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Research on Impact of Tax Incentives on Corporate Innovation: Empirical Evidence from China's A-Share Listed Companies

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Abstract. Innovation serves as the fundamental engine driving high-quality economic growth and securing technological self-reliance and advancement. As an important policy tool for the country to encourage enterprise innovation, tax incentives have formed a policy system represented by R&D expense super-deduction coupled with income tax reduction for high-tech enterprises and immediate refund of value-added tax upon collection. Using China's A-share listed firms from2008 to 2023 as the baseline sample, this paper investigates how tax-incentive policies shape corporate innovation. The study finds that China's tax incentive policies significantly improve corporate innovation, and this conclusion holds following robustness tests. Heterogeneity test show that promoting the impact of tax incentives on corporate innovation is more pronounced in private enterprises, high-tech industry enterprises, and small-scale enterprises. The research conclusions offer a theoretical basis as well as practical guidance for optimizing tax policies and corporate innovation strategies.

Keywords: Tax incentives, corporate innovation, baseline regression, mechanism test, heterogeneity.

1. Introduction

With deepening implementation of an innovation-driven development strategy, tax incentives have become one of core policy tools for Chinese government to incentivize corporate innovation. Especially after the "14th Five-Year Plan" clearly identified technological self-reliance and self-improvement as national strategic pillar, policy system represented by R&D expense super-deduction coupled with income tax reduction for high-tech enterprises has been continuously enhanced. For example, in 2023, super-deduction ratio for R&D expenses was uniformly increased to 100% and implemented long-term. Relevant data show that nationwide R&D super-deductions totaled RMB 1.85 trillion that year, up 13.6 % year on year. However, while policy dividends continue to be released, their effects show obvious structural differentiation: the innovation vitality of some enterprises is effectively stimulated, but some studies also point out that over-reliance on policies may lead to a decline in innovation quality or resource misallocation. Thus, how to optimize

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the combination of tax policy tools and enhance the targeting and sustainability of policies has become an urgent issue.

Against this background, this study draws on China's A-share listed companies from 2008 to 2023 to explore the influence of tax incentive policies on corporate innovation. By applying the methods of literature research, empirical analysis, and comparative analysis, this study investigates whether and how tax incentives induce corporate innovation, as well as extends the analysis of differential performance of tax incentives in private enterprises, high-tech industry, and small-scale enterprises from a heterogeneity perspective. The paper's innovation lies in creating a comprehensive analytical framework that integrates externality theory, information asymmetry theory, signaling theory, behavioral economics, and institutional theory to study tax policy's impact on corporate innovation. It also analyzes the differences in mechanisms and effects of tax policy across various enterprises by considering property rights, scale, and industry characteristics, providing empirical evidence for policy optimization.

2. Literature review and research hypothesis

In research on tax incentives and innovation effect, many scholars have done a lot of explorations. Zhang Xindong and He Yanan discovered that implementation of tax incentive policies was positively linked to richness of corporate innovation output; innovation output of tax-advantaged enterprises was richer in new products, patents and scientific research awards [1]. Chu Deyin, Ji Fan et al. empirical analysis discovered that although direct influence of tax incentives on corporate patent output was not conducive to growth of patent quantity, tax policies could play a strong incentive effect on growth of patent output through mediating effect of corporate R&D expenditure [2]. Sun Ziyuan and Liang Chen demonstrated that corporate innovation output was positively impacted by the strength of tax incentives, and that the incentive impact of the intensity of tax incentives on innovation quality was less than the incentive impact on innovation quality; in other words, the incentive effect on innovation quality was greater than the incentive effect on innovation quantity [3]. As for link between tax incentives as well as innovation performance, Yang Yanlin along with Hu Xi found that in addition to direct positive effect of tax incentives on corporate innovation performance [4]. Li Weian, Li Haobo et al. indicated that tax incentives could play a mediating effect through R&D investment as well as non-R&D innovation investment to enhance corporate innovation performance indirectly, but this kind of incentive effect also existed the significant difference among enterprises [5]. In comparative studies of fiscal subsidies as well as tax incentives, Chen Yuanyan, He Mingjun et al., taking high-tech enterprises among listed companies as the research sample, discovered that fiscal subsidies coupled with tax incentives had significant positive effects on the number of patents granted to enterprises, as well as the role of tax incentives in promoting patent output was more prominent, but impact on the number of invention patents was not significant [6]. In their analysis of the incentive effects of tax and fiscal policies on business technological innovation, Ning Liang and Li Jichen discovered that tax incentives had a greater incentive effect than fiscal subsidies at the output stage [7]. Drawing on data from Chinese listed companies, Qu et al. empirically found that tax incentive policies had positive incentive effects on total innovation output, strategic innovation output, and substantive innovation output [8]. Using the business environment as a moderating variable, Li Jianfei et al. discovered that the indirect effect of tax reduction policy support on corporate substantive and strategic innovation output was more significant the better the business environment, and that the incentive effect on substantive innovation was larger than that on strategic innovation output [9]. Czarnitzki et al. employed propensity score matching method and found that R&D tax incentive policy has a significant

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incentive effect on corporate innovation in Canadian manufacturing [10]. Cappelen et al. employed the instrumental variable method and found that tax incentive policy has an incentive effect and the effect is not very large, but the spillover effect is strong [11].

Corporate innovation is essential for national technological advancement and economic growth but faces challenges such as capital allocation issues, risk-return imbalances in R&D, and lack of decision-making confidence. Tax incentive policies can mitigate these market failures by easing financial constraints and restructuring cost-benefit dynamics. Hypothesis H is proposed.

H: Tax incentives can improve the level of corporate innovation.

3. Research design

3.1. Data sources and sample description

In terms of sample selection, this study selects China's A-share listed companies from 2008 to 2023 as the initial sample to examine influence of tax incentive policies on corporate innovation. The CSMAR database is the source of all listed firms' financial data, whereas the Wind database is the source of corporate innovation data. The following sample processing was performed. Firstly, considering the significant differences in business characteristics and accounting rules between financial industry firms and non-financial industries, their financial indicators and innovation models were difficult to compare effectively with other sectors. Thus, these firms were excluded. Secondly, enterprises subject to Special Treatment (ST) or suspended listing (PT) often face abnormal financial conditions and high operational risks. Because their financials and innovation metrics are likely to be distorted and fail to capture the true tax-innovation link under normal operations, these firms were excluded. Thirdly, firms with asset-liability ratios exceeding a reasonable range (greater than 1), indicating insolvency, were already in financial distress. Their operational decisions and innovation investments might be dominated by debt pressure rather than the actual impact of tax incentive policies. Thus, they were excluded. Samples with missing core financial indicators or innovation data were also removed, as incomplete key information could lead to biased empirical analysis results. Finally, all continuous variables in this study were winsorized at the 1% and 99% levels to reduce the impact of outliers on regression results and guarantee the validity of the research findings. After this series of screening and processing steps, a total of 18,914 firm-year observations remained.

3.2. Variable definitions

Corporate innovation (lnPatent1) is measured as the natural logarithm of one plus the firm’s total patent applications filed in the year. This metric is used because patent applications directly capture the output of R&D activities and reflect the contemporaneous effectiveness of innovation efforts. Taking the natural logarithm of one plus the number of patents granted during the year, lnPatent3 corrects for the right-skewness that characterizes raw patent counts. This serves as a robustness check indicator because the grant process involves substantive examination, which better reflects the quality and technological significance of innovation outcomes.

According to Zhen Hongxian et al.'s method, Tax Incentive (TaxRefund) is calculated as the ratio of "tax refunds received" to the total of "tax refunds received" and "taxes paid" from the cash flow statement [12]. This ratio accurately captures the scale of tax benefits received by the firm. Profitability (roa), measured by return on total assets, is controlled because a firm's profit level determines the internal funds available for sustained R&D investment. Firm size (size), determined

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by the natural logarithm of total assets, is regulated because larger companies usually have more resources, R&D teams, and technical accumulation, all of which have an impact on their capacity for innovation. Because the amount of debt financing affects a company's financial risk and its ability to fund hazardous innovation projects, financial leverage (lev), which is measured by the asset-liability ratio, is controlled. Growth Ability (growth), measured by the operating revenue growth rate, is controlled because high-growth firms may have stronger motivation and market pressure to innovate. Ownership Structure (top1), the percentage of shares held by the largest shareholder, is controlled because ownership concentration can impact corporate decision-making mechanisms and the strategic allocation of resources towards innovation. Firm Age (lnage), measured by the natural logarithm of the firm's listing age plus one, is controlled because innovation patterns may differ between younger and more mature firms at different lifecycle stages. Cash Flow (cflow), measured by the ratio of operating cash flow to total assets, is controlled because sufficient cash flow provides essential liquidity to support ongoing and long-term R&D activities. CEO Duality (dual) is a dummy variable indicating whether the chairman and the general manager are the same person. It is controlled because this governance structure affects decision-making efficiency and risk appetite, which can influence innovation decisions. Board size, which is determined by the number of board directors, is regulated because it affects the range of viewpoints and the effectiveness of assessing innovative ideas. Because independent directors improve oversight and may guarantee a more sensible distribution of R&D resources, board independence (independent), as determined by the proportion of independent directors to all board members, is regulated.

3.3. Model specification

$$lnPatent1_{it} = \beta_0 + \beta_1 TaxRefund_{it} + \beta_j Controls_{it} + FirmFE + YearFE + \varepsilon_{it} \quad (1)$$

This study employs a multiple linear regression model (OLS) with two-way fixed effects to test core hypothesis. In Equation (1), $\mathrm{lnPatent1_{it}}$ represents the corporate innovation level of firm i in year t and is core dependent variable of this paper; $\mathrm{TaxRefund_{it}}$ represents the degree of tax incentives for firm i in year t and is core explanatory variable. Controls represent the series of control variables selected in this paper, with specific definitions as above. FirmFE represents firm fixed effects, used to capture time-invariant firm-specific elements; Year FE represents year fixed effects, used to capture firm-invariant time-specific factors. ε_{it} denotes error term. Furthermore, to mitigate autocorrelation and heteroskedasticity issues in the panel data, all regressions use firm-clustered robust standard errors.

3.4. Descriptive statistics

The variables' descriptive statistics in this paper are displayed as follows. The mean of lnPatents1 is 1.204, with minimum as well as maximum values of 0.000 and 9.737, indicating a dispersed distribution of innovation capability across the sample, with some firms having a large number of patents. The mean of TaxRefund is 0.189, with minimum as well as maximum values of 0 and 0.992, suggesting substantial variation in degree of tax incentives received by firms, providing fundamental data distribution support for subsequent empirical analysis. The distributions of remaining control variables are within reasonable ranges, namely that mean asset-liability ratio (lev) is 0.375, within a reasonable interval; mean shareholding ratio of the largest shareholder (top1) is 33.417%, indicating a high degree of ownership concentration; and the mean of dual is 0.341,

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meaning that in 34.1% of the firms, chairman as well as general manager are the same person, suggesting diversity in governance structures.

4. Empirical analysis

4.1. Correlation analysis

Correlation analysis reveals that correlation coefficient of TaxRefund as well as lnPatents1 is 0.098, significant at 1% level, pointing to a positive association between corporate innovation and tax incentives. All control variables are linked to dependent variable, suggesting that the selection of explanatory variables for further research is reasonable. For example, financial leverage (lev), firm size (size), board size (board), etc., are significantly correlated with innovation, which indicates the rationality of control variables selected in the model. Multicollinearity diagnostics yield the following VIFs for each variable: lev (1.75), size (1.67), board(1.57), roa (1.48), independent (1.46), cflow (1.31), dual (1.07), top1 (1.05), TaxRefund (1.03), growth (1.02). All VIFs fall comfortably below 10, suggesting no severe multicollinearity problems, thus allowing for regression analysis.

4.2. Baseline regression analysis

Following correlation analysis, pooled OLS method is employed for regression analysis to discuss the impact of tax incentives on corporate innovation. Regression outcomes show that the model's goodness-of-fit (R^2) consistently exceeds 0.8, suggesting a good model fit and high reliability of the regression results. Column (1) contains fixed effects but no control variables. The coefficient of TaxRefund was 0.402, significant at the 1% level (*) with a t-value of 2.653, indicating that tax incentives positively affect corporate innovation and preliminarily confirming Hypothesis H of this study. Model (2) built upon Model (1) by introducing a series of control variables. The coefficient of the core explanatory variable TaxRefund was 0.420, remaining significant at the 1% level (*) with a t-value of 2.740. This coefficient was marginally higher than that in Model (1), suggesting that the positive impact of tax incentives on corporate innovation remains significant and slightly strengthened even after controlling for other factors.

Among the control variables, only profitability (roa) is significantly positive at 10% level, while other variables (like firm size and financial leverage) are not significant, suggesting the dominant influence of the core explanatory variable.

4.3. Robustness tests

To ensure the robustness of the conclusions, robustness tests are conducted by replacing the dependent variable. Specifically, corporate innovation is re-measured as lnPatents3, which is the natural logarithm of one plus the number of patents granted to the firm in the same year. Model (1) included only the core explanatory variable. The coefficient of TaxRefund was 0.319, significant at the 5% level (**) with a t-value of 2.193, showing a substantial positive association between tax refunds and lnPatents3 without controlling for other variables. This suggests that increased tax refunds may positively affect this patent metric. Model (2) incorporated a series of control variables. The coefficient of the core explanatory variable TaxRefund remained significant at the 5% level (**) with a value of 0.342 and a t-value of 2.323. This coefficient was marginally higher than in Model (1), demonstrating that the positive impact of tax refunds on lnPatents3 remains significant and slightly strengthened after controlling for other factors. Among the control variables, firm size and the shareholding ratio of the largest shareholder (top1) showed significant positive effects on

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lnPatents3, while CEO duality (dual) exhibited significant negative effects. Other variables showed no significant impact, highlighting tax incentives as a major force of corporate innovation.

4.4. Heterogeneity analysis

Depending on business features and industry variations, tax incentives may have different effects on corporate innovation. Grouped regressions were conducted based on nature of property rights and firm size, along with high-tech industry attributes to better understand impact of tax incentives on corporate innovation. Regression results reveal that tax incentives will greatly encourage innovation of private enterprises (coefficient 0.694*) but have no significant effect on SOEs (coefficient -0.159). Tax incentive coefficient is 0.815* in high-tech industries but 0.008 in traditional industries. The coefficient is 0.933*** in small scale enterprises and -0.156 in big enterprises. Namely, the coefficient of tax incentives in promoting the innovation of enterprises only significantly exists in private enterprises, high-tech industry and small-scale enterprises, but does not significantly exist in SOEs, traditional industry and big enterprises. Reasons for this situation are as follows.

Regarding the nature of property rights, SOEs may have "soft budget constraints", relying on direct government funding or implicit guarantees, causing a weaker marginal response to tax incentives; private enterprises face market competition pressure and are more inclined to invest incentive funds into innovation to enhance competitiveness; and private enterprises face stronger financing constraints, and tax incentives directly alleviate funding pressure. As for industry differences, core competitiveness of high-tech industries lies in technological innovation; R&D investment is a "necessity for survival", R&D investment is large as well as risky, alongside tax incentives help reduce R&D costs and enhance innovation incentives; traditional industries rely mainly on mature technologies, with low innovation demand, making the policy effects less apparent. In terms of firm size, small-scale enterprises often have short decision-making chains and flexible resource allocation, allowing tax incentive funds to be quickly converted into R&D investment; large-scale enterprises may experience fund "leakage" due to complex hierarchies and agency problems, leading to reduced policy transmission efficiency.

Finally, the level of corporate governance also influences the promoting impact of tax incentives on corporate innovation. When corporate governance level is low, management often lacks supervision and incentives, leading them to prioritize short-term interests and allocate tax reduction funds to areas that can quickly enhance short-term performance (such as purchasing wealth management products, dividends) rather than long-term and high-risk R&D, or even misappropriating funds for personal gain. Furthermore, in enterprises with excessive ownership concentration (majority shareholder dominance) or excessive dispersion (management entrenchment), R&D decisions are easily interfered with by non-market factors (such as majority shareholders' preference for traditional business, management's avoidance of innovation risks). Tax funds may be invested in low-efficiency "pseudo-innovation" projects (such as low-tech improvements), failing to generate genuine innovation output. To test the above inference, this paper draws on research by Zhou Qian et al., selecting indicators such as executive shareholding ratio, executive compensation, proportion of independent directors, institutional investor shareholding, board size, ownership balance, as well as CEO duality. A comprehensive corporate governance index (Governance) is constructed using principal component analysis, with a higher index denoting stronger governance quality [13]. Firms are split each year into "high-governance" and "low-governance" sub-samples according to the annual median of the index. In the regression results, the coefficient for firms with high governance levels was 0.651***, while it was only 0.171 for firms

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with low governance levels. It can be observed that tax incentives spur innovation only in sub-sample with high corporate governance levels, thereby confirming the above conjecture.

5. Policy implications

First, enhance inclusive support for SMEs by raising the super-deduction ratio for R&D expenses to 150% and allowing flexible incentive timing. Implement Zhejiang's "Three No Needs" and "Three Automatics" mechanisms to improve accessibility. Simplify declarations through "smart tax calculation" features and permit small enterprises to use "assessed collection + R&D proportional deduction" methods to reduce compliance costs.

Second, there is a need to optimize targeted incentives for high-tech industries. Learn from US R&D tax credits in AI, quantum computing and biological breeding. Establish a "negative list + dynamic supplement" mechanism. Explore combining "tax incentives + special funds" similar to EU's €400 billion clean tech support. Introduce accelerated depreciation for R&D equipment and insurance for first products.

Lastly, guiding innovation resource spillover from large enterprises is essential. Provide 10% corporate income tax credit for large enterprises sharing technology platforms and patents with SMEs. Allow 200% super-deduction for basic research investments, linking to national labs and major scientific facilities like Huawei's "Harmony Ecosystem Innovation Center" with universities.

6. Conclusion

This study examines the effects of tax incentive policies on company innovation using China's A-share listed companies from 2008 to 2023 as a starting sample. Research conclusions show that China’s tax incentive policy has a promoting impact on corporate innovation, and above conclusions are robust to the sensitivity analysis. The results of heterogeneity analysis show that promoting impact of tax incentives on corporate innovation is more obvious in private enterprises, high-tech industry enterprises, and small-scale enterprises. The research conclusions offer a theoretical basis coupled with practical guidance for optimizing tax policies and corporate innovation strategies.

However, sample selection has certain limitations. Considering data availability, Shenzhen and Shanghai A-share listed companies from 2008 to 2023 are chosen as research sample, but listed companies cannot cover all enterprise types in China. Future research could be conducted when the information disclosure level of non-listed companies improves, to obtain more universal research conclusions and more profound policy recommendations.

References

[1] Zhang, X. D., He, Y. N., & Ma, X. M. (2014). Analysis of the incentive effect of R&D tax preferential policies on corporate innovation output: A study based on national-level enterprise technology centers. Contemporary Finance & Economics, 2014(11), 35-45.

[2] Chu, D. Y., Ji, F., & Yang, S. (2017). Fiscal subsidies, tax incentives and patent output in strategic emerging industries. Taxation Research, 2017(04), 99-104.

[3] Sun, Z. Y., Liang, C., & Wei, H. F. (2020). What kind of tax incentives can motivate innovation in high-tech enterprises? Empirical evidence from preferential intensity and specific preferential policies. Journal of Beijing Technology and Business University (Social Sciences), 35(05), 95-106.

[4] Yang, Y. L., & Hu, X. (2021). Tax incentives and corporate innovation performance: Dual mediating effects based on R&D investment and non-R&D innovation investment. Industrial Economic Review, 12(01), 85-103.

[5] Li, W. A., Li, H. B., & Li, H. C. (2016). Innovation incentive or tax shield? Research on tax incentives for high-tech enterprises. Science Research Management, 37(11), 61-70.

DOI: 10.54254/2754-1169/2026.NJ30538

[6] Chen, Y. Y., He, M. J., & Zhang, X. Y. (2018). Fiscal subsidies, tax incentives and the structure of corporate innovation output: Evidence from China's high-tech listed companies. Taxation Research, 2018(12), 48-54.
[7] Ning, L., & Li, J. C. (2019). The incentive effect of fiscal and tax policies on enterprise technological innovation. On Economic Problems, 2019(11), 38-45.
[8] Qu, X. H., Wang, J., & Zhang, R. L. (2022). Research on the incentive effect of tax rate preferences on innovation output. Finance and Accounting Monthly, 2022(12), 16-25.
[9] Li, J. F., Shui, H. L., & Song, W. (2023). Business environment, policy support and corporate innovation incentives: Empirical evidence from China's A-share listed companies. Nankai Business Review, 26(05), 39-51.
[10] Czarnitzki, D., Hanel, P., & Rosa, J. M. (2011). Evaluating the impact of R&D tax credits on innovation: A microeconometric study on Canadian firms. Research Policy, 2011(2).
[11] Cappelen, A., Raknerud, A., & Rybalka, M. (2012). The effects of R&D tax credits on patenting and innovations. Research Policy, 2012(2).
[12] Zhen, H. X., Wang, X., & Fang, H. X. (2023). Administrative protection of intellectual property rights and corporate digital transformation. Economic Research Journal, 58(11), 62-79.
[13] Zhou, Q., Xu, X. F., & Lu, Z. F. (2020). Deleveraging: Who is more active and prudent? Management World, 36(08), 127-148.