder for media coverage and is constantly distorted and amplified in the process of dissemination, eventually leading to a sharp fall in the stock price. For instance, Jaggi et al. [8] found that firms with frequent performance disclosures are more likely to reduce their research and development expenditures in order to meet market earnings expectations. This line of research provides evidence for the market pressure hypothesis. The stress hypothesis suggests that increased media attention promotes surplus management by managers. Furthermore, certain studies indicate that the state-owned enterprises face more severe agency problems, characterized by internal control and institutional deficiencies, which weaken the effectiveness of media supervision and disrupt the positive constraining effect of media coverage. Under such circumstances, executives are more prone to making short-sighted decisions for profit-seeking purposes, which is detrimental to corporate innovation [8].

In the later stages of research, an increasing number of scholars have discovered that media voice serves as a mechanism for constraining corporate reputation, which helps alleviate the asymmetry between companies and the market, thereby positively impacting internal corporate governance [9, 10]. The disclosure and dissemination of information by the media enhance its circulation in the market, mitigate the asymmetry of information between companies and the market, and increase operational transparency, thus facilitating external supervision by investors [10]. The later literature fits the idea that the media as a third party to the company plays an effective monitoring role in the development of the company [8]. The monitoring hypothesis argues that the media has an information dissemination function and that the media disseminates news to a wide audience, including the company's shareholders, external creditors, and regulators. Among them, regulators have a coercive role in correcting corporate behavior, and media coverage of corporate violations draws the attention of regulators, thus forcing managers to correct their misconduct [10]. Second, media coverage can have an impact on the reputation of managers and boards of directors, and their reputation is exposed not only to many boards of directors but also to the general public, putting their pay and competitive opportunities in jeopardy, thus serving to regulate behavior [11].

Based on a review of the literature, previous research has focused on examining the impact of traditional print media on corporate innovation, resulting in contrasting views between the market pressure hypothesis and the effective supervision hypothesis [12, 13]. However, the emergence of digital media as a source of information has disrupted the traditional landscape, with more diverse channels of information dissemination altering the ways information is acquired and interacted with [14]. Digital media are information carriers that record, process, and disseminate processes in binary form [15]. It is an innovative form of media, and its characteristic is that it does not require considerable storage space and breaks the monopoly of communication paper media. Secondly, communication is personalized and evolves into a close supply and demand relationship with the audience for information services, and users can choose what they want to focus on at any time according to their needs. Consequently, the impact of digital media information dissemination on corporate innovation may differ from that of traditional media. For starters, the increasing use of digital media increases business openness. This implies that firms whose strategies prioritize short-term performance gains over long-term development are more easily recognized by investors [16]. As a result, digital media information dissemination can generate more robust external supervision effects and prevent the overvaluation or undervaluation of company value. Additionally, managers, their past experiences and performance will be comprehensively recorded in the digital information environment, creating reputational pressures that help mitigate agency problems. According to the above analysis, this paper believes the managers' short-sighted profit-making behavior will be diminished as the efficiency of information dissemination improves, promoting the company more focused on long-term development.

3 Research methodology

3.1 Model construction

In this study, the linear regression model's unknown parameters are estimated using the ordinary least squares approach. This model is used in this study to examine how business innovation is impacted by the diffusion of information via digital media. At the same time, year, industry, and area fixed effects were controlled to ensure the rigor of the article's conclusions and the accuracy of the data [17]. The benchmark regression model for this study is shown in Equation (1).

$$Patents_{i,t+1} = \alpha + \alpha_1 Media_{it} + \alpha_2 Size_{it} + \alpha_3 BM_{it} + \alpha_4 Roa_{it} + \alpha_5 Q_{it} + \alpha_6 Top_{it} + \alpha_7 Leverage_{it} + \alpha_8 Age_{it} + \alpha_9 SOE_{it} + \alpha_{10} Big_{it} + i.area + \varepsilon_{i,t+1} \quad (1)$$

Where the subscripts i and t represent the industry and year, respectively. *Patents* is the number of corporate patent applications. *Media* is the number of Internet news reports. *Size* is the firm's total assets at the end of the year. *BM* is the ratio of a company's book value to the market value of the stock. *Roa* expressed by dividing a company's net income by the average total assets. *Q* (Tobin's Q) represents the investment and growth opportunities of the firm. *Top* refers to the proportion of the number of shares held by the largest shareholders of a listed company to the total number of shares of the listed company. *Leverage* is related to the financial risk of a firm. *Age* is the year of observation minus the year of establishment of the company. Whether the nature of the enterprise is a state-owned enterprise (*SOE*) or not is used

as one of the dummy variables, if it is a state-owned enterprise is represented by the number 1, and non-state-owned enterprise is represented by the number 0. The other dummy variable is the Big 4 audit (*Big*) which means that the Big 4 audit data is recorded as 1 and the non-Big 4 audit is recorded as 0. Generally, in China, the Big 4 are PwC, DTT, KPMG, and EY.

3.2 Dependent variable

The dependent variable in this paper is corporate innovation, measured using the number of corporate patent applications (*Patents*). This paper takes into account the invention patents of the listed company's parent company and its subsidiaries, associated company as well as a joint venture company. At present, Chinese patents are mainly divided into three types: (national) invention patents, design patents and new utility model patents. A national invention patent is defined as "an invention is a new technical solution for a product, a method or an improvement thereof", which mainly refers to a variety of new products that can be manufactured industrially, including solid, liquid, gas and other items with a certain shape. A design patent is defined as "an aesthetically pleasing and industrially applicable new design of a product in shape, pattern or combination thereof, as well as the combination of color and trait and pattern". A utility model patent is defined as "a utility model is technically applicable solution for the shape, construction or combination of products". Among them, invention patents are the most original and representative among these three types of patents, which are closely related to enterprise innovation. Therefore, in the subsequent robustness test, the sum of the number of enterprise patents is replaced by the three different patent subtypes as the explanatory variables respectively. Furthermore, the number of patent applications is handled by adding 1 to the natural logarithm of the total number of patent applications filed by the company to eliminate the multicollinearity.

3.3 Explanatory variable

The central explanatory variable in this paper is digital media news dissemination (*Media*), measured as the logarithm of the number of Internet news reports. Digital media news distribution includes cultural content products and services generated, produced, managed, distributed, operated and consumed with digital technology. The essence of digital media is "software media", which is characterized as computable and programmable. It is not only versatile, variable, timely and interactive, but the database will influence society as a form of cultural and artistic identity. From the Internet to mobile Internet, from traditional media to new media, from full media to intelligent media, digital media are playing an increasingly important role in connecting social elements and reconstructing social life. The traditional media ecological pattern is undergoing significant and continuous changes, and the outreach of digital media is constantly being updated and iterated with breakthrough innovations.

In the Web 1.0 era, communication was characterized by static, one-way browsing, the main feature of which was the massive use of static HTML pages to publish information and the beginning of the use of browsers to access information, strong user demand for information aggregation, association, search, that is, "content media" [18]; Web 2.0 to interact, share the real-time network as Web 2.0 is characterized by interactive and sharing real-time network, which evolves from top-down websites to a mature bottom-up Internet system led by the collective wisdom and power of users, emphasizing user participation, online network collaboration, and social relationship network, i.e. "relationship media" [19]; Web 3.0 is

characterized by networking and personalization, providing more intelligent services, further deep mining information and making it interoperable directly from the underlying database, making information services more accurate, personalized and intelligent, realizing the division and fission of information, emphasizing deep user participation and crowd creation, thus reflecting the value of Internet users' participation, i.e. "service media". In contrast, traditional paper media is slightly inferior in scope and speed of dissemination, and its publication has a certain time and economic cost. In the literature review section, we realize that at this stage with the emergence of digital media information sources have overturned the traditional pattern, so the use of digital media as an explanatory variable is more persuasive and contemporary [20].

3.4 Dummy variable

In the regression analysis, dummy variables can improve the precision and accuracy of the model regression. In this paper, whether the nature of the enterprise is a state-owned enterprise (SOE) or not is used as one of the dummy variables, and if it is a state-owned enterprise is represented by the number 1, and non-state-owned enterprise is represented by the number 0. In particular, corporate governance theory suggests that corporate principal-agent problems have a significant impact on innovation, but due to the specificity of China's institutional environment, SOEs have an "owner-deficit problem". State-owned enterprises (SOEs) are owned or controlled by the state, and the government's will and interests determine the behavior of SOEs. Secondly, as a form of production and management organization, SOEs have both commercial and public welfare characteristics. Their commercial nature is reflected in the pursuit of preserving and increasing the value of state-owned assets, while their public welfare nature is reflected in the fact that SOEs are usually established to achieve the state's goal of regulating the economy and play a role in harmonizing the development of all aspects of the national economy.

The other dummy variable is the Big 4 audit (*Big4*) which means that the Big 4 audit data is recorded as 1 and the non-Big 4 audit is recorded as 0. Generally, in China, the Big 4 are PwC, DTT, KPMG, and EY.

3.5 Intermediary variable

One of the mediating variables applied in this paper for the testing of the mechanism of action is the management expense ratio (*MR*), which is measured by the percentage of management expenses to the main business income, and this indicator mainly reflects the waste caused by excessive on-the-job consumption of managers. According to China's corporate accounting standards and other regulations, the so-called management expenses include employee education expenses (2% of my corporate salary), amortization of intangible assets, provision for bad debts, provision for inventory decline, etc., of which the corporate expenses include headquarter personnel salaries and benefits (benefits are calculated at 14% of salary), travel expenses, office expenses, depreciation expenses, etc. When examining the effectiveness of supervision and governance of digital media information technology, the smaller the management expense ratio, the better, indicating that the supervision and governance of digital media information technology is effective.

Another mediating variable applied in this paper in the mechanism of action test, asset turnover (*TR*), is measured by the ratio of operating income to total assets at the end of the period to estimate residual loss. The so-called residual loss is a loss of value caused by the agent's decision, which is equal to the difference in firm value between the agent's decision and the principal's utility-maximizing decision conditional on the agent's information and ability. It can be divided into two kinds of explicit loss and implicit loss. Explicit loss mainly refers to on-the-job consumption and non-operating expenditures due to decision-making errors or internal control deficiencies; implicit loss refers to the loss of value due to the laziness of the managers, the low level of production technology, or the backwardness of the marketing methods, which results in the shrinkage of the enterprise's market share. Among the residual losses, hidden losses are difficult to measure and observe directly, and can generally only be represented by proxy variables such as a reduction in asset turnover. Generally speaking, the higher the number of asset turnovers or the lower the number of days of turnover, the faster the turnover rate and the stronger the operating capacity; whereas a decrease in asset turnover means an increase in residual losses.

3.6 Data

In this paper, Chinese A-share listed companies from 2007 to 2020 are selected as the initial research sample, and the original sample is processed as follows: non-Shanghai and Shenzhen A-share listed companies are excluded; samples in ST and PT categories are excluded; financial listed companies are excluded; and samples with missing data are excluded. Further, in order to exclude the influence of outliers on parameter estimation, this paper shrinks all continuous variables at 1% level. After the above screening, a total of 28,197 observations are obtained.

The corporate innovation data and financial data used in this paper come from the CSMAR database, and the news coverage data come from the CNRDS database. Since this paper focuses on digital media reports, only the relevant data module of online financial news is selected, which collects news report data from more than 400 important online media, including news reports from 20 mainstream online financial media, such as Hexun.com, Sina Finance, Oriental Fortune.com, Tencent Finance, NetEase Finance, Phoenix Finance, China Economy, Sohu Finance, Finance, HuaXun Finance, FT Chinese, Qianjiang.com, CICC Online, China Securities Network, Securities Star, Caixin.com, Pescadores.com, China Business News, China Business News, 21CN Finance Channel and Caijing.com. These 20 online financial media not only belong to the top in terms of quantity and quality of financial news reports in China, but are also financial websites that investors often browse and pay attention to, so the news they report is of significant value. In addition, the data module also includes news data from more than 400 other large and important websites, industry websites or local websites. In other words, the source of the data is rich and authoritative. Descriptive statistics of the data are presented in Table 1.

Table 1. Descriptive statistics.

Variables	Obs.	Mean	Std. dev.
Patents	28,197	2.383	1.846
Media	28,197	4.216	1.251
Size	28,197	22.048	1.299
BM	28,197	0.433	0.294
Roa	28,197	0.038	0.059
Q	28,197	2.023	1.291
Top	28,197	35.411	14.897
Leverage	28,197	0.431	0.21
Age	28,197	2.789	0.36
SOE	28,197	0.4	0.49
Big	28,197	0.055	0.229

4 Results

4.1 Benchmark regression

Table 2 reports the estimated results of the impact of digital media information dissemination on firm innovation. It reveals that the estimated coefficients of digital media news dissemination (*Media*) consistently pass the significance test at the 1% level, which shows that digital media information dissemination can play a role in encouraging firm innovation.

Table 2. Benchmark regression results.

Variables	(1)	(2)
Media	0.317*** (0.009)	0.258*** (0.009)
Constant	1.048*** (0.039)	1.406*** (0.111)
Control	Y	Y
Industry FE	N	Y
Area FE	N	Y
Year FE	N	Y
Obs.	28,197	28,197
Adj. R^2	0.046	0.383

Notes: *** indicates significance at the 1% level. The t -value is reported in parenthesis.

Unlike traditional media, the content and dissemination of digital media is more decentralized. Anyone can publish information via the Internet, and users can freely choose to read, watch and share it; at the same time, it can disseminate or form a strong public opinion in a very short period of time, satisfying the public's needs for "information" and "expression" and becoming a largely free market for information and opinions. It is difficult for companies that are heavily covered by the media to build a good reputation if they do not pay attention to their innovations. As a result, the pressure to focus on performance brought about by digital media coverage has shifted to pressure to innovate, thus promoting corporate innovation.

4.2 Mechanism analysis

According to the previous relevant literature, the core mechanism by which digital media information dissemination affects corporate innovation lies in the supervisory governance effect [5]. However, it is not known whether this mechanism actually exists. Based on this, the next part of this paper will analyze the core mechanism of digital media information dissemination influencing corporate innovation based on its supervisory governance effect. More specifically, this paper examines the impact of digital media information dissemination on the agency costs of firms. Theoretically, if digital media information dissemination does play a supervisory governance effect, then the agency costs of firms should be reduced [21]. Based on this idea, this paper uses the management expense ratio and total asset turnover ratio to measure agency costs, and then examines the effects of digital media information dissemination on both separately.

As shown in column 1 of Table 3, the estimated coefficients of *Media* are significantly negative, which indicates that digital media information dissemination reduces firms' overhead costs. The depreciation in the management expenses is mainly the apportionment of the original value of the office equipment, houses and vehicles of the administrative department after deducting the expected net salvage value in its life cycle, and its original value refers to the actual cost of acquiring these fixed assets, such as purchase price, value-added tax, transportation and miscellaneous charges, security fees and so on. As the media continues to increase the frequency of exposure to the company's financials, as well as tracking reports of significant internal news, the company's internal executives increase interest rates in order to meet their market demand for higher internal operating rates, and therefore reduce overhead costs. Further, by looking at column 2 of Table 3, it is clear that the estimated coefficient of *Media* is significantly positive, which indicates that digital media information dissemination enhances the total asset turnover of the firm. These results fully suggest that digital media information dissemination helps to mitigate corporate agency conflicts and reduce agency costs, thus providing direct evidence for the supervisory governance effect of digital media information.

Table 3. Mechanism analysis results.

Variables	(1)	(2)
Media	-0.005*** (0.001)	0.018*** (0.002)
Control	N	N
Industry FE	Y	Y
Area FE	Y	Y
Year FE	Y	Y
Obs.	28,194	28,197
Adj. R^2	0.209	0.297

Notes: *** indicates significance at the 1% level. The t-value is reported in parenthesis. Columns (1) and (2) show the regression results for management expense ratio and total asset turnover ratio, respectively.

4.3 Heterogeneity analysis: information transparency

News media is an important tool to alleviate the problem of information asymmetry between investors and listed companies in time, and one of the main sources of information for investors to form expectations about the future operation and risks of listed companies [6]. According to the theoretical analysis in the previous section, for companies with higher information transparency, their own information disclosure quality is higher, the marginal contribution of the media monitoring role is lower, and thus digital media news dissemination has a technological innovation is promoted weaker. Based on this, this paper takes the financial information opacity as the starting point and divides the sample into two groups of high and low transparency based on the median, followed by group regression.

In the results in Table 4, it is shown that digital media information dissemination is more significant for companies with low transparency of financial information compared to companies with high transparency of financial information. This indicates that digital media can effectively transmit information and have a stronger regulatory governance effect on companies with low transparency.

Table 4. Heterogeneity analysis I.

Variables	(1)	(2)
Media	0.246*** (0.014)	0.264*** (0.011)
Control	N	N
Industry FE	Y	Y
Area FE	Y	Y
Year FE	Y	Y
Obs.	10,215	17,982
Adj. R^2	0.417	0.376

Notes: *** indicates significance at the 1% level. The t-value is reported in parenthesis. Columns (1) and (2) show the regression results for high and low transparency, respectively.

4.4 Heterogeneity analysis: reputation incentive

In order to examine the innovative incentive effects of digital media news dissemination as influenced by public opinion pressures, this paper separately looks at the number of Guba posts and financial news of WeChat public accounts to portray the pressure of online public opinion concerns faced by companies. Firms with few Guba posts and few financial news are classified as low online opinion pressure groups according to the median per year, and firms with high Guba posts and high financial news are classified as high online opinion pressure groups, and group regression is conducted separately [22]. Table 5 reports the results of the grouped regressions based on online opinion pressure. It can be found that the estimated coefficients of digital media information dissemination are significantly positive in every subgroup, but the coefficient values are larger in the groups with more Guba posts and more WeChat public accounts, which implies that the promotion of media coverage on firms' innovation is stronger in high online opinion pressure compared to low online opinion pressure firms.

The current multimedia communication methods represented by mobile phones and the Internet make the public both the receiver and the publisher of information. The public and the media can likewise participate in public discussions through online platforms, thus realizing the expression of emotions and exchange of views on real social events and social phenomena. Many retail investors often pay attention to stock bars and financial news public numbers and exchange opinions with each other on them, and these discussions and dissemination will form public opinion, which will have an impact on enterprises. In companies with high public opinion pressure, the reputational incentive effect of digital media communication is stronger; in companies with less public opinion pressure, the reputational incentive effect of digital media communication is weaker. This is because in the case of high public opinion pressure, managers can make more timely investment decisions in corporate innovation for long-term benefits.

Table 5. Heterogeneity analysis II.

Variables	(1)	(2)	(3)	(4)
Media	0.204*** (0.012)	0.255*** (0.012)	0.226*** (0.012)	0.254*** (0.013)
Control	N	N	N	N
Industry FE	Y	Y	Y	Y
Area FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Obs.	14,105	14,092	15,102	13,095
Adj. R^2	0.371	0.413	0.380	0.368

Notes: *** indicates significance at the 1% level. The t-value is reported in parenthesis. Columns (1), (2), (3) and (4) show the regression results for less Guba posts, more Guba posts, less financial news and more financial news, respectively.

5 Robustness test

To test the robustness of the research findings, this paper uses corporate R&D investment and patent grants to replace the number of patent applications to examine the impact of digital media information dissemination on corporate innovation from the perspective of innovation input and final output transformation. At the same time, three types of patents (invention patents, utility model patents, and design patents) are used as explanatory variables to further test the innovation output of enterprises respectively. Since the granting of invention patents is subject to substantive examination, the number of invention patents granted is usually a more accurate reflection of a company's technological R&D strength [23]. The results can be referred to Table 6.

The results of column 1 show that the estimated coefficient of *Media* is positive and significant at the 1% level, indicating that digital media information dissemination effectively enhances corporate R&D investment. In addition, considering that patent applications in China are not equal to the final innovation achievements of enterprises and that the innovation of patents can be finally confirmed only after the patents are granted, this paper further employs the number of patents granted for the test, and the results can be found in the second column

of Table 6. It can be found that the estimated coefficient of *Media* is still significantly positive and significant at the 1% level.

Further, considering that the types of patents of Chinese listed companies include national invention patents, design patents and new utility model patents. This paper examines the impact of digital media news dissemination on the three types of patent applications respectively, and the results are shown in columns 3-5 of Table 6. The observation results show that among all patent types, the estimated coefficient of *Media* is positive and has the strongest impact on invention patents. This shows that digital media information dissemination plays a substantial role in promoting the innovation output of enterprises. Observing the Table 6 reveals, however, the utility model patents are not important, because their main content is a new technical solution for the shape, structure or combination of products which is suitable for practical use, and their inventiveness and technical level requirements are lower than those of invention patents. Design patents are also not important because their main content is a new design for the shape, pattern or combination thereof, color and form of a product, which is not a substantial innovation.

Table 6. Robustness test.

Variables	(1)	(2)	(3)	(4)	(5)
Media	0.144*** (0.052)	0.237*** (0.008)	0.029*** (0.005)	0.008** (0.003)	0.004** (0.002)
Control	N	N	N	N	N
Industry FE	Y	Y	Y	Y	Y
Area FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Obs.	17,169	28,197	28,197	28,197	28,197
Adj. R^2	0.199	0.397	0.061	0.043	0.023

Notes: ** and *** indicate significance at the 5% and 1% levels, respectively. The t-value is reported in parenthesis. Columns (1), (2), (3), (4) and (5) show the regression results for corporate R&D investment, patent grants, national invention patents, new utility model patents and design patents, respectively.

6 Discussion

Although multiple tests indicate that the findings of this paper are robust, due to some data selection limitations, the results of this paper may be biased and need further improvement.

Firstly, the exclusion of non-Shanghai and Shenzhen A-share listed companies, ST and PT categories, financial listed companies, and samples with missing data may introduce a selection bias, potentially limiting the generalizability of the findings. The excluded companies might have different characteristics that could impact the results. Secondly, the focus on online financial news might overlook important information from other sources like traditional print media, broadcast news, or specialized industry publications. This narrow scope may limit the understanding of the overall media landscape and its impact on corporate innovation.

7 Conclusion

As the main body of innovation activities, the innovation behavior of enterprises is not only about their own development but also has important significance for industrial structure upgrading and social and economic growth [24]. In the current context of economic development transformation, in the big data and complex information environment of technological update and iteration, it is crucial to understand what role digital media has played in the development of enterprise innovation. Do digital media play a positive corporate governance role and promote corporate innovation; or do they generate attention pressure and induce management short-sightedness thereby inhibiting innovation? To address this question, this paper first examines the impact of digital media on corporate innovation using the amount of news coverage of companies in Internet media (*Media*) as a measure of digital media information dissemination. The regression results show that digital media information dissemination can significantly promote corporate innovation. Second, this paper analyzes the heterogeneity of the relationship between digital information dissemination and corporate innovation in two dimensions: information transparency and reputation incentive and finds that the positive impact of digital media information dissemination on corporate innovation is more significant in companies with low information transparency and high opinion pressure.

The main contributions of this study are threefold. First, in the current digital media information dissemination environment and national innovation strategy, media news coverage can effectively promote corporate innovation, which supports the "effective regulation hypothesis" and provides new evidence that media coverage influences corporate innovation [1]. Second, the mechanism of action of digital media information dissemination on the impact of corporate innovation is verified from an external regulatory perspective [11]. This paper shows that digital media information dissemination can promote corporate innovation by improving corporate governance, and the above effect is stronger in firms with low transparency and high opinion pressure. These findings reveal the inner logic of digital media information dissemination affecting corporate innovation and help to understand the role of media in the capital market under the Internet information environment more deeply and comprehensively [12]. Third, the conclusions of this paper have important policy implications. At this stage, the Chinese government constantly emphasizes the innovation-driven development strategy and implements a series of innovation incentive policies. The research in this paper finds that digital media information dissemination can effectively promote enterprise innovation, which provides a useful reference for relevant departments to promote the transformation and upgrading of enterprises through building a good digital media information environment.

8 Suggestion

In recent years, the corporate governance role of the media has gained widespread attention. At the same time, public expectations for companies to take on more social responsibility, the prevalence of stakeholder theory and the need for corporate investor relations management have led to the increasing socialization of corporate governance issues. From the perspective of corporate social responsibility, citizens, as social citizens, should take up their responsibilities and play an active role in social governance [3]; from the perspective of

relevant stakeholders, according to the definition of relevant stakeholder theory, in addition to the first level of relevant stakeholders such as shareholders, creditors, employees, customers, suppliers, etc., people who can influence the company or hand the company's influence include the media and other people with special They belong to the second level of relevant interests.

Although the company's survival does not depend on this part of the population, it is equally influenced by them; from the perspective of the company's investor relations management, the media is an important object of investor relations management and plays a dual role in investor relations: first, as a carrier of company information disclosure, the media transmits relevant information to the capital market; second, the media provides effective external supervision of the company's behavior [6]. The above shows that the socialization of corporate governance issues has required that corporate governance is not only limited to the internal supervision and control of the company, but also subject to the supervision of the society, and the press opinion disseminated through the media is an important part of the social supervision of corporate governance [24]. The external governance role played by the media in capital markets is well documented by empirical evidence and is receiving increasing attention and attention. Like the pressures generated by an active stock market, the pressure of negative media coverage can lead companies or managers to be more short-sighted and to abandon risky but high-value investments. However, the corporate governance function of the media needs to be based on the premise that the media are truly and objectively communicating information [15].

From the supply side of the media, journalists, editors and media owners all have their own preferences and beliefs; however, from the demand side, media coverage in reality often shows a clear "ideological bias" in order to gain the attention of the audience, earn advertising money, and gain the support of the government or other interest groups to meet their preferences and needs. Therefore, the state also needs to provide policy recommendations and reforms from the perspective of the news media, so that the media can report the facts in a more professional and standard manner, and stop the trend of pomposity. China has a large retail investor base and it is easy to follow the trend. If the information conveyed by social media is inaccurate or misleading, the potential risk posed cannot be ignored [5]. Currently, China's domestic information disclosure system is gradually improving, and basic level information such as financial statements are becoming more and more transparent, but at the same time, it also brings a lot of false information provided, and I should pay attention to investor education from now on. Among the large number of retail investors in China, many have professional knowledge as well as mastery of information, but there are still many who do not have such professional financial knowledge and information and are at an information disadvantage [4]. The purpose of investor education is to let them know that the purpose of investment is to grow wealth rather than gambling and speculation, and that while pursuing the rate of return they must also take into account the risks taken; secondly, to improve the investors' own cultivation and quality, invest rationally and not listen to rumors.

This paper has important policy implications. The positive role played by the media in corporate governance as an important medium of information dissemination in financial markets and as an extra-legal institutional environment as well as has been confirmed by numerous studies [9]. A core element of the Chinese government's "supply-side" reform is how to promote the transformation of China's economy from factor-driven and investment-

driven to innovation-driven. This paper argues that in the digital information era, the media should further play an external regulatory role in corporate governance, and encourage and publicize the innovation of listed companies by forming a public opinion guide through the Internet media to encourage innovation [25]. Through the guidance and supervision of public opinion, listed companies are inhibited from over-investing in the financial market, prompted to return to their main business and enhance their core competitiveness through innovation. However, as the main supplier of capital market information, media communication failure can lead to a reduction in the transparency of market information, increase information asymmetry in the market, generate noise interference, and potentially lead to market failure and government failure. Therefore, in order to prevent media communication failure, further correction and improvement should be considered from a legal perspective [17]. First, both financial media and securities journalists should comply with the law and report according to the law. The securities market needs to be protected by the rule of law, and the media needs to report in accordance with laws and regulations, and any inaccurate reports may cause harm to the market or enterprises. Second, active public opinion supervision, and professional media opinion supervision is an effective restraint for the deception of poor-quality companies, so that the capital market can run under the sun.

At the same time, digital media information dissemination is conducive to enhancing corporate transparency [2]. By disclosing reports on the company's innovation process, the media allows investors to understand the innovation process and helps actively innovative companies to build a good reputation, thus weakening executives' motivation to avoid innovative behavior and make other short-termism decisions because of potential failures. In today's Chinese society, the public opinion guiding effect of mainstream media on the status of corporate innovation subjects is of great importance in enhancing the awareness of Chinese companies' innovation and improving their technological innovation capabilities.

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