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Corporate Tax Cuts for Small Firms: What Do Firms Do?

Abstract

What do small firms do when given a semi-permanent corporate income tax cut? We examine firm responses to a substantial reduction in the tax rate for small- and micro-profit enterprises (SMPE) in China, using gradual increases in the qualifying threshold during 2010-2016 for identification. Based on confidential tax returns, we find that newly qualified SMPEs with immediate tax savings increased investment and productivity, while there was no change in wages or payout to shareholders. There is some weak evidence the tax cut induced entry of micro-sized firms in financially constrained sectors. Yet its size-based design led to bunching and incentivized firms to slow down growth when they approached the size threshold.

Keywords: corporate tax, small businesses, investment, productivity, firm entry.

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1 Introduction

Small businesses are often thought to be essential to job creation, innovation, investment and productivity growth, especially in developing countries (Ayyagari et al., 2014; Decker et al., 2014; Haltiwanger et al., 2016; OECD, 2015). Small firms also often lack adequate access to finance (Beck and Demirguc-Kunt, 2006; Beck et al., 2008). Consequently, governments around the world have implemented various programs to alleviate small firms' financial constraints, including tax incentives and preferences. What, then, do small firms do when they experience a tax cut? There is little empirical evidence on this question, partly reflecting the lack of data on small firms. Meanwhile, there are strong concerns that tax preferences specifically granted to small firms may be distortionary by encouraging them to stay small (Benedek et al., 2017; Tsuruta, 2020).

In this study, we examine the impact of a series of corporate income tax (CIT) rate cuts on certain "small and micro-profit enterprises" (SMPEs) in China. SMPE represent the vast majority of Chinese business taxpayers: in a sample comprising confidential CIT returns in a large Chinese province used in our study, SMPEs represented 84% of all firms and 47% of registered employees in these firms in 2016. Starting in 2010, only half of SMPEs' taxable income needed to be included when computing CIT liability, reducing the effective CIT rate for affected SMPEs by half (from an original rate of 20%). Non-SMPEs, in contrast, faced a flat rate of 25%. The SMPE rate cuts were offered within a relatively stable CIT regime and were viewed by the government as a pure transfer to businesses. The qualifying threshold for the rate cut in terms of taxable income was gradually raised from 30,000 RMB to 300,000 RMB during our sample period 2010-2016,[1] offering opportunities for quasi-experimental studies.

Using confidential CIT returns for manufacturing firms in a large province and a difference-in-differences (DiD) approach, we first examine how small firms spent immediate tax savings when the SMPE taxable income threshold was increased in 2012, 2014 and 2015. For identification, we compare SMPEs whose taxable income fell between the old and new thresholds, becoming newly eligible for the lower CIT rate, with large firms that never qualified for the lower tax rate. As the increases in the SMPE threshold were unexpected, the lower tax rate represented a shock to newly qualified SMPEs. We focus on four outcomes: investment, total wage, payout to shareholders, and total factor productivity. To address the concern that firms may manipulate their

[1] These amounts convert to 4,688-46,875 USD, using an exchange rate of 1 USD=6.4 RMB.

taxable income to qualify for the SMPE tax cut, we exclude firms bunching below the SMPE threshold from the treatment group. To further reduce biases due to behavioral response, we exclude firms whose taxable income was above the qualifying threshold one year before the policy change and which shrank into the new qualifying range in the policy change year. We use two alternative identification strategies as robustness checks. First, we compare newly qualified SMPEs with partnership firms. Partnerships are not subject to the CIT and there was no change in partnership taxation during our sample period, making them a potentially better control group. However, the scope of this exercise is limited to one outcome variable, investment, due to data limitations. Second, we use the Instrumental Variables (IVs) approach to address the potential endogeneity of firms' treatment status. Specifically, we use firms' taxable income one year before the SMPE policy change, multiplied by their pre-reform average taxable income growth rate, to predict firms' taxable income in the reform year. We then use this predicted taxable income as an instrument for a firm's actual treatment status. We obtain similar results using these different identification strategies.

We find that newly qualified SMPEs with immediate tax savings increased their investment rate relative to the control groups. Further, the tax cut led to a significant increase in the total factor productivity (TFP) of newly qualified firms. Increased fixed assets investment appears not to be the only mechanism for the productivity increase: a higher after-tax cash flow may have allowed firms to engage in other productivity-enhancing activities. Consistent with the conjecture that the tax cut relaxes financial constraints, the increases in investment and productivity are more prominent for the earliest treatment cohort, which tended to be the smallest firms. In contrast, we find no evidence that the SMPE tax rate cut increased treated firms' total wage or payout to shareholders.

60-70% of SMPEs in the province we study are loss-making. The ratio of loss-making SMPEs is also considerably higher than that of non-SMPEs. This underlines a severe limitation of income tax cuts for small businesses. The problem is aggravated by the fact that SMPEs' loss-making status tends to be persistent, rendering the present value of any future tax savings small. We find that losses moderate the impact of the tax cut on investment and productivity. Thus, the SMPE tax cuts are more useful for a minority of "small winners" that manage to generate and maintain positive taxable income.

Meanwhile, the SMPE tax policy elicited certain behavioral responses. Besides a clear pattern of taxable income bunching below the SMPE threshold, we find that firms'

sales, business costs, and fixed assets growth all slow down significantly when they approach the SMPE taxable income threshold. The SMPE tax policy may thus have discouraged small firms from expanding once they approach the threshold. On the other hand, there is no evidence that firms strategically shift profit across time to utilize the tax incentive. Moreover, based on the annual reports of large listed firms, we show that the SMPE tax incentive was not misused by large firms during our sample period, as few of them claimed the SMPE tax benefit via owning qualified subsidiaries. Our analysis of behavioral responses thus supports our DiD design.

Lastly, we examine whether a lower CIT rate encourages entrepreneurs to set up small corporations. For any given entry cost, a higher expected after-tax profit is likely to induce incorporation; a lower CIT rate may also increase small firms' expected survival probability. Both predict a negative correlation between the CIT rate and the establishment of new small corporations. To test this, we apply a Differences-in-Discontinuities approach and analyze the establishment of micro-sized corporations before and after each SMPE tax policy change. We find weak evidence that the SMPE tax policy led to greater entry of micro-sized corporations in the short run: this positive effect only exists in more financially constrained industries and only when the SMPE taxable income threshold was substantially increased.

Our study contributes to several existing literature and policy debates. First, we add to the growing body of research on firm responses to corporate taxation. In practice, targeted tax incentives are more common than rate cuts(OECD, 2015). Perhaps reflecting this policy choice, existing studies give more attention to targeted incentives, such as accelerated depreciation for fixed assets investment (Maffini et al., 2019b; Zwick and Mahon, 2017) and R&D tax credits for innovation (Agrawal et al., 2020; Dechezleprêtre et al., 2016; Koga, 2003; Lokshin and Mohnen, 2012). The impact of rate cuts, however, may differ from that of targeted incentives: rate cuts are likely to be more salient to small firms; firms can utilize tax savings on a wider range of activities; and rate cuts may also trigger distinct behavior responses, such as profit shifting. While some studies consider the impact of US state-level corporate tax rate changes (Akcigit et al., 2022; Giroud and Rauh, 2019; Heider and Ljungqvist, 2015; Mukherjee et al., 2017), they do not focus on small firms and each studies only a specific response margin. Pham (2020) examines a CIT cut in Vietnam that lasts for only one year. In comparison, we examine the effect of a CIT rate cut which is both larger in magnitude and more permanent, and on a wide range of behavioral margins.

Our results may be usefully compared with Harju et al. (2022), which analyzes the impact of a general CIT rate reduction in Finland on small firms. While they find a null impact of the tax cut on small firms' investment, we show that SMPEs use tax savings to boost both investment and productivity. Another important difference is that the Chinese corporate tax rate cut only targets small firms, leading to behavioral responses absent in an "across-the-board" tax cut as in Harju et al. (2022). In practice, size-based incentives targeting small businesses are common, and our results shed light on potential distortions brought by such size-based policies.

Second, we add to the literature on the effectiveness of policies for alleviating small businesses' financial constraints. The Chinese setting, we believe, is representative of emerging economies in terms of the low quality of financial and institutional development, where small firms face limited access to external finance. In the mix of small business support programs, grants/subsidies and loans are more widely used than tax schemes (Horvath and Lang, 2021; Rotemberg, 2019). We show that cutting the CIT rate can effectively relax the financial constraint of small firms, but such effect is moderated by pervasive firm losses. To increase the effectiveness of CIT cut for small firms, governments must consider more generous tax treatment for losses simultaneously.

Third, our paper closely relates to the literature on the effects of taxation (CIT in particular) on entrepreneurship. While some studies (Da Rin et al., 2011; Darnihamedani et al., 2018; Djankov et al., 2010; Giroud and Rauh, 2019; Suárez Serrato and Zidar, 2016) find that the CIT is negatively correlated with firm entry, others find no or small effect of the CIT on entrepreneurship (Bruce and Deskins, 2012; Bruce and Mohsin, 2006). We show that on average, cutting the CIT has a limited impact on small firm incorporation, at least in the short run. Nevertheless, the policy appears to be effective in more financially constrained industries and when it generate greater potential tax savings.

Finally, our study contributes to the growing literature on the effectiveness of tax incentives in developing countries (Chen et al., 2019, 2021; Cui et al., 2022). Cui et al. (2022) find that the majority of Chinese firms with eligible investments fail to claim tax benefits for accelerated depreciation, likely due to a lack of awareness or understanding. They also show that awareness of the benefits tends to decrease as firm size decreases. A cut in the CIT rate is more straightforward, and we show that it is salient and effective in the same setting of low taxpayer sophistication. Our finding thus informs the debate on the optimal design of tax incentives in developing countries.

2 Policy Background

Under China's Enterprise Income Tax Law, "small and micro-profit enterprises" are entitled to a 20% tax rate, as compared to the regular 25% rate. SMPEs are defined in State Council regulations as firms with (i) annual taxable income not exceeding 300,000 yuan, (ii) not more than 80 employees (or 100 employees for industrial firms), and (iii) total assets of not more than 10 million yuan (or 30 million yuan for industrial firms). In response to the Global Financial Crisis, China's Ministry of Finance announced in December 2009 that for any SMPE with taxable income not in excess of 30,000 yuan, only half of its taxable income needed to be included in computing tax liability. The tax rate on such firms was thus effectively reduced to 10%.[2] This rate reduction initially was to apply only in 2010—the first year for our data—but was subsequently renewed for 2011. Beginning in 2012, the taxable income threshold under which the half-income-inclusion rule applied was raised several times: (i) 60,000 yuan for 2012-3; (ii) 100,000 yuan for 2014;(iii) 200,000 yuan for the first three quarters of 2015; and (iv) 300,000 yuan for the 4th quarter of 2015 and 2016. By the end of 2016—the last year of our data—the half-income inclusion regime had completely eclipsed the 20% regime for SMPEs. Figure 1 illustrates this series of gradual increases in the taxable income threshold.[3] Meanwhile, the qualifying thresholds in terms of total assets and employees remained intact. Non-SMPEs remained subject to a flat CIT rate of 25% throughout the sample period.

While the half-income-inclusion rule for SMPE firms was initially announced as "temporary", it has been repeatedly renewed and become an important tax reduction measure receiving great political emphasis.[4] Chinese President Xi Jinping spoke of these policies as delivering "inclusive" tax cuts.[5]

[2]If the SMPE firm already qualified for some other preferential rate, such as the 15% rate for high-and-new-technology enterprises of HNTEs, the half-income inclusion approach could lead to an even lower corporate tax rate, i.e. 7.5%. In the rest of the paper, we will refer to the policy as a cut of the CIT rate to 10%—this being the effect on most firms.

[3]In the remainder of this paper, we refer to the changing taxable income threshold for the half-inclusion rule as the SMPE taxable income threshold, ignoring the 300,000 yuan annual income threshold where the applicable statutory rate changes from 20% to 25%.

[4]We study the rate reduction for SMPEs during the 2010-2016 period, but in 2017, China further raised the taxable income threshold for the half-income-inclusion rule to 500,000 yuan (for 2017-19), and in 2018, to 1 million yuan (for 2018-2020). In 2019 (for the years 2019-2021), the asset and employee thresholds were also lifted, and eligible firms earning less than 1 million yuan could include only one quarter of their income—reducing their tax rate to 5%–while those with income in the 1 and 3 million range can claim half-income inclusion or a 10% rate.

[5]One interpretation of the policy is that China's political leadership adopted the view that to maintain economic growth, it is no longer sufficient to channel resources to large and politically connected firms

Potential confounding policies. Our study examines the earlier phases of this policy by focusing on the increasing taxable income threshold for SMPE eligibility introduced in 2012, 2014, and March 2015. In terms of potentially confounding policies during the same period, three are notable. First, China gradually rolled out the integration of its VAT with the Business Tax, a turnover tax on services, between 2012 and 2016 (Cui, 2014; Xing et al., 2022). Because we investigate the impact of income tax reductions on firm productivity, we choose to focus on manufacturing firms, which were not directly impacted by the 2012-2016 VAT reform.[6] Second, under the CIT regime, the government enacted accelerated depreciation (AD) policies in 2014 and 2015 (Cui et al., 2022; Fan and Liu, 2020). Cui et al. (2022) show that AD had limited impact on firm investment due to low take-up, and is thus unlikely to confound the treatment effect we identify due to the SMPE tax policy.[7] Third, the law on the personal income tax (PIT) was amended in 2011. However, the top CIT rate remained lower than the highest marginal rates on wage (45%), non-wage labor compensation (32%), or self-employment income (35%).[8] Corporations in China are allowed a wide range of deductions in computing income, while deductions are limited for wage earners.[9] Therefore, the PIT changes would not have fundamentally changed the relative benefits of earning income through the corporate form for entrepreneurs with the potential of earning high income.

Saliance of the policy. To examine whether the SMPE rate cuts possessed salience, Figure B1 provides the search intensity for the following keywords (in Chinese) on Baidu, China's most popular search platform: "preferential corporate income tax rate for SMPEs", and "qualifying criteria for SPMEs". As a benchmark, we also illustrate the search intensity for "tax reporting". Figure B1 shows that part of the volatility in search intensity for the first two keywords is driven by the search for "tax reporting". There are periods of intensive searches for the first two keywords–notably during calendar

(Bai et al., 2016). Expansionary or "proactive" fiscal policy must target small firms.

[6]It is reasonable to assume that indirect impacts of the VAT reform through affected suppliers and customers were similar across our treated and control groups.

[7]Cui et al. (2022) show that the claiming rate of the AD benefits increases with firm size. If larger firms are more likely to take up AD incentives and increase investment as a consequence, we may be identifying the lower bound for the treatment effect of the SMPE tax cut.

[8]The PIT rate in China on dividend and capital gain from ownership of non-listed companies is 20%. Depending on the CIT rate, the aggregate income tax rate on income earned through a corporation can thus range from 24% to 40%.

[9]Income from sole proprietorship or partnerships is taxed currently, but losses cannot flow through to reduce other (e.g. wage) income (Cui, 2007).

years 2012, 2014, and 2015– suggesting that the policy attracted much attention. In comparison, we plot the search intensity for the keyword "accelerated depreciation for fixed assets". Online searches for the SMPE tax cuts were substantially more intensive than for AD, confirming the former's greater salience.

Figure B2 plots the claiming rate of the lower tax rate for qualified SMPEs, where each point represents the claiming rate for firms in each $\pm$ 5,000 RMB taxable income bin. Comparing the claiming rates below and above each taxable income threshold introduced in 2012, 2014, and March 2015, we observe immediately that the SMPE tax benefit claiming rate is around 90%. In comparison, using the same tax returns, Cui et al. (2022) documented that firms failed to claim accelerated depreciation benefits on over 80% of eligible investments.

3 Empirical strategy

3.1 Baseline DiD

What did SMPEs do when a tax cut generated immediate tax savings? To answer this question, we adopt the standard DiD strategy and compare firms newly qualified for the tax cut (due to the rising SMPE taxable income threshold) with large firms whose taxable income was always above 300,000 yuan and total assets always above 30 million yuan (i.e., firms that always faced the 25% rate during our sample period). An alternative identification strategy would use the RDD to compare firms just below and above each new taxable income threshold. But this faces two problems: some firms manipulate their taxable income to bunch just below the threshold; and as the threshold continues to rise, firms just above the current threshold would be affected by later policy changes. While a donut RDD strategy (Bajari et al., 2011; Barreca et al., 2011; Benzarti and Harju, 2021) may solve the first issue, it cannot deal with the second. We discuss the endogeneity problem further in Section 3.2.

For the benchmark analysis, we regard a firm as being *treated* in year c if: 1) it was below the SMPE asset threshold in year c;[10] 2) its taxable income was between the old and the new qualifying thresholds in the policy change year c; 3) it experienced a reduction in the income tax rate in year c relative to prior years. Criterion 3 implies that we do not regard a firm as being treated by the policy change in year c if its tax rate did

[10]We only observe firms' total employment upon registration and hence, we do not impose the restriction on employment.

not drop, even if its taxable income fell into the new tax bracket. This excludes firms, for example, whose taxable income grew from below 30k to between 30k and 60k in 2012. As such firms already enjoyed a lower tax rate before 2012, excluding them from the 2012 treatment group sharpens our identification.

One concern with our choice of the control group is that large firms may not be comparable with smaller firms.[11] We will show that the parallel trend assumption, essential for the DiD estimations, is largely satisfied in various analyses. As a further robustness check, we only include large firms whose taxable income was between 300,000 and 1.5 million yuan (the median level of taxable income for all large firms) as a smaller control group. Results are reported in Table B1 for our key outcome variables, which are similar to the benchmark results. Yet another concern is that large firms may benefit from the SMPE tax cut if they set up small subsidiaries and shift profit there. Section 5.3 presents evidence against the prevalence of such behavior.

We study the policy changes in 2012, 2014, and March 2015.[12] Specifically, we estimate the following equation for each treatment cohort $c \in \{2012, 2014, 2015\}$:

$$Y_{i,t,c} = \beta_c^{DiD} T_{i,c} \times Post_{t,c} + \gamma_c X_{i,t,c} + \varphi_{i,c} + \varphi_{s,t,c} + \varepsilon_{i,t,c}. \tag{1}$$

where $Y_{i,t,c}$ is the outcome variable of interest, including firm-level investment, TFP, wage, the level of payout, and an indicator for positive payout. $Post_{t,c}$ is an indicator for post-treatment years. $T_{i,c}$ is an indicator for being treated in year c. $X_{i,t,c}$ indicates firm-level controls. Specifically, when estimating the treatment effect on the total factor productivity, we control for the size effect by including firms' annual sales (in logs), which is a common practice in the literature (Atanassov and Liu, 2020; Hall and Ziedoins, 2001). $\varphi_{i,c}$ is the firm-level fixed effect. We also include 2-digit industry-year fixed effect, $\varphi_{s,t,c}$, to capture any unobserved industry-year factors. In all estimations, we cluster the standard errors over the industry-year pair.

[11] An alternative control group is firms with taxable income always below 30k and that always paid CIT at 10%. However, these "always-SMPEs" were exposed to the 2010 rate change, and if the effect of this change manifests in subsequent years, our estimates may be biased.

[12] We cannot identify the effects of the 2010 change through a DiD approach as our data begins in 2010. We do not examine the increase in taxable income threshold from 200k to 300k either—it was implemented in October 2015 and hence, firms only had 14 months to respond.

3.2 Endogeneity

Excluding bunching and shrinking firms. Treated firms may manipulate taxable income to qualify as SMPEs, which would lead to endogenous treatment. Indeed, as Section 5.3 discusses, we find significant bunching below the SMPE taxable income thresholds. We control for such endogeneity by excluding from the DiD estimations firms with taxable income close to the qualifying threshold (which are most likely to be the manipulators). Specifically, we exclude those whose taxable income was in the range $((1-1.5\%) \times S_t, S_t)$, where S_t is the qualifying taxable income threshold in year t. Excluding firms further away from the threshold yields similar results (see Table B2).

As a further check, we exclude firms whose taxable income shrank from above the new qualifying threshold S_{new} in year $c-1$ to be within the bracket $[S_{old}, S_{new}]$ in the policy change year c. These firms may be suspected of reducing their taxable income to obtain tax benefits, and excluding them leads to cleaner identification. The disadvantage of this approach is a smaller sample of treated firms.

Comparing with partnership firms. We also compare newly qualified SMPEs (after excluding bunchers) with firms organized as partnerships. Since partnerships are not subject to the CIT, they represent an alternative control group(Harju et al., 2022). However, for partnerships, our dataset contains information only from their financial statements and not tax returns. We do not observe their total wage or payout, and also lack data for computing TFP. We thus only use partnerships as the alternative control group to examine the impact of the tax cut on fixed asset growth.

IV estimations. In Appendix B, we report estimation results using the Instrumental Variables approach. Let $T_{i,t,c}$ indicate the actually observed treatment status, as defined by criteria 1-3. Since $T_{i,t,c}$ may be endogenous, we follow Pham (2020) and use firms' taxable income in year $c-1$ to predict their taxable income in the policy change year. We then define the predicted treatment status for each firm as $T^{IV}_{i,t,c}$, which equals 1 if firm i in year c: 1) was below the total assets threshold; 2) had predicted taxable income between the old and the new qualifying threshold; and 3) experienced a reduction in the income tax rate relative to prior years according to the predicted taxable income. We use $T^{IV}_{i,t,c}$ as an instrument for the actually observed treatment status, $T_{i,t,c}$. The first-

stage estimation for each treatment cohort $c \in \{2012, 2014, 2015\}$ is:

$$D_{i,t,c} = \rho_c D^{IV}_{i,t,c} + \delta_c X_{i,t,c} + \varphi_{i,c} + \varphi_{s,t,c} + \epsilon_{i,t,c}, \tag{2}$$

where $D_{i,t,c} = T_{i,c} \times Post_{t,c}$, $D^{IV}_{i,t,c} = T^{IV}_{i,c} \times Post_{t,c}$. Denote $\hat{D}_{i,t,c}$ as the predicted endogenous variable from the first-stage estimation. The second-stage estimation is:

$$Y_{i,t,c} = \beta^{IV}_c \hat{D}_{i,t,c} + \gamma_c X_{i,t,c} + \varphi_{i,c} + \varphi_{s,t,c} + \varepsilon_{i,t,c}, \tag{3}$$

The impact of the policy change on firm-level performance is then β^{IV}_c.

4 Data

We use confidential administrative data of CIT returns from one large and prosperous Chinese province. The de-identified tax returns cover a large population of firms for the period 2010-2016, and are matched with information from income statements and balance sheets for the years 2012-2016, as well as firms' tax registration records. The tax registration data is a snapshot of the universe of firms in the province as of 2017. It covers information such as the date of establishment, employment upon registration, and size classification by tax authorities. An additional investor dataset provides the percentage of shareholding of each firm by 72 types of investors, such as individuals, state-owned enterprises, privately-owned enterprises, foreign enterprises, etc. We use this information to identify firms that are likely to be subsidiaries of another company.

Two features distinguish our data from those used by others studying Chinese firms, e.g. the Annual Survey of Industrial Firms (ASIF) (Brandt et al., 2017). Unlike the ASIF data that consists of firms with annual revenue greater than 5 million RMB, our data covers firms of all sizes, allowing us to examine the impact of tax cuts on SMPEs. Moreover, our data covers more recent years than ASIF–which is available only up until 2013–making possible the analysis of the impact of the recent SMPE tax cuts.

Chinese CIT returns do not report capital expenditures. We proxy for the nominal investment rate by the annual change in the natural logarithm of firm-level fixed assets, evaluated at historical cost,[13] which should approximate the true investment rate if asset disposal is infrequent and small in magnitude. To analyze changes in firm productivity,

[13]We also examine the effects of the SMPE tax cuts on annual growth of real capital stocks as a robustness check and obtain similar results. Results are available upon request.

we first estimate a production function for each 2-digit Chinese Industry Classification (CIC) industry in manufacturing and calculate the firm-level TFP utilizing the results from the production function estimations. We adopt the control function approach following De Loecker and Warzynski (2012) and Ackerberg et al. (2015, ACF henceforth) and estimate a Cobb-Douglas production function, which uses intermediate input as the proxy variable and explicitly distinguishes firms' TFP from idiosyncratic productivity shocks. We control for firm size (by tax authority classification) and whether a firm is profitable to account for the heterogeneous shocks along these dimensions on firms' input usage decisions. As a robustness check, we also estimate the production function using the Olley and Pakes (1996, OP henceforth) methodology, which uses investment as the proxy variable to estimate the production function. We document the construction of the main variables in our productivity estimations and the details of the estimation procedures in Appendix A.

For regression analyses, we require firms to report necessary financial information, such as taxable income, total assets, wages, and fixed assets. Because TFP is a key outcome in our analysis, we limit our sample to manufacturing firms. Next, we apply the criteria discussed in Section 3.1 for the treatment group. We also require each firm to report at least two years both before and after the policy change. Table 1 illustrates how we select the treatment groups step by step. In the final sample, we obtain 713 firms in the 2012 treatment cohort, 707 firms in the 2014 treatment cohort, and 1,408 firms in the 2015 treatment cohort (column 5). These samples are further reduced when we exclude firms whose taxable income shrank into the new qualifying range (column 6).

Table 2 provides summary statistics of the key variables for the three treatment groups and the control group, respectively. As expected, treated firms tend to be smaller than control firms in terms of annual sales and total wage bills, and the 2012 treatment cohort consists of firms smaller than those in the latter two treatment cohorts. Treated firms tend to have a lower growth rate of fixed assets, and a lower profitability proxied by the ratio of net profit to fixed assets. Based on the ACF method for calculating the TFP, treated firms are on average less productive than larger firms in the control group.

5 Results

5.1 How did firms spend the tax savings?

5.1.1 Investment

There are two channels through which a lower CIT rate can affect investment. First, the tax cut brings a higher after-tax cash flow. Blanchard et al. (1994) show that for a financially constrained firm experiencing a cash windfall, it should invest all the cash in projects with positive net present value as long as the windfall does not completely relieve its financial constraint. Given their small sizes, SMPEs are highly likely to be financially constrained both before and after the tax cut.[14] Since we focus on manufacturing firms that tend to rely on fixed assets for production, our conjecture is that those SMPEs with immediate tax savings should prioritize in purchasing fixed assets. Second, a lower CIT rate reduces the user cost of capital (UCC), which implies a higher investment rate (Bond and Xing, 2015; Hall and Jorgenson, 1967; Maffini et al., 2019a).

We report the DiD estimation results from our main specification in Table 3, where the dependent variable is the investment rate, and the control group is large firms. The odd-numberd columns report results where we only exclude bunching firms from the treatment group (baseline sample). In even-numbered columns, we further exclude firms whose taxable income was above the qualifying threshold one year before the policy change year c but which shrank into the new qualifying range in year c. While the point estimates are all positive, the estimated treatment effect tends to be both larger and more significant in the even-numbered columns.

Table 4 presents the DiD estimation results where we compare newly qualified SMPEs with comparable partnership firms. We are only able to conduct the DiD estimations for the 2014 and 2015 cohorts since we can only calculate the growth of fixed assets for partnerships after 2012. As before, in odd-numbered columns, we keep shrinking firms in the treatment group and exclude them in even-numbered columns. Furthermore, we report the IV estimation results for the impact of the SMPE tax policy on treated firms' investment in the first three columns of Table B3. Consistent with the baseline DiD estimate in Table 3, we find a significant increase in treated firms' investment rate using both of these two alternative identification strategies.

Based on Column 2 of Table 3, the 2012 treated firms increased their investment rate

[14]SMPEs in our sample report a 2.3% ratio of cash holdings to total assets, compared with 15.8% for non-SMPEs.

by around 2.8 percentage points (p.p.). For the latter two treatment cohorts, the estimated increase in investment rate is smaller in magnitude, around 1.7-1.3 p.p (Columns 4 and 6). The mean investment rate before treatment is around 7% and 8% for the first two cohorts and 10% for the 2015 cohort. This implies an increase in investment rate by 40%, 21%, and 13% for the three cohorts, respectively. This heterogeneity in response may reflect the fact that the 2012 treatment cohort represents the smallest firms, which also tend to be most financially constrained.

We can convert these estimates into the elasticity of the investment rate with respect to changes in the tax component of UCC, assuming that the changes in investment are induced by changes in UCC alone. Assume the risk-adjusted interest rate is 7% and the present value of tax deduction for 1 dollar of newly acquired fixed assets is 0.752[15], cutting the statutory CIT rate from 20% to 10% implies a drop in the tax component of UCC by around 3.2%. Thus, the implied elasticity of the investment rate with respect to the tax component of UCC is around 12.5, 6.6 and 4 for the three treatment cohorts. The elasticity for the 2012 treatment cohort appears to be larger than the range of estimates in the literature, though the latter does not focus on small firms, and usually studies more targeted investment tax incentives like accelerated depreciation. For example, the comparable elasticity is between 8-9 in Maffini et al. (2019a) and 6.5 in Ohrn (2018). On the other hand, this estimate is considerably smaller than that found by Pham (2020) who studies a temporary CIT rate cut for small firms in Vietnam.[16] For the latter two treatment cohorts, the estimated investment elasticity is close to the range found in the literature.

To investigate the tax cuts' dynamic effects on firm investment, Figure 2 plots the treatment effect for each year relative to the reference year (one year before each policy change), conditioning on firm fixed effects. The blue line indicates the dynamic DiD estimates and the associated confidence intervals, using the baseline sample that includes shrinking firms. The red line indicates the results based on the alternative sample that excludes shrinking firms. Figure 2 shows that the investment rate in the 2012 treatment cohort increased gradually from 2012, becoming significantly different from the control group by 2014. For the 2014 treatment cohort, the investment rate rose more quickly and became significantly different from the control group by 2015. For the 2015 treatment

[15]This is the present value of deductions for the 10-year asset class that consists of production equipment under the regular, not accelerated, depreciation schedule. See Cui et al. (2022).

[16]Pham (2020) considers the investment-capital ratio as the outcome variable when calculating the tax elasticity. Note that the Chinese SMPE tax cuts were viewed as more or less permanent, while the tax cut in Vietnam is temporary.

cohort, the increase in investment in the sample excluding shrinking firms (red-line) is observed immediately in 2015. There is no significant difference between the treated and control groups before each policy change, as best demonstrated by Panels b and c.[17] This supports the parallel trend assumption for the validity of our DiD design.

5.1.2 Wages and payout

We next examine whether the CIT cut affects treated firms' other decisions, including total wage and payout. There are three possible channels for an effect on total wage: a firm may utilize tax savings to hire more or better employees; employment and total wage would increase when fixed asset investment increases if capital and labor are complements, and would decrease if they are substitutes; and firms may share rent with employees and pass tax savings to them (Fuest et al., 2018).

We do not observe wage per worker or annual employment, so cannot analyze the effect of the tax rate cut on these margins. Instead, we observe firms' annual total wage bills and use the total wage (in logs) as the dependent variable in the DiD estimations. Columns 1-3 of Table 5 report the DiD estimation results when we use the natural logarithm of total wage as the dependent variable, based on the sample without shrinking firms. We present the corresponding IV estimation results in Columns 1-3 of Table B4. Table 5 shows that the tax cut had little impact on treated firms' total wage relative to the control group.[18]

Newly qualified SMPEs with immediate tax savings could also increase payouts to shareholders.[19] We do not observe dividend payout in the tax returns, but can calculate payout as $Payout_{i,t} = RE_{i,t-1} + Income_{i,t} - RE_{i,t}$, where $RE_{i,t}$ is firm $i's$ retained earnings in year t and $Income_{i,t}$ is its net income in year t. In Columns 4-5 of Table 5, we use the natural logarithm of payout as the outcome variable. In Columns 6-7, we construct a dummy variable that equals 1 if a firm had positive payouts in a certain year, and use this as the dependent variable in the DiD estimations. There is no evidence that treated firms increased payout to shareholders at the intensive or extensive margin. We report the corresponding IV estimation results in Columns 4-7 of Table Table B4, where we continue to find a null impact on payouts. Taken together, our analysis suggests that

[17] For the investment rate, the data starts from 2011 since we take the first difference of log fixed assets.

[18] However, Tuzel and Zhang (2021) show that tax incentives can lead firms to increase skilled labor while cutting the routine workforce. The null impact on total wage may thus hide potential substitution between workers of different skills.

[19] During the sample period, the Chinese dividend tax rate did not change.

firms use tax savings to boost fixed asset investment rather than increasing wages or distributing to shareholders.

5.1.3 Productivity

We next examine whether the tax cuts affected firm productivity. Table 6 reports the DiD estimates where the dependent variable is firm-level TFP (in logs). In odd-numbered columns, we use the baseline sample. In even-numbered columns, we exclude shrinking firms. Treated firms experienced significant TFP increases relative to the control group. Based on the estimates in the even-numbered columns, the magnitude of the TFP increase is similar across three treatment cohorts, around 1.8-2.7%. Using the alternative OP method to estimate the production function, we obtain qualitatively similar results as reported in Table B5, although the point estimates tend to be larger.[20] We obtain similar results in IV estimations, as reported in the last three columns of Table B3.

Figure 3 reports the results from the dynamic DiD estimations. Similar to Figure 2, we set the reference year to be one year before each tax rate change. The blue line indicates the treatment effect on the baseline sample, while the red line indicates the treatment effect when we exclude shrinking firms. We observe a gradual increase in TFP among treated firms after each policy change year, for all three treatment cohorts. TFP also appears to increase faster than investment, suggesting that investment in higher-quality fixed assets may not be the only source for TFP increase. Instead, firms may have spent the tax savings on other productivity-enhancing investments.

Our view echoes several recent firm-level studies on the tax effect on TFP (Jacob, 2021; Liu and Mao, 2019). In particular, Liu and Mao (2019) find that enhanced cash flow due to China's 2009 VAT reform increased smaller firms' productivity by around 18 percent. In their study, the semi-elasticity of TFP with respect to the changes in the after-tax profit (also scaled by fixed assets) is around 0.72.[21] Table B6 shows that the SMPE tax cuts increased treated firms' after-tax profit as a ratio to fixed assets by 2.7 p.p for the 2012 treatment cohort, and 1.3 p.p. for the 2014 and the 2015 treatment cohort, based on the sample excluding shrinking firms (the even-numbered columns). These translate into comparable semi-elasticities between 1 and 1.46 for the three treatment

[20] The OP approach uses firm-level investment as the proxy variable. Since we measure investment using annual changes in fixed assets, this reduces the sample size for the OP approach.

[21] We averaged the dynamic effects of the VAT reform on firms' cash flow, in Liu and Mao (2019) to obtain this figure.

cohorts. Our estimates are thus larger than that found in Mao and Liu (2019).

5.1.4 Heterogeneity: the role of enhanced cash flow

Through what channel did the tax cuts influence firms' investment and productivity? The tax cut both lowers the cost of capital and may relax firms' financial constraints and enable them to invest more. Firms in each treatment cohort with different distances to the taxable income threshold experienced the same reduction in the cost of capital, but obtained different incremental cash flow. If the cash flow channel is important, we should find a larger impact of the tax cut on firms with greater tax savings.

To test this hypothesis, we estimate the effect of each 1,000 RMB tax saving on firms' investment and productivity. To calculate immediate tax savings, we multiply the firms' taxable income in the policy change year by the changes in the statutory CIT rate (i.e., 10%). We then interact the amount of tax saved (in thousand RMB) with $Post_{i,t}$, and replace this term with the benchmark interaction term in the DiD estimations. Table 7 reports the results. For all three treatment cohorts, we find positive and significant effects of tax savings on treated firms' investment and productivity. To interpret the estimated coefficients, take investment as an example. When we exclude the shrinking firms (in the even-numbered columns), 1,000 RMB of tax saving leads to a 0.6 p.p. increase in the investment rate for the 2012 treatment cohort, and increases of 0.2 and 0.1 p.p for the 2014 and 2015 treatment cohorts. For TFP, the interpretation is similar.

The SMPE tax cut thus generated a larger impact on firms with higher taxable income– in line with the Arnold et al. (2011), which showed that the effect of CIT on TFP is larger for firms in more profitable industries. It is worth noting that the effect of each 1,000 RMB tax saving becomes smaller for the latter two treatment cohorts. This is explainable if the smaller 2012 treatment cohort is more financially constrained, and the impact of additional cash flow is greater on them. This cross-cohort comparison again points to the enhanced cash flow channel as an explanation for the observed increases in investment and productivity.

5.2 Loss-making SMPEs

So far, we have examined how small firms use immediate tax savings from tax cuts. However, small firms may be more likely to be in loss positions than larger firms, and for loss-making firms, there is no immediate tax saving from the rate cut. Moreover,

if a firm expects to generate positive taxable income only far in the future, the benefit of rate cuts would be much dampened. Notably, during our sample period, Chinese firms' losses cannot be carried back and can be carried forward for at most 5 years.

Table 8 shows the prevalence of loss-making firms for SMPEs and non-SMPEs. Around 54-73% of SMPEs reported tax loss for at least one year during our sample period, a considerably higher percentage than for non-SMPEs. In addition, the ratio of the stock of taxable losses to revenue is much higher for SMPEs than for non-SMPEs. Further analysis shows that around 30% of SMPEs always reported tax losses. Losses tend to be persistent over time–for an SMPE with tax losses in the current year, the chance that it would remain loss-making next year is 91%.

Table 8 further reports the prevalence of firms with non-positive net income on their financial statements. SMPEs are more likely to report operating losses in financial reporting than non-SMPEs, and the percentage of loss-making firms for financial reporting is similar to that found in tax returns. Thus, the larger proportion of SMPEs with tax losses likely reflects poorer performance, rather than higher tax non-compliance.

The treatment firms in our baseline DiD estimations were by definition profitable in the policy change year and also tend to be profitable persistently: only a small percentage ever reported losses. Thus, we have low power to test the effect of loss-making using the baseline approach. To shed light on the effect of loss-making, Panels a-b of Figure 4 plot the estimated differences in investment rate and productivity between always profitable SMPEs and the always-large firms over time (represented by the blue line), and the differences between "ever-loss making" SMPEs that reported tax losses in at least one year and the the always-large firms (represented by the red line). We set 2010 as the reference year and estimated the differences in means between groups year by year while controlling for firm and industry-year fixed effects. For this descriptive analysis, we include all SMPEs as defined by the policy each year. Relative to the control group of large firms, Figure 4 shows an upward trend in SMPE firms' investment rate and TFP, consistent with a positive impact of the tax cut. One caveat is that the sample composition for Figure 4 changes over time, as we include larger firms in later years when the SMPE size threshold changes. This could partially contribute to the upward trend in investment and TFP of SMPEs shown by Figure 4, if larger firms invest more and are more productive. With this caveat in mind and assuming the effect of sample composition change is similar for the two groups of SMPEs, Figure 4 shows the blue line stays above the red line, offering graphical evidence that loss-making moderates

the impact of the corporate income tax cut.

5.3 Behavior responses

5.3.1 The distribution of taxable income

The SMPE tax incentive creates a notch in the CIT rate schedule. This creates strong incentives for firms to bunch just below the taxable income threshold. Figure 5 plots the distribution of taxable income around the 2010 (Panel a), 2012 (Panel b), 2014 (Panel c) and 2015 (Panel d) thresholds for all manufacturing firms in the tax return. We normalize firms' taxable income by subtracting S_t from the actual taxable income, where S_t is the SMPE taxable income threshold in place in year t. In Panel a, we clearly observe bunching below 0 in firms' tax returns in 2010 and 2011 (the blue line), but the distribution of taxable income around the particular threshold becomes smooth after 2012 (the yellow line). We observe similar transient bunching around the other taxable income thresholds.

Figure 5 also shows that instead of creating a missing mass, the tax notches cause firms to also bunch just above the taxable income threshold. Cui et al. (2024) investigate such "wrong-side bunching", and trace it to requirements on taxpayers to make tax prepayments throughout the year: taxpayers who made prepayments by applying rates higher than 10% were especially likely to display "wrong-side bunching." Cui et al. (2024) suggests that frictions in the refund process may lead taxpayers to forego the benefit of the lower rate while minimizing tax liability by bunching just above the thresholds. This behavior substantially disappeared after 2014, when taxpayers more easily accessed favorable prepayment rules and refunds.[22]

Figure 5 shows the static distribution of firms' taxable income. If it is costly for firms to cross the taxable income threshold, they may also have strong incentives to manipulate taxable income growth to stay below the threshold. It is thus interesting to study whether firms adjust taxable income growth, conditional on the level of taxable income in the current year. Following Garbinti et al. (2023), we calculate the normalized income growth rate as follows:

$$\tilde{g}_{i,t} = \frac{T_{i,t+1} - T_{i,t}}{T_{i,t}} - \frac{S_{t+1} - T_{i,t}}{T_{i,t}} = \frac{T_{i,t+1} - S_{t+1}}{T_{i,t}} \tag{4}$$

[22] As can be seen in Panels c and d in Figure 5).

where $T_{i,t}$ indicates firm i's taxable income in year t, and $S_{i,t}$ indicates the taxable income threshold in year t. If a firm is located exactly at the taxable income threshold in year $t+1$, $\tilde{g}_{i,t}$ equals 0. When its taxable income is located below the threshold, $\tilde{g}_{i,t}$ is negative, and vice versa. We examine the taxable income growth rate for four groups of firms, classified by the distance of firms' taxable income to the threshold: 1) "just below", those whose taxable income is within [$S_{i,t}$-10,000, $S_{i,t}$]; 2) "far below", those whose taxable income is below $S_{i,t}$-10,000; 3) "just above", those whose taxable income is within [$S_{i,t}$, $S_{i,t}$+10,000]; and 4) "far above", those above $S_{i,t}$+10,000.[23]

Figure B3 examines the distribution of firms' taxable income growth rate from year t to year $t+1$, conditional on the distance between the firms' current taxable income and the SMPE threshold in year t. Consistent with the conjecture about a motive to manipulate, we find bunching around 0 in the distribution of the normalized growth rate, for the "just below" group of firms. We also observe bunching of the normalized taxable income growth below 0 for the "just above" firms since 2012. In comparison, there is much weaker bunching around 0 for the "far below" or the "far above" group, indicating heterogeneity in firms' behavior responses to the income threshold.

FigureB4 examines the distribution of total assets around the 30 million RMB threshold. We contrast two groups: first, firm-year observations where the firm's taxable income was above the SMPE threshold ("non-SMPEs"); and second, firm-year observations where a firm's taxable income was below the SMPE threshold in a particular year ("potential SMPEs"). For both groups, the distribution of total assets is smooth around the notch, suggesting that the total assets threshold was harder to manipulate than taxable income.

5.3.2 Misreporting or real responses?

There are several explanations for the observed bunching of taxable income. First, it may be caused by under-reporting, achieved by either under-reporting sales or over-reporting costs. Second, bunching can result from shifting of taxable income across periods. Third, firms may slow down real growth to stay below the SMPE threshold. We analyze these channels in this section.

We first plot the conditional means of the growth rates of sales and business costs for each cohort of SMPEs year by year in Figure 6, using the baseline sample of treatment firms but adding back the bunchers. As a comparison, we plot the conditional

[23] We explain in more details about the classification in Figure B3.

means for always large firms as in our baseline DiD estimations. We control for firm and industry-year fixed effects in the estimations, and use the year before each threshold change as the reference year. The red lines indicate the growth rates of SMPEs eligible for the rate cuts in 2012, 2014 or 2015. The blue lines indicate the growth rates of the control group. In Figure 6, we observe a slowdown of sales and cost growth in the policy change years for the 2012 and 2014 treatment cohorts, relative to the control group. For the 2015 treatment cohort, the trend of sales or cost growth is similar to that of the control group throughout the sample period. If firms under-report taxable income to qualify as for the lower tax rate, they would under-report sales and/or over-report costs. Thus, the simultaneous slowdown of sales and costs in the policy change year for the first two treatment cohorts point to real responses, rather than under-reporting. Similarly, if firms shift profit inter-temporarily, they may delay the recognition of income (or accelerate the recognition of costs) to claim the SMPE benefit in the policy change year, and postpone income (or reduce the costs) when the taxable income threshold increases. We do not observe such strategic shifting of sales or costs in Figure 6.

To further examine real responses, we estimate the following equation:

$$\triangle Ln(Y_{i,t}) = \beta Threshold_{i,t-1} + \varphi_i + \varphi_{s,t} + \varepsilon_{i,t} \tag{5}$$

where $Threshold_{i,t-1}$ is an indicator that equals 1 when an SMPE's taxable income in year $t-1$ is within the range $[(1-3\%) \times S_{t-1}, S_{t-1}]$, and S_{t-1} is the SMPE taxable income threshold in year $t-1$. $Y_{i,t}$ is firm $i's$ sales, business costs, fixed assets or taxable income in year t. We assume that firms would adjust their taxable income, sales, costs, and fixed assets in year t, conditional on their taxable income status in year $t-1$. In some estimations, we also include the lagged dependent variable on the right-hand side of Equation 5, which could be a predictor of the current-year growth rate (i.e., growth rate naturally slow down as firm size increases). Our hypothesis is that if the SMPE tax incentive causes real responses, firms would slow down expansion when they get close to the threshold.

Table 9 shows the estimation results, using the sample of firms that were SMPEs for at least once during our sample period. First, we find that firms slow down taxable income growth (columns 1-2) in year t if they are close to the SMPE threshold in year $t-1$. In columns 3-4, we show that sales growth slow down significantly when firms approach the threshold, which is consistent with both under-reporting of revenue and slow down of firm growth. We fail to find evidence for inflating business costs

when firms approach the threshold (columns 5-6). On the contrary, the growth rate of business costs significantly declines in year t when the firm is in the left-neighborhood of the taxable income threshold in the previous year. As a further analysis, we use $\triangle Ln(Fixed\ assets)$ as the outcome variable in Equation 5, and examine whether firms slow down investment when approaching the taxable income threshold. Columns 7 and 8 report the estimation results. We find that firms significantly slow down the growth rate of fixed assets in year t when they approach the SMPE taxable income threshold in year $t-1$. Together, the slowdown in the growth of business costs and fixed assets points to real activity responses.

The evidence for the slow-down of real activities relates to the concern that threshold-based tax incentives may incentivize firms to stay small (Tsuruta, 2020). As a further, descriptive analysis, Table 10 traces each cohort of qualified SMPEs over our sample period. For example, 16% (1,247/7,768) of qualified SMPEs in 2010 grew above the CNY 30K taxable income threshold after one year, and 38% grew above this threshold in at least one subsequent year. We can also examine how many SMPEs grew above the changing SMPE taxable income threshold. Around 28% of the 2010 cohort of SMPEs grew to be non-SMPEs at least once during our sample period. Unsurprisingly, for the later SMPE cohorts, the probability of growing above the taxable income threshold is much lower: they had less time to expand and the taxable income threshold continued to rise. Clearly, the SMPE tax scheme did not entirely inhibit growth among qualified firms. Nevertheless, a large proportion of treated firms remained SMPEs until 2016.

5.3.3 Behavior response of large firms

The SMPE tax cuts may induce large firms to set up eligible SMPE subsidiaries and enjoy the lower tax rate by shifting profits into such new entities. To fully examine this would require information on ownership structures that link parent firms with subsidiaries, which is infeasible through our data.[24] Nevertheless, for each firm in our data, we know the percentages of shareholdings by different types of shareholders: individuals, corporations, and other types. We utilize this information to distinguish firms that are potentially subsidiaries from others. In particular, firms wholly owned by another corporation are subsidiaries.

Table B7 shows the triple DiD estimations where we interact $Treated \times Post$ with a dummy indicating potential subsidiaries, and include this interaction as an additional

[24]Since firms in the tax return are anonymous, we cannot match them with external databases.

explanatory variable. If large firms merely shift profit into qualified SMPE subsidiaries, the tax cut may have little impact on these subsidiaries' investment. Meanwhile, we might observe a larger increase in TFP for the subsidiaries, since profit increases while capital remains unchanged. However, we find no significant difference between potential subsidiaries and stand-alone firms in terms of investment or TFP.

To reinforce this finding, we manually collect information from listed firms' annual reports about whether they claimed SMPE tax benefits via subsidiaries. Listed firms in China are required to disclose the tax benefits they claim. Figure B5 illustrates the trend of listed companies with SMPE subsidiaries during 2009-2017 (2017 is the last year for which we can obtain annual reports). Despite an increasing trend, the percentage of listed firms with SMPE subsidiaries remains small—only reaching 3% by 2017. This is unsurprising: the tax saving due to the SMPE tax cut by 2016 was still small (for each SMPE, the maximum tax saving is 30K RMB=300K $\times 10\%$), and large firms may not find it a significant tool for tax reduction.

5.4 Firm entry

When the cost of entry is fixed, a cut in the CIT rate and the resulting increase in expected after-tax profit may induce more entrepreneurs to set up new firms. A lower CIT rate could also increase the expected probability of survival, which is crucial for small businesses. For these reasons, we expect to observe more small firm entries with the gradual lift of the SMPE threshold.

We examine the effect of the 2010, 2012, and 2015 SMPE cuts on firm entry. We do not analyze the entry effect of the 2014 policy change as it coincides with the easing of the registered capital requirement in the Company Law, implemented on March 1st of that year, which significantly lowered the barrier for business registration (see Cui and Wei (n.d.)). The 2010 SMPE tax policy was announced on December 2, 2009, the 2012 policy on November 29, 2011, and the 2015 policy on March 3rd, 2015. We analyze observations within a 60-day window around the policy announcement dates. If the policy announcement was unexpected and had an immediate impact on firm entry, we should observe an increase in small firm entries shortly after each policy announcement. Further, if the SMPE tax policy influenced firm entry through relaxing financial constraints, the effect should be larger in industries that are more constrained.

We employ the Differences-in-Discontinuities (DI-RD) approach developed by Grembi et al. (2016). The idea is to use observations in a pre-policy year to control for the time-

invariant changes around each policy announcement date. For this purpose, we use entry data around November 29 and December 2 in 2008, as well as March 3d in 2009, as the control group for the 2010, 2012 and 2015 policy change, respectively. We use the following regression specification:

$$Ln(Newfirms_{ijrt}) = \alpha + \beta D_{it} + f_0(t) + D_{it}g_0(t) + S_i \times (\tau + \gamma D_{it} + f_1(t) + D_{it}g_1(t)) + \phi_{jm} + \phi_w + \phi_r + \epsilon_{ist} \quad (6)$$

where the running variable t measures the number of days relative to the policy announcement date and D_t equals to 1 after the policy announcement date. $f(t)$ and $g(t)$ capture the local linear trend of firm entries before and after the policy date in year s. $S_i = 1$ for the actual policy years, while $S_i = 0$ for the control years. With the identifying assumption that the seasonal effect is constant over years, β captures the discontinuous changes in firm entries due to seasonal effects. γ is the coefficient of interest, capturing the additional changes in firm entry caused by the SMPE policy announcement. ϕ_{jm}, ϕ_w and ϕ_r denote the industry-month, day-of-the-week, and prefecture city fixed effects, respectively. We exclude national holidays and weekends from the estimations.

We use tax registration data to examine the effect of the SMPE rate cut on firm entry. Our data covers all firms incorporated in the province we study. To be consistent with our basic analysis, we limit the study of firm entry to the manufacturing sector. The tax registration data does not provide information for determining a firm's eligibility for SMPE benefits upon registration. Instead, firms are either categorized as "micro", "small", "medium", "large" according to a national classification system used for statistical (i.e. non-tax) purposes or "unclassified".[25] Table B8 shows that the average and median levels of employment and registered capital for "micro" and "unclassified" firms are both much lower than the SMPE thresholds. Therefore, we analyze the entry of "micro" and "unclassified" firms as an approximation for SMPE entry. We define y_{ijrt} as the natural logarithm of the total number of newly registered micro and unclassified firms in each (2-digit) industry-prefecture-day triplet.[26]

[25]For example, for a manufacturing firm to be classified as a "micro" firm, its total employees cannot exceed 20 and annual revenue cannot exceed 3 million CNY. Tax authorities are responsible for classifying firms into size categories. It is common for this classification to be completed only some years after firms first register for tax purposes, especially for smaller firms.

[26]In the province we study, there are more than 10 prefecture cities. We cannot disclose the exact number for confidentiality reasons.

To test whether the impact of tax cuts on entry is larger on more financially constrained industries, we calculate external finance dependence, defined as the fraction of capital expenditures not financed by operating cash flows, for each 2-digit CIC industry using ASIF data.[27] We define an industry to be financially constrained if its average external finance dependence during 2004-2007 is above the sample median across all manufacturing industries during 2004-2007, and as being unconstrained otherwise.

Figure 7 plots the 7-day average number of newly registered micro and unclassified firms (in logs) across 2-digit industries within 60 days around the actual and placebo "policy date" for the 2009, 2011, and 2015 SMPE tax policy announcements. Panel A shows that there is no change in the entry of micro and unclassified firms around Dec 2, 2009, for firms in either unconstrained or constrained industries, or around the corresponding placebo date (Dec 2, 2008). Panel B also shows little discontinuity around Nov 29, 2011 (the actual announcement date) or the corresponding placebo date (Nov 29, 2008). In Panel C, we find a jump in the entry of micro and unclassified firms in constrained industries shortly after March 3, 2015 (the actual announcement date), while there is no discontinuity in firm entry in constrained industries around March 3rd, 2009, which serves as the placebo. For unconstrained industries, there is not much difference in the entry pattern of micro and unclassified firms between the actual and placebo policy dates.

Table 11 presents the DI-RD estimates. Consistent with Figure 7, the announcements for the 2010 and 2012 SMPE tax policies appear to have a null impact on entries of micro and unclassified firms, regardless of the severity of industry-level financial constraints (columns 1-4). In column 6, we find that the 2015 SMPE policy announcement led to a relative increase (around 7.5 percent) in the entry of micro and unclassified firms in financially constrained industries, which is statistically significant at the 10 percent level. However, the impact of the 2015 policy announcement on firm entry in less constrained industries remains insignificant (column 5). Overall, we can conclude that the SMPE tax policy had a rather limited impact on the entry of small firms. The effect, however, tends to be positive when the taxable income threshold rises (and hence leads to more tax savings) and when we consider more financially-constrained industries.

One question is whether the CIT rate cut leads firms to switch from partnerships to

[27] The ASIF data does not report firm-level capital expenditures. We calculate it as the sum of increases in firms' long-term investment, fixed assets, and intangible assets, minus current year capital depreciation, as in Feng et al. (2012). Following Rajan and Zingales (1998), operating cash flow is defined as the sum of cash flow, inventory reductions, reductions in receivables, and increases in the firm's payables.

corporations. In Table B9, we conduct the DI-RD estimation based on the registration data of partnership firms. There, we generally find a null impact of the SMPE tax policy on the entry of partnerships. In particular, there is no significant drop in the establishment of partnerships following the SMPE policy change. Thus, the policy is unlikely to have caused small businesses to switch their organizational forms.

6 Conclusion

What will small firms do when they receive a large and semi-permanent corporate tax cut? Our study sheds light on this question by utilizing a large cut in the CIT rate for qualified small- and micro-profit firms in China, where the qualifying taxable income threshold rose 10-fold in five years. We find that newly-qualified manufacturing firms use immediate tax savings on investment and enhance their productivity. For these small firms, cutting the CIT rate was likely to be more effective than more complex tax incentives, such as accelerated depreciation, in stimulating investment. In the context of developing countries, our study implies that a straightforward tax rate cut may be a better option than accelerated depreciation, which may suffer from low take-up due to complexity or weak tax administration.

We find that loss-making moderates the impact of the corporate tax cut. Given the prevalence of losses among small businesses, policymakers should consider offering more generous tax provisions for losses (for example, extending the years for loss-carry forward) as a complement to the tax cut. The SMPE tax policy also has a limited impact on firm entry, but the effect becomes significantly positive when the taxable income threshold is substantially increased. Meanwhile, we find that the threshold-based tax incentive triggered behavioral responses like bunching and created some disincentives for expansion. Our analyses thus highlight the limitations and potential distortions associated with size-based tax cuts for small businesses.

We only examine the impact of the early implementation of the Chinese corporate tax cuts for qualified SMPEs. As the qualifying threshold continues to rise after 2016, it remains interesting to study the effects of the more recent changes. Our study also has not addressed other important consequences of the SMPE tax cut, for example, how it affected small firms' survival *ex-post*. The survival of small businesses matters for the labor market since they are important to job creation and destruction in the economy (Davis et al., 1996; Li and Rama, 2015; Neumark et al., 2011). Examining the impact of

the tax cut on firm survival requires a longer data span and a proper indicator for exit. We thus leave this for future research.

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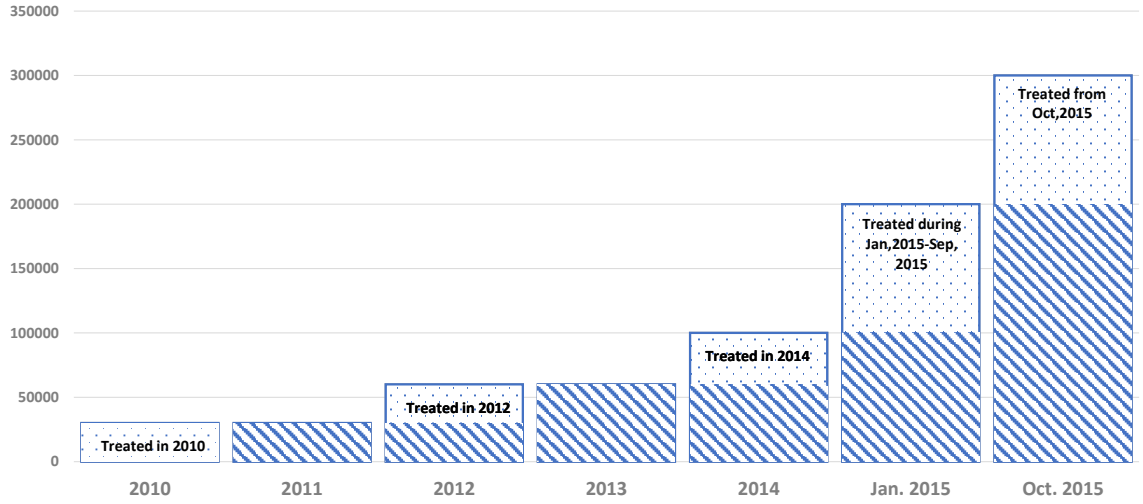
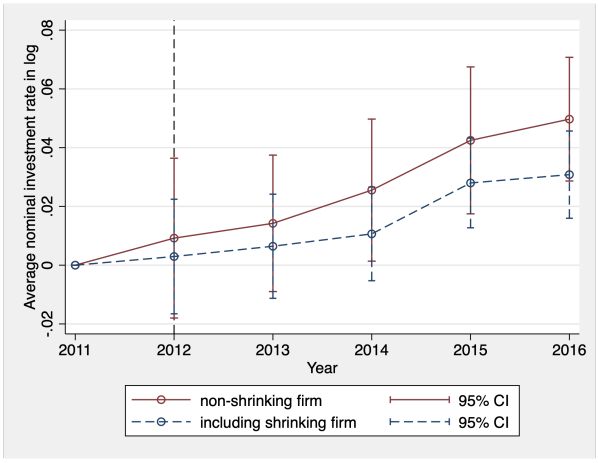
Figure 1: The qualifying taxable income threshold for SMPEs

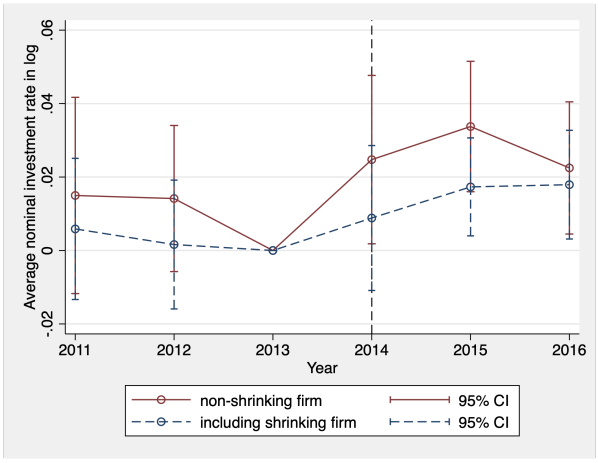


Notes: This figure illustrates the changing qualifying threshold in terms of taxable income (in RMB) for small and micro-profit (SMPE) firms during 2010-2016.

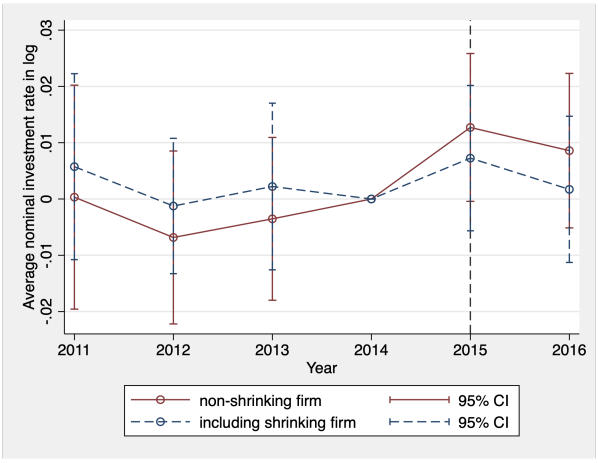
Figure 2: The dynamic effects of corporate tax cuts on fixed assets growth



(a) 2012



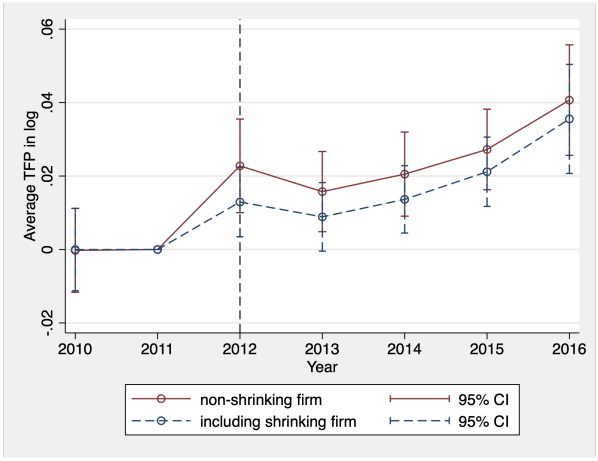
(b) 2014



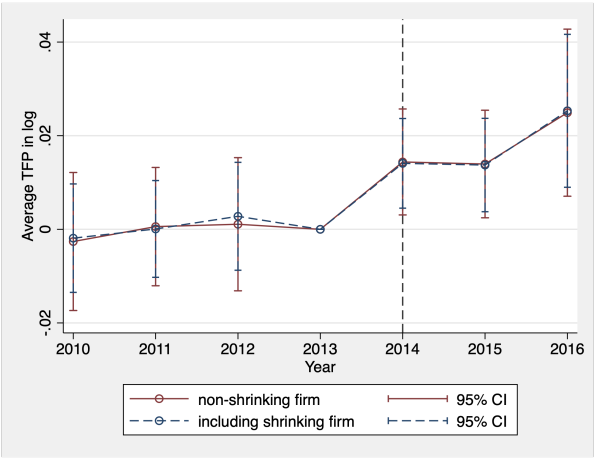
(c) 2015

Notes: This figure plots the estimated dynamic effects of the CIT cut on firms' investment rate for the 2012, 2014 and 2015 cohorts, respectively. The blue line indicates the treatment effect on the baseline sample of newly qualified SMPEs. The red line indicates the treatment effect when we exclude newly qualified SMPEs whose taxable income exceeded the new policy threshold one year before the policy year ("shrinking firms"). The point estimates, which represent the relative change of treated firms' investment rate year by year, and their corresponding confidence intervals are obtained by estimating the following specification: $\Delta log(\text{Fixed asset})_{i,t,c} = \sum \beta_{t,c} year_t \times T_{i,c} + \varphi_{i,c} + \varphi_{s,t,c} + \varepsilon_{i,t,c}$ for each of the reform cohorts respectively. The dependent variable is the annual change in the log of fixed assets; $T_{i,c}$ is the treatment dummy, $year_{t,c}$ is the series of year dummies where the year preceding the rate change year is used as the base year and omitted from the equation for each cohort; $\varphi_{i,c}$ is firm-level fixed effect, and $\varphi_{s,t,c}$ is the industry-year fixed effect. Robust standard errors are clustered at the industry-year level.

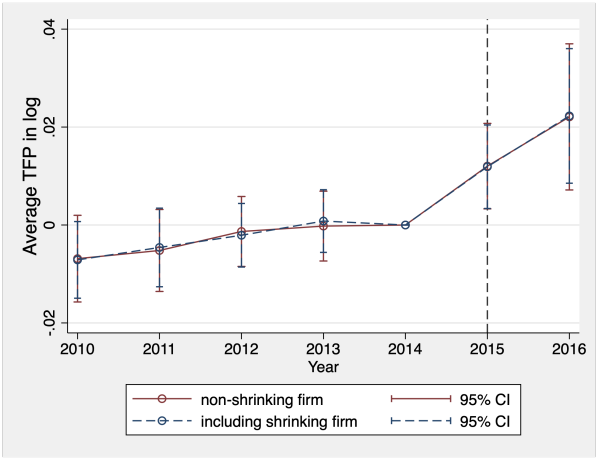
Figure 3: The dynamic effects of corporate tax cuts on TFP



(a) The 2012 cohort



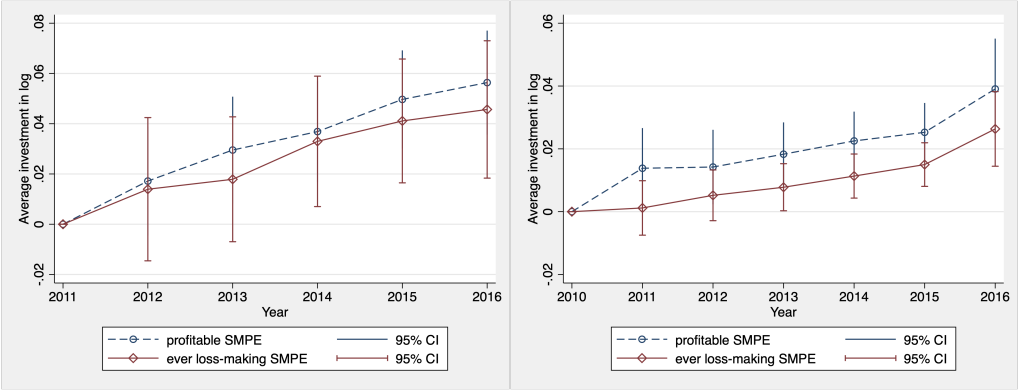
(b) The 2014 cohort



(c) The 2015 cohort

Notes: This figure plots the estimated dynamic effects of the CIT cut on firms' TFP for the 2012, 2014 and 2015 cohorts, respectively. We use the ACF method to calculate the TFP, as explained in details in Appendix A. The blue line indicates the treatment effect on the baseline sample of newly qualified SMPEs. The red line indicates the treatment effect when we exclude newly qualified SMPEs whose taxable income exceeded the new policy threshold one year before the policy year ("shrinking firms"). The point estimates, which represent the relative change of treated firms' TFP in log by year, and their corresponding confidence intervals are obtained by estimating the following specification: $log(TFP)_{i,t,c} = \sum \beta_{t,c} year_{t,c} \times T_{i,c} + \gamma_c X_{i,t,c} + \varphi_{i,c} + \varphi_{s,t,c} + \varepsilon_{i,t,c}$, for each of the reform cohorts respectively. $T_{i,c}$ is the treatment dummy; $year_{t,c}$ is the series of year dummies where the year preceding the rate change year is used as the base year and omitted from the equation for each cohort; $X_{i,t,c}$ is firm-level sales (in logs); $\varphi_{i,c}$ is firm fixed effect, and $\varphi_{s,t,c}$ is the industry-year fixed effect. Robust standard errors are clustered at the industry-year level.

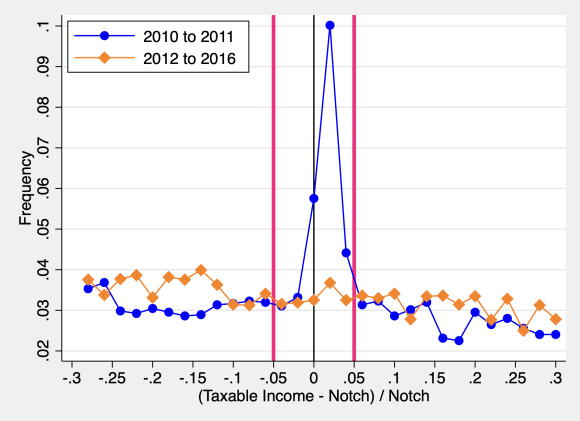
Figure 4: The effect of corporate tax cuts on SMPEs: the role of losses



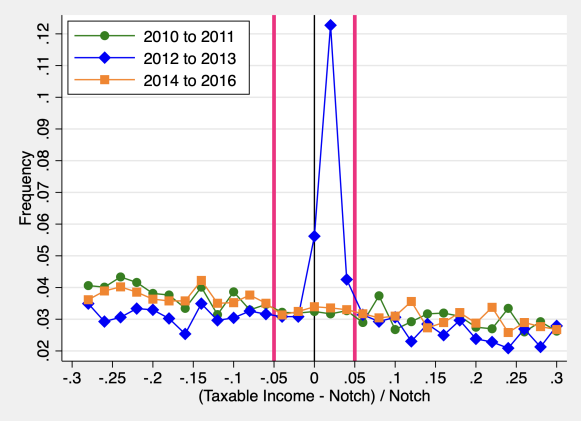
(a) Investment rate (b) Ln(TFP)

Notes: Panels a-b plot the average investment rate and TFP (in logs) of always-profitable SMPEs (blue line) and ever-loss-making SMPEs (red line), relative to large firms over the sample period. In this figure, SMPEs are firms with taxable income and total assets below the policy threshold in each year. We do not have total assets information for 2010-2011 and thus rely on fixed assets instead. The point estimates, representing the conditional average differences between always-profitable SMPEs (or ever-loss-making SMPEs) and the control group of always large firms, and their corresponding confidence intervals are obtained by estimating the following specification: $Y_{i,t} = \sum \beta_t year_t \times T_i + \gamma X_{i,t} + \varphi_i + \varphi_{s,t} + \varepsilon_{i,t}$. $year_t$ is the series of year dummies where the year 2010 is used as the base year; T_i is an indicator for always-profitable SMPEs or ever-loss-making SMPEs; $X_{i,t}$ represents firm-level sales (in logs), which we only include in panel b; φ_i is the firm-level fixed effect, and $\varphi_{s,t}$ is the industry-year fixed effect.

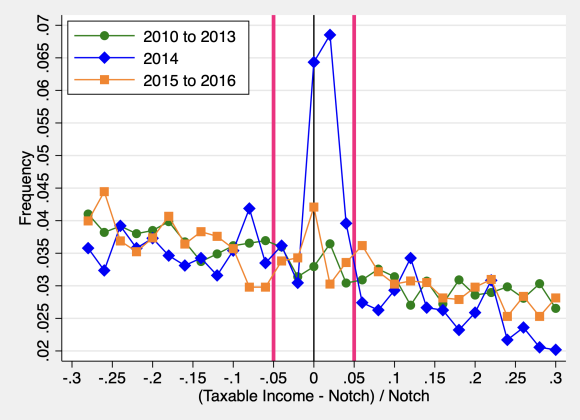
Figure 5: The distributions of taxable income around the SMPE qualifying thresholds



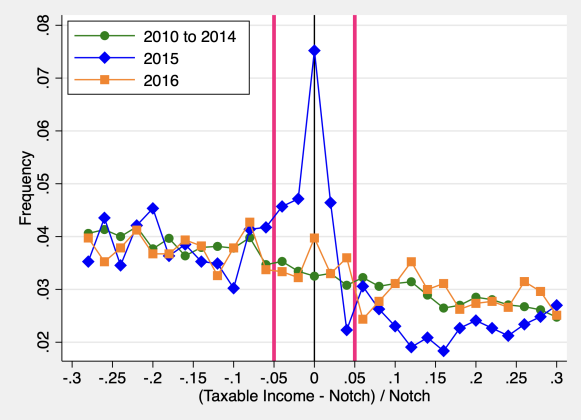
(a) The 2010 policy threshold



(b) The 2012 policy threshold



(c) The 2014 policy threshold

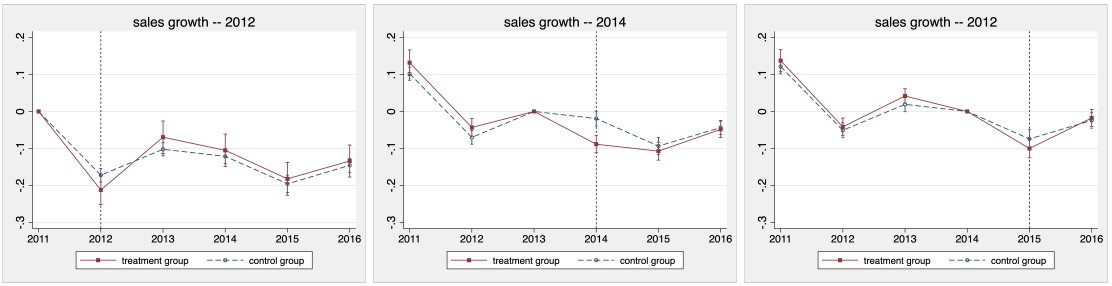


(d) The 2015 policy threshold

Notes: This figure illustrates the distributions of taxable income surrounding the SMPE qualifying thresholds in 2010, 2012, 2014, and 2015. Observations are grouped into 30 equally spaced bins, ranging from 70% to 130% of the respective policy threshold, and the frequency of firms in each bin is displayed relative to the threshold for each corresponding year. The horizontal axis represents the percentage deviation from the policy threshold. Panel a displays the distribution of taxable income relative to the 30,000 taxable income threshold in 2010-2011 and 2012-2016. Panel b depicts the taxable income distribution relative to the 60,000 taxable income threshold in 2010-2011, 2012-2013, and 2014-2016. Panel c shows the taxable income distribution relative to the 100,000 taxable income threshold in 2010-2013, 2014, and 2015-2016. Finally, Panel d demonstrates the taxable income distribution relative to the 200,000 taxable income threshold in 2010-2013, 2015, and 2016.

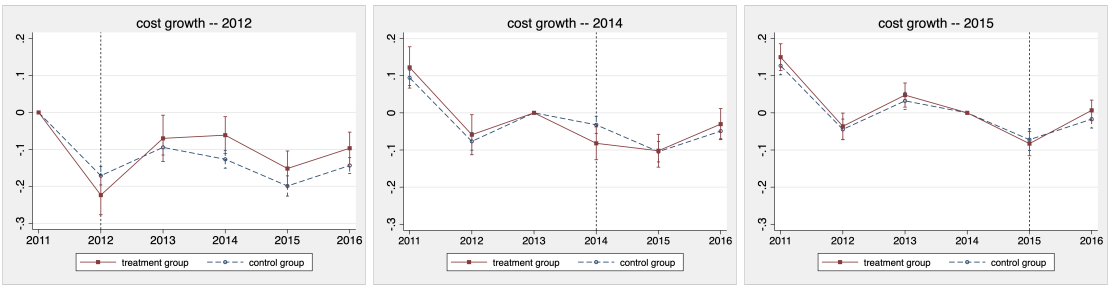
Figure 6: Sales and costs growth of treatment and control firms

Panel A. Δ Ln(Sales)



(a) 2012 (b) 2014 (c) 2015

Panel B. Δ Ln(Costs)

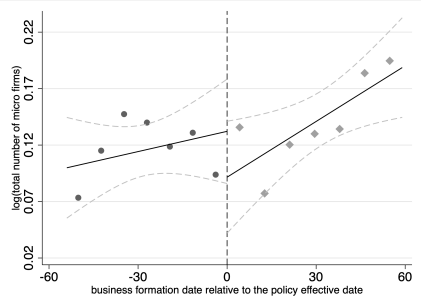


(d) 2012 (e) 2014 (f) 2015

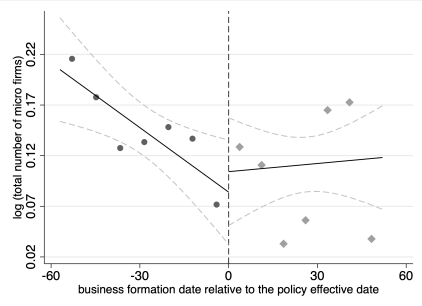
Notes: This figure plots the conditional means of the growth rates of sales and production costs for the baseline treatment (including bunching firms) and control groups, respectively. The point estimates and their corresponding confidence intervals are obtained by estimating the following specification: $Y_{i,t} = \sum \beta_t year_t + \varphi_i + \varphi_{s,t} + \varepsilon_{i,t}$, for the treatment group (the red line) and the control group (the blue line), separately. $year_{t,c}$ is a series of year dummies. The year preceding each SMPE taxable income threshold change is used as the base year and omitted from the estimations. φ_i is firm-fixed effect, and $\varphi_{s,t}$ is industry-year fixed effect. Robust standard errors are clustered at the industry-year level.

Figure 7: The effect of corporate tax cuts on firm entry

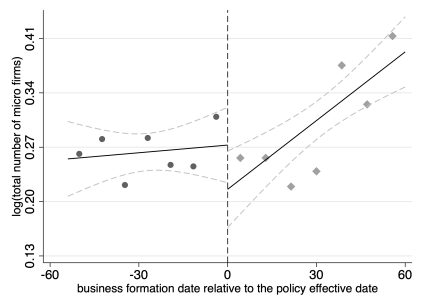
Panel A. The 2010 policy announcement



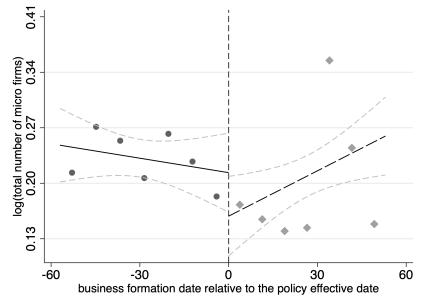
(a) Dec 2 2009: unconstrained industries



(b) Dec 2 2008: unconstrained industries

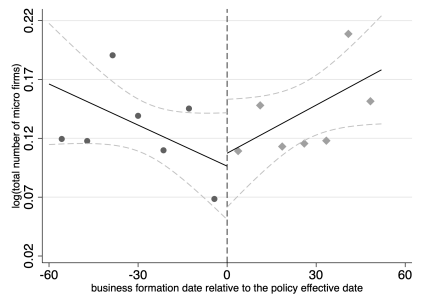


(c) Dec 2 2009: constrained industries

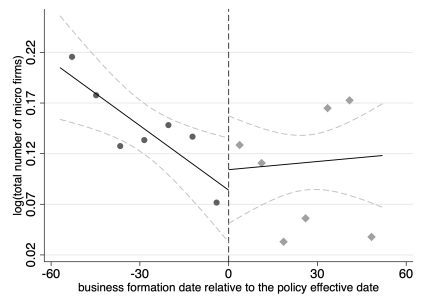


(d) Dec 2 2008: constrained industries

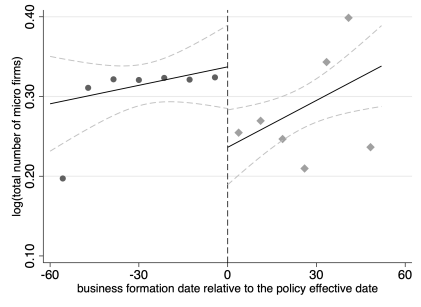
Panel B. The 2012 policy announcement



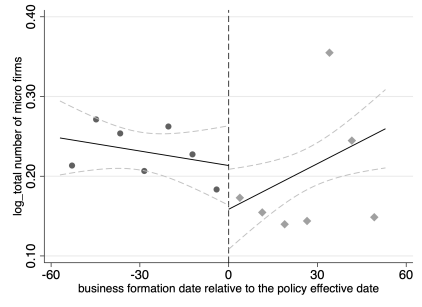
(e) Nov 29 2011: unconstrained industries



(f) Nov 29 2008: constrained industries



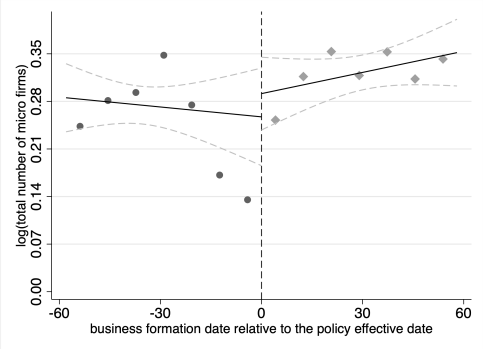
(g) Nov 29 2011: constrained industries



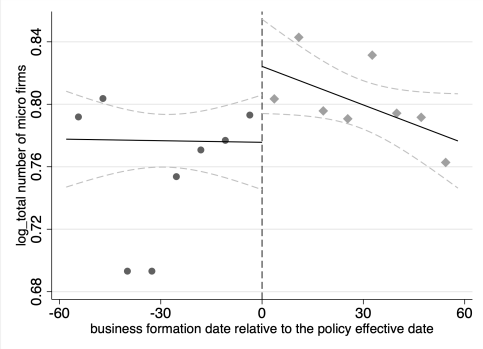
(h) Nov 29 2008: constrained industries

Figure 7: The effect of corporate tax cuts on firm entry—continued

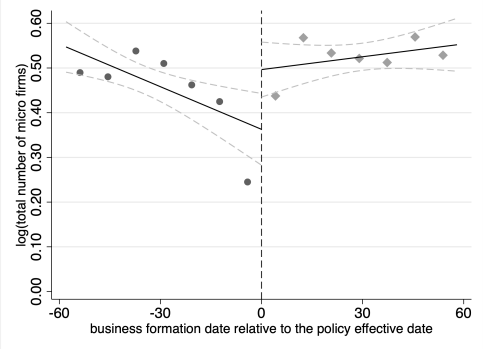
Panel C. The 2015 policy announcement



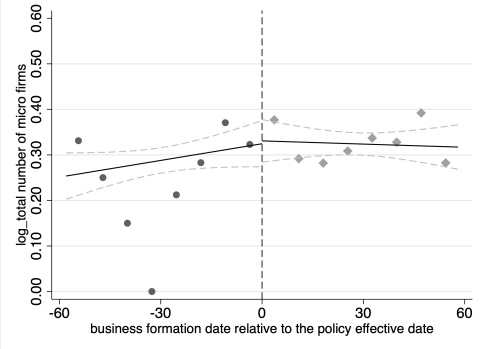
(i) March 3rd 2015: unconstrained industries



(j) March 3rd 2009: unconstrained industries



(k) March 3rd 2015: constrained industries



(l) March 3rd 2009: constrained industries

Note: In Panel A-C, each figure plots the average number of newly registered firms (in logs) within 60 days around the actual and placebo policy announcement dates for financially constrained and unconstrained industries in the 2010, 2012, and 2015 SMPE tax policies, respectively. The fitted lines on both sides are separately estimated with local linear regression. 95% confidence intervals are plotted around the fitted lines.

Table 1: Construction of the treatment groups

	Between old & new income thresholds (1)	Below assets threshold (2)	Reduction in tax rate (3)	Exclude bunchers (4)	Two obs. before & after policy change (5)	Exclude shrinking firms (6)
2012	2,195	2,091	1,074	985	713	333
2014	1,984	1,861	851	773	707	378
2015	3,018	2,765	1,596	1,482	1,408	897

Notes: This table illustrates how we construct the three cohorts of treatment groups. Column 1 requires firms' taxable income to fall within the old and the new taxable income threshold in the policy change year. Column 2 requires firms' total assets to be below 30 million RMB. We require a treated firm to experience a cut in the corporate income tax rate for the first time in the policy change year (Column 3). In Column 4, we drop firms whose taxable income is close to the threshold. In column 5, we require each firm to report at least two observations before and after the policy change year. Column 5 presents the baseline treatment group. In column 6, we exclude firms whose taxable income was above the new threshold one year before the policy change and subsequently shrank into the new qualifying range in the policy change year. Column 6 presents the sample where we exclude "shrinking firms" from the treatment group.

Table 2: Summary statistics for key variables

	Obs	Mean	Median	SD	Min	Max
A: 2012 treatment cohort						
$\Delta Ln(Fixed\ assets)$	4,113	0.06	0.007	0.133	-0.188	0.588
$Ln(TFP)$	3,758	7.064	7.077	0.46	5.962	8.675
$Ln(Sales)$	4,803	15.247	15.311	1.015	4.193	18.56
$Ln(Wages)$	3,926	12.696	13.088	2.33	0	15.936
$Ln(Net\ profit/Fixed\ assets)$	4,795	0.017	0.013	0.089	-0.50	0.468
Taxable income (1,000 RMB)	4,897	73.115	46.585	189.62	0	7899.199
B: 2014 treatment cohort						
$\Delta Ln(Fixed\ assets)$	3,898	0.072	0.012	0.139	-0.189	0.588
$Ln(TFP)$	3,624	7.099	7.105	0.461	5.962	8.675
$Ln(Sales)$	4,680	15.492	15.519	0.848	8.454	18.511
$Ln(Wages)$	3,766	13.008	13.284	2.00	0	15.661
$Ln(Net\ profit/Fixed\ assets)$	4,584	0.044	0.028	0.087	-0.546	0.588
Taxable income (1,000 RMB)	4,702	123.275	88.751	152.185	0	3861.805
C: 2015 treatment cohort						
$\Delta Ln(Fixed\ assets)$	7,874	0.087	0.03	0.147	-0.189	0.588
$Ln(TFP)$	7,556	7.105	7.109	0.452	5.962	8.675
$Ln(Sales)$	9,370	15.865	15.844	0.684	10.185	19.236
$Ln(Wages)$	7,675	13.371	13.586	1.714	0	16.010
$Ln(Net\ profit/Fixed\ assets)$	9,252	0.067	0.045	0.087	-0.480	0.541
Taxable income (1,000 RMB)	5,827	176.583	152.800	140.441	0	3450.018
D: Control firms						
$\Delta Ln(Fixed\ assets)$	15,072	0.098	0.050	0.151	-0.202	0.588
$Ln(TFP)$	15,042	7.210	7.192	0.490	5.962	8.675
$Ln(Sales)$	17,643	17.555	17.423	1.042	10.546	23.128
$Ln(Wages)$	15,189	14.690	15.001	1.504	0	17.007
$Ln(Net\ profit/Fixed\ assets)$	17,575	0.10	0.070	0.102	-0.473	0.756
Taxable income (1,000 RMB)	17,654	4396.499	1237.927	21703.47	300.000	1,133,816

Notes: This table reports the summary statistics for key variables in our analyses based on the benchmark sample. Treated firms are defined in Section 3.1. The control group consists of firms whose taxable income were always above 300,000 yuan and hence paid income tax at the rate of 25% during our sample period 2010-2016.

Table 3: The impact of SMPE tax cuts on investment rate

Dependent variable: Δ Ln$(Fixed\ assets)$						
	2012		2014		2015	
	(1)	(2)	(3)	(4)	(5)	(6)
$T_{i,2012} \times Post_{2012}$	0.015**	0.028***				
	(0.007)	(0.01)				
$T_{i,2014} \times Post_{2014}$			0.011**	0.017**		
			(0.005)	(0.007)		
$T_{i,2015} \times Post_{2015}$					0.003	0.013***
					(0.004)	(0.004)
Observations	19,106	16,949	18,766	17,310	22,734	19,841
Firm FE	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓

Notes: In this table, we report the estimated effect of the SMPE corporate tax cut on treated firms' investment rate. The dependent variable is the annual change in the natural logarithm of fixed assets. We use the benchmark sample of treated firms in columns 1, 3 and 5. We exclude "shrinking firms" from the treatment group in columns 2, 4 and 6. The control group consists of large companies whose taxable income were always above 300,000 yuan and hence always paid corporate tax at a rate of 25%. We control for firm-level and industry-year fixed effects. Robust standard errors are clustered at the industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 4: The impact of the SMPE tax policy changes on investment: using partnership firms as the control group

	ΔLn(Fixed assets)			
	(1)	(2)	(3)	(4)
$T_{i,2014} \times Post_{i,2014}$	0.015***	0.028***		
	(0.005)	(0.008)		
$T_{i,2015} \times Post_{i,2015}$			0.000	0.010**
			(0.004)	(0.004)
Observations	21,332	20,257	24,090	22,084
Firm FE	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓

Notes: In this table, we report the estimated effect of the tax cuts for SMPEs on firms' investment. We employ partnership firms as the control group whose sales during the sample period were between 5% and 95% of the sales distribution of the treatment groups, and fixed assets above 10% of the fixed assets distribution of the treatment group. We use the benchmark sample of treated firms in columns 1 and 3. We exclude "shrinking firms" from the treatment group in columns 2 and 4. We control for firm-level and industry-year fixed effects. Robust standard errors reported in the parentheses are clustered at the industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 5: The impact of the SMPE tax cuts on wage and payout

	Ln(Wage)			Ln(Payout)		I(Payout>0)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$T_{i,2012} \times Post_{2012}$	0.078						
	(0.109)						
$T_{i,2014} \times Post_{2014}$		0.087		-0.57^{**}		-0.017	
		(0.078)		(0.288)		(0.025)	
$T_{i,2015} \times Post_{2015}$			-0.041		-0.158		-0.015
			(0.053)		(0.149)		(0.016)
Observations	16,930	17,141	19,804	11,180	11,156	11,156	13,032
Controls	✓	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓	✓

Notes: In this table, we report the DiD estimation results for the effect of the SMPE tax cut on treated firms' wages and payout. The dependent variable is total wage (in logs and added by one) in columns 1-3, payout (in logs and added by one) in columns 4-5, and an indicator for positive payout in columns 6-7. Payout is calculated as: Payout$_t$ = Net Profit$_t$ + Retained Earnings$_{t-1}$ − Retained Earnings$_t$. If the payout is negative, we set $Ln(Payout)$ to be zero. For this exercise, we use the baseline treatment group but exclude shrinking firms. The control group consists of large companies whose taxable income were always above 300,000 yuan and hence always paid corporate tax at a rate of 25%. We control for firm-level and industry-year fixed effects. We control for firm sales (in logs) in all columns. Robust standard errors are clustered at the industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 6: The impact of SMPE tax cuts on total factor productivity

Dependent variable: Ln(TFP)						
	2012		2014		2015	
	(1)	(2)	(3)	(4)	(5)	(6)
$T_{i,2012} \times Post_{2012}$	0.019***	0.027***				
	(0.004)	(0.004)				
$T_{i,2014} \times Post_{2014}$			0.017***	0.018***		
			(0.004)	(0.004)		
$T_{i,2015} \times Post_{2015}$					0.019***	0.019***
					(0.004)	(0.004)
Observations	18,529	16,498	18,401	16,899	22,335	19,434
Controls	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓

Notes: In this table, we report the estimated effect of the SMPE corporate tax cut on treated firms' total factor productivity (using the ACF method). We use the baseline treatment group in columns 1, 3 and 5. We exclude "shrinking firms" from the treatment group in columns 2, 4 and 6. The control group consists of large companies whose taxable income were always above 300,000 yuan and hence always paid corporate tax at a rate of 25%. We control for firm-level and industry-year fixed effects, as well as firm sales (in logs) in all columns. Robust standard errors are clustered at the industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 7: Heterogeneity: the role of tax savings

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Dep. var.: ΔLn(Fixed assets)						
$Savings_{i,2012} \times Post_{2012}$	0.003**	0.006**				
	(0.0014)	(0.002)				
$Savings_{i,2014} \times Post_{2014}$			0.001***	0.002**		
			(0.001)	(0.001)		
$Savings_{i,2015} \times Post_{2015}$					0.0002	0.001***
					(0.0002)	(0.0003)
Observations	19,106	16,949	18,772	17,125	22,751	19,847
Panel B: Dep. var.: Ln(TFP)						
$Savings_{i,2012} \times Post_{2012}$	0.004***	0.006***				
	(0.001)	(0.001)				
$Savings_{i,2014} \times Post_{2014}$			0.002***	0.002***		
			(0.0004)	(0.0005)		
$Savings_{i,2015} \times Post_{2015}$					0.001***	0.001***
					(0.0002)	(0.0002)
Controls	✓	✓	✓	✓	✓	✓
Observations	18,730	16,734	18,481	16,944	22,410	19,597
Firm FE	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓

Notes: In this table, we report the estimated effect of the actual amount of tax savings on treated firms' investment rate and total factor productivity. Tax savings are measured in 1,000 RMB. We use the baseline treatment group in columns 1, 3 and 5. We exclude "shrinking firms" from the treatment group in columns 2, 4 and 6. The control group consists of large companies whose taxable income were always above 300,000 yuan and hence always paid corporate tax at a rate of 25%. We control for firm-level and industry-year fixed effects in all columns, and firm sales in Panel B. Robust standard errors are industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 8: How widespread are loss-making firms?

	2010	2011	2012	2013	2014	2015	2016
SMPE							
Stock of tax losses/revenue	0.12	0.15	0.14	0.14	0.13	0.13	0.13
% Loss-making firms in tax returns	70.10	73.11	60.34	62.14	58.96	54.91	54.00
% Firms with non-positive net income	N.A	N.A	63.26	63.10	59.16	53.84	53.90
Non-SMPE							
Stock of tax losses/revenue	0.023	0.024	0.041	0.044	0.060	0.081	0.10
% Loss-making firms in tax returns	11.46	11.49	18.48	20.01	25.04	33.61	39.00
% Firms with non-positive net income	N.A	N.A	22.45	22.94	25.95	32.42	36.45

Notes: This table shows the ratio of the stock of taxable losses to revenue, and the percentage of loss-making firms, for SMPE and non-SMPE firms separately based on the tax return. We also show the proportion of firms reporting non-positive net income in their income statement.

Table 9: Behavior responses when firms approach the SMPE taxable income threshold

Dep. Var. $\Delta y_{i,t}$	ΔLn(Taxable income)		ΔLn(Sales)	
	(1)	(2)	(3)	(4)
$Threshold_{i,t-1}$	-0.140^{***}	-0.109^{***}	-0.044^{***}	-0.029^{**}
	(0.029)	(0.028)	(0.014)	(0.014)
$\Delta y_{i,t-1}$		-0.300^{***}		-0.216^{***}
		(0.016)		(0.019)
Observations	80,864	55,636	116,248	92,531
Dep. Var. $\Delta y_{i,t}$	ΔLn(Costs)		ΔLn(Fixed assets)	
	(5)	(6)	(7)	(8)
$Threshold_{i,t-1}$	-0.046^{***}	-0.042^{**}	-0.011^{**}	-0.006
	(0.012)	(0.015)	(0.005)	(0.005)
$\Delta y_{i,t-1}$		-0.270^{***}		-0.174^{***}
		(0.019)		(0.002)
Observations	70,641	38,802	122,651	99,359
Firm FE	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓

Notes: We examine whether the growth rates of sales, costs, fixed assets and taxable income slow down when a firm approaches the SMPE threshold. We use the sample of firms that claimed the SMPE status at least once during our sample period for this exercise. $Threshold_{i,t-1}$ is an indicator that equals 1 when a firm's taxable income is within the range $[(1-3\%) \times S_{t-1}, S_{t-1}]$, where S_{t-1} is the SMPE taxable income threshold in year $t-1$. In even-numbered columns, we control for the lag-dependent variable on the right-hand side as a robustness check. We control for firm-level and industry-year fixed effects in all columns. Robust standard errors reported in the parentheses are clustered at the year-sector level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 10: Stay small or grow?

	2011	2012	2013	2014	2015	2016	Total	Percentage
Panel A: The 2010 SMPEs: 7,768								
Threshold 1: 30K	1,247	1,269	1,264	1,286	1,152	1,355	2,958	38.1%
Threshold 2: Defined by policy	1,247	794	809	660	393	377	2,180	28.1%
Panel B: The 2012 SMPEs: 10,739								
Threshold 1: 60K			1,127	1,283	1,277	1,541	2,761	25.7%
Threshold 2: Defined by policy			1,127	742	393	386	1,760	16.4%
Panel C: The 2014 SMPEs: 13,711								
Threshold 1: 100K					1,006	1,474	1,897	13.8%
Threshold 2: Defined by policy					309	344	551	4.0%
Panel D: The 2015 SMPEs: 16,817								
Threshold 1: 200K						1,250	1,250	7.4%
Threshold 2: Defined by policy						440	440	2.6%

Notes: This table reports the number of firms that grow above the taxable income thresholds of SMPEs in each year since each income tax rate change. The first taxable income threshold of each panel is the qualifying threshold of SMPEs in the rate change year of each cohort. The second taxable income threshold of each panel is the threshold of SPMEs in place in each calendar year and is therefore time-varying.

Table 11: Effects of the SMPE tax cuts on firm entry: DI-RD

	2010		2012		2015	
	(1) L	(2) H	(3) L	(4) H	(5) L	(6) H
D_t	-0.019	-0.041	0.01	-0.029	-0.03	0.075^*
	(0.039)	(0.039)	(0.026)	(0.024)	(0.049)	(0.042)
Fixed-effects	day-of-the-week, industry-month, prefecture					
N(effective)	2,505	4,870	2,467	4,736	3,987	6,381

Note: In this table, we report the DI-RD estimation results based on Equation 6. "L" stands for low external financial dependence and "H" stands for high external financial dependence. The running variable is the number of days between the firm's registry day and the policy announcement day. The dependent variable takes the log form of the total number of micro and unclassified firms by industry, prefecture, and day. Standard errors clustered by industry-month are in parentheses. * p <0.1, ** p <0.05, *** p <0.01.

Appendix

A The Total Factor Productivity Estimation

To obtain firm-level total factor productivity, we first estimate a production function, following the approach in De Loecker and Warzynski (2012) and Ackerberg et al. (2015). Specifically, we start with a Cobb-Douglas production function:

$$q_{i,t} = \beta_l l_{i,t} + \beta_m m_{i,t} + \beta_k k_{i,t} + \omega_{i,t} + \epsilon_{i,t}, \tag{A.1}$$

where $q_{i,t}$, $l_{i,t}$, $m_{i,t}$ and $k_{i,t}$ are the log transformations of firm-level output, labor, intermediate input and capital, respectively. $\omega_{i,t}$ is firm-level total factor productivity and $\epsilon_{i,t}$ represents idiosyncratic shocks to the firm-level output. We follow Levinsohn and Petrin (2003) and specify the demand for intermediate input as:

$$m_{i,t} = m(l_{i,t}, k_{i,t}, MPE_{i,t}, SPE_{i,t}, loss_{i,t}, \omega_{i,t}), \tag{A.2}$$

where $MPE_{i,t}$ is an indicator for being a micro-profit firm (MPE), $SPE_{i,t}$ is an indicator for being a small-profit firm (SPE), and $loss_{i,t}$ indicates that a firm is in the loss-making position. We explicitly control for firm size and profit status to account for the heterogeneous shocks along these dimensions on the firm's decisions of the optimal input usage. Assuming that there exists a monotonic relationship between $m_{i,t}$ and $\omega_{i,t}$, productivity can then be proxied by the inversion of function (A.2):

$$\omega_{i,t} = h(l_{i,t}, k_{i,t}, MPE_{i,t}, SPE_{i,t}, loss_{i,t}, m_{i,t}), \tag{A.3}$$

The estimation proceeds in two steps. In the first step, we estimate:

$$q_{i,t} = \phi(l_{i,t}, m_{i,t}, k_{i,t}, MPE_{i,t}, SPE_{i,t}, loss_{i,t}) + \epsilon_{i,t},$$

where:

$$\begin{aligned} \phi(.) &= \beta_l l_{i,t} + \beta_m m_{i,t} + \beta_k k_{i,t} + \omega_{i,t} \\ &= \beta_l l_{i,t} + \beta_m m_{i,t} + \beta_k k_{i,t} + h(l_{i,t}, k_{i,t}, MPE_{i,t}, SPE_{i,t}, loss_{i,t}, m_{i,t}). \end{aligned} \tag{A.4}$$

Then we construct the estimate for productivity as:

$$\hat{\omega}_{it} = \hat{\phi}_{i,t} - (\beta_l l_{i,t} + \beta_m m_{i,t} + \beta_k k_{i,t}) \tag{A.5}$$

In the second stage, we rely on the law of motion for productivity specified as equation (A.6) below:

$$\omega_{i,t} = g(\omega_{i,t-1}, MPE_{i,t}, SPE_{i,t}, loss_{i,t}) + \varepsilon_{i,t} \tag{A.6}$$

to recover the innovation of productivity $\varepsilon_{i,t}(\beta)$, given $\beta = (\beta_l, \beta_m, \beta_k)$. We then use the following moment condition to estimate the production function parameters using General Method of Moments (GMM):

$$E = \varepsilon_{i,t}(\beta) \begin{bmatrix} l_{i,t-1} \\ m_{i,t-1} \\ k_{i,t} \end{bmatrix} = 0 \tag{A.7}$$

Lastly, we calculate the estimates of the firm-level TFP as:

$$\hat{\omega}_{i,t} = q_{i,t} - (\hat{\beta}_l l_{i,t} + \hat{\beta}_m m_{i,t} + \hat{\beta}_k k_{i,t}). \tag{A.8}$$

A. *Output* – $\hat{q}_{i,t}$

We use nominal sales deflated by an output price index as the proxy for output. We obtain the producer-price index ($PPI_{s,t}$) at the 2-digit industry level for 2010-2016 from the Chinese Statistics Yearbook, and multiply it by the aggregate manufacturing PPI of the province ($PPI_{Province,t}$)to which our data belong relative to the country ($PPI_{CN,t}$) to construct the province-sector specific output deflator:

$$P^o_{s,t} = PPI_{s,t} \times \frac{PPI_{Province,t}}{PPI_{CN,t}}. \tag{A.9}$$

Denote $r_{i,t}$ as the nominal sales. We can calculate real sales as:

$$\hat{q}_{i,t} = \frac{r_{i,t}}{P^o_{s,t}}. \tag{A.10}$$

B. *Intermediate input* – $m_{i,t}$

Firms in our sample do not directly report expenditure on material. However, it can be calculated as business costs net of labor costs and current depreciation according to the accounting rules. We utilize the 2012 input-output table of the province we study to calculate the 2-digit industry-level input deflator. Specifically, for each 2-digit industry, the input deflator is the weighted average of output deflators of other 2-digit industries, using as weights the coefficients in the IO table. We then divide the firm-level nominal intermediate expenditure by the 2-digit industry-level input deflator to obtain $m_{i,t}$.

C. *Employment – $l_{i,t}$*

Our data does not include information of annual employment but only employment at registration and annual total wage bill. We first obtain the wage deflator from the Chinese Statistics Yearbook, and divide nominal wage by this deflator to obtain firm-level annual real wage, as well as real wage growth rate $rl_{i,t}$. Let $RL_{i,reg} = L_{i,2010}/L_{i,reg}$ denote the ratio of a firm's 2010 employment ($L_{i,2010}$)in its initial employment upon registration ($L_{i,reg}$). Assume the growth rate of employment is the same as the growth rate of real wage. The annual employment of a firm can be inferred as:

$$L_{i,t} = L_{i,2010} \times \prod_{2011}^{t}(1+rl_{i,t}) = RL_{i,reg} \times L_{i,reg} \times \prod_{2011}^{t}(1+rl_{i,t}) \quad \text{for} \quad t \in [2011, 2016]. \tag{A.11}$$

The log-transformation then is:

$$l_{i,t} = \log(RL_{i,reg}) + \log(L_{i,reg}) + \log[\prod_{2011}^{t}(1 + rl_{i,t})]. \tag{A.12}$$

Although $\log(RL_{i,reg})$ is not observable, it is time-invariant and firm-specific. Therefore, it will be fully controlled for when we include firm-specific fixed effects while estimating the production function.

D. *Real capital stock – $k_{i,t}$*

We follow Song and Wu (2015) to infer the firm-level real capital stock ($K_{i,t}$) as follows:

$$K_{i,t} = (1-\delta)K_{i,t-1} + \frac{BK_{i,t} - BK_{i,t-1}}{P_t}, \tag{A.13}$$

where δ is annual depreciation rate, $BK_{i,t}$ is the gross book value of fixed capital stock, and P_t is the price index of investment.

For firms that are established in and/or after 2010, the initial real capital stock is simply initial book value of fixed capital stock deflated by the investment price index: $BK_{i,0}/P_0$, where time 0 refers to the firm's birth year. For firms founded before 2010, we predict their initial $BK_{i,0}$ as:

$$BK_{i,0} = \frac{BK_{i,t_1}}{(1+g)^{t_1-t_0}}, \tag{A.14}$$

where t_1 is the first year that the firm appears in our sample, and g is the average growth rate of fixed assets. For firms that appear for more than 3 years in the tax return, we set g equal to the average growth rate of fixed assets of this firm over the sample period. Otherwise, g is proixed using the average growth rate of fixed assets at the 2-digit CIC industry level for the province we study between 1998 and 2010, which we calculate using the ASIF database provided by the National Bureau of Statistics of China.[28]

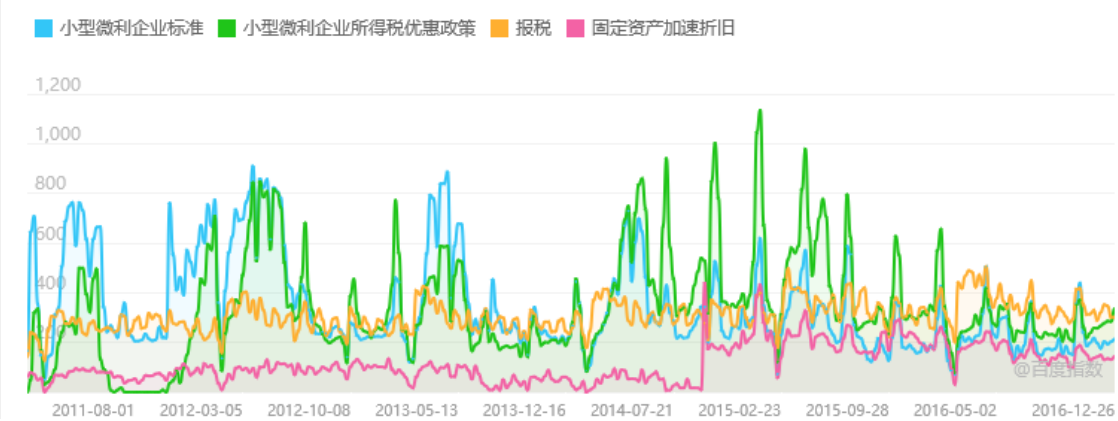
Last, we use the Brandt-Rawski deflator [29] in the place of the investment price index, and set the annual depreciation rate to be 9% following the convention in the literature. We also experiment with a depreciation rate of 5% which is used in Song and Wu (2015), and obtain nearly identical estimates of firm-level TFP.

[28]The ASIF data is available starting from 1998.

[29]The Brandt-Rawski deflator is only available up to 2007. We thus use the investment deflator for the province of our main dataset from the Chinese Statistics Yearbook after 2007.

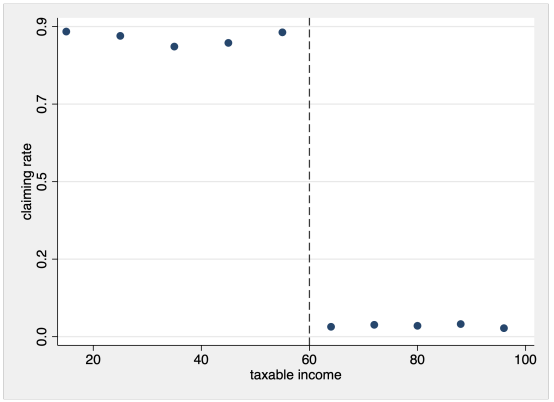
B Additional Figures and Tables

Figure B1: Salience of the tax rate cuts for SMPEs

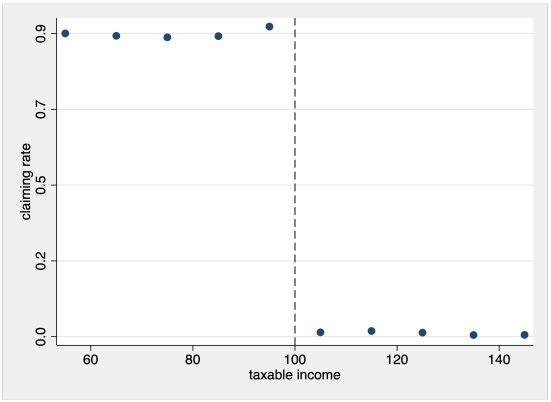


Notes: This figure plots the Baidu search intensity for the key words (all in Chinese): qualifying thresholds for SMPEs (blue), preferential CIT policies for SMPEs (green), tax filing (yellow), and accelerated depreciation for fixed assets (red). The period covers from January 1st, 2011 to December 31, 2016.

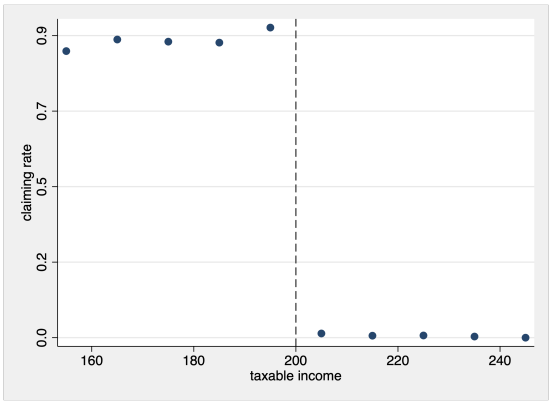
Figure B2: Claiming rate of the SMPE tax incentive



(a) 2012



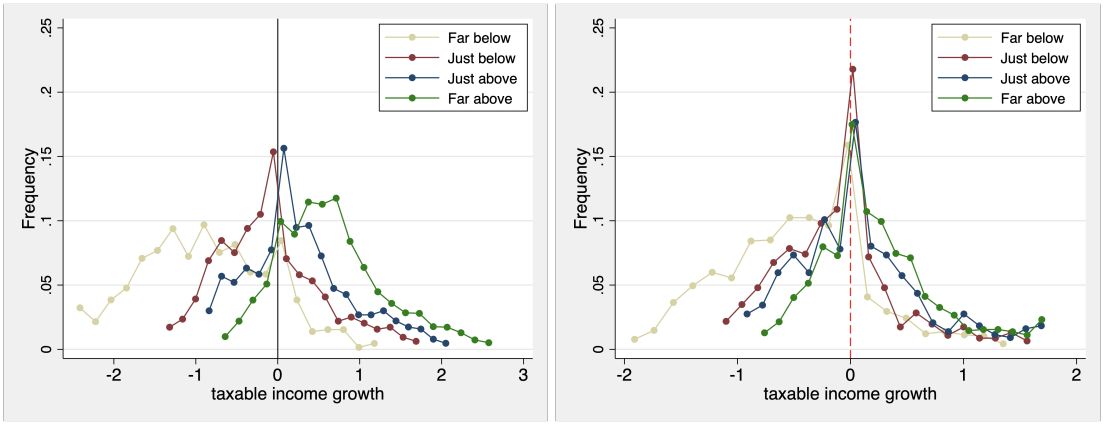
(b) 2014



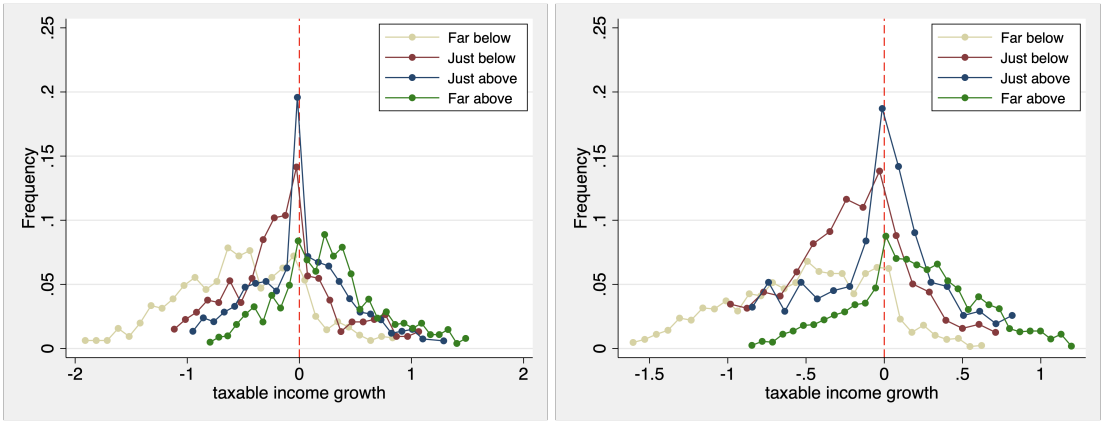
(c) 2015

Notes: This figure plots the percentage of firms reporting CIT rates equal to or below 10% in 2012, 2014 and 2015, respectively. The horizontal axis is firms' taxable income in 1,000 RMB. Each point in the figure is calculated by taking the percentage of claiming firms within the $\pm$ 5,000 RMB taxable income window. The vertical dashed line in each panel represents the taxable income threshold eligible for the SMPE tax cut in 2012, 2014 and 2015.

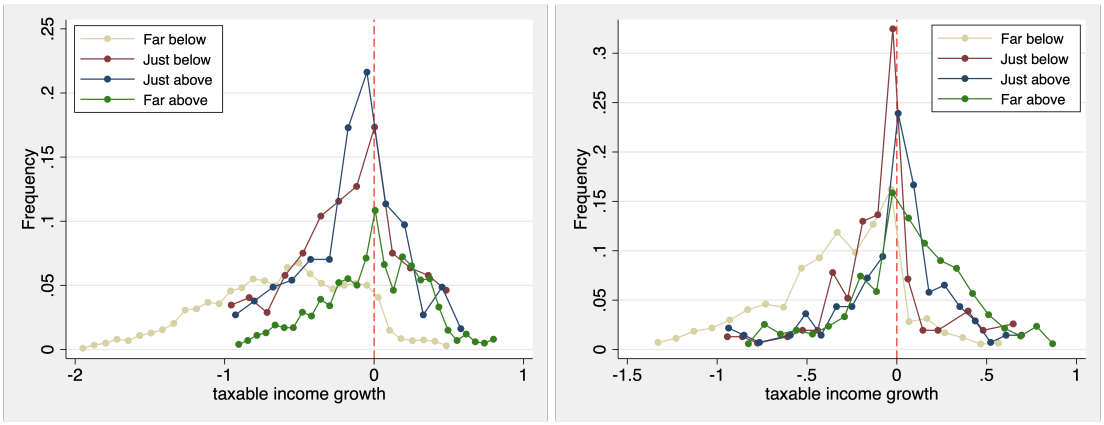
Figure B3: Normalized taxable income growth around the taxable income threshold



(a) from 2010 to 2011 (b) from 2011 to 2012



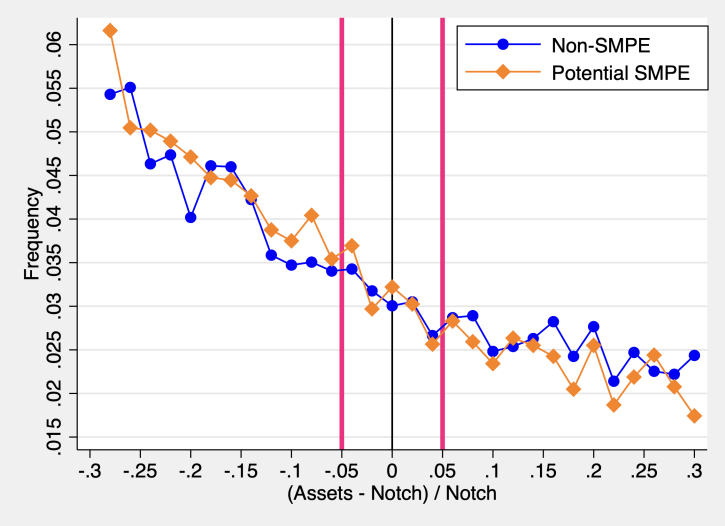
(c) from 2012 to 2013 (d) from 2013 to 2014



(e) from 2014 to 2015 (f) from 2015 to 2016

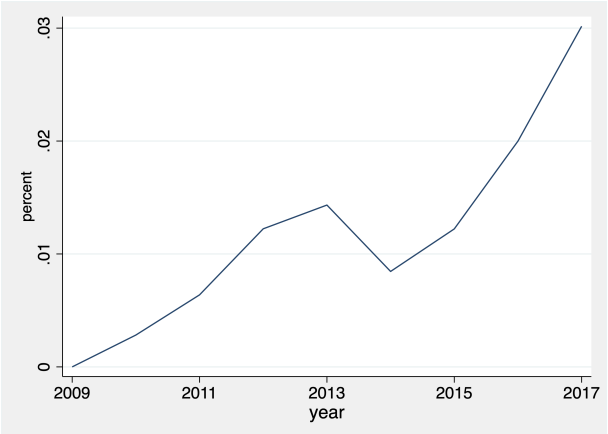
Note: Each panel plots the distribution of normalized taxable income growth from year t to $t+1$ around the policy threshold in year t, respectively. In Panel a, we categorize firms with taxable income between 10-20k, 20-30k, 30-40k, and 40-100k as the "far below", "just below", "just above", and "far above" groups, respectively. In Panels b-c, the four groups are defined as firms with taxable income between 30-50k, 50-60k, 60-70k, and 70-100k, respectively. In panel d, the four groups are defined as firms with taxable income between 60-90k, 90-100k, 100-110k, and 110-180k, respectively. In panel e, the four groups are defined as firms with taxable income between 100-190k, 190-200k, 200-210k, and 210-280k. In panel f, the four groups are defined as firms with taxable income between 200-290k, 290-300k, 300-310k, and 310-380k, respectively.

Figure B4: The distributions of total assets around the SMPE qualifying thresholds



Notes: This figure plots the distributions of total assets around the SMPE total assets threshold (30 million RMB) for potential SMPEs with taxable income below the policy threshold (the yellow line) and non-eligible firms with taxable income above the policy threshold (the blue line) during 2012-2016, separately.

Figure B5: Percentage of listed firms with SMPE subsidiaries



Note: This figure plots the percentage of publicly listed Chinese firms with subsidiaries paying the corporate income tax at the 10% rate during the period 2009-2017. We collect the information manually from listed firms annual reports.

Table B1: The impact of the SMPE tax cuts on investment and TFP: a smaller control group

	Δlog(Fixed Assets)			Ln(TFP)		
	(1)	(2)	(3)	(4)	(5)	(6)
$T_{i,2012} \times Post_{2012}$	0.029***			0.024***		
	(0.012)			(0.004)		
$T_{i,2014} \times Post_{2014}$		0.021***			0.016***	
		(0.007)			(0.004)	
$T_{i,2015} \times Post_{2015}$			0.014**			0.018***
			(0.005)			(0.004)
Observations	7,391	7,569	10,295	7,128	7,341	9,996
Controls				Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Industry-year FE	Y	Y	Y	Y	Y	Y

Notes: In this table, we report the estimated effect of the tax cuts for SMPEs on firms' investment and TFP. We restrict the control firms to large firms whose taxable income during the sample period was between 300,000 and 1.5 million RMB. We use the treatment group where we exclude "shrinking firms" in this table. We control for firm-level and industry-year fixed effects in all columns, and control for firms sales (in logs) in addition in the last three columns. Robust standard errors reported in the parentheses are industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B2: Robustness check: excluding more bunching firms

	2012		2014		2015	
	5%	10%	5%	10%	5%	10%
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Δ Ln(Fixed Assets)						
$T_{i,C} \times Post_C$	0.015**	0.014*	0.014**	0.015**	0.003	0.003
	(0.007)	(0.007)	(0.005)	(0.006)	(0.004)	(0.004)
Observations	18,724	18,330	18,418	22,073	19,528	21,071
Panel B: Ln(TFP)						
$T_{i,C} \times Post_C$	0.02***	0.02***	0.018***	0.018***	0.02***	0.02***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Controls	Y	Y	Y	Y	Y	Y
Observations	18,395	18,047	18,158	17,609	21,748	20,796
Firm FE	Y	Y	Y	Y	Y	Y
Industry-year FE	Y	Y	Y	Y	Y	Y

Notes: This table applies different exclusion criteria to the treated firms. Treatment groups in columns 1, 3 and 5 exclude firms within the 5% range of the upper qualifying taxable income threshold for each cohort. Treatment groups in columns 2, 4 and 6 exclude firms within the 10% range of the upper qualifying taxable income threshold. We use the baseline treatment group (including shrinking firms) and control group for this exercise. We control for firm-level and industry-year fixed effects in all regressions. We control for firm sales (in logs) in the TFP estimations. Robust standard errors are clustered at the industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B3: The impact of the SMPE tax cuts on investment and TFP: IV estimation results

	Δlog(Fixed Assets)			Ln(TFP)		
	(1)	(2)	(3)	(4)	(5)	(6)
$T_{i,2012} \times Post_{2012}$	0.032***			0.025***		
	(0.012)			(0.004)		
$T_{i,2014} \times Post_{2014}$		0.021***			0.014***	
		(0.007)			(0.005)	
$T_{i,2015} \times Post_{2015}$			0.020***			0.018***
			(0.005)			(0.004)
KP statistics	3423.67	35040.12	8793.82	7008.79	24226.43	8465.03
Observations	19124	18790	22769	18747	22427	
Controls				Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Industry-year FE	Y	Y	Y	Y	Y	Y

Notes: In this table, we report the estimated effect of the tax cuts for SMPEs on firms' investment and TFP using the IV approach. The IV estimation is illustrated in Section 3.2. We control for firm-level and industry-year fixed effects in all columns, and control for firm sales (in logs) in addition in the last three columns. Robust standard errors are reported in the parentheses, and are clustered at the industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B4: The impact of the SMPE tax cuts on wage and payout: IV approach

	Ln(Wage)			Ln(Payout)		I(Payout>0)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$T_{i,2012} \times Post_{2012}$	0.10						
	(0.13)						
$T_{i,2014} \times Post_{2014}$		0.13		-0.48		-0.01	
		(0.089)		(0.31)		(0.028)	
$T_{i,2015} \times Post_{2015}$			-0.041		-0.11		-0.017
			(0.062)		(0.16)		(0.018)
KP statistics	6791.83	22006.82	8762.82	7551.77	6744.55	7551.77	6744.55
Observations	18,981	18,738	22,637	12,281	14,993	12,281	14,993
Controls	✓	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓	✓

Notes: In this table, we report the DiD estimation results for the effect of the SMPE tax cut on treated firms' wages and payout, using the benchmark treatment group. The dependent variable is total wage (in logs) in columns 1-3, payout (in logs) in columns 4-5, and an indicator for positive payout in columns 6-7. Payout is calculated as: Payout$_t$ = Net Profit$_t$ + Retained Earnings$_{t-1}$ − Retained Earnings$_t$. If the payout is negative, we set $Ln(Payout)$ to be zero. The control group consists of large companies that always faced a 25% corporate tax rate. We control for firm-level, year-sector-level fixed effects, and firm sales (in logs) in all columns. Robust standard errors are clustered at the industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B5: The impact of the SMPE tax cuts on firm-level TFP – OP approach

Dependent variable: Ln(TFP)						
	2012		2014		2015	
	(1)	(2)	(3)	(4)	(5)	(6)
$T_{i,2012} \times Post_{2012}$	0.025***	0.041***				
	(0.006)	(0.009)				
$T_{i,2014} \times Post_{2014}$			0.038***	0.033**		
			(0.005)	(0.007)		
$T_{i,2015} \times Post_{2015}$					0.032***	0.033***
					(0.006)	(0.007)
Observations	15,749	14,040	15,588	14,341	18,794	16,408
Controls	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓

Notes: In this table, we report the estimated effect of the lower corporate tax rate for SMPEs on treated firms' total factor productivity. The dependent variable is firm-level TFP (in logs), obtained by estimating the production function using the Olley and Pakes (OP, 1996) methodology. We use the benchmark treated firms in columns 1, 3 and 5. We exclude "shrinking firms" from the benchmark treatment group in columns 2, 4 and 6. The control group consists of large companies that always pay corporate tax at a rate of 25%. We control for firm-level and industry-year fixed effects, as well as firm sales (in logs) in all columns. Robust standard errors are clustered at the industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B6: The impact of tax cuts on firms' after-tax profit

Dependent variable: Ln(After-tax profit/Fixed assets)						
	2012		2014		2015	
	(1)	(2)	(3)	(4)	(5)	(6)
$T_{i,2012} \times Post_{2012}$	0.013***	0.027***				
	(0.003)	(0.003)				
$T_{i,2014} \times Post_{2014}$			0.005**	0.013***		
			(0.002)	(0.002)		
$T_{i,2015} \times Post_{2015}$					0.006***	0.013***
					(0.002)	(0.002)
Observations	22,179	19,715	21,880	19,968	26,555	23,169
Controls	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓

Notes: In this table, we report the estimated effect of the lower corporate tax rate for SMPEs on treated firms' after-tax profit (scaled by total fixed assets). We use the baseline sample of treated firms in columns 1, 3 and 5. We exclude "shrinking firms" from the baseline treatment group in columns 2, 4 and 6. We control for firm sales (in logs), firm-level and industry-year fixed effects in all columns. Robust standard errors are clustered at the industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B7: Independent SMPEs versus potential subsidiaries

	ΔLn(Fixed Assets)			Ln(TFP)		
	(1)	(2)	(3)	(4)	(5)	(6)
$T_{i,2012} \times Post_{2012}$	0.014**			0.02***		
	(0.006)			(0.004)		
$T_{i,2012} \times Post_{2012} \times$	0.037			-0.021		
$Corp.owned_i$	(0.041)			(0.017)		
$T_{i,2014} \times Post_{2014}$		0.012**			0.018**	
		(0.005)			(0.004)	
$T_{i,2014} \times Post_{2014} \times$		-0.025			-0.014	
$Corp.owned_i$		(0.021)			(0.012)	
$T_{i,2015} \times Post_{2015}$			0.003			0.019***
			(0.011)			(0.004)
$T_{i,2015} \times Post_{2015} \times$			0.003			0.009
$Corp.owned_i$			(0.027)			(0.015)
Observations	19,088	18,748	22,698	18,712	18,463	22,375
Controls				✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓

Notes: This table reports the triple DiD estimation results when we distinguish potential subsidiaries from other firms in the treatment groups. $Corp.owned_i$ is a dummy that equals 1 if a firm is wholly owned by a single corporation, and 0 otherwise. We use the baseline treatment group and the always-large firms as the control group. We control for firm-level and industry-year fixed effects in all columns. We control for sales (in logs) in columns 4-6. Robust standard errors are clustered at the industry-year level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B8: The levels of employment and registered capital upon firm establishment

	Obs.	Mean	Medium
A. Micro-firm entries			
Employees	932,741	14.26	8
Capital (in 1,000 RMB)	932,741	4,187	600
B. Small-firm entries			
Employees	135,727	41.70	21
Capital (in 1,000 RMB)	135,727	9,703	2,100
C. Medium/Large-firm entries			
Employees	9,192	413.9	240
Capital (in 1,000 RMB)	9,192	100,951	23,800
D.Unclassifid-firm entries			
Employees	264,280	8.95	6
Capital (in 1,000 RMB)	264,280	4,892	1,000

Notes: This table presents the summary statistics for the levels of employment and registered capital when firms were established during 2005-2017. We use the snapshot of the 2017 registration data for the universe of firms in the province we study.

Table B9: Effects of the SMPE tax cuts on partnership firm entry: DI-RD

	2010		2012		2015	
	(1) L	(2) H	(3) L	(4) H	(5) L	(6) H
D_t	-0.003	-0.005	0.02	-0.074	0.069	-0.075
	(0.05)	(0.039)	(0.055)	(0.046)	(0.051)	(0.072)
Fixed-effects	day-of-the-week, industry-month, prefecture					
N(effective)	693	1,216	710	1,037	760	1,131

Note: In this table, we report the DI-RD estimation results based on Equation 6. "L" stands for low external financial dependence and "H" stands for high external financial dependence. The running variable is the number of days between the unlimited liability company's registry day and the policy announcement day. The dependent variable takes the log form of the total number of micro and unclassified firms by industry, prefecture, and day. Standard errors clustered by industry-month are in parentheses. * p <0.1, ** p <0.05, *** p <0.01.