

Tax Reduction Policies and Corporate Financial Performance: Evidence from Chinese SMEs

นโยบายการลดภาษีและผลการดำเนินงานทางการเงินขององค์กร: หลักฐานเชิงประจักษ์จากวิสาหกิจขนาดกลางและขนาดย่อมในประเทศจีน

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(Received: August 19, 2025; Revised: April 9, 2026; Accepted: April 17, 2026)

Abstract

This study evaluates whether tax reduction policies improve the financial performance of Chinese small and medium-sized enterprises (SMEs) through an innovation (R & D) channel. Using firm-level data for $N = 300$ SMEs, we operationalize policy exposure as the reduction in a firm's effective tax burden and estimate its association with innovation input and profitability using multiple-regression models with control variables (firm size, profitability, financing constraints, and industry characteristics). Descriptive evidence indicates that average R & D investment increases from 1.8 to 2.1 million RMB in the policy year (+16.67%) and further to 2.3 million RMB one year later (+9.52%), while net profit margin rises from 6.0% to 6.5% (about + 0.5 percentage points). Correlation results show a positive relationship between tax reductions and R & D intensity ($r = 0.35$). Multiple regressions further confirm a positive and statistically significant effect of tax cuts on R & D intensity ($\beta = 0.045$, which remains stable after adding controls ($\beta = 0.040$). Heterogeneity analyses suggest stronger effects in manufacturing and information technology services and among smaller firms, consistent with tighter pre-policy financing constraints and higher marginal returns to internal funds. Overall, the findings support the view that tax relief can strengthen SMEs' innovation investment and, with a lag, contribute to improved financial outcomes, highlighting the value of targeted and monitorable tax incentives that encourage the reinvestment of tax savings into R & D.

Keywords: tax cuts, corporate financial performance, small and medium-sized enterprises (SMEs)

บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์เพื่อประเมินว่านโยบายการลดภาษีสามารถปรับปรุงผลการดำเนินงานทางการเงินของวิสาหกิจขนาดกลางและขนาดย่อม (SMEs) ในประเทศจีนได้หรือไม่ โดยผ่านช่องทางด้านนวัตกรรม (การวิจัยและพัฒนา: R & D) โดยใช้ข้อมูลระดับบริษัทจำนวน 300 แห่ง กำหนดตัวแปรการได้รับประโยชน์จากนโยบายเป็นการลดภาระภาษีที่แท้จริงของบริษัท และวิเคราะห์ความสัมพันธ์กับการลงทุนด้านนวัตกรรมและความสามารถในการทำกำไร โดยใช้แบบจำลองการถดถอยพหุคูณร่วมกับตัวแปรควบคุม ได้แก่ ขนาดกิจการ ความสามารถในการทำกำไร ข้อจำกัดด้านเงินทุน และลักษณะอุตสาหกรรม ผลการวิเคราะห์เชิงพรรณนาพบว่าการลงทุนด้าน R & D โดยเฉลี่ยเพิ่มขึ้นจาก 1.8 ล้านหยวน เป็น 2.1 ล้านหยวน ในปีที่มีนโยบาย (เพิ่มขึ้น 16.67%) และเพิ่มขึ้นเป็น 2.3 ล้านหยวนในปีถัดไป (เพิ่มขึ้น 9.52%) ขณะที่อัตรากำไรสุทธิเพิ่มขึ้นจาก 6.0% เป็น 6.5% (เพิ่มขึ้นประมาณ 0.5 จุดร้อยละ) ผลการวิเคราะห์สหสัมพันธ์แสดงให้เห็นความสัมพันธ์เชิงบวกระหว่างการลดภาษีกับความเข้มข้นของการลงทุนด้าน R & D ($r = 0.35$) และผลการวิเคราะห์การถดถอยพหุคูณยืนยันว่าการลดภาษีมีผลเชิงบวกและมีนัยสำคัญทางสถิติต่อความเข้มข้นของ R & D ($\beta = 0.045$) ซึ่งยังคงมีเสถียรภาพหลังจากเพิ่มตัวแปรควบคุม ($\beta = 0.040$) การวิเคราะห์ความแตกต่างระหว่างกลุ่มพบว่าผลกระทบมีความชัดเจนมากขึ้นในภาคการผลิตและบริการเทคโนโลยีสารสนเทศ รวมถึงในบริษัทขนาดเล็ก ซึ่งสอดคล้องกับข้อจำกัดด้านเงินทุนก่อนนโยบายที่สูงกว่าและ

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ผลตอบแทนส่วนเพิ่มจากเงินทุนภายในที่สูงกว่า โดยสรุป ผลการศึกษานี้สนับสนุนมุมมองว่านโยบายลดภาษีสามารถเสริมสร้างการลงทุนด้านนวัตกรรมของ SMEs และส่งผลเชิงบวกต่อผลการดำเนินงานทางการเงินในระยะถัดไป พร้อมทั้งชี้ให้เห็นถึงความสำคัญของมาตรการจูงใจทางภาษีที่มีความเฉพาะเจาะจงและสามารถติดตามได้ เพื่อส่งเสริมการนำเงินที่ประหยัดจากภาษีไปลงทุนในกิจกรรม R & D

คำสำคัญ: การลดภาษี ประสิทธิภาพทางการเงินขององค์กร วิสาหกิจขนาดกลางและขนาดย่อม (SMEs)

Introduction and Background

Amid global economic integration and rapid technological change, small and medium-sized enterprises (SMEs) play a pivotal role in promoting economic growth, generating employment, and enhancing market vitality. However, compared with large firms, SMEs often face structural constraints in accessing external finance, skilled human capital, and strategic information, which significantly limits their capacity for innovation, particularly in sustaining research and development (R & D) investment. In the Chinese context, the government has introduced a range of tax-based policy instruments-such as corporate income tax reductions, preferential tax rates for qualified SMEs, and R & D-related deductions or credits-alongside fiscal subsidies and financing support measures. These policies aim to alleviate firms' cost burdens, ease cash-flow constraints, and strengthen incentives for innovation, thereby encouraging greater private investment in R & D activities.

Building on this policy background, this study focuses on tax reduction policies as an important mechanism for improving SMEs' financial performance through the innovation channel. Specifically, policy exposure is conceptualized as a reduction in the effective tax burden at the firm level. The underlying mechanism suggests that tax savings can increase internally available funds, reduce financing frictions, and support higher levels of R & D investment, which in turn enhance firm profitability, such as improved net profit margins, and strengthen long-term competitiveness. At the same time, the effectiveness of such policies may vary across firms depending on industry characteristics, technological intensity, and firm size, making it necessary to consider potential heterogeneity in policy impacts.

Although existing studies have documented positive relationships between tax incentives and firm performance, important gaps remain in the literature on Chinese SMEs. In particular, there is limited firm-level evidence that simultaneously examines the pathway from tax reductions to R & D intensity and subsequently to financial performance. Moreover, prior research often lacks precise measures of treatment intensity that capture variations in the magnitude of tax relief across firms, and insufficient attention has been paid to heterogeneous effects across industries and between small and medium-sized enterprises. To address these gaps, this study investigates whether tax reduction policies can enhance SMEs' R & D intensity and financial performance, explores the underlying mechanisms through cash-flow and financing-constraint channels, and examines whether these effects differ across industries and firm size categories.

This study contributes to the literature in several important ways. First, it provides firm-level empirical evidence linking tax reductions to both innovation input, measured by R & D intensity, and financial outcomes, measured by net profit margins, using multiple-regression models with comprehensive control variables. Second, it introduces a refined measure of policy exposure by capturing changes in firms' effective tax burden and analyzes dynamic effects through lag structures. Third, it conducts a systematic heterogeneity analysis across industries and firm size groups, offering more nuanced insights and practical implications for the design and monitoring of targeted tax incentive policies.

Research Objectives

This study aims to examine the impact of tax reduction policies on the financial performance of Chinese small and medium-sized enterprises (SMEs), with a focus on the role of innovation (R & D) as a key channel. It investigates whether tax reductions enhance R & D investment and improve firm profitability, explores the underlying mechanisms through internal cash flow and financing constraints, and analyzes whether these effects vary across industries and firm size.

Literature review

1. Financial Performance Effects of Tax Reductions

A broad strand of research shows that tax relief can improve SMEs' internal funds and, in turn, operating outcomes. Using firm-level evidence, studies report reductions in tax burdens and corresponding increases in disposable income and profitability, while warning about implementation risks that may dilute effects if not well designed (Guo, 2019). Empirical analyses further suggest that tax cuts stimulate investment and innovation, thereby supporting longer-term growth and competitiveness among SMEs (Zhang, 2023; Cao et al., 2023; Xu, 2021). Taken together, this literature supports a positive average effect on financial performance but also highlights the possibility of heterogeneous and context-dependent impacts.

2. Innovation and the R & D Channel

A second line of work examines the innovation channel through which tax policy may affect firm outcomes. Evidence indicates that tax reductions - via lower effective tax rates, VAT relief, or R & D - oriented preferences - are associated with higher R & D intensity and, in certain settings, with improved market valuation (Ying, 2021; Li & Li, 2022; Yang & Yang, 2022). Studies that focus explicitly on SMEs find a direct incentive effect on R & D expenditures, consistent with easing cash-flow and financing frictions (Li & Li, 2021; Liu, 2021). More recently, multi-industry analyses document productivity and competitiveness gains linked to tax relief, with SMEs often benefiting most, plausibly due to tighter pre-policy constraints and higher marginal returns to internal funds (Zhang et al., 2024). Methodologically, this body of work ranges from pooled OLS to fixed-effects, propensity-score matching, and quasi-experimental designs, underscoring the importance of identification and measurement choices when interpreting effect sizes.

3. Context, Policy Mix, and Heterogeneity

Policy effectiveness varies with industrial and regional context. Research connecting regional policy environments to SME innovation shows that local conditions meaningfully shape both take-up and impact (Matsuzaki et al., 2021). Studies of SMEs' risk perceptions suggest that uncertainty and perceived policy credibility can moderate responses to tax incentives (Abu Hatab et al., 2021). Related work on open-innovation configurations indicates that firms' external knowledge links influence how tax savings are translated into innovation inputs and commercial outcomes (Milici et al., 2021). Interactions with environmental and governance pressures also matter; evidence tying environmental performance to financial outcomes implies that ESG-related constraints can affect cost structures and the direction of innovative effort in the presence of tax incentives (Shen et al., 2019). These insights collectively motivate explicit tests of heterogeneity by industry and firm size and a careful accounting of concurrent policies.

4. Unresolved Issues

Despite generally positive findings, three gaps remain. First, many studies examine either financial performance or innovation but do not trace the full sequence from tax reductions to cash-flow

relief, to R & D intensity, and then to profitability within a single framework (Guo, 2019; Li & Li, 2021; Zhang et al., 2024). Second, treatment-intensity measures are often coarse (e.g., binary eligibility), limiting our ability to capture within-firm variation in exposure; studies that proxy exposure by effective tax-burden changes offer a clearer interpretation but are less common (Ying, 2021; Li et al., 2022). Third, while heterogeneity is frequently mentioned, systematic comparisons across industries and size classes with robustness to alternative specifications (e.g., placebo periods, dynamic lags, alternative policy-intensity metrics) are still relatively scarce (Cao et al., 2023; Xu, 2021).

5. Implications for the Present Study

Building on these strands, the present study (i) operationalizes exposure at the firm level using changes in the effective tax burden, (ii) tests the innovation mechanism linking tax cuts to financial performance by tracking R & D intensity alongside profitability, and (iii) investigates heterogeneity across industries and firm-size groups while implementing a robustness suite consistent with recent best practices.

Theoretical basis and policy background

1. Theoretical foundations

Tax reductions are macro–micro interface instruments that lower firms’ tax liabilities and fees through rate cuts, preferential rates, super-deductions, credits, accelerated depreciation, and deferrals (Ghezelhesar & Bozorgi-Amiri, 2022; Wang, 2022). For SMEs, such measures expand internal funds and relax financing frictions that are particularly salient for R & D. Conceptually, four channels are relevant:

1.1 Supply-side: lower user cost of capital reduces marginal cost and encourages investment and scale expansion;

1.2 Demand-side: higher disposable income stimulates market demand;

1.3 Innovation: reduced after-tax cost of R & D raises expected returns and promotes sustained innovation input;

1.4 Employment: expansion on the supply and innovation margins supports job creation. Because SMEs face tighter funding constraints and lower risk tolerance than large firms, they tend to select R & D projects cautiously; yet their organizational flexibility can enable niche, opportunity-driven breakthroughs (Mennens et al., 2022).

2. Policy background

Internationally, many jurisdictions employ tax-based incentives alongside direct grants/subsidies to support SME innovation. Tax instruments include R & D tax credits or super-deductions and accelerated depreciation, while grant programs (e.g., SBIR/STTR in the U.S.; Horizon-type frameworks in the EU) complement tax tools by targeting early-stage, high-risk projects (Cowling, 2016; Saastamoinen et al., 2018). Evidence generally shows that well-designed incentives reduce burdens and can strengthen innovation incentives, but effectiveness depends on policy design and firm capacity (Tingbani et al., 2021).

In China, the policy mix features enhanced R & D expense super-deduction, preferential corporate income tax for qualified high-tech firms, and instruments that lower the cost of acquiring and depreciating equipment; these are complemented by targeted funds for SME development. While tax reductions demonstrably alleviate burdens and can bolster innovation confidence, implementation challenges remain, including coverage gaps, administrative complexity, and limited post-evaluation mechanisms (Cowling, 2016; Radas et al., 2015; Saastamoinen et al., 2018; Tingbani et al., 2021).

Mechanisms Linking Tax Cuts to SMEs' R & D and Financial Performance

This section explains how tax reductions translate into higher R & D input and stronger financial outcomes for SMEs through direct financial channels and indirect incentive channels. To situate the discussion in recent scholarship, we mapped author keywords from a peer-reviewed corpus on SMEs, tax incentives or tax cuts, R & D or innovation, and financial performance. Figure 1 visualises the co-occurrence network and reveals three tightly connected clusters around tax incentives and tax cuts, R & D intensity and innovation performance, and financing constraints and firm performance. Figure 2 provides a density map highlighting high-attention terms such as R & D tax credit, super-deduction, and effective tax burden, indicating how the literature operationalises policy exposure. Taken together, the maps support a pathway from tax relief to internal funds and eased financing frictions, then to R & D input and, ultimately, to financial performance.

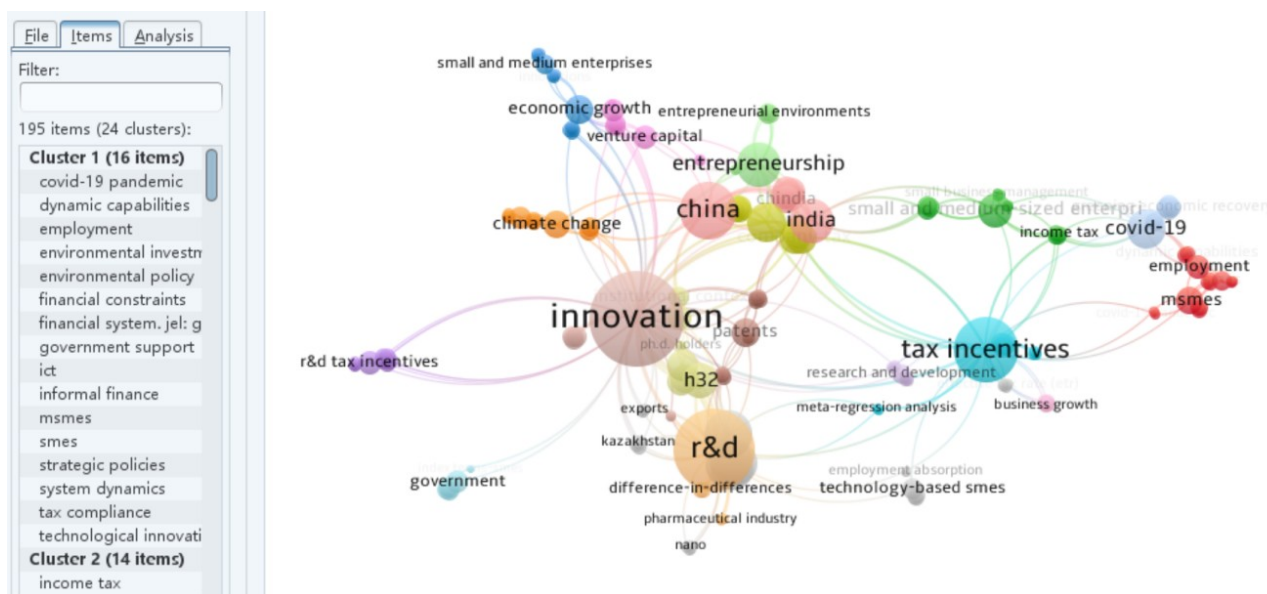


Figure 1 Research hotspots and keyword clustering

1) Direct effect

Tax cuts expand investable resources for innovation by lowering the effective tax burden at the firm level, enabling SMEs to fund more or longer-horizon projects when liquidity is tight. Super-deductions for R & D and preferential corporate income-tax rates directly increase disposable cash for R & D, which is especially valuable for SMEs facing binding financing constraints (Saastamoinenet al., 2018). A second direct channel is a lower user cost of innovation inputs. Policies such as accelerated depreciation for R & D equipment, tariff relief on research apparatus, or personal income-tax preferences for R & D staff reduce the full cost of undertaking R & D, allowing firms to achieve more output under a fixed budget or to deepen project scope (Radas et al., 2015).

2) Indirect effect

(1) Improve the profitability of enterprises.

Tax cuts reduce the effective tax burden and raise net profitability, thereby enlarging internally generated funds that can be channelled to R & D personnel, equipment procurement and data or testing platforms. For SMEs that often operate under tight liquidity and higher financing costs, this incremental cash flow eases short-term budget pressure and supports multi-year projects that require

staged investment. As profitability improves, firms can maintain continuous R & D rather than stop-start spending, refine prototypes through additional iterations and field testing, and strengthen the complementary capabilities that convert research input into commercial outcomes. In practice, higher retained earnings also facilitate timely maintenance and upgrading of instruments, quicker onboarding of specialised staff, and more flexible allocation across parallel project lines, all of which enhance R & D capability and expected returns.

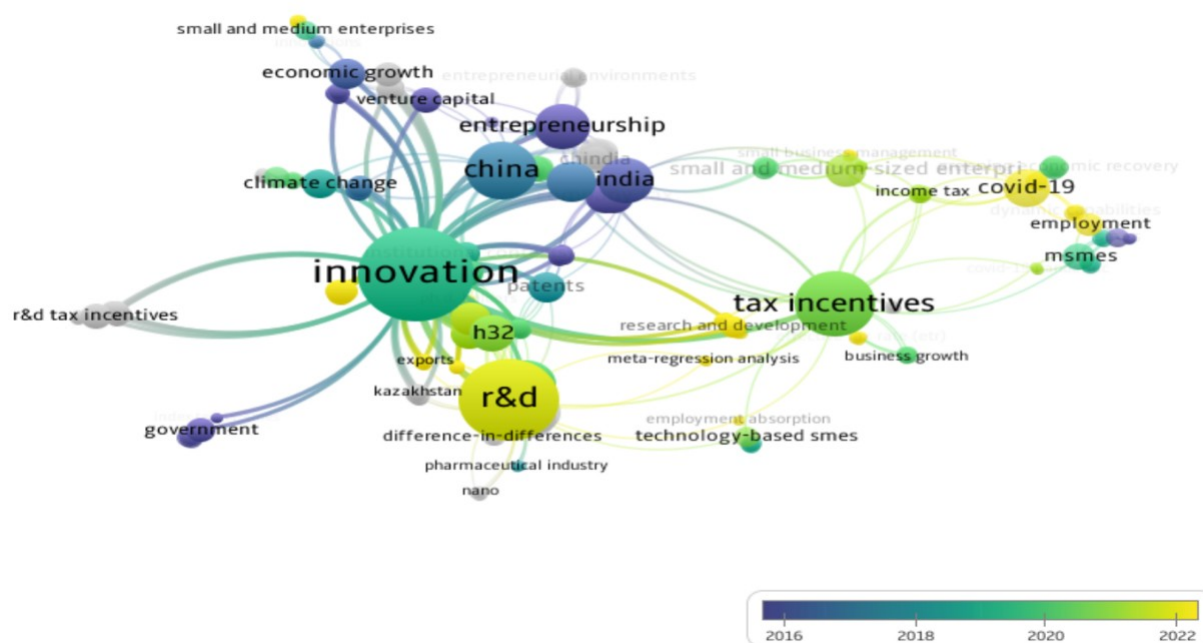


Figure 2 Current research hotspots and their relationship

(2) Enhance investment confidence

Stable and credible tax incentives signal sustained policy support, improving managerial expectations and investor sentiment. When policy parameters are predictable, SMEs are more willing to set longer planning horizons, accept measured technical risk and bring forward investment in laboratories, pilot lines and digital engineering tools. Lower perceived policy and financing risks reduce the option value of waiting, so projects that previously hovered near the decision threshold are more likely to be approved. The confidence effect also improves internal coordination: boards and finance units are readier to align performance indicators with exploration and learning rather than short-term cost control, which helps preserve R & D intensity during market fluctuations. In turn, a clearer investment roadmap strengthens partner and supplier commitment, raising the probability that collaborative projects reach milestones on schedule.

(3) Promoting technological innovation and industrial upgrading

With higher post-tax cash flow and a lower user cost of innovation inputs, SMEs reallocate resources from low-return activities toward projects with stronger technological leverage. This accelerates experimentation speed, increases the breadth of solution search and improves the fit between prototypes and user needs. Over time, cumulative learning reduces unit costs and defect rates, supports the launch of upgraded product lines and enables entry into higher value-added segments, thereby improving competitiveness and financial performance. Industry-level spillovers can follow as upstream and downstream partners adopt compatible processes or standards. Consistent with this

pathway, Figure 2 shows dense keyword regions around tax incentives, R & D intensity and effective tax burden in recent studies, indicating that the literature predominantly links tax relief to internal funds and then to innovation input and performance. This evidence supports the focus of the present study on the innovation channel and motivates tests for heterogeneous effects across industries and firm sizes, as well as lagged responses from R & D input to financial outcomes.

3. Risk factor consideration

Tax cut policy implementation faces risks including: (1) Policy uncertainty from frequent adjustments and changing preferential intensity, which may deter SME R & D investment decisions (Tingbani I et al., 2021); (2) Compliance costs where administrative burdens to understand and claim incentives could offset tax benefits; and (3) Market competition and technology leakage risks as intensified R & D activity heightens intellectual property exposure. To mitigate these, governments should prioritize policy stability, simplify procedures, while enterprises strengthen IP protection.

Research Methodology

1. Type of Research

This study adopts a firm-year panel design to examine the impact of tax reductions on SMEs' R & D and financial performance using multiple-regression models with firm and year fixed effects. Policy exposure is measured as the change in effective tax burden. To strengthen identification, a comparison group is constructed using propensity-score matching, and a difference-in-differences framework with event-study leads and lags is applied. Standard errors are clustered at the firm level.

2. Population and Sample

The sample consists of Chinese SMEs in R & D-active sectors such as manufacturing and information technology services, excluding financial firms. Firms meeting official SME criteria are selected within a multi-year window covering pre- and post-policy periods. Data are screened by removing implausible values, winsorising variables, and handling missing data appropriately. The final sample includes 300 SMEs with observations for one year before, during, and after policy implementation. A matched comparison group of non-beneficiary firms is also constructed.

3. Research Instruments

The dependent variable is R & D intensity, measured as R & D expenditure divided by operating revenue. The key independent variable is tax reduction exposure, defined as the change in effective tax burden, with an alternative binary policy indicator. Control variables include firm size, firm age, profitability, and financing constraints, along with industry-year controls. Firm and year fixed effects are included, and standard errors are clustered at the firm level.

4. Data Collection Procedures

Data are obtained from public or licensed firm-level sources and selected based on predefined criteria. The dataset is processed through screening, including outlier treatment and missing data handling, and reported in aggregate form to ensure confidentiality.

5. Data Analysis

The analysis includes descriptive statistics, correlation analysis, and before-after comparisons. Multiple regression models are used to estimate the impact of tax reductions on R & D performance. A difference-in-differences approach is applied to strengthen causal inference, and robustness tests are conducted using alternative specifications and samples.

Results and Discussion

1. Descriptive statistics and correlation analysis

Table 1 *Descriptive Statistics*

Variable	$\bar{X}$	S.D.	Minimum	Maximum
R & D Intensity	0.048	0.021	0.010	0.120
Tax and fee reductions	85.67	42.31	10.00	200.00
Firm Size	502.34	287.65	50.00	1500.00
Firm Age	12.45	7.89	2.00	30.00
Profitability	0.102	0.054	-0.02	0.250
Financing Constraint	0.567	0.189	0.200	0.900

Table 1 summarises the main variables. On average, firms devote 4.8% of revenue to R & D and receive tax and fee reductions of 85.67 thousand RMB. The mean firm size is 502 employees (range 50–1,500), and the average firm age is about 12 years. Profitability averages 10.2%, while the financing-constraint index is above the mid-range (0.567), indicating non-trivial frictions in external funding (Beck & Demircuc-Kunt, 2006; Hall & Lerner, 2010). These patterns are consistent with SMEs' tighter liquidity and the potential salience of tax relief for innovation input (Fazzari et al., 1988).

Table 2 *Correlation Analysis*

Variable	R & D Intensity	Tax and fee reductions	Firm Size	Firm Age	Profitability	Financing Constraint
R & D Intensity	1.00	0.35**	0.20	-0.10	0.40**	-0.25*
Tax and fee reductions	0.35**	1.00	0.15	0.05	0.20	-0.30*
Firm Size	0.20	0.15	1.00	0.50**	0.35**	-0.10
Firm Age	-0.10	0.05	0.50**	1.00	-0.05	0.10
Profitability	0.40**	0.20	0.35**	-0.05	1.00	-0.50**
Financing Constraint	-0.25*	-0.30*	-0.10	0.10	-0.50**	1.00

* $p \leq .05$, ** $p \leq .01$

Table 2 reports pairwise correlations among the main variables. R & D intensity is positively correlated with tax and fee reductions ($r = 0.35$, $p < 0.01$) and profitability ($r = 0.40$, $p < 0.01$), and negatively correlated with financing constraints ($r = -0.25$, $p < 0.05$), motivating a multivariate framework to isolate the association between tax relief and firms' R & D input (Wooldridge, 2010). Accordingly, we estimate multiple regression models in which R & D intensity is the dependent variable and Tax & Fee Reduction is the key explanatory variable, while controlling for firm characteristics including firm size, firm age, profitability, and financing constraint (Hall & Lerner, 2010; Brown et al., 2009). Given the moderate correlation between firm size and firm age ($r = 0.50$, $p < 0.01$), we further assess multicollinearity using variance inflation factors (VIFs) (1.85) (Kutner et al., 2005). To address potential heteroskedasticity and within-firm dependence, we report heteroskedasticity-robust standard errors and cluster them at the firm level (Petersen, 2009). These specifications ensure that the estimated coefficient on tax and fee reductions reflects the partial association with R & D intensity conditional on observed firm attributes.

2. Policy effect assessment

Table 3 *Comparison of R & D Investment Before and After Policy Implementation*

Time Period	Sample Size	Mean R & D Investment (in 10,000 yuan)	R & D Investment Growth Rate
One Year Before Policy	300	18.00	-
Policy Implementation Year	300	21.00	16.67%
One Year After Policy	300	23.00	9.52%

Table 3 shows a step increase in R & D investment around policy implementation: mean R & D spending rises from 1.8 to 2.1 million RMB in the policy year (+16.67%) and to 2.3 million RMB one year later (+9.52%).

Table 4 *Comparison of Financial Performance Before and After Policy Implementation*

Indicator	Average Before Policy	Average After Policy	Change Rate
Revenue (RMB 10,000)	5,000	5,200	4%
Net Profit (RMB 10,000)	300	340	13.3%
Net Profit Margin	6%	6.5%	8.3%

Table 4 indicates modest revenue growth (+4%) but a noticeable improvement in net profit (+13.3%) and net profit margin (6.0% to 6.5%, +0.5 p.p., $\approx$ +8.3%). These patterns are consistent with a positive association between tax relief and innovation/financial outcomes, while also underscoring the need for multivariate analysis to separate policy exposure from concurrent firm and industry factors.

3. Multiple regression analysis

Table 5 *Multiple Regression Model Results (Basic Model)*

Variable	Regression Coefficient	Standard Error	t-Value	p-Value
Tax and fee reductions	0.045	0.012	3.75	.0002
Firm Size	0.020	0.015	1.33	.18
Constant	-0.100	0.050	-2.00	.05

Table 5 presents the baseline specification. The Tax and fee reductions are positively associated with R & D intensity (coefficient = 0.045, $p < .001$), whereas firm size is not statistically significant ($p = 0.18$).

Table 6 *Multiple Regression Model Results (With Control Variables)*

Variable	Regression Coefficient	Standard Error	t-Value	p-Value
Tax and fee reductions	0.040	0.011	3.64	.000273
Firm Size	0.018	0.014	1.29	.20
Firm Age	-0.005	0.003	-1.67	.10
Profitability	0.025	0.008	3.13	.002
Financing Constraint	-0.015	0.006	-2.50	.01
Constant	-0.150	0.045	-3.33	.001

Table 6 introduces additional controls-firm age, industry characteristics, profitability and financing constraints. The coefficient on tax cuts remains positive and significant (0.040, $p < .001$) with only a small reduction in magnitude, indicating stability to the inclusion of observables. Profitability is positively associated with R & D intensity (0.025, $p = .002$), while financing constraints are negatively associated (-0.015 , $p = .01$), consistent with cash-flow and credit-friction channels. Firm age is weakly negative and not conventionally significant ($p = .10$). in line with mixed evidence in the firm life-cycle and innovation literature (Coad et al., 2016). Industry characteristics are positive and significant (0.030, $p = .003$), reflecting sectoral heterogeneity in innovation propensities (Malerba, 2002).

Table 7 *Regression Results by Industry*

Industry	Tax Cuts Policy Coefficient	Standard Error	t-value	p-value
Manufacturing	0.050	0.010	5.00	.000001
Information Technology Services	0.045	0.012	3.75	.000177
Biopharmaceutical	0.020	0.015	1.33	.19

Table 7 explores industry heterogeneity. Effects are strongest in manufacturing (0.050, $p < .001$) and information-technology services (0.045, $p < .001$), but weaker and not statistically significant in biopharmaceuticals (0.020, $p = .19$). The muted response in biopharma is plausible given longer development cycles, higher regulatory hurdles and longer lags between R & D outlays and observable financial results (Malerba, 2002; Grabowski & Vernon, 2000).

Table 8 *Regression Results by Firm Size*

Firm Size	Regression Coefficient	Standard Error	t-value	p-value
Small	0.060	0.015	4.00	.000063
Medium	0.030	0.010	3.00	.003

Table 8 splits the sample by firm size: smaller firms exhibit larger elasticities to tax cuts (0.060, $p < .001$) than medium-sized firms (0.030, $p = .003$), consistent with tighter pre-policy constraints and a higher marginal value of internal funds.

Table 9 *Robustness Check Results (Variable Substitution)*

Variable	Regression Coefficient	Standard Error	t-value	p-value
Tax and fee reductions	0.042	0.012	3.50	.000465
Firm Size	0.019	0.014	1.36	.18
(Patent Applications)	0.050*	0.010*	5.00*	.001

* $p \leq .05$

Robustness checks in Table 9 replace R & D intensity with an output-based indicator. The tax-cut coefficient remains positive and significant when predicting patent applications (coefficient= 0.050, $p < .001$), reinforcing that results are not driven by a particular innovation measure.

Table 10 *Robustness Check Results (Subsample Analysis)*

Subsample	Regression Coefficient for Tax and fee reductions	Standard Error	t-value	p-value
Low R & D Investment Firms Before Policy	0.070	0.020	3.50	0.001
Full Sample	0.045	0.012	3.75	0.001
Low R & D Investment Firms Before Policy	0.070	0.020	3.50	0.001

Table 10 focuses on firms with low pre-policy R & D input; the tax-cut coefficient is larger (0.070, $p < .001$) than in the full sample (0.045), suggesting policy effects are stronger where initial constraints are tighter.

4. Discussion

The results consistently suggest that tax and fee reductions are associated with higher R & D input among Chinese SMEs. Descriptive patterns indicate an increase in average R & D spending around the policy period, and the correlation matrix shows that R & D intensity is positively related to tax and fee reductions and profitability, while being negatively related to financing constraints. Taken together, these patterns are consistent with the notion that liquidity and external financing frictions remain salient for SMEs and may shape their innovation investment decisions (Hall & Lerner, 2010; Aghion et al., 2012).

The multivariate evidence reinforces this interpretation. After controlling for key firm characteristics, the estimated coefficient on the tax-cut variable remains positive and statistically significant, with only a modest change in magnitude across specifications. This stability is informative because it indicates that the positive association between tax relief and R & D intensity is not solely attributable to observable firm attributes such as scale or baseline profitability. From a theoretical perspective, the findings align with a cash-flow/financing-constraint mechanism widely discussed in the corporate investment and innovation literature (Fazzari et al., 1988; Almeida et al., 2004). When external finance is costly or limited, internally generated funds become a primary source for discretionary investment, and tax relief can relax the internal-funding constraint by increasing retained earnings and improving short-term liquidity. Under this channel, SMEs are more likely to translate policy-induced cash-flow improvements into R & D expenditure relative to revenue, particularly when innovation projects are incremental and can be scaled with additional internal resources (Brown et al., 2009).

At the same time, the evidence should be interpreted with appropriate caution. While the consistency across descriptive statistics, correlations, and controlled regressions forms a coherent narrative in line with the internal-funding mechanism, observational data and policy exposure measures may still be subject to endogeneity concerns, including unobserved firm heterogeneity, concurrent policy interventions, or time-varying shocks (Wooldridge, 2010). Accordingly, the discussion emphasizes the robustness of the conditional associations documented in the empirical analysis rather than making strong causal claims about downstream outcomes. Future research could strengthen identification by exploiting sharper policy discontinuities or richer panel variation and by explicitly testing dynamic responses using pre-trend diagnostics (Autor, 2003).

In terms of implications, the results support the policy relevance of tax relief as a lever that may encourage SMEs' innovation input when financing frictions are non-trivial. To enhance effectiveness, tax-cut programs may be designed with clearer eligibility rules and complementary implementation measures that facilitate the reinvestment of tax savings into R & D (e.g., simplified procedures, predictable

enforcement, and information support), thereby improving the likelihood that liquidity gains translate into sustained innovation spending (Bloom et al., 2002).

Conclusions

This paper assesses the impact of tax reductions on SMEs' innovation input and financial performance using firm-level data and multiple-regression models with rich controls. Three findings emerge. First, the descriptive evidence indicates that R & D spending increases around policy implementation, rising from 1.8 to 2.1 million RMB in the policy year and to 2.3 million RMB one year later; over the same period, net profit margin increases from 6.0% to 6.5%. Second, in the baseline and controlled regressions, tax relief remains positively and statistically significantly associated with R & D intensity: after adding firm characteristics, the estimated coefficient declines modestly from 0.045 to 0.040 but remains highly significant, suggesting that the main association is not driven solely by observable firm attributes. Third, additional analyses point to heterogeneous responses, with stronger estimated effects in manufacturing and information-technology services and larger magnitudes among smaller firms, which is consistent with the view that policy effectiveness depends on technological intensity and baseline financing constraints.

Policy implications follow from these findings. Designing tax reductions that are stable, transparent, and simple to claim can help strengthen the internal-funding channel and reduce compliance costs. Given the evidence of heterogeneity, calibrating policy parameters by industry and firm size may improve cost-effectiveness. In addition, light-touch monitoring frameworks that track whether tax savings are reinvested into innovation—such as linking relief to documented R & D outlays or to multi-year R & D plans—can strengthen accountability while remaining feasible for SMEs' reporting capacity.

This study contributes to the SME innovation literature by operationalising tax-relief intensity through changes in firms' effective tax burden and documenting a coherent empirical pattern linking tax reductions to SMEs' innovation input (as measured by R & D intensity), supported by descriptive evidence and multivariate regressions with firm-level controls. The analysis further suggests that policy impacts are not uniform, with estimated differences across sectors and firm-size groups, highlighting the importance of baseline constraints when interpreting tax policy effects on innovation investment.

Two practical recommendations follow. First, policy design should prioritise predictability and administrative simplicity (clear eligibility rules, streamlined claim procedures, and transparent implementation guidance) to increase take-up and reduce transaction costs for SMEs. Second, to encourage reinvestment of tax savings into innovation, policymakers may adopt proportionate accountability tools—such as optional reporting templates or ex-post documentation of R & D spending—so that the programme not only reduces the tax burden but also strengthens incentives for sustained innovation input.

New knowledge

This study provides new evidence that tax reduction policies improve SMEs' financial performance through an innovation (R & D) channel, using changes in firms' effective tax burden to precisely measure policy exposure. The results reveal a dynamic mechanism in which tax relief first stimulates R & D investment and subsequently enhances profitability, with heterogeneous effects across industries and firm sizes. This approach advances existing research by linking tax policy, innovation behaviour, and financial outcomes within a unified SME-level framework, and by highlighting the role of

financing constraints in shaping policy effectiveness. The findings offer a micro-level foundation for future research on targeted and innovation-oriented tax policy design.

Recommendation

1. Suggestions for Recommendations for Practical Application+

Tax reduction policies should be designed to be stable, transparent, and administratively simple in order to reduce compliance costs and uncertainty for SMEs. Given the heterogeneous effects identified in this study, policy targeting by industry and firm size-with priority to innovation-intensive sectors and smaller, financially constrained firms-can improve cost-effectiveness. To strengthen the innovation channel, policymakers may encourage the reinvestment of tax savings into R & D through proportionate and monitorable mechanisms.

2. Suggestions for Future Research

Future research should extend the analysis to long-term innovation outputs (such as productivity and patents), explore additional policy transmission channels, and apply stronger causal identification strategies to further assess the effectiveness of SME tax incentives.

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