The Hidden Costs of Tax Incentive Take-up

Zhiqi Zhao [*]

Abstract: Why do eligible firms fail to claim tax benefits? This paper investigates the drivers of imperfect take-up by exploiting a threshold-based tax cut policy targeting small firms in China. Using nationally representative administrative data, we document that only 40 percent of eligible firms claim tax benefits. We then employ a fuzzy regression discontinuity design and find that claiming the benefits significantly increases small firms' tax consulting costs, which act as a hidden "entry fee" discouraging policy participation. The analysis further rules out audit risk and administrative approval barriers as alternative mechanisms. Moreover, we show that for participating firms, the realized tax savings are substantial enough—net of the consulting costs—to promote investment. These results indicates that to design effective tax incentives, policymakers should explicitly account for compliance frictions and take-up costs.

Keywords: Tax incentives, Take-up, Small Businesses, Consulting costs
JEL: H25, H32, D22

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1.Introduction

Small firms play a crucial role in fostering economic growth, generating employment, and driving innovation (Decker et al., 2014). Tax incentives—by alleviating financial frictions—are widely regarded as effective policy tools to stimulate small firms' investment and boost business activity (Zwick and Mahon, 2017; Maffini et al., 2019; Pham 2020). Nevertheless, the effectiveness of such policies depends on whether eligible firms actually claim the tax benefits. In the U.S, only 37% eligible firms claimed refunds for net operating losses, with small firms failing to claim at higher rates (Zwick, 2021). Similar patterns of imperfect take-up are observed in developing countries; for instance, in a large Chinese province, over 80% of eligible investment failed to claim accelerated depreciation (Cui et al., 2022). Low take-up rates substantially limit the impact of tax incentives on small firms. Therefore, understanding the frictions that hinder the take-up of these benefits is a question of policy relevance. Despite its importance, empirical evidence regarding the underlying causes remains limited, largely due to the scarcity of comprehensive tax and financial data on small firms.

In this paper, we investigate the determinants of imperfect take-up by exploiting a threshold-based tax incentive policy targeting small business in China. Under this policy, Small and Micro-Profit Enterprises (SMPEs) with annual taxable income below a threshold of 300,000 RMB (around 43,000 USD) are eligible for a reduced corporate income tax (CIT) rate of 20%, down from the standard rate of 25%.[1]Theoretically, small firms should be more responsive to tax rate cut as it offers a more straightforward and salient benefit compared to targeted incentives such as accelerated depreciation (Cui et al., 2025). Nevertheless, using the National Tax Survey Database (NTSD), we uncover a striking puzzle: only 40% eligible, profitable SMPEs actually claim the tax benefits.[2]

Motivated by this fact, we hypothesize that this low take-up rate is primarily driven by "tax consulting costs"—the frictions arising from small firms' reliance on external

[1] While SMPE qualification is subject to additional eligibility criteria, the annual taxable income threshold serves as the primary binding constraint for the majority of small firms.

[2] Cui et al. (2025) document a higher take-up rate among manufacturing SMPEs using administrative data from a large and prosperous province in China. We use a nationally representative sample that spans all sectors and covers less developed regions. The difference in findings likely reflects that manufacturing SMPEs in advanced provinces typically have better tax compliance and more sophisticated local tax administration, creating a lower-friction environment for claiming benefits.

consulting services. Small firms often lack sophisticated tax planning capabilities (Agrawal et al., 2020); consequently, they struggle to navigate complex tax and financial documentations (Aarbu and Mackie-Mason, 2003) and must rely on external paid preparer (Zwick, 2021). We argue that the fees paid to these intermediaries act as a hidden cost that discourages policy participation.

To test this hypothesis, we first leverage the rich tax and financial data in the NTSD to construct a proxy variable for tax consulting costs adhering to Chinese accounting standards. We then quantify the causal impact of claiming tax benefits on these costs. The sharp discontinuity in take-up rates at the taxable income threshold enables us to apply a fuzzy regression discontinuity (RD) design for identification. Our main findings show that claiming the tax benefits causes a 54.7% surge in SMPEs' tax consulting costs. This suggests that consulting fees act as a critical wedge, deterring small firms from participating even in straightforward tax cut policies.

We further conduct analysis to rule out two alternative mechanisms—the complexity of administrative approval and tax audit risk—that might explain the low take-up. First, complex administrative approval procedures may deter taxpayers from applying for tax benefits (Aarbu and Mackie-Mason, 2003; Castell et al., 2025). However, a 2014 reform replaced the ex-ante approval requirement with an ex-post filing system, allowing eligible SMPEs to self-declare for tax relief. Our results reveal that SMPEs continued to bear substantial tax consulting costs, as the requirement to prepare complex documentation remained unchanged after the reform. Second, since claiming tax benefits may place firms on the tax audit priority list, firms with low tax compliance—common among small businesses—may strategically forgo incentives to avoid audit (Williamson, 2011; Zwick, 2021). Our analysis shows that participation in the policy does not significantly increase the probability of tax audits. Taken together, these results suggest that consulting fees associated with claiming tax benefits emerge as the primary driver of incomplete take-up.

Complementing the causal analysis of consulting costs, we further investigate firms' strategic behavioral responses. The threshold-based tax design creates an incentive for adjusting taxable income if the expected tax savings exceed the cost of adjustment. To

analyze the cost-benefit trade-off facing firms at the margin, we employ a bunching estimation to identify the intent-to-treat (ITT) effect and then derive the corresponding Wald estimator. Our findings show that for every 1% increase in tax relief, tax consulting costs rise by 0.368%. Although this elasticity is below unity—rationalizing the bunching behavior of sophisticated firms—the necessity of paying these "entry fees" acts as a screening friction. This barrier likely discourages less sophisticated firms from participating, resulting in the observed imperfect take-up.

Our paper first contributes to the literature by providing new evidence for the phenomenon of imperfect take-up of tax benefits and quantifying a critical underlying friction. Previous studies have significantly enhanced our understanding of the low take-up, particularly regarding complex incentives like bonus or accelerated depreciation (Kitchen and Knittel, 2011; Cui et al., 2022). Aarbu and Mackie-Mason (2003) suggest that compliance costs are the primary deterrent for small firms' take-up, but they lack a direct measure of such costs. We advance this literature by empirically measuring the consulting fees paid to external tax preparers, upon whom small firms heavily rely (Zwick, 2021), and demonstrate that these costs act as a "hidden friction" that significantly impedes take-up even for straightforward tax cut policies, challenging the assumption that policy simplicity guarantees participation.

Second, we contribute to the literature on the research of threshold-based tax incentives. Prior research demonstrates that such policies can effectively stimulate eligible firms to increase investment (Maffini et al., 2019; Pham 2020; Li et al., 2021) as well as boost R&D expenditure and patenting (Dechezleprêtre et al., 2023). However, these thresholds also elicit strategic behavioral responses, particularly among small firms. Evidence suggests firms may relabel administrative expenses as R&D (Chen et al., 2021) or intentionally slow the growth of sales and capital stock to retain their small status (Tsuruta, 2020; Cui et al., 2025), leading to bunching below policy thresholds. Our study advances this literature by revealing the hidden costs of such behavior. We show that engaging in these strategic adjustments to secure eligibility requires external consulting expenditures that constitute an "entry fee"—a friction that previous studies on bunching have largely overlooked.

Third, we contribute to the literature analyzing the effect of tax incentives on small firms' investment. While our primary focus is on the drivers of imperfect take-up, a critical economic question remains: did the policy generate any positive real effects? Prior literature offers mixed evidence, ranging from significant positive responses driven by the alleviation of financial frictions (Zwick and Mahon, 2017; Cui et al., 2025) to null effects (Harju et al., 2022). We extend the literature by examining whether the realized tax savings were substantial enough—net of the consulting costs—to actually promote small firms' capital accumulation. Adopting the classification of Fan and Liu (2020), we find that the policy significantly boosts eligible investment (production purposes) while having no impact on ineligible investment (non-production purposes). This reveals that, even after paying the "entry fee" of consulting costs, the net tax savings remain sufficient to alleviate financial constraints and support core operational expansion.

The remainder of the paper is structured as follows. Section 2 introduces the institutional background. Section 3 outlines the empirical design and data. Section 4 presents the main results, while Section 5 discusses alternative mechanisms and broader impacts on investment. Section 6 conducts a bunching analysis. Section 7 concludes.

2. Institutional background

Under China's Enterprise Income Tax Law, effective since 2008, "Small and Micro-Profit Enterprises" are eligible for a reduced corporate tax rate of 20%, a significant reduction from the standard rate of 25%. To qualify for SMPE status, a firm must satisfy the following policy thresholds: (i) annual taxable income not exceeding 300,000 RMB (around 43,000 USD), (ii) no more than 80 employees (or 100 employees for industrial enterprises), and (iii) total assets no more than 10 million RMB (or 30 million RMB for industrial enterprises). Among these criteria, the annual taxable income threshold serves as the primary binding constraint for most firms. While the eligibility thresholds were progressively raised in later years—increasing to 500,000 RMB in 2017, 1 million RMB in 2018, and 3 million RMB in 2019, accompanied by further rate reductions—the policy framework remained highly stable between 2008

and 2015, with the income threshold fixed at 300,000 RMB. Consequently, to minimize confounding effects from frequent post-2015 policy adjustments, our empirical analysis focuses exclusively on the period from 2007 to 2015.[3]

The procedure for claiming these tax benefits involve a two-stage process: self-declaration by the SMPE and administrative approval from the tax authorities. In the self-declaration stage, eligible firms are required to submit a comprehensive application report (detailing the legal basis, scope, and calculated amount of tax relief), financial statements, tax returns, and other relevant documents. The accuracy and completeness of these documents are strictly mandated. In the approval stage, tax authorities review the submission; relief is granted only upon formal verification. Discrepancies, such as incomplete documentation or calculation errors, trigger a rejection or a requirement for resubmission, imposing additional administrative burdens on applicants.

Figure 1 shows the distribution of the tax incentive take-up rates for the period 2009-2015.[4] A striking pattern emerges: despite the substantial tax savings offered, the take-up rate among eligible SMPEs (those to the left of the 300,000 RMB cutoff) is surprisingly low, averaging only around 40%. This rate drops further to approximately 21% for firms with taxable income near zero, where the marginal benefit of the tax cut is negligible. Conversely, a negligible fraction of firms to the right of the threshold is observed receive benefits, likely reflecting minor measurement errors or instances of non-compliance. This prevalent "incomplete take-up" to the left of the threshold presents an empirical puzzle that motivates our investigation into hidden transaction costs.

[3] While the income threshold remained constant at 300,000 RMB during this period, two minor variations occurred. First, between 2010 and 2015, SMPEs with very low taxable income (e.g., below 30,000–200,000 RMB depending on the year) could qualify for a further reduced effective tax rate of 10%. Second, prior to 2014, eligibility was technically restricted to firms subject to tax audits, though this restriction was lifted in 2014 to include all assessment types.

[4] Although the policy was enacted in 2008, data on the actual receipt of tax benefits and the specific magnitude of relief are only observable in our dataset starting from 2009. Accordingly, the Fuzzy Regression Discontinuity analysis utilizes the sample from 2009 to 2015.

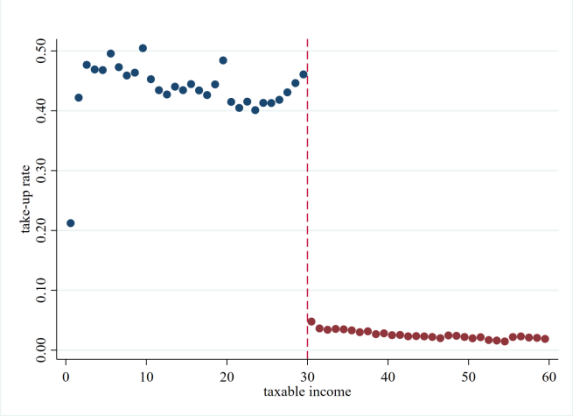


Figure 1 Take-up rate of the SMPE tax incentives

Note: Figure 1 illustrates the discontinuity in the take-up rate of the SMPE tax incentives around the policy threshold for the period 2009-2015. The vertical dashed line indicates the taxable income threshold of 300,000 RMB. Each dot represents the average take-up rate within each bin.

3. Empirical design

3.1 Data

We use firm-level administrative data from the National Tax Survey Database, covering the period 2007-2015. The data are jointly collected by the State Administration of Taxation of China and the Ministry of Finance of China based on the stratified random sampling method. Local tax authorities responsible for the surveyed firms are required to ensure the completion and quality of the data, which significantly enhances the accuracy of the key information on firm background, taxation, financing, and performance (Liu and Mao, 2019). The database has a large sample size of approximately 700,000 firms surveyed annually. It contains a significant number of SMPEs and rich financial detail. The database is well-suited for our research question due to its large annual sample size and comprehensive representation of SMPEs.

To prepare our working sample, we performed serval data cleaning procedures. First, we standardized variable names across survey years by linking and recoding them based on the item descriptions provided in the survey documentation. Second, we keep sample of firms with 15- or 18-digit taxpayer identification numbers (TINs) , from which we extract the 9-digit organizational code from the TIN as the firm identifier for linking observations across years.[5] Third, to make the industry codes comparable across the sample period, we harmonize the industry classification codes before and

[5] In October 2015, China implemented a reform that changed the taxpayer identification number (TIN) from a 15-digit format to an 18-digit format. As the reform was implemented at the end of 2015, some enterprises were affected in that year, with their TINs consisting of 18 digits. The specific rules for truncation are as follows: for TINs with 15 digits, digits 7 to 15 correspond to the organization code; for TINs with 18 digits, digits 9 to 17 correspond to the organization code. The policy details can be found at https://www.cods.org.cn/c/2020-10-29/12575.html.

after 2011, the year in which the modified classification system was introduced. Fourth, we excluded outliers and observations unlikely to have any incentive to claim tax benefits, including those with an effective tax rate below 0 or above 1, or with non-positive values for total assets, employees, taxable income, or total profit. We further winsorize all continuous variables at the 1st and 99th percentiles to mitigate the influence of extreme values.

After the data cleaning procedures outlined above, we adopt the data-driven mean squared error (MSE) method proposed by Calonico et al. (2014) to calculate the optimal bandwidth for our RD analysis. Table 1 presents the descriptive statistics of key variables within a 20,000 RMB bandwidth on either side of the policy threshold. The firms in this sample are relatively small, with an average of approximately 23 employees and average total assets of around 5.3 million RMB.

Table 1 Descriptive statistics

	Below Threshold			Above Threshold		
Variables	Obs.	Mean	S.D.	Obs.	Mean	S.D.
Panel A：Policy response variables						
Take-up (Dummy , 1 for take-up and 0 otherwise）	15754	0.454	0.498	9866	0.043	0.202
Amount of tax relief	15489	1.239	1.392	9795	0.088	0.472
Panel B：Firm characteristics						
Ownership (Dummy, 1 for SOEs and 0 for non-SOEs)	15754	0.010	0.102	9866	0.010	0.099
Administrative expenses	15383	5.831	1.759	9640	5.799	1.819
R&D expenses	15453	0.021	0.255	9664	0.023	0.260
Profit	15438	5.427	0.619	9614	5.494	0.637
Total asset	15323	8.583	0.966	9532	8.592	0.988
Total fixed asset	15056	5.787	2.327	9398	5.863	2.285
Employees	15466	3.128	0.833	9645	3.153	0.835
Tax consulting costs	9322	4.831	1.796	5830	4.790	1.846
External advisory fees	15754	0.599	5.413	9866	0.543	5.092
Late Fees and Tax Penalties	11449	0.130	0.603	7162	0.141	0.631
Assessed and Supplementary VAT payable	10142	0.170	0.527	6366	0.182	0.543
Fixed asset investment	12959	2.918	2.655	8042	2.869	2.653
Eligible fixed asset investment	12019	2.409	2.660	7412	2.372	2.642
Ineligible fixed asset investment	11932	0.657	1.662	7362	0.645	1.639

Note: (1) Table 1 reports the descriptive statistics. Panel A presents the descriptive statistics for policy response variables, while Panel B presents those for firm characteristics. The variable external advisory fees is measured in levels (in thousands of RMB), whereas all continuous variables are log-transformed as ln(1 + Y) to accommodate zero values. The unit of the untransformed level values is also in thousands of RMB. (2) SOEs mean State-Own Enterprises.

3.2 Identification strategy

Our main identification strategy is a Fuzzy Regression Discontinuity (RD) design. We adopt this approach because treatment assignment does not perfectly determine

treatment take-up. The Fuzzy RD framework accounts for this imperfect compliance by using a two-stage least squares (2SLS) approach. The first stage estimates the effect of eligibility on the actual take-up of the incentive. The reduced form estimates the effect of eligibility on our outcome variable, tax consulting costs. The second stage uses eligibility as an instrument for take-up to estimate the Local Average Treatment Effect (LATE), which captures the causal effect of claiming benefits on tax consulting costs for the subpopulation of firms whose participation is determined by crossing the eligibility threshold (compliers).

$$Takeup_{ijt} = \alpha Eligible_{ijt} + f(Z_{ijt} - 30) + \alpha_j + \delta_t + \mu_{ijt} \quad (1)$$

$$Y_{ijt} = \beta Eligible_{ijt} + f(Z_{ijt} - 30) + \alpha_j + \delta_t + \mu_{ijt} \quad (2)$$

$$Y_{ijt} = \tau \hat{Takeup}_{ijt} + f(Z_{ijt} - 30) + \alpha_j + \delta_t + \mu_{ijt} \quad (3)$$

Equations (1)-(3) represent first-stage, reduced-form, and second-stage regressions, respectively. Y_{ijt} denotes the tax consulting costs for firm i in industry j in year t. $Eligible_{ijt}$ is a dummy variable indicating whether an SMPE's running variable (i.e., the annual taxable income, denoted by Z_{ijt}) exceeds 300,000 RMB, and $f(Z_{ijt}$-30) represents a local linear function of the running variable. Our baseline specification applies a triangular kernel weighted local linear regression approach, which assigns more weights to observations closer to the cutoff point. We later examine the robustness of our estimates to the choice of kernel function by using uniform and epanechnikov kernels. We control for two-digit industry fixed effects and year fixed effects, denoted by α_j and δ_t, respectively. μ_{ijt} represents the error term, and standard errors are clustered at the firm level[6].

The local average treatment effect (LATE) is given by the ratio of the reduced-form and first-stage coefficients as follows:

$$\tau = \lim_{e \to 0} \frac{E[Y_{ijt} \mid Z_{ijt} = 30 + e] - E[Y_{ijt} \mid Z_{ijt} = 30 - e]}{E[Takeup_{ijt} \mid Z_{ijt} = 30 + e] - E[Takeup_{ijt} \mid Z_{ijt} = 30 - e]} \quad (4)$$

Since the NTSD does not include a variable that directly measures tax consulting costs, we employ accounting methodologies to construct a proxy variable. According

[6] The estimation of this RD model with fixed effects is implemented using the two-step approach suggested by Lee and Lemieux (2010) and He et al., (2020), where industry and year fixed effects are absorbed by running OLS regression of Y_{ijt} on a set of industry and year dummies and then applying the estimations on the residualized Y_{ijt}.

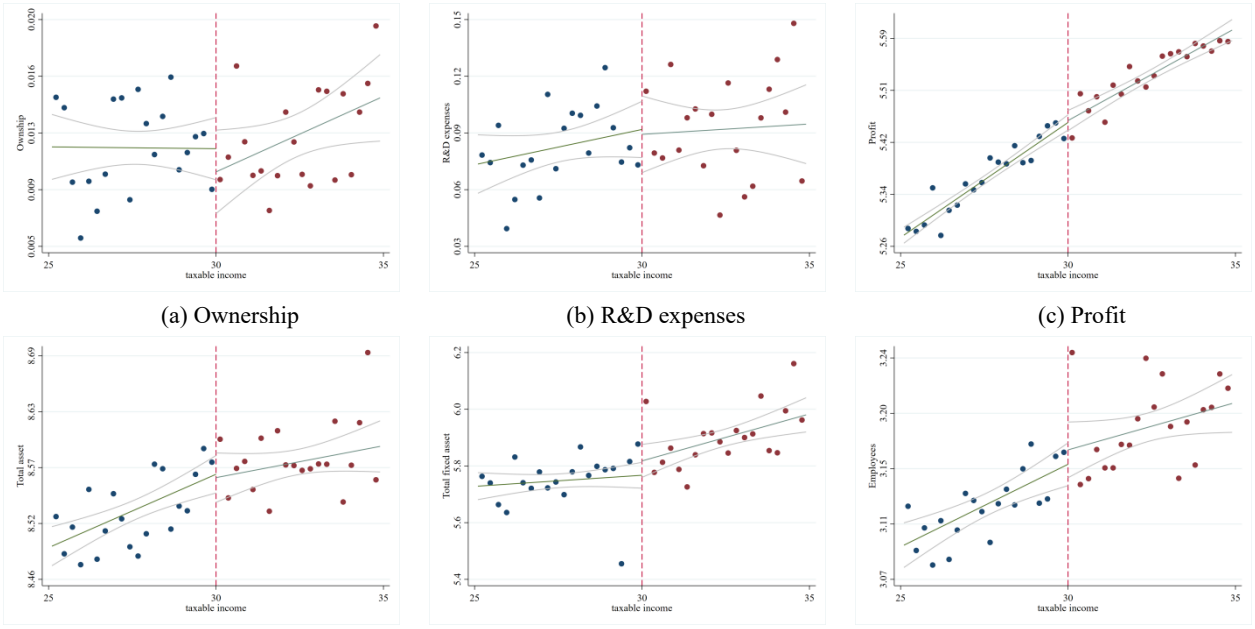
to Chinese accounting standards, tax consulting costs (Y_{ijt}) are classified as a subcategory of administrative expenses. We isolate this variable by decomposing administrative expenses and subtracting components unrelated to tax consulting services. The specific construction method is detailed in Appendix B. A brief summary is calculated as follows: tax consulting costs (Y_{ijt}) $\approx$ administrative expenses - R&D expenses – business entertainment expenses – taxes items classified under administrative expenses – office related expenses – management salaries and benefits. To mitigate concerns regarding measurement error, we also test the robustness of our results using "external advisory fees" as an alternative outcome variable.

3.3 Validating identification assumptions

A key identification assumption of the RD design is that firms cannot precisely manipulate the running variable to sort into the treatment group. As documented in section 6, we observe a discontinuity in the density of taxable income at the threshold, indicating that some firms engage in strategic adjustment to qualify for the tax incentive. To address the concern that manipulation could invalidate the identification assumption, we provide a series of evidence.

First, we show that key firm-level pre-determined characteristics do not change discontinuously at the 300,000 RMB policy threshold. In Figure 2, we graphically illustrate the smoothness of several important firm characteristics (including ownership, R&D expenditures, profit, total assets, total fixed assets, and number of employees) across the policy threshold in the pre-treatment year (2007). We find no evidence of discontinuous jumps at the threshold for these pre-determinants, confirming that firms just above and below the cutoff were comparable. Second, to address the concern that manipulators drive our results, we employ a "Donut-hole" approach by excluding observations located close to the cutoff, where manipulation is most concentrated. Third, we test the sensitivity of our results to the choice of kernel weighting and re-estimate using a uniform kernel. This assigns equal weight to all observations within the bandwidth, thereby diluting the influence of observations strictly at the threshold. All robustness tests yield results consistent with our baseline estimates. We therefore argue

that potential sorting at the threshold is not the primary driver of our findings.[7] Given the substantial discontinuity in the actual take-up rate, we argue that the RD design can provide valid causal evidence in this context



(a) Ownership (b) R&D expenses (c) Profit

(d) Total asset (e) Total fixed asset (f) Employees

Figure 2 Continuity Test of Pre-Determinants

Note: Figure 2 presents the continuity of pre-determined firm characteristics around the policy threshold in the pre-treatment year of 2007. All continuous variables are log-transformed as ln(1 + Y). The vertical dashed line indicates the taxable income threshold of 300,000 RMB. Each dot represents the average value of the outcome variable within each bin. The solid lines show the fitted values from local linear regressions, and the shaded areas represent the 95% confidence intervals.

4.Empirical Results

4.1 The effect of tax incentive on tax consulting costs

We begin by presenting RD evidence to visually illustrate the discontinuous change in the outcomes of interest across the policy threshold. As an initial check, we examine the distribution of total administrative expenses on both sides of the policy cutoff to assess potential tax incentive effect. As shown in Figure 3, there is a significant discontinuous jump in administrative expenses at the cutoff, suggesting that claiming the tax benefit leads to increased spending on firms' administrative costs.

[7] Existing literature establishes that a smooth density of the running variable is neither a necessary nor a sufficient condition for the validity of the RD design (McCrary, 2008; Choi and Lee, 2023; Li et al., 2021).

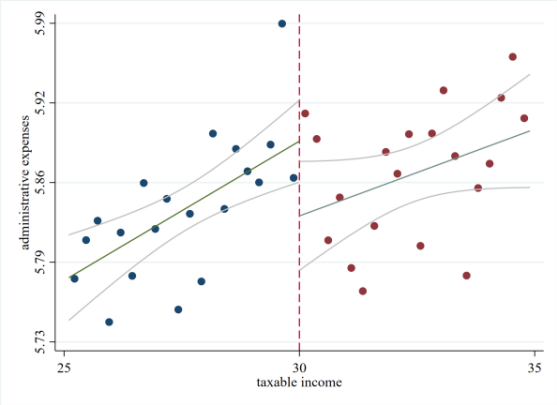


Figure 3. Effect on administrative expenses

Note: Figure 3 illustrates the discontinuity in firms' administrative expenses around the policy threshold between 2009 and 2015. The administrative expenses are log-transformed as ln(1 + Y). The vertical dashed line represents the taxable income threshold of 300,000 RMB. Each dot denotes the average administrative expense within each bin. The solid lines show the fitted values from local linear regressions, and the shaded areas represent the 95% confidence intervals.

To identify the source of the increase, we further decompose total administrative expenses to isolate tax consulting costs. As illustrated in Figure 4, tax consulting costs exhibit a pronounced discontinuity at the cutoff. This provides strong graphical evidence that claiming tax benefit directly drives up firms' expenditures on external tax consulting services.

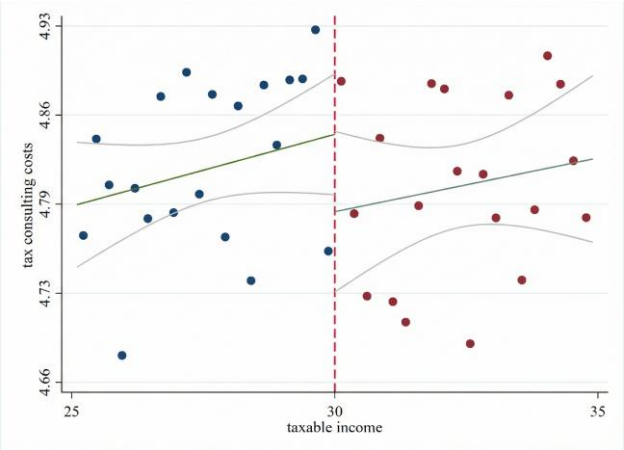


Figure 4 Effect on tax consulting costs

Note: Figure 4 illustrates the discontinuities in tax consulting costs around the policy threshold between 2009 and 2015. Tax consulting costs are log-transformed as ln(1 + Y). The vertical dashed line marks the taxable income threshold of 300,000 RMB. Each dot represents the average value of the outcome variable within each bin. The solid lines show the fitted values from local linear regressions, and the shaded areas indicate the 95% confidence intervals.

To quantify the effect of tax incentive on tax consulting costs, we report the regression results in Table 2. Columns 1-3 of Table 2 report the first-stage, reduced-form, and second-stage results, respectively. The estimate in Column 1 confirms our observation in Figure 1, showing a significant effect in the first stage: When firms cross the eligibility threshold, the policy take-up rate drops significantly (about 36.1 percentage points). In the reduced-form result in Column 2, the eligible SMPEs incur

15% higher tax consulting fees at the policy threshold. Column 3 reports the second-stage estimates from the fuzzy RD specification. The coefficient on take-up is 0.436 and it is statistically significant at the 1% level. This LATE estimate suggests that claiming the tax benefits causes a 54.7% increase in firms' tax consulting costs.[8]

Table 2 Baseline result

	(1)	(2)	(3)
Model	First Stage	Reduce Form	Second Stage
Depend Variables	Take-up	Tax consulting costs	Tax consulting costs
Eligible	-0.361***	-0.162***	
	(0.013)	(0.051)	
Take-up			0.436***
			(0.142)
Observations	18464	20474	17822
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Kernel	triangular	triangular	triangular

Note: Table 2 reports the estimation results of the fuzzy RD design, with taxable income as the running variable. All regressions use a triangular kernel and control for industry and year fixed effects. Standard errors clustered at the firm level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

4.2 Robustness checks

First, we present the robustness of our estimates to varying bandwidths, ranging from 5,000 to 50,000 RMB. As shown in Appendix Figure A1, the LATE point estimates remain broadly robust, indicating that the baseline regression results are not sensitive to bandwidth choice.[9]

Second, to ensure our main findings are robust to the measurement of the outcome variable, we re-estimate the baseline model using external advisory fees as the alternative outcome variable.[10] Appendix Figure A2 presents a discontinuity in the external advisory fees at the policy cutoff. The local linear estimation results reported in Appendix Table A1 further confirm that our primary results remain consistent across different measures of the outcome variable.

Third, we conduct placebo tests using pseudo-thresholds set at 260,000, 280,000,

[8] In the second stage estimation, $e^{0.436} - 1 = 54.7\%$; In the reduced form estimation, $e^{-0.162} - 1 = -15\%$.

[9] The point estimates are insignificant only at the 5,000 RMB bandwidth, likely due to a very small sample size.

[10] We do not use external advisory fees as our primary outcome variable for two reasons. First, the National Tax Survey Database defines external advisory fees as the expenses for certification, attestation, and consulting services. Although tax consulting costs are embedded within this category, they represent only a portion of the total expenses and are not equivalent. Second, as a non-mandatory reporting item in financial accounts, this variable suffers from significant zero-inflation issues.

320,000, and 340,000 RMB. This addresses the concern that due to SMPEs' limited internal accounting capacity, they might incur high external consulting fees regardless of the policy cutoff. As reported in Appendix Table A2, the point estimates are all statistically insignificant at these pseudo-thresholds, confirming that the effect of the tax incentive on tax agency costs is unique to the actual policy threshold.

Given potential concerns regarding the manipulation of the running variable (taxable income), we conduct a series of robustness checks to validate our identification strategy. First, we assess the sensitivity of our estimates to the choice of kernel function. While our baseline specification uses a triangular kernel—which assigns the highest weight to observations at the cutoff—we re-estimate the model using both uniform and epanechnikov kernels. By assigning equal weight to all observations within the bandwidth, the uniform kernel mitigates the influence of data points located strictly at the threshold, where manipulation is most likely to cluster. As shown in Appendix Table A3, the results are robust to these alternative specifications: the point estimates remain statistically significant and quantitatively stable. Second, we conduct a donut-hole analysis to directly address the manipulation concern by excluding observations around the cutoff. Specifically, we sequentially exclude firms within different ranges around the cutoff (i.e., from 1,000 RMB to 10,000 RMB, in increments of 1,000 RMB). As illustrated in Appendix Figure A3, the estimates remain statistically significant and quantitatively similar to the baseline estimate. In sum, the consistency of our estimates across these tests helps alleviate concerns that our results are driven by potential manipulation around the policy threshold.

5. Alternative mechanisms and broader impacts

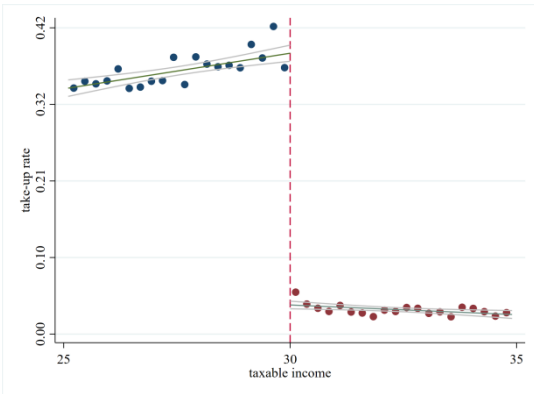
5.1 Complexity of administrative approval

As detailed in Section 2.1, the process through which SMPEs claim tax incentives consist of two stages: self-declaration by the firm and subsequent approval by the tax administration. During the study period (2007-2015), a major policy reform was introduced in 2014 that replaced the ex-ante administrative approval requirement with

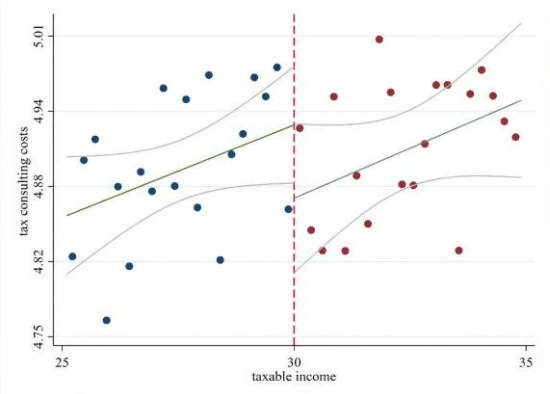
an ex-post filing system.[11] The shift allowed eligible SMPEs to claim and receive the tax benefits directly. Consequently, the take-up rate for income tax incentives among SMPEs increased significantly after the reform. As illustrated in Figures 4(a) and 4(c), the take-up rate rose from approximately 35% in the pre-reform period to around 66% after the reform.

While the 2014 reform eliminated the administrative approval step, it did not simplify the application procedures. After the reform, SMPEs were still required to prepare complex documentation to claim tax benefits, implying that the substantive application burden remained largely unchanged. Figure 5 illustrates the discontinuities in both take-up rates and tax consulting costs across the policy cutoff for both periods. As shown in Figure 5(b), prior to the reform, firms just below the eligibility threshold incurred significantly higher tax consulting costs than those just above it. Figure 5(d) confirms that this pattern persisted after the reform: firms to the left of the cutoff continued to face higher tax consulting costs compared to those on the right. Taken together, these results suggest that, despite the removal of the approval requirement, firms continued to bear substantial tax consulting costs when claiming tax benefits.

Table 3 reports the RD estimates by dividing the sample into pre-2014 and post-2014 periods. As shown in Column (3) of Table 3, prior to the 2014 reform, the tax incentive policy resulted in a 37.0% increase in firms' consulting fees, statistically significant at the 5% level. Following the reform (Column 6), the estimated LATE increased to 76.6%, remaining significant at the 5% level.

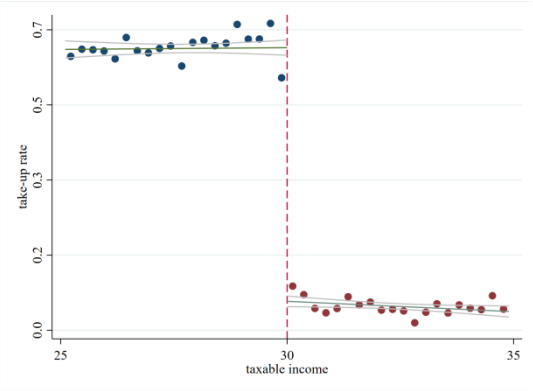


(a) Take-up rate before 2014

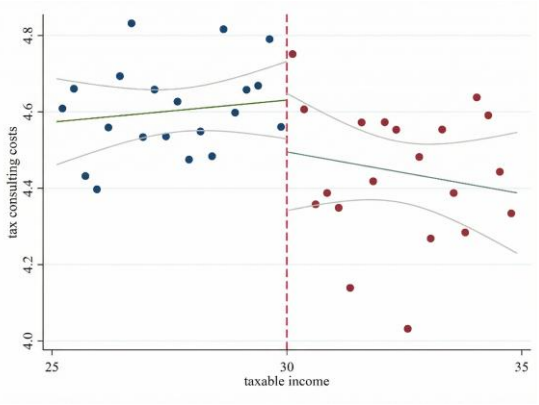


(b) Tax consulting costs before 2014

[11] Qualifying SMPEs may self-assess and claim tax incentives during the interim period without pre-approval; they need only file their employment and asset data with tax authorities for record-keeping during the annual tax reconciliation filing.



(c) Take-up rate after 2014



(d) Tax consulting costs after 2014

Figure 5 The impact of the 2014 administrative reform

Note: Figure 5 shows the difference in the take-up rate and the tax agency costs around the policy threshold before and after the 2014 administrative reform. The tax consulting costs are log-transformed as ln(1 + Y). Figures (a) and (b) show the results before the reform, while Figures (c) and (d) show the results after the reform. The vertical dashed line indicates the taxable income threshold of 300,000 RMB. Each dot represents the average of the outcome variable within each data bandwidth, and the solid line and curve represent the fitted line and the 95% confidence interval from the local linear regression.

Table 3 The impact of the 2014 administrative reform

	Before 2014			After 2014		
	（1）	（2）	（3）	（4）	（5）	（6）
Model	First Stage	Reduce Form	Second Stage	First Stage	Reduce Form	Second Stage
Depend Variables	Take-up	Tax consulting costs	Tax consulting costs	Take-up	Tax consulting costs	Tax consulting costs
Eligible	-0.322***	-0.106**		-0.443***	-0.257**	
	(0.014)	(0.049)		(0.027)	(0.110)	
Take-up			0.315**			0.569**
			(0.154)			(0.250)
Observations	15527	21049	17538	3709	5101	4476
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Kernel	triangular	triangular	triangular	triangular	triangular	triangular

Note: Columns (1) to (3) of Table 3 report the estimation results by repeating the baseline regression using the sample before 2014, while Columns (4) to (6) use the sample from 2014 onward. The running variable is taxable income. All regressions control for industry and year fixed effects. Standard errors clustered at the firm level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

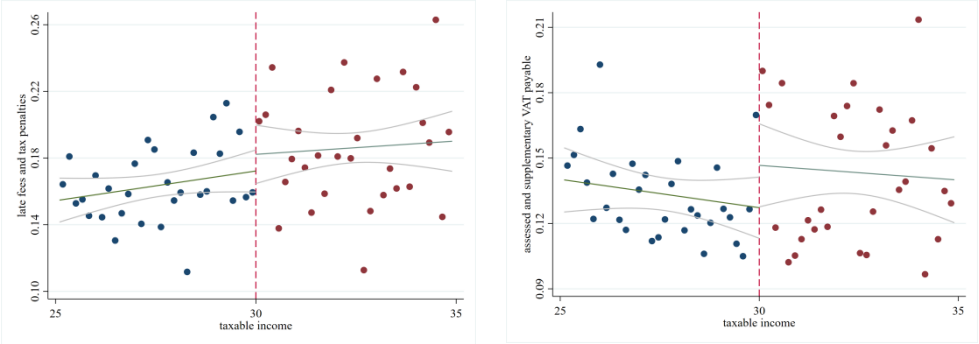
5.2 Audit risk

China faces challenges related to low tax compliance, with some firms engaging in tax evasion or underreporting to reduce their effective tax burden. Consequently, claiming tax benefits—which may place firms on the tax authorities' audit priority list—carries a perceived risk. Firms with low compliance levels may strategically forgo these benefits to avoid triggering an audit (Williamson, 2011; Zwick, 2021), which

potentially explains the low take-up rate of the tax incentive.

To rule out the concern that the audit risk mechanism might confound our baseline results, we examine two financial indicators commonly related to tax audit risk: (1) late fees and tax penalties, and (2) assessed and supplementary VAT payable.[12] The results are presented in Figure 6 and Table 4. Figure 6(a) illustrates the RD plot using late fees and tax penalties as the outcome variable, revealing that firms to the left of the cutoff incur slightly lower penalties and fines compared to those to the right. Columns (2) and (3) of Table 4 show the reduced-form and second-stage estimates from the fuzzy RD design, both of which yield statistically insignificant coefficients.

Similarly, Figure 6(b) displays the RD plot using assessed and supplementary VAT payable. The visual evidence suggests that firms to the left of the cutoff report lower supplementary VAT amounts than those on the right. Columns (4) and (5) of Table 4 confirm this observation, reporting statistically insignificant estimates. Collectively, these findings suggest that participation in the tax incentive policy does not increase the likelihood of being subject to tax audits, thereby ruling out audit risk as the primary driver of the low take-up rate among SMPEs.



(a) late fees and tax penalties (b) assessed and supplementary VAT payable

Figure 6 The impact of tax audit risk

Note: Figure 6 displays the RD plots for two indicators of tax audit risk: late fees and tax penalties (Panel a) and assessed and supplementary VAT payable (Panel b). Both variables are log-transformed as ln(1 + Y). The vertical dashed line indicates the taxable income threshold of 300,000 RMB. Each dot represents the average of the outcome variable within each data bandwidth, and the solid line and curve represent the fitted line and the 95% confidence interval from the local linear regression.

[12] Late fees and tax penalties refer to fines levied by tax authorities for infractions related to VAT, business tax, and other taxes. Assessed and Supplementary VAT payable refers to the amount of VAT that a taxpayer is required to pay following a tax inspection.

Table 4 The impact of tax audit risk

	（1）	（2）	（3）	（4）	（5）
Model	First Stage	Reduce Form	Second Stage	Reduce Form	Second Stage
Depend Variables	Take-up	Late fees and tax penalties	Late fees and tax penalties	Assessed and supplementary VAT payable	Assessed and supplementary VAT payable
Eligible	-0.361***	0.173		-0.457	
	(0.013)	(0.165)		(0.454)	
Take-up			-0.001		-0.080
			(0.055)		(0.179)
Observations	18464	22664	29309	19456	17881
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Kernel	triangular	triangular	triangular	triangular	triangular

Note: Table 4 reports the estimation results by repeating the baseline regression using late fees and tax penalties, and assessed and supplementary VAT payable as outcome variables. Both variables are log-transformed as ln(1 + Y). The running variable is taxable income. All regressions control for industry and year fixed effects. Standard errors clustered at the firm level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

5.3 Broader impacts on investment

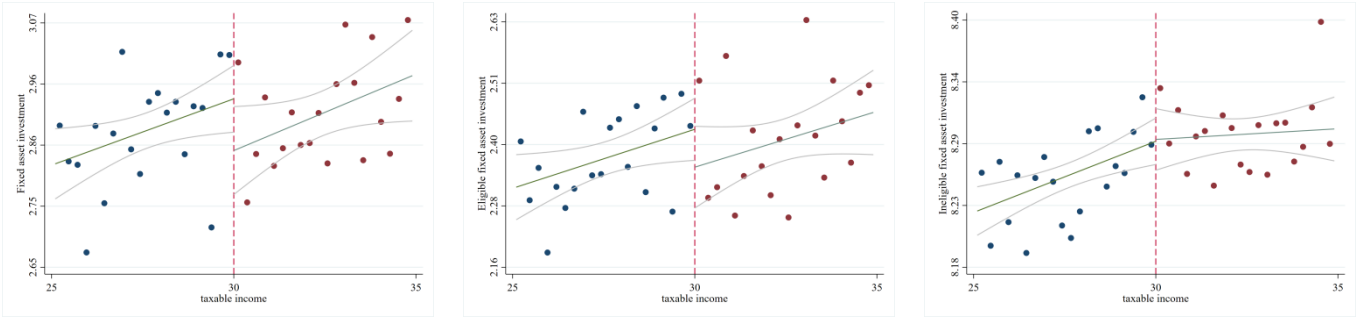
While our primary analysis highlights the hidden costs of the tax incentive—specifically, tax consulting costs—a critical economic question remains: Did the policy generate any positive real effects? Although the government's stated goal was tax relief, standard theory predicts that the resulting increase in after-tax cash flow should relax financial constraints and spur investment (Zwick and Mahon, 2017). Therefore, we examine whether the tax savings were substantial enough—net of the increased consulting costs—to effectively promote capital accumulation among SMPEs.

To answer this, we examine the impact of the threshold-based tax incentive on investment behavior among eligible SMPEs. Following Liu and Mao (2019), we measure investment as the logarithm of real gross fixed asset investment. To better understand the nature of this response, we disaggregate fixed asset investment into two categories (Fan and Liu, 2020): eligible investment (production equipment and factory buildings) and ineligible investment (non-production equipment and factory buildings).

As shown in Figure 7(a), total fixed asset investment exhibits a clear upward jump at the policy threshold. Figures 7(b) and 11(c) further reveal that this increase is primarily driven by eligible fixed asset investment, while ineligible fixed asset

investment shows no significant change. Table 5 reports the local linear estimates from the Fuzzy RD design. As presented in column (3), the policy generates a LATE of 46.4% on total fixed asset investment, statistically significant at the 5% level. Decomposing this effect, Column (5) shows the estimated LATE on eligible fixed asset investment is 39.4% (statistically significant at the 10% level). In contrast, column (7) reports a negligible and statistically insignificant estimate for ineligible fixed asset investment.

In sum, these results provide complementary insights to our earlier findings. They indicate that while the tax incentive induces hidden costs in the form of higher consulting fees, the liquidity benefit it provides is substantial enough to outweigh them. Furthermore, the fact that firms channel these resources specifically into productive assets—rather than non-productive expenditures—suggests that the policy successfully alleviates financial constraints, allowing SMPEs to expand their core operational capacity despite the administrative friction.



(a) Fixed asset investment (b)Eligible fixed asset investment (c)Ineligible fixed asset investment

Figure 7 Effect on Investment

Note: Figure 7 shows the difference in fixed asset investment, eligible fixed asset investment and ineligible fixed asset investment around the policy threshold. Both variables are log-transformed as ln(1 + Y). The vertical dashed line indicates the taxable income threshold of 300,000 RMB. Each dot represents the average of the outcome variable within each data bandwidth, and the solid line and curve represent the fitted line and the 95% confidence interval from the local linear regression.

Table 5 Effect on Investment

	（1）	（2）	（3）	（4）	（5）	（6）	(7)
Model	First Stage	Reduce Form	Second Stage	Reduce Form	Second Stage	Reduce Form	Second Stage
Depend Variables	take-up	Fixed asset investment	Fixed asset investment	Eligible fixed asset investment	Eligible fixed asset investment	Ineligible fixed asset investment	Ineligible fixed asset investment
Eligible	-0.361***	-0.140**		-0.124**		-0.009	
	(0.013)	(0.061)		(0.055)		(0.032)	
take-up			0.381**		0.332*		0.020
			(0.165)		(0.177)		(0.083)
Observations	18464	29250	24652	36207	21042	36190	33735
Year FE	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES
Kernel	triangular	triangular	triangular	triangular	triangular	triangular	triangular

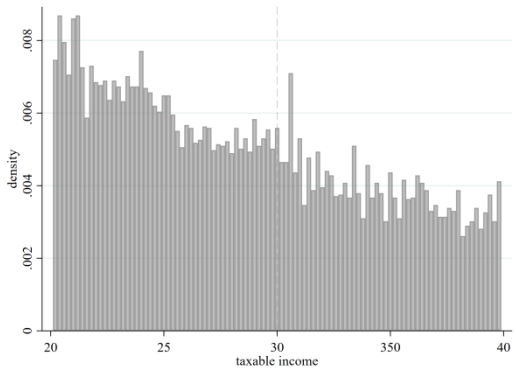
Note: Table 5 reports the estimation results by repeating the baseline regression using fixed asset investment, eligible fixed asset investment and ineligible fixed asset investment as outcome variables. Both variables are log-transformed as ln(1 + Y). The running variable is taxable income. All regressions control for industry and year fixed effects. Standard errors clustered at the firm level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

6. Strategic Responses: A Bunching Analysis

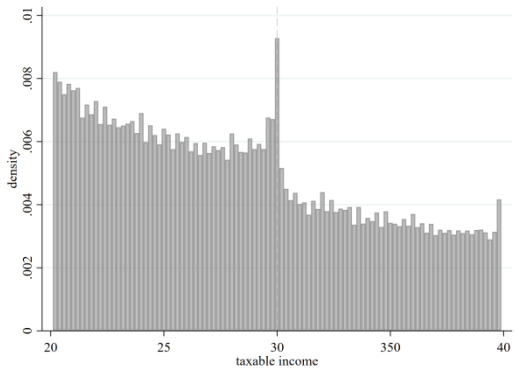
While our previous RD analysis treated the manipulation of the running variable primarily as an identification challenge (addressed via a series of robustness checks), this behavior fundamentally reflects a strategic choice by firms. Rational firms will only manipulate their taxable income to fall just below the threshold if the expected tax savings exceed the associated costs. Crucially, our findings in Section 4 suggest that these costs are non-trivial: they include tax consulting expenditures acting as an “entry fee” for policy eligibility. Therefore, analyzing the magnitude of this bunching allows us to understand the trade-off SMPEs face between the policy’s tax benefits and the costs of manipulation.

Figure 8 presents the distribution of the running variable—taxable income—before and after the policy implementation in 2008. Figure 8(a) shows that in the pre-policy period, the distribution of firms’ taxable income was continuous around the policy threshold of 300,000 RMB. This is formally confirmed by the McCrary (2008) density test in Figure 8(c), which rejects the presence of any discontinuity. In contrast, figure 8(b) displays a clear bunching pattern just below the threshold following the policy implementation. Figure 8(d) presents the corresponding McCrary test for the post-

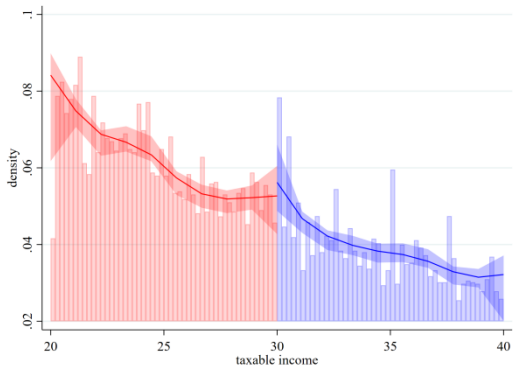
policy period, exhibiting a statistically significant break in the density function. This result confirms that firms strategically bunch below the threshold to access tax benefits despite the additional consulting costs involved.



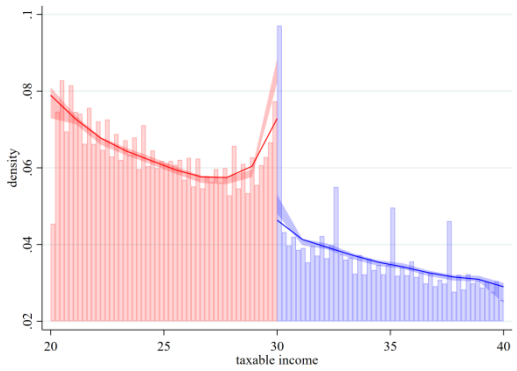
(a) Distribution of firms' taxable income before 2008



（b）Distribution of firms' taxable income after 2008



(c) Conducting the McCrary test using the pre-2008 sample



(d) Conducting the McCrary test using the post-2008 sample

Note: Figure 8(a) and (b) present the distribution of firms' taxable income before and after the policy implementation in 2008. Prior to the policy, the distribution of taxable income is smooth at the policy threshold, while after the policy implementation, there is a noticeable bunching at the threshold. Figure 8(c) and (d) further present the results of the McCrary (2008) test. In Figure 8(c), the p-value of the McCrary (2008) test is 0.2017, and the t-value is 1.2767, indicating no evidence of tax manipulation before the policy. In Figure 8(d), the p-value of the McCrary (2008) test is 0.000, and the t-value is -12.504, indicating significant tax manipulation after the policy implemented.

Figure 8 Distribution of taxable income around the policy threshold

To formally quantify this behavior and its implications, we apply a bunching estimation approach, following the empirical frameworks developed by Diamond and Persson (2016) and Chen et al. (2021). The empirical procedure is described below.

The first step is to estimate the counterfactual density and identify the bunching window where the manipulation occurs. Specifically, we use the distribution of firms located outside this excluded range—assumed to be unaffected by the policy—to estimate the counterfactual distribution near the threshold. This process involves fitting a flexible polynomial to the observed distribution while omitting the data within the excluded range, and then extrapolating the fitted values toward the threshold. The selection of the upper and lower bounds of the excluded range is crucial for accurately

estimating the counterfactual distribution. To avoid arbitrary selection, we employ a data-driven five-fold cross-validation method based on machine learning algorithms.[13] This procedure jointly determines the three optimal parameters: the lower bound of the excluded range Z_L, the upper bound of the excluded range Z_U, and the degree of polynomial fitting q:

$$c_{jt} = \sum_{i=0}^{q_t} \beta_{it} \cdot (z_{jt})^i + \sum_{i=z_{Lt}}^{z_{Ut}} \gamma_{it} \cdot 1[z_{jt} = i] + \varepsilon_{jt} \qquad (6)$$

where c_{jt} is the number of enterprises in bin j during year t, with firms grouped by taxable income using a bin width of 1,000 RMB. z_{jt} represents the taxable income of the firm in bin j during year t, and q_t is the optimal polynomial degree for the fitting process in year t. The term $1[z_{jt} = i]$ is an indicator variable for the excluded range, which equals 1 if the taxable income of the firm falls within the excluded range, and 0 otherwise. We use the sample data to fit Equation (6) and obtain the counterfactual distribution $\hat{c}_{jt} = \sum_{i=0}^{q_t} \beta_{it} \cdot (z_{jt})^i$.

The second step is to estimate the counterfactual value of outcome variables：

$$Y_{jt} = \sum_{i=0}^{q_t} \beta_{it} \cdot (z_{jt})^i + \sum_{i=z_{Lt}}^{z_{Ut}} \gamma_{it} \cdot 1[z_{jt} = i] + Ind_j + year_t + \varepsilon_{jt} \qquad (7)$$

Equation (7) defines Y_{jt} as the mean of the outcome variable for firms in group j during year t, Ind_j represents the industry fixed effect for firms in industry j (based on a two-digit industry code), and $year_t$ represents the year fixed effect. Based on equation (7), the counterfactual state of the firm's outcome variable can be derived as $\hat{Y}_{jt} = \sum_{i=0}^{q_t} \beta_{it} \cdot (z_{jt})^i$.

The third step is to compare the estimated counterfactual average of the outcome variable with the observed average within the excluded range. The difference between them yields the ITT effect—capturing the average change in

[13] The specific steps are as follows: Step 1: Cross-Validation Procedure. We randomly partition the sample into five equal groups (folds). In each iteration, we retain one fold as the validation set and use the remaining four folds as the training set to estimate the counterfactual distribution. This process is repeated for each of the five folds. We record the Mean Squared Error (MSE) of the prediction for each iteration to evaluate the goodness-of-fit. Step 2: Determine the Optimal Bunching Window. For a given lower bound of any bunching range, the upper bound of the range is determined by two conditions:(i) At the 10% significance level, we fail to reject the null hypothesis that the estimated Bunching Mass is equal to the Missing Mass; (ii) Among the candidate ranges that satisfy the first criterion, the bunching range that minimizes the Mean Squared Error (MSE) is chosen.

the outcome driven by taxable income manipulation for firms located within the bunching window:

$$\hat{ITT}^{Y_t} = E[Y_t \mid bunching,\ d \in (Z_{Lt}, Z_{Ut})] - E[Y_t \mid nobunching,\ d \in (Z_{Lt}, Z_{Ut})]$$
$$= \left[\frac{1}{N^{Exc.}} \sum_{dt \in (Z_{Lt}, Z_{Ut})} Yit\right] - \left[\int_{Z_{Lt}}^{Z_{Ut}} \hat{f}_o(r) E[\hat{Y}_t \mid nobunching,\ d \in (Z_{Lt}, Z_{Ut})] dr\right] \quad (8)$$

If the outcome variable Y represents the amount of tax relief, then ITT_1 indicates the average change in tax savings for firms within the excluded range, corresponding to the first-stage estimate of the LATE. If Y represents tax consulting costs, then ITT_2 indicates the average change in consulting fees for firms within the excluded range, serving as the reduced-form estimate. Following the Wald estimator proposed by Diamond and Persson (2016), the LATE for compliers can be expressed as $LATE=ITT_2/ITT_1$. This ratio measures the marginal increase in consulting costs incurred per unit of tax relief obtained through strategic manipulation.

Figure 9 presents the graphical results of the bunching estimation. In each panel, the vertical dashed lines indicate the lower and upper bounds of the excluded range, estimated to lie between 288,000 RMB and 320,000 RMB. This range reflects where firms are engaging in manipulation behavior, strategically adjusting their taxable income to satisfy the policy threshold. Figure 9(a) displays both the observed density (red connected line) and the estimated counterfactual density (solid blue line) of taxable income. Figures 9(b), 9(c), and 9(d) show the counterfactual estimation for the key outcome variables: the amount of tax relief for SMPEs, administrative expenses, and tax consulting costs, respectively. The results show that within the excluded range, firms' manipulation behavior leads to significantly higher tax relief, administrative expenses, and tax consulting costs (as indicated by the blue circles) compared to the counterfactual estimates (red line). This effect is particularly pronounced immediately to the left of the policy threshold, consistent with firms incurring higher external consulting fees to obtain tax benefits.



(a)Distribution of 2008 to 2015 (b)Amount of tax relief

(c)Administrative expenses (d)Tax agency cost

Figure 9 Graphical estimation results of the bunching analysis

Note: Figure 9 presents the graphical results of the counterfactual estimation. The vertical dashed lines mark the lower and upper bounds of the excluded region, while the vertical solid line indicates the taxable income threshold of 300,000 RMB. In panel (a), the red connected line represents the observed distribution of firm, and the solid blue line represents the estimated counterfactual distribution. Panels (b), (c), and (d) display the residualized outcome variables after removing fixed effects (blue circles, weight by firm frequency) and the estimated counterfactual outcomes (red solid lines).

Table 6 reports the ITT estimates of the tax incentives on key outcome variables, along with the corresponding LATE estimates. In Panel A, the results indicate that strategic taxable income manipulation leads to a significant increase in both claimed benefits and associated costs: on average, firms within the excluded range report 18.4% higher tax relief, 5.5% higher administrative expenses, and 6.8% higher tax consulting costs relative to the counterfactual scenario. All estimates are statistically significant at the 10% level. In Panel B, since the outcome variables are log-transformed, these estimates can be interpreted as elasticities. The results imply that for every 1% increase in the amount of tax relief, administrative expenses rise by an average of 0.297%, while tax consulting costs increase by 0.368%. These findings suggest that manipulating taxable income to qualify for tax benefits imposes additional consulting costs on SMPEs. While this elasticity is below unity—rationalizing the bunching behavior of sophisticated firms—the necessity of paying these "entry fees" acts as a friction. This barrier disproportionately affects firms lacking sophisticated tax planning capabilities, deterring their participating and driving the observed imperfect take-up.

Table 6 Estimates of ITT effects and LATE

Panel A: ITT					
	ITT	SE	T-Stat	5th Perc.	95th Perc.
ln(1+amount of tax relief)	0.184	0.066	2.769	0.034	0.177
ln(1+administrative expenses)	0.055	0.024	2.299	0.015	0.093
ln(1+tax consulting costs)	0.068	0.030	2.278	0.018	0.116
Panel B: LATE					
	WALD LATE	5th Perc.	95th Perc.		
Administrative expenses to tax relief	0.297	0.124	1.689		
Tax consulting costs to tax relief	0.368	0.143	2.052		

Note: Table 6 reports the estimation results from the bunching analysis. Panel A presents the Intent-to-Treat (ITT) estimates. The first column reports the weighted ITT estimates, followed by standard errors in the second column and t-values in the third. The fourth and fifth columns display the 90% confidence intervals (5th and 95th percentiles) derived from 5,000 bootstrap replications. Panel B reports the Local Average Treatment Effect (LATE). The second and third columns present the corresponding 90% confidence intervals (5th and 95th percentiles) based on 5,000 bootstrap replications.

7.Conlusion

Tax incentives serve as a pivotal policy tool for promoting the high-quality development of SMPEs; however, their real-world effectiveness critically depends on implementation. This study evaluates China's income tax incentive policy for SMPEs, introduced in 2008, using firm-level data from the 2007-2015 NTSD. Our descriptive analysis reveals a puzzle: despite the policy's generosity, the take-up rate remains relatively low at approximately 40%. To explain this imperfect take-up, we identify tax consulting costs as a key hidden friction for small firms. Our findings suggest that reliance on third-party tax intermediaries significantly increases the transaction costs of claiming tax benefits, thereby hindering the full realization of the policy's intended effects.

We then employ a fuzzy RD design to empirically assess the impact of the tax incentive on firms' tax consulting costs. The results indicate that the policy participation generates a 54.7% surge in tax consulting costs. This finding remains robust across a battery of validity checks. Crucially, we rule out alternative explanations: benefiting from the policy does not increase the likelihood of tax audits, and firms continue to incur significant consulting fees despite recent simplifications in the administrative approval process. This suggests that the low take-up rate cannot be attributed primarily to audit risks or complexity of administrative approval, but rather to the direct pecuniary costs of consulting services.

Additionally, recognizing that firms may strategically manipulate their taxable income to qualify for the policy, we conduct an extended analysis using the bunching estimation to assess the trade-off SMPEs face between the policy's tax benefits and the adjustment costs. The results reveal that for every 1% increase in the amount of tax relief, tax consulting costs rise by an average of 0.368%. Since this elasticity is well below unity, it rationalized the bunching behavior of firms willing to pay for external tax consulting services.

Our research carries significant policy implications. A central takeaway is that policymakers should explicitly account for take-up rates during the design phase of tax incentives. Even if a policy offers substantial benefits, its economic efficiency is severely undermined if high transaction costs prevent widespread participation. In the context of SMPEs, we identify tax consulting costs as a critical "hidden friction" that significantly impedes policy take-up. To mitigate this friction and enhance the efficacy of tax incentives, the administration should implement complementary measures to lower barriers to participation and reduce reliance on paid intermediaries. Specifically, tax authorities should enhance their public support services to facilitate independent compliance. By simplifying the preparation and filing of tax-related documents, the government can directly diminish the necessity for firms to hire professional tax agents. Crucially, this would lower the pecuniary burden of tax consulting fees, ensuring that the tax relief benefits the firms themselves rather than being dissipated through intermediary costs.

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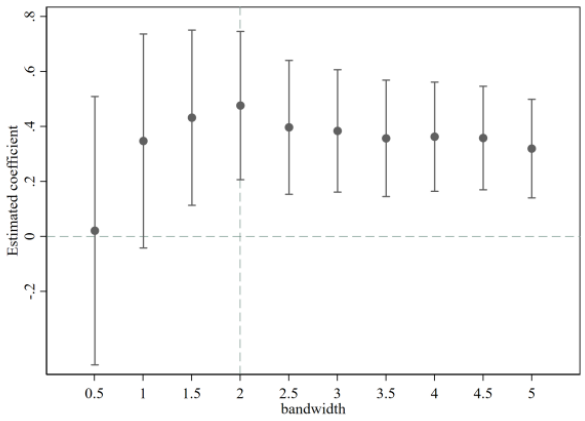
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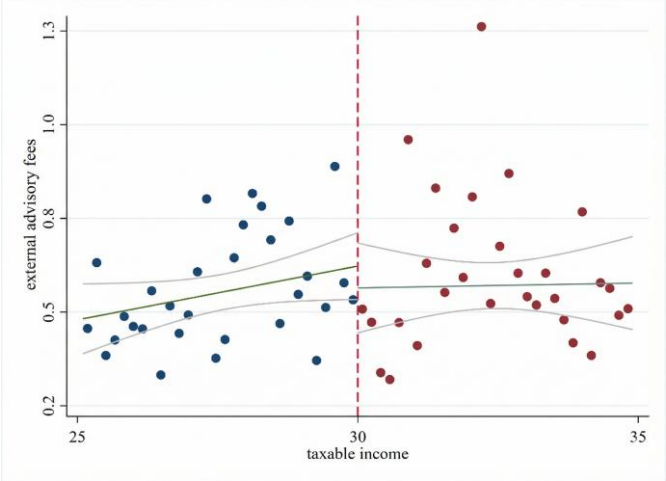
Appendix A: Additional Figures and Tables

Figure A1 Bandwidth sensitivity



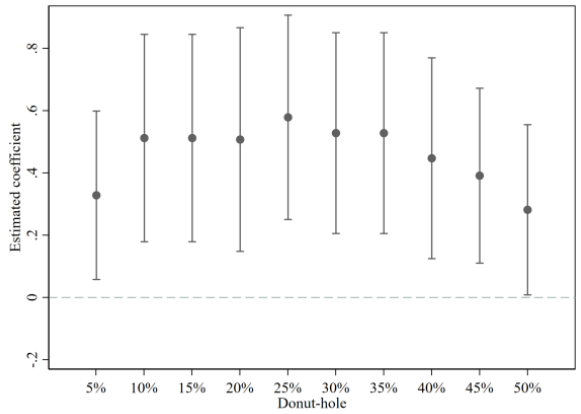
Note: Figure A1 shows the LATE point estimates and their 95% confidence intervals across varying bandwidths. The bandwidths range from 5,000 to 50,000 RMB, in increments of 5,000 RMB. The regressions use a triangular kernel function, controlling for industry and year fixed effects, with standard errors clustered at the firm level.

Figure A2 Alternative outcome variable



Note: Figure A2 shows the difference in the external advisory fees around the policy threshold. The external advisory fees are measured by their level values. The vertical dashed line indicates the taxable income threshold of 300,000 RMB. Each dot represents the average of the outcome variable within each data bandwidth, and the solid line and curve represent the fitted line and the 95% confidence interval from the local linear regression.

Figure A3 Donut-hole RDD



Note: Figure A3 shows the LATE point estimates and their 95% confidence intervals obtained from re-estimating the baseline regression after excluding observations within different ranges around the cutoff (i.e., from 1,000 RMB to 10,000 RMB, in increments of 1,000 RMB). The regression uses a triangular kernel function, controls for industry and year fixed effects, and clusters standard errors at the firm level.

Table A1 Alternative outcome variable

	（1）	（2）	（3）
Model	First Stage	Reduce Form	Second Stage
Depend Variables	Take-up	External advisory fees	External advisory fees
Eligible	-0.361***	-0.239**	
	(0.013)	(0.111)	
Take-up			0.595**
			(0.244)
Observations	18464	30112	41126
Kernel	triangular	triangular	triangular

Note: Columns (1) to (3) of Table A1 report the estimation results by repeating the baseline regression using external advisory fees as the outcome variable, measured in levels. The running variable is taxable income. All regressions control for industry and year fixed effects. Standard errors clustered at the firm level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A2 Pseudo-thresholds

	（1）	（2）	（3）	（4）
Threshold	260,000 RMB	280,000 RMB	320,000 RMB	340,000 RMB
Second Stage（LATE）	6.793	6.889	5.547	-8.840
	(33.870)	(12.481)	(28.358)	(8.253)
Observations	9679	10096	6230	7864
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Kernel	triangular	triangular	triangular	triangular

Note: Columns (1) to (4) of Table A2 report the LATE estimates obtained by repeating the baseline regression using pseudo-thresholds set at 260,000, 280,000, 320,000, and 340,000 RMB, respectively. The running variable is taxable income. All regressions use a triangular kernel and control for industry and year fixed effects. Standard errors clustered at the firm level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A3 Sensitivity of kernel function selection

	（1）	（2）	（3）	（4）	（5）	（6）
Model	First Stage	Reduce Form	Second Stage	First Stage	Reduce Form	Second Stage
Depend Variables	Take-up	Tax consulting costs	Tax consulting costs	Take-up	Tax consulting costs	Tax consulting costs
Eligible	-0.375***	-0.170***		-0.365***	-0.167***	
	(0.011)	(0.050)		(0.012)	(0.050)	
Take-up			0.347**			0.453***
			(0.168)			(0.139)
Observations	20880	17822	10921	18464	19788	17121
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Kernel	uniform	uniform	uniform	epanechnikov	epanechnikov	epanechnikov

Note: Columns (1) to (3) of Table A3 report the estimation results by repeating the baseline regression using a uniform kernel, while columns (4) to (6) use the epanechnikov kernel. The running variable is taxable income. All regressions control for industry and year fixed effects. Standard errors clustered at the firm level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Appendix B: Construction of Tax Consulting Costs

Since the National Tax Survey Database (NTSD) lacks a direct measure of tax consulting costs, we construct a proxy variable based on Chinese accounting standards. Under these standards, tax consulting costs (Y_{ijt}) are recorded as a subcategory of administrative expenses. We therefore derive our proxy by decomposing administrative expenses and deducting components unrelated to tax consulting services.

Specifically, according to the *Chart of Accounts and Accounting Treatments* issued by the Ministry of Finance of China (Cai Kuai [2006] No. 18)[14], "administrative expenses" refer to costs incurred in organizing and managing firm's business operations.[15] Based on the items outlined in this accounting standard, we classify administrative expenses into eight components: (i) R&D expenses; (ii) business entertainment expenses; (iii) taxes and fees (e.g., property tax, vehicle and vessel usage tax, urban land use tax, and stamp duty); (iv) office-related expenditures, including depreciation of office assets, office supplies, and travel expenses; (v) management personnel compensation and benefits, including salaries, welfare payments, and union fees; (vi) tax consulting costs, including payments to intermediaries and consultancy services; (vii) office material consumption (e.g., low-value consumables); and (viii) other miscellaneous management-related expenditures (e.g., board meeting fees, litigation costs, mineral resource compensation fees, pollution charges, and start-up costs).

[14] Although this accounting standard (issued in 2006) was revised in 2014, the definition and composition of administrative expenses remained consistent throughout our 2007–2015 sample period. Substantive changes to this category were introduced only after 2015. Thus, the 2006 standard provides a consistency for identifying and extracting tax consulting costs in our data.

[15] The policy details can be found at https://czj.sh.gov.cn/zys_8908/zcfg_8983/zcfb_8985/hj_9035/cwhjjbzdgf/20061201/0017-156907.html



Figure B1: Overview of the composition of administrative expenses and data availability

As shown in Appendix Figure B1, constructing the tax consulting cost measure requires the use of multiple variables, which can be categorized into three main types based on data availability:

(i) Variables directly provided by the NTSD: The NTSD explicitly reports data on total administrative expenses, R&D expenses, business entertainment expenses, and tax items classified under administrative expenses. These components constitute the largest share of administrative expenses and are directly deducted when isolating tax consulting costs.

(ii) Approximated Variables: The NTSD does not directly include data on office-related expenditures, and management personnel compensation and benefits. Therefore, we approximate these components using available proxy variables, as detailed below.

Office-related expenditures: These primarily consist of travel expenses, office supply expenses, and depreciation expenses for administrative departments. Specifically, administrative travel expenses are proxied by the NTSD variable "external payments for transportation, accommodation, and other travel-related costs". Office supply expenses are proxied by "purchases of office supplies".[16] Depreciation

[16] The variable for external office supplies expenditure is available only for the years 2011-2015. For the missing years (2009-2010), we impute values using the industry average of external office supplies expenditure based on the two-digit industry category code from 2011.

expenses for administrative departments are approximated by subtracting "depreciation on production-related equipment, buildings, and structures" from "total depreciation expenses" in the NTSD.[17]

Management personnel compensation and benefits: We estimates them using the following formula:

$$\text{Managerial compensation and benefits}_{ijt} \approx \text{total wage and benefit payments}_{ijt} \cdot \frac{\text{executive compensation}(listed\ company)_{ijt}}{\text{total wages}(listed\ company)_{ijt}}$$

The above formula estimates the management compensation for SMPE *i* in year *t* by multiplying the SMPE's total wage and benefit payments by the average share of executive compensation in total wages observed among publicly listed firms in the same two-digit industry *j* in year *t*. For SMPEs, the total wage and benefit payments are calculated as the sum of "total wages and bonuses accrued throughout the year" and "social insurance contributions paid during the year", as reported in the NTSD. The Data on executive compensation and total wages for listed firms are obtained from the China Stock Market & Accounting Research (CSMAR) Database.

(iii)Variables without data or approximations: Data for office material consumption and other miscellaneous administrative expenses are unavailable and cannot be reliably approximated. However, material consumption related to office operations accounts for a negligible proportion of administrative expenses, and SMPEs are less likely to incur other types of administrative costs[18]. Therefore, the measurement error arising from the omission of these minor items is unlikely to affect the robustness of the empirical results.

Final Calculation: Following the data processing steps as described above, we construct the proxy for tax consulting costs as follows:

Tax consulting costs ≈ administrative expenses - R&D expenses - Business entertainment expenses - Taxes classified under administrative expenses - Office-related expenses - Management personnel salary and benefits.

[17] The total depreciation expense minus the depreciation on production and operational equipment, and buildings represents the depreciation on non-production and non-operational assets. This residual serves as a proxy for administrative depreciation, which represents the vast majority of non-production and non-operational asset depreciation.

[18] Other miscellaneous administrative expenses mainly consist of board of directors' fees, litigation costs, mineral resource compensation fees, pollution discharge fees, and start-up costs. Given their limited scale, SMPEs typically lack formal boards of directors, and thus incur no such fees. Moreover, their relatively narrow business scope makes it unlikely for them to generate significant litigation, mineral resource compensation, or start-up costs.