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

October 2021

Wei Cui (Peter A Allard School of Law, University of British Columbia)
Mengying Wei (School of Banking and Finance, University of International Business and Economics)
Weisi Xie (Antai College of Economics and Management, Shanghai Jiao Tong University)
Jing Xing (Antai College of Economics and Management, Shanghai Jiao Tong University)

Working paper | 2021-16

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

Wei Cui † Mengying Wei ‡ Weisi Xie § Jing Xing¶

Abstract

What do small firms do when given an income tax cut? We address this question by examining the consequences of a sharp reduction in the corporate income tax rate for small- and micro-profit enterprises (SMPE) in China based on confidential tax returns. Utilizing the gradual increases in the qualifying threshold for SMPEs during 2010-2016, we find that newly qualified SMPEs with positive taxable income increased investment, interest expense and productivity. SMPEs in taxable losses did not respond to the tax cut. The tax cut induced more SMPEs to register, especially those in financially constrained sectors. Despite these positive effects, firms' fixed asset growth slows down when they get closer to the SMPE threshold. Our study contributes to understanding the effect of tax preferences for small businesses.

Keywords: tax incentives, small firms, productivity, investment, firm entry

*We thank Katarzyna Bilicka, Huasheng Gao, Roger Gordon, Jeff Hicks, Max Norton, Jun Qian, Shangjin Wei, Eric Zwick, seminar participants at Oxford University Centre for Business Taxation and Fanhai International School of Finance, participants at the IIPF annual conference, CCER Summer Institute, and the Econometric Society China Meeting for helpful comments and suggestions. Cui acknowledges financial support from the Social Sciences and Humanities Research Council of Canada. Xing acknowledges financial support from National Natural Science Foundation of China (No. 71903125) and Shanghai Pujiang Program (No. 16PJC056).

†Peter A Allard School of Law, University of British Columbia

‡School of Banking and Finance, University of International Business and Economics

§Antai College of Economics and Management, Shanghai Jiao Tong University

¶Antai College of Economics and Management, Shanghai Jiao Tong University. Corresponding author. Email: jing.xing@sjtu.edu.cn.

1 Introduction

Small businesses are often thought to be essential to job creation, innovation, investment and productivity growth (Ayyagari et al., 2014; Decker et al., 2014; Haltiwanger et al., 2016; OECD, 2015). However, small firms often do not have adequate access to financing (Beck and Demirguc-Kunt, 2006; Beck et al., 2008). Consequently, governments around the world have implemented various support programs for small firms to alleviate their financial constraints, including the grant of preferential corporate tax rate. What do small firms do when they experience a corporate tax cut? There is little empirical evidence about this issue, partly reflecting the lack of data on small private 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 analyze the effect of corporate tax cut on small firms by utilizing a series of corporate income tax rate cuts for certain "small and micro-profit enterprises" (SMPEs) in China as a natural experiment. Specifically, only half of such SMPEs' taxable income needed to be included when computing its income tax liability since 2010. This effectively reduced the statutory corporate income tax (CIT) rate for the affected SMPEs by a half (from an original rate of 20%). Importantly, the qualifying threshold for this tax cut in terms of taxable income was gradually raised from 30,000 RMB to 300,000 RMB during our sample period 2010-2016.[1] The SMPE rate cuts were offered within a relatively stable corporate income tax regime put in place in 2008. They were not designed to address compliance issues or focus on particular behavioral margins, but were viewed by the government as a pure transfer to businesses.

Using the difference-in-differences approach based on confidential corporate tax returns for manufacturing firms in a large province, we find that SMPEs with positive taxable income and newly eligible for the lower CIT rate increased their investment rate, relative to large firms that never qualified for the lower tax rate. We also find that eligible SMPEs did not increase their total wage bill, suggesting that small manufacturing firms face more urgent needs for equipment than for labor. Interestingly, newly qualified SMPEs with positive taxable income increased, rather than reducing, interest expense relative to the control firms, indicating that enhanced cash flow may have increased their debt capacity. Further, we find that the tax cut led to a significant increase in the total factor productivity of newly qualified and profitable SMPEs, suggesting that firms spent the tax savings

[1] These taxable income thresholds are around 4,688-46,875 USD, using an exchange rate of 1 USD=6.4 RMB.

on productivity-enhancing activities. Overall, our findings are in line with predictions put forward by Blanchard et al. (1994) that facing a windfall of cash, firms that are financially constrained both before and after the windfall should prioritize in investing in projects with positive net present value, rather than repaying the investors.

Among treated SMPEs with positive taxable income, the increase in investment and productivity becomes more prominent as tax saving from the tax rate cut increases. Further, we find that the tax cuts favor profitable SMPEs while loss-making SMPEs did not react to the tax cuts. These findings highlight the importance of the enhanced cash flow. Since 60-70% of SMPEs in our sample were making taxable losses, the effect of the lower corporate tax rate on a typical SMPE's investment and productivity is limited. Rather, the tax cuts only benefit "small winners".

We also examine whether a lower corporate tax rate influences small firms' entry decision. Facing a fixed entry cost, a higher expected after-tax profit is likely to induce firm entry. To test this hypothesis, we apply the regression discontinuity design (RDD) to the tax registration data for the universe of manufacturing firms in the province we study, and analyze the entry rate of micro-sized firms just before and after each increase in the SMPE taxable income threshold during 2010-2016. We show that the increases in the SMPE taxable income threshold led to a significantly higher entry rate of micro-sized firms, especially for firms in industries that were more likely to be financially constrained.

A size-based tax cut can lead to behavioral responses. In addition to documenting bunching below the taxable income threshold, we address the issue whether the threshold-based corporate tax benefit distorts SMPEs' incentives to expand. We find that 28% of SMPEs newly qualified in 2010 grew subsequently above the SMPE threshold at least once by 2016. Note that we exclude bunchers below the taxable income threshold in the benchmark DID estimations, for a cleaner identification. Bringing back the bunchers to the sample, we find no evidence that fixed asset growth slows down when firms get closer to the taxable income threshold. However, firm growth does slow down significantly when they get closer to the total assets threshold. Combining our baseline results with this additional evidence, we conclude that a lower tax rate for small businesses based on size does not necessarily discourage firm expansion. Specifically, while a threshold based on taxable income is more likely to cause reporting manipulation, it appears to exhibit less distortion to real growth than one based on total assets.[2]

Our study makes several contributions to existing literatures and policy debates.

[2]The majority of OECD countries with a lower CIT rate for small businesses use some income threshold, while Japan uses a capital threshold (OECD, 2015).

First, we add to the literature on the effectiveness of government policies that aim to alleviate small businesses' financial constraints. In the mix of supporting programs, grants/subsidies and loans are most widely used (Horvath and Lang, 2021; Rotemberg, 2019). Tax incentives for small firms usually target a specific margin. For example, accelerated depreciation (e.g., bonus depreciation) is used to lower the cost of capital for investment in fixed assets, and R&D tax credits aim to encourage innovation. In comparison, a cut in the statutory corporate tax rate that aims at reducing small businesses' tax burden is somewhat less common (OECD, 2015), even though it is likely to be more salient and potentially less distorting. Existing studies on tax incentives for small firms reflect this pattern of public policy choice: there are more studies on deductions and tax credits (Agrawal et al., 2020; Dechezleprêtre et al., 2016; Koga, 2003; Lokshin and Mohnen, 2012; Maffini et al., 2019) than on the effects of tax cuts (Harju et al., 2020; Pham, 2020).[3] What small firms do with their enhanced cash flow following a tax rate cut remains unclear and we are aware of few studies investigating the issue.

Second, our study is closely related to the strand of literature on how financial constraints affect productivity growth (Chemmanur et al., 2011; Krishnan et al., 2015; Levine and Warusawitharana, 2021). In particular, we contribute to the understanding of how lowering small firms' tax burden affects their productivity. Evidence from the few existing studies is mixed. Arnold et al. (2011) find that CIT rates are negatively associated with industry-level total factor productivity, but has no impact on small and young firms. Romero-Jordán et al. (2020) show that corporation tax prevents the SMEs in Spain from improving their productivity. Based on a panel of European countries, Gemmell et al. (2018) find that it takes longer for small firms' productivity to catch up with the frontier when the statutory corporate tax rates are higher. None of these studies utilizes the natural experiment approach as we do, which should provide a better identification.

Third, our study contributes to the growing literature on the effectiveness of tax incentives in developing country contexts (Chen et al., 2019, 2021), to which simpler tax incentives may be more suited. Cui et al. (2020) find that the majority of Chinese firms with eligible investments fail to claim tax benefits for accelerated depreciation, likely due to lack of awareness or understanding. They also show that awareness of complex tax incentives tends to decrease as firm size decreases. We show that even in countries with poor taxpayer sophistication, a straightforward corporate tax cut

[3] Harju et al. (2020) analyze the impact of a 2014 universal corporate rate reduction in Finland on small firms, where the scale of the tax cut (from 24.5% to 20%) is small. Pham (2020) examines a corporate tax cut in Vietnam that lasts for only one year. The tax cut for Chinese SMPEs is both large in scale and more permanent.

for small firms is salient and effective, at least for the "small winners".

2 Policy Background

Under China's 2008 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 asset 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 its income tax liability. The tax rate on such firms was thus effectively reduced to 10%.[4] 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: the threshold was (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 gradual increase in the taxable income threshold for SMPEs during our sample period. Meanwhile, the qualifying thresholds in terms of total asset and employees remained intact.

While the half-income-inclusion rule for SMPE firms has always been announced as "temporary", it has become an important general tax reduction measure receiving great political emphasis.[5] We study the rate reduction for SMPEs during the 2010-2016 period as our data ends in 2016, but it is worth noting that in 2017, the government 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

[4] If the SMPE firm already qualified for some other preferential statutory 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%.

[5] A turning point came in 2015, when Premier Li Keqiang made tax reduction a central component of the government's policy to encourage entrepreneurship. As a result, the threshold for the tax preference was raised twice that year.

3 million range can claim half-income inclusion or a 10% rate.[6] Chinese President Xi Jinping spoke of these policies as delivering "inclusive" tax cuts. [7]

Our study examines the earlier phases of this policy by focusing on the increasing qualifying threshold in terms of taxable income for SMPEs 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). Because we investigate the impact of income tax reductions on firm productivity, in our study we choose to focus on manufacturing firms, which were not directly impacted by the 2012-2016 VAT reform.[8] Second, under the CIT regime, the government enacted accelerated depreciation policies in 2014 and 2015 (Cui et al., 2020; Fan and Liu, 2020). These policies affected manufacturing firms large and small, and thus again can be assumed to affect our treated and control groups equally. Third, the law on the personal income tax (PIT) was amended in 2011, which (i) lowered the tax rate for lower levels of wage income, (ii) slightly raised tax at the highest levels of wage income, and (iii) lowered tax on sole proprietor or partnership income. However, the top corporate tax rate remained lower than the highest marginal rates on wage (45%), non-wage labor compensation (32%), or self-employment income (35%).[9] Corporations in China are allowed a wide range of deductions in computing income, while deductions are limited for wage earners.[10] 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—although the CIT rate cut itself may certainly have increased such benefits.

To examine whether the SMPE rate cuts possessed salience, Figure B1 provides the search intensity for the following key words (in Chinese) on Baidu, China's most popular search platform : "preferential corporate income tax rate for SMPEs", and "the qualifying criteria for SPMEs". As a benchmark, we also illustrate the search

[6] In the rest of the paper we will refer to the policy as a cut of the corporate tax rate to 10%. This is largely accurate for the period we study, although the partial-income-inclusion rule could also apply to taxpayers facing the 15% (before 2016) and 25% (after 2016) statutory rates.

[7] 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 political connected firms (Bai et al., 2016). Expansionary or "proactive" fiscal policy must target small firms.

[8] 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.

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

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

intensity for"tax reporting". Figure B1 shows that part of the volatility in the search intensity for the first two key words is driven by the search for "tax reporting". There are periods of intensive searches for the first two key words–notably during calendar years 2012, 2014 and 2015– suggesting that the policy attracted much attention. In comparison, we plot the search intensity for the key word "accelerated depreciation for fixed assets" (AD), a tax incentive effective from 2014 that allows firms to opt to a faster depreciation. Accelerated depreciation is more complex than a straightforward rate cut, and Cui et al. (2020) show that poor understanding of this tax incentive led to rather low level of take up. Online searches for the SMPE tax cuts were substantially more intensive than for AD, confirming the former's greater salience.

3 Empirical strategy

We adopt a standard differences-in-differences (DID) strategy to identify the effect of the preferential CIT scheme for SMPEs. By construction, we aim to pin down the effect on SMPEs that became qualified for a rate cut because of a change in threshold. Since our data covers 2010-2016, we focus on the policy changes in 2012, 2014, and March 2015. 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 of 2015 and hence, firms only had 14 months to respond.

Specifically, we estimate the following equation for each treatment cohort $c \in \{2012, 2014, 2015\}$:

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

where $Y_{i,t,c}$ is the outcome variable of interest, including firm-level investment, total factor productivity, wage, and interest expense. $Post_c$ is an indicator for post-treatment years:

$$Post_c = \begin{cases} 1 & \text{if} \quad t \geq c, \\ 0 & \text{otherwise.} \end{cases} \tag{2}$$

$T_{i,c}$ is an indicator for being treated by the rate cut in year c. We regard a firm as being *treated* in year c if: 1) it was below the SMPE assets and employment thresholds in year c ; 2) its taxable income was between the old and the new qualifying thresholds in the policy change year c; and 3) it experienced a reduction in the income tax rate in year c relative to prior years. To satisfy criteria 1, we exclude firms with annual total assets above 30 million yuan and initial employees upon registration

greater than 100 from the treatment group.[11] By criteria 3, a firm was not treated by the policy change in year c if its tax rate did 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. Moreover, our construction of the treatment group automatically excludes SMPEs in taxable losses in the rate change years.[12]

As each rate cut likely affected firms of different sizes, our definition of treatment allows an examination of whether the effect of the tax cut is different across the treatment cohorts. The treatment effect for each cohort may well differ also because the earlier treatment cohort would have more time to adjust during our sample period. Note a firm can only be treated once, according to criteria 3. That is, if a firm treated in 2012 had taxable income between 60K and 100K RMB in 2014, the policy change in 2014 would not affect the firm's actual tax rate (still at 10%) and hence, we do not regard this firm as being treated in 2014. However, if the 2014 policy change is unexpected, the firm could be regarded as receiving an unexpected windfall of tax savings in 2014. To identify the effect of each wave of tax cut, we thus exclude firms from each treatment cohort that were exposed to subsequent policy changes.

One concern is that treated firms may manipulate taxable income to qualify as SMPEs, which would lead to endogenous treatment. In the left panels of Figure B2, we plot the distribution of the taxable income (in logs) across all firms in the tax return in each rate change year. There, we observe a prominent concentration of firms around the qualifying thresholds. These bunching patterns indicate possible manipulation. The other two qualifying criteria, namely total assets and employees, should be more difficult to manipulate than taxable income. For example, we plot the distributions of total assets (in logs) across firms in Figure B3, which appears to be smooth without obvious bunching. In our benchmark analysis, we thus exclude treated firms whose taxable income was close to the qualifying thresholds of each rate change. Specifically, we exclude those whose taxable income was in the range $((1-1.5\%) \times Threshold_c, (1+1.5\%) \times Threshold_c)$, where $Threshold_c$ is the qualifying threshold in terms of taxable income for rate change in year c. The right

[11] We only observe the number of total employees in a taxpayer registry and not in the tax returns. Since 2014, tax administrators in the province we study has prompted taxpayer to update their tax registry information each year, but it is unknown how many firms complied. If some firms reported their most recent employment and also experienced growth in employment during 2010-2016, they may be excluded from the treatment group and our growth estimates may be biased downward.

[12] Section 5.2 discusses loss-making firms.

panels of Figure B2 magnify the area of exclusion.[13]

We use firms that always paid income tax at the rate of 25% (that is, the "large" firms) during our sample period 2010-2016 as the the control group. These firms were not affected by changes in the SMPE qualifying threshold as their taxable income was always above the affected ranges and they never experienced any reduction in the CIT rate. In principle, any firm facing a constant CIT rate and staying in the same tax bracket throughout the sample years can serve as a potential control. An alternative choice for the control group appears to be firms with taxable income always below 30k and always paid corporate income tax at 10%. However, these "always-SMPEs" were exposed to the 2010 rate change, and if the effect of this change manifests in a subsequent year, our estimates may be biased.

In Equation (1), $X_{i,t,c}$ is a set of time-varying controls at the firm level. Since firm-level investment and productivity are both strongly correlated with firm sales, we control for firms' annual sales in most estimations to single out the effect of the tax rate changes.[14] $\varphi_{i,c}$ is firm-level fixed effect. We include 2 digit industry-year fixed effects, $\varphi_{s,t,c}$, to capture any unobserved industry-year factors. To alleviate the concern that the tax rate changes targeting SMPEs were implemented as a response to different time trends experienced by firms of different sizes, we include interactions between firms' initial sizes and the time trends to control for such possible confounding effects. We measure firms' initial sizes by employment upon registration. Under the assumption that, conditioning on the covariates and the fixed effects included in Equation (1), the error term is uncorrelated with the treatment dummy, the conditional independent assumption (CIA) holds. β_c^{DID} then captures the effects of the rate changes on firms' performance. For estimations, we cluster the standard errors over the firm and industry-year to allow for arbitrary forms of heteroskedasticity.

4 Data

We use confidential administrative data of corporate tax returns from one large and prosperous Chinese province to analyze the tax cuts' impact on newly qualified SMPEs. 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

[13] In Table B3, we exclude newly qualified SMPEs whose taxable income was within the 5% or 10% range of the qualifying threshold for taxable income. The results are similar to what we obtained in the benchmark estimations.

[14] For example, the neoclassical investment theory predicts a positive association between output and capital stocks in equilibrium (Hall and Jorgenson, 1967). It is also common to control for sales in the estimations of TFP (Atanassov and Liu, 2020; Hall and Ziedoins, 2001).

sheets for the years 2012-2016, as well as firms' tax registration records. The firms' tax registration data is a snapshot of the universe of manufacturing firms in the province we study as in 2017. It covers information such as the date of establishment, which allows us to examine the effect of tax cut on firm entry. The tax registration data also provides information on firms' capital and employment upon registration, as well as their size classification as determined by tax authorities. In addition, we obtain certain information about each firm's investors, including the percentages of shareholdings by investor types.[15] We use this information to distinguish firms in the tax returns that are likely to be subsidiaries of another company.

Two features distinguish our data from those used by other researchers studying Chinese firms, notably the Annual Survey of Industrial Firms (ASIF) collected by the National Bureau of Statistics.[16] Unlike the ASIF data that consists of above-scale manufacturing firms, our data covers firms of all sizes, allowing us to examine the impact of tax cuts on SMPEs.[17] Second, the tax returns cover more recent years than the ASIF–which is available only up until 2013–making possible the analysis of the impact of the recent SMPE tax cuts.

Our proxy for the nominal investment rate is the annual change in the natural logarithm of firm-level fixed assets, evaluated at historical cost.[18] While Chinese corporate tax returns do not report capital expenditures, this measure should approximate the true investment rate if asset disposal is infrequent and small in magnitude. To analyze how the tax rate changes affected newly qualified SMPEs' productivity, we first estimate a production function for each 2-digit Chinese Industry Classification (CIC) industry in manufacturing, and calculate the firm-level total factor productivity 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 firm's TFP from idiosyncratic productivity shocks. We 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. 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 esti-

[15] The investor dataset provides the percentage of share holding by 72 types of investors, such as individuals, state-owned enterprises, privately-owned enterprises, foreign enterprises, and other organizations.

[16] See Brandt et al. (2017) for detailed discussions of ASIF.

[17] "Above-scale" firms refer to firms with annual revenue greater than 5 million RMB.

[18] 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.

mate the production function. We document the construction of the main variables used 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. After restricting our sample of manufacturing firms and going through the above steps, we obtain 758 firms in the 2012 treatment cohort, 592 firms in the 2014 treatment cohort, and 1,153 firms in the 2015 treatment cohort. Table 1 illustrates how we select the treatment groups step by step.

Table 2 provides summary statistics in terms of key variables during our sample periods for the three treatment and control groups, respectively. As expected, the treated firms tend to be smaller than firms in the control group in terms of total assets, fixed assets, annual sales and total wage bills. Also unsurprisingly, 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 lower profitability proxied by the ratio of net profit to fixed assets. Only 28% of the 2012 treatment cohort reported positive interest expenses, and this ratio increases as firm becomes larger. This indicates that smaller firms have less access to external financing. Based on the ACF method, we find that treated firms are on average less productive than larger firms in the control group.

5 Results

5.1 Responses of profitable SMPEs

5.1.1 How did firms spend the tax savings?

Blanchard et al. (1994) show that for a financially constrained firm experiencing a cash windfall, it should invest all of the cash to undertake projects with positive net present value as long as the windfall does not completely relieve the firm's financial constraint. Given their small sizes, our treated SMPEs are highly likely to be financially constrained both before and after the tax cut. Since these are manufacturing firms which tend to rely on fixed assets for production, our conjecture is that the treated firms should prioritize in purchasing fixed assets.

To test this hypothesis, we report the DID estimation results based on our main specification in Table 3, where the dependent variable is the investment rate, proxied by the annual change in the natural logarithm of fixed assets. It shows that newly qualified SMPEs with positive taxable income in all three treatment cohorts increased their investment rate significantly after the tax rate changes, relative to the

control group. The 2012 treated firms increased their investment rate by around 2.2 percentage points, significant at the 5 percent level. For the latter two treatment cohorts, the estimated increase in investment rate is smaller in magnitude, around 1.6 and 1.2 percentage points, respectively. The mean investment rate before treatment is 12%, 13% and 16% for the three treatment cohorts. This implies an increase in investment rate by 18%, 12% and 7.5%.

To investigate the dynamic effects of the tax rate changes on firm-level investment, we plot in Figure 2 the average investment rate for each year relative to the reference year (one year before each policy change), conditioning on the full set of covariates and firm fixed effects, for the treated and control groups respectively. We find that the parallel trends assumption largely holds.[19] Figure 2 shows that the investment rate in the 2012 treatment cohort started to increase from 2013, but such increase only became statistically significant since 2015. For the 2014 treatment cohort, the investment rate started to rise significantly from 2015. For the 2015 treatment cohort, investment also increased in both 2015 and 2016. A possible explanation for the delayed response of the 2012 cohort is that, the tax cut generated a relative small amount of immediate tax saving for them (6K yuan at the maximum). A firm may thus need to accumulate tax savings over time to purchase fixed assets. For the latter two treatment cohorts, the amount of more immediate tax saving is much higher.

To undertake any positive NPV project, a firm may also utilize tax savings to hire more employees or better employees. Given our treated firms are in the manufacturing industries, however, demand for fixed assets may be more urgent than that for labor. Separately, recent studies suggest that firms share rent with employees and pass through tax savings to them (Fuest et al., 2018). When a firm is financially constrained, however, rent sharing may be less likely. For these reasons, we hypothesize that treated SMPEs are less likely to spend tax savings on labor than on purchasing fixed assets. Unfortunately, we do not observe wage per worker or annual employment. This prevents us from analyzing the effect of the tax rate cut on these margins. Instead, we observe firms' annual total wage bills. Column 1 of Table 4 indicates that the estimated treatment effects on total wage for the three treatment cohorts are all positive. Such effects, however, are not statistically significant. Figure 3 illustrates the dynamic effects on total wage, which again shows the null impact. We also use the ratio of fixed assets to total wages (in logs) as the dependent variable in the DID estimations in column 2 of Table 4. If the SMPE tax cuts did not change the unit price of capital or labor, the change in $Ln(PK/WL)$

[19] Note for investment rate, the data starts from 2011 since we take the first-difference of the fixed assets in logs.

should be equivalent to that in $Ln(K/L)$. For all three treatment cohorts, this ratio increased significantly after the tax cuts. We obtain similar results when using the ratio of real fixed assets in real total wages (in logs) as the dependent variable in column 3. These results indicate that the tax rate cuts led treated SMPEs to become more capital intensive.

When the corporate income tax rate declines, a firm facing the perfect capital market should reduce debt as interest deductions now bring a smaller tax shield. The case for a constrained firm is likely to differ. As argued by Blanchard et al. (1994), a financially constrained firm receiving a windfall of cash should not use the tax savings to repay the investors, such as repaying its debt. In fact, they predict that such firms may increase debt usage since the enhanced cash flow enlarges their debt capacity. This view is echoed by Ivanov et al. (2020) who show that tax cuts lead to higher leverage, especially for privately held firms, as they result in lower default.

In the first three columns in Table 5, we find that total interest expense increased for all three treatment cohorts after the tax cut relative to that of the control firms, although only significantly so for the 2014 and 2015 cohorts. In columns 4-6 of Table 5, we find that treated firms became more likely to report positive interest expenses after they received the tax cut, relative to the control firms. Figure 4 shows that the positive impact on debt usage becomes most prominent in 2016 for all three treatment cohorts. One concern is that the usage of debt may be caused by falling internal fund, despite of the tax cut. In Table B2 in the Appendix, we find that treated firms experienced a relative increase in their after-tax profit (scaled by fixed assets). The dynamic plot in Figure B5 reinforces this finding. This indicates that treated firms did not increase borrowing as a response to shrinking internal fund. Rather, all else equal, increased after-tax profit and cash flow enable firms to borrow.

5.1.2 Productivity

We next examine whether the tax cut affects treated firms' productivity. Table 6 reports the DID estimates where the dependent variable is firm-level total factor productivity (in logs). Treated firms experienced significant increase in their TFP, relative to the control group. The magnitude of the TFP increase is similar across three treatment cohorts, around 1.5-1.7%. Using the alternative OP method to estimate the production function, we obtain qualitatively similar results as reported in Table B1, although the point estimates tend to be larger.[20]

[20] Note that 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.

Figure 5 report 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. We observe a gradual increase in TFP among treated firms after the tax rate changes, for all three treatment cohorts. TFP also appears to increase faster than investment, suggesting that investment in better, more efficient fixed assets is not the only source for TFP increase. Instead, firms may have spent the tax savings on other types of productivity-enhancing activities, such as training.

Our view echos that in Liu and Mao (2019), who find that enhanced cash flow due to China's 2009 transition from a production-based VAT system to a consumption based VAT 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] In Table B2, we find that the tax rate changes increased treated firms' after-tax profit as a ratio to fixed assets by 2.3 percent for the 2012 treatment cohort, 1.8 percent for the 2014 treatment cohort, and 1.6 percent for the 2015 treatment cohort. These translate into an analogous semi-elasticities between 0.65 and 1.06 for the three treatment cohorts. Our findings are thus comparable to that found in Mao and Liu (2019) for smaller firms.

5.1.3 The effect of enhanced cash flow

The SMPE tax cuts should have larger impact on firms with greater tax savings. For example, for the 2012 treatment cohort, the maximum tax saving is 6,000 RMB (60,000$\times$ 10%), while the minimum is 3,000 RMB (30, 000$\times$ 10%). The effect is likely to be more substantial for firms closer to the upper qualifying threshold, if the cash flow effect is important. To examine this potential heterogeneity, we estimate the effect of one thousand RMB tax saving due to the SMPE rate cuts on firms' investment and TFP. We first calculate how much the tax cuts lowered treated firms' tax liability, by multiplying 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 the post-treatment dummy and include this term in the DID estimations.

We report the estimation results in Table 7. For all three treatment cohorts, we estimate a positive and significant effect of tax savings on treated firms' investment and TFP. 1,000 RMB of tax saving is associated with around 0.3 percent increase in TFP for the 2012 treatment cohort. This effect becomes smaller for the latter two treatment cohorts, which is around 0.2 and 0.1 percent respectively. For investment,

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

1,000 RMB of tax saving leads to 0.5 percentage point increase in the investment rate for the 2012 treatment cohort, and this is reduced to 0.2 and 0.1 percentage point for the 2014 and 2015 treatment cohorts.

This analyses suggests that the SMPE rate cut generates a larger impact on firms with higher taxable income. Our finding is in line with the Arnold et al. (2011), who find that the effect of CIT on TFP is larger for firms in more profitable industries. Note that treated firms with different distances to the taxable income threshold experienced the same reduction in the cost of capital, but obtained different incremental cash flow. This result thus highlights the enhanced cash flow channel as the key explanation for observed increases in investment and productivity.

5.1.4 Behaviour responses

The lower CIT rate creates a notch in the corporate tax schedule. As a result, taxpayers may shift income to eligible firms and years. For example, firms can accelerate the recognition of revenue when they are still eligible and postpone the recognition of costs until they become non-eligible. Such behavioral responses may bias our estimations, especially (upward) for TFP.

In our benchmark estimations, we already exclude firms with taxable income near the qualifying threshold. As a robustness check, in Table B3, we exclude more firms by enlarging the bunching range. The results in terms of investment rate and productivity are unchanged. As a further check, we plot the evolution of taxable income, revenue and business costs for the treated and control groups in Figure 6. We use the year before each policy change as the reference year. Figure 6 does not reveal any significant diverging trends between treated and control groups in terms of these three variables, either before or after each treatment year. In Figure B4, we also analyze the distribution of sales, net profit, and business costs against firms' taxable income for all firms (excluding the bunchers) in each of the rate change years 2012, 2014 and 2015, respectively. There, we do not find discontinuity in the distributions of these variables between the old and new taxable income thresholds. This provides further evidence that the increase in the taxable income threshold for SMPE tax benefit did not trigger substantial inter-temporal shifting for the non-bunchers. Two factors may explain the limited behavior responses as we document. First, the SMPE tax policies may have come to be regarded as more or less permanent. Second, as we show later, the majority of SMPEs remained as SMPEs by the end of our sample period. If firms expect to stay as SMPEs for a long time, they would have weaker incentives to engage in inter-temporal shifting.

Another concern is that the SMPE tax policies may induce large firms to spin-off

and enjoy the lower tax rate by shifting profits into the new entities. If our treatment groups contain such spin-offs, our DID estimates may be biased downward. To fully examine this would require additional information on ownership structures that can link parent firms with subsidiaries, which is not possible through our tax return data.[22] Nevertheless, we know the percentages of share holdings by different types of shareholders upon registration: individuals, corporations, and other types.[23] We thus utilize this information to distinguish between treated firms that are potentially subsidiaries and others. Specifically, we regard those owned by a single corporation as most likely subsidiaries.

Firms in the registration data either are categorized as "micro", "small", "median", "large" according to a national classification system used for statistical (i.e. non-tax) purposes[24] or are "unclassified". 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. The tax authority is also more likely to delay the classification for smaller firms than for larger ones. Table B4 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. For this reason, we combine "micro" and "unclassified" firms, which are most likely to be SMPEs. Table B5 shows that around 38% of "micro" (including "unclassified") firms are wholly owned by one individual, and as high as 87% of these firms have individuals as the largest shareholder. In contrast, less than 5% of the "micro" firms are wholly owned by a single corporation, and less than 9% report their largest shareholders to be corporations. Combining the tax registration data with the tax returns, we obtain the shareholding information for the three treatment cohorts as in the baseline estimations. Less than 4% of our treated firms are wholly owned by just one corporation.

Table B6 shows the triple DID estimations where we interact $Treated \times Post$ with a dummy indicating a treated firm to be a potential subsidiary, and include this interaction as an additional explanatory variable. For TFP, we find that SMPEs in the 2012 treatment cohort exhibit somewhat smaller increase (significant at the 10 percent level) if they were potential subsidiaries. However, there is no significant difference for the 2014 and 2015 treatment cohorts between potential subsidiaries

[22] Since firms in the tax return are anonymous, we cannot match them with external databases (such as Orbis) to map the ownership.

[23] We match an investor structure data set with tax return data. The investor data provides the share holdings by each type of investors, with 72 types of investors in total. We compute the total shares holdings of individuals and corporations based on the shares of these 72 types of investors.

[24] 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.

and stand-alones. For investment and after-tax cash flow, we find that potential subsidiaries do not exhibit different responses to the tax cuts. Taking together, there is only limited evidence that our benchmark estimates are affected by possible spin-off.

If large firms shift profit into newly set-up SMPEs, on the other hand, we expect to see a dip in their taxable income, especially towards the end of our sample—setting up SMPEs to shift profit should be a more appealing strategy when the taxable income threshold is higher. Moreover, we may find a dip in TFP of large firms if they shift revenue into SMPEs, but not factor inputs. We do not observe declining taxable income of the large firms (the control group) in the top panel of Figure 6. Figures 2 and 5 also indicate that large firms experienced no significant change in their investment or TFP trend during our sample period. Overall, these findings indicate that our baseline results are unlikely to be confounded by such behavior responses.

5.2 Loss-making SMPEs

One challenge for targeting tax incentives at small firms is that they are more likely to be in taxable losses than larger firms. For loss-making SMPEs, there is no immediate tax saving from the tax cut. If a firm expects the generate positive taxable income only sufficiently far in the future, the benefit of tax cut would be much dampened. In our benchmark estimations, the treatment group by definition consists of firms with positive taxable income. This excludes SMPEs in taxable losses. Table 8 shows the percent of loss-making firms for SMPEs and non-SMPEs. Based on the tax return, around 54-73% of SMPEs were in taxable losses during our sample period 2010-2016. These are considerably higher than the percent of loss-making non-SMPEs. Around 30% of SMPEs are always in taxable losses during 2010-2016, as reported in the tax returns. For these SMPEs, there would be no tax saving during our sample period. In addition, the ratio of the stock of taxable losses to revenue is also much higher for SMPEs than non-SMPEs. Losses tend to be persistent over time–for an SMPE with taxable losses in the current year, the chance that it would remain loss-making next year is 91%.

In Table 8, we further calculate the percent of firms reporting non-positive net income according to their income statements, since tax and financial reporting differ. SMPEs are more likely to report operating losses in financial reporting than non-SMPEs. The percent of loss-making firms in tax returns is also similar to that in financial reporting. Thus, the larger proportion of SMPEs with taxable losses should reflect poorer performance by smaller firms, rather than a higher level of

tax non-compliance.

Figure 7 plots the estimated differences in firm-level TFP and investment rate between always-loss-making SMPEs and control firms over time. We show that such differences are stable. This indicates that the lower tax rate for SMPEs had little impact on loss-making SMPEs' investment or productivity during our sample period. Therefore, while the tax cuts benefit SMPEs with positive taxable income, they had no impact on the large proportion of SMPEs in losses. It follows that the overall effect of the SMPE tax incentives may also be severely limited by the prevalence of loss-making firms. Consistent with this conjecture, Figure 8 shows that the SMPE tax cuts had no visible impact on investment and TFP of the average SMPE in our sample. The tax cuts appear to benefit only the few small winners.

5.3 Firm entry

When the cost of entry is fixed, a cut in the corporate tax rate and the resulting increase in expected after-tax profit may induce individuals to become entrepreneurs and set up new corporations. The corporate rate cut may also induce existing businesses to incorporate. We use the tax registration data to examine the effect of the SMPE rate cut on firm entry. Our registration data is a 2017 snapshot of all firms in the province we examine and covers all firms established during 2005-2017. Since the tax registration data starts from 2005, 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 tax cut as it coincides with the easing of the registered capital requirement in the Company Law, implemented on March 1st that year, which significantly lowered the barrier for business registration. To be consistent with our basic analysis, we limit the study of firm entry to the manufacturing sector.

To estimate how the lower corporate tax rate affects firm entry, we employ a sharp regression discontinuity design (RDD) to examine entry patterns just before and after each "policy date", defined below. We use the following regression specification:

$$y_{jt} = \alpha + \delta D_t + f(t) + D_t g(t) + \phi_{jm} + \phi_w + \epsilon_{jrt} \tag{3}$$

where the running variable t measures the number of days relative to the "policy date". Note that both the 2010 and 2012 policy changes were effective from January 1st of the year, while both were announced one month before the effective date.[25] Instead of using the policy announcement date, we take the effective date for these two policy changes as the "policy date"–if a small firm registered shortly before the

[25]The 2010 and 2012 tax policy changes were announced on December 2, 2009 and November 29, 2011, respectively.

effective date, it would not enjoy the new tax benefits until next calendar year. In contrast, the 2015 SMPE tax policy change was announced on March 3rd 2015, and it became effective retroactively from January 1st that year. As long as the policy change is unexpected, we would expect to observe an increase in small firm entries only after March 3rd. Thus, we use the announcement date as the 2015 "policy date". D_t equals to 1 since the "policy date".

The tax registration data does not provide information for determining a firm's eligibility for SMPE benefits upon registration. Thus, we analyze the entry of "micro" and "unclassified" firms as an approximation for SMPE status, as discussed previously in Section 5.1.4. We define y_{jt} as the natural logarithm of total number of newly registered micro and unclassified firms in each (2-digit) industry-prefecture-date triplet.[26] $f(t)$ and $g(t)$ are quadratic functions of time t. ϕ_{jm} and ϕ_w denote the industry-year-month and day-of-the-week fixed effects, respectively. We exclude national holidays and weekends from the estimations.

It has been argued that more financially constrained firms may benefit more from a corporate tax cut. To test this heterogeneity, we calculate external finance dependence for each 2-digit CIC (Chinese Industry Classification) sector using ASIF data. The ASIF data covers comprehensive financial statement information for all above-scale firms in the manufacturing sector. External finance dependence is defined as the fraction of capital expenditures not financed by operating cash flows.[27] We define a sector to be financially constrained if its average external finance dependence during 2004-2007 is above the median level of this ratio across all sectors during 2004-2007, and as being unconstrained otherwise. If the CIT cuts for SMPEs induce small firms to enter the market, we expect to see a stronger effect in more financially constrained sectors.

Figure 9 plots the 7-day average number of newly registered micro and unclassified firms (in logs) across 2-digit industries within 140 days around the "policy date" for the 2010, 2012 and 2015 rate changes. There, we observe an increase in the intercept at each time threshold for firm entries in financially constrained sectors for the first two policy changes, while there is no significant jump for firms in the unconstrained sectors. For the 2015 tax cut, while we find a positive increase in entry for micro and unclassified firms in financially constrained sectors, such an

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

[27] The ASIF data does not report firm-level capital expenditures, and we calculate it as the sum of increase in firms' long-term investment, fixed assets and intangible assets as well as the firm's 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, plus inventory reductions, reductions in receivables and increases in the firm's payables.

increase is not statistically significant. Thus, the initial two tax cuts appear to generate a more substantial impact on firm entries. This is unsurprising since the first two tax cuts affect smaller firms that likely face tighter financial constraints.

To implement the RDD estimations, we employ the algorithm developed by Calonico et al. (2014) to select optimal bandwidth non-parametrically. Table 9 presents the bias-corrected and robust RDD estimates. Consistent with Figure 9, we find that SMPE tax policy changes increased entries of micro and unclassified firms in the constrained sectors by approximately 18-19% for the 2010 and 2012 tax cuts, which are statistically significant (columns 2 and 4). The estimated coefficient is positive for firm entries in the unconstrained sectors as well (columns 1 and 3). However, these point estimates are both lower and less significant. We also conduct placebo tests, using the same policy date (January 1st) for 2013-2016 in the Table B7, distinguishing between constrained and unconstrained sectors.[28] In that table, none of the estimates are significantly different from 0. For the 2015 SMPE tax cut, we continue to obtain a larger point estimate for the constrained industries than that for the unconstrained ones (Table 9, columns 5 and 6). However, neither estimate in these two columns is significant.

5.4 Stay small or grow?

One concern about threshold-based tax incentives is whether they would incentivize firms to stay small in fear of losing the tax benefits (Tsuruta, 2020). Table 10 traces qualified SMPEs in each rate change year over our sample period. Focusing on qualified SMPEs in 2010, for example, we find that 16% (1,247/7,768) of them grew above the 30K taxable income threshold after one year. More generally, we can examine how many early-eligible SMPEs grew above the SMPE taxable income threshold that varied over time due to the policy changes in later years. Around 28% of these firms grew to be non-SMPEs at least once during our sample period. For qualified SMPEs in later rate change years, the probability of growing above the SMPE taxable income threshold is much lower, partly reflecting the fact that they had less time to expand. This descriptive analysis suggests that the SMPE tax schemes did not inhibit growth among qualified firms. Nevertheless, a large proportion of treated firms remain as SMPEs by 2016.

To further shed light on this issue, we examine whether the growth rate of net fixed assets slows down when an SMPE gets closer to the SMPE threshold. We first examine the taxable income threshold. The assumption is that investing in fixed

[28] We exclude January 1st 2011 from the placebo test due to another policy shock on January 27 that year: the SMPE tax benefit was announced to be extended from 2010 to 2011.

assets may help the firm become more productive and profitable. This, in turn, may lead to higher taxable income. For this exercise, we use the full sample of firms in the tax return. Importantly, we no longer exclude firms whose taxable income bunch below each SMPE taxable income threshold, as in our benchmark estimations. We then construct a dummy "Within 3%" that equals 1 when an SMPE's taxable income in year t is within the range $[(1-3\%) \times S_t, S_t]$, where S_t is the SMPE taxable income threshold in year t. Similarly, we construct two more dummies, "Within 5%" and "Within 10%". If the SMPE tax scheme induces qualified firms to slow down their investment in fear of losing the benefit, we expect to find a negative coefficient on these distance dummies. Columns 1-3 of Table 11 report the estimation results. We control for the same set of variables as in the baseline investment estimations. No matter which distance indicator we use, there is no evidence that the growth rate of net fixed assets becomes smaller when an SMPE gets closer to the taxable income threshold.

Firms can easily manipulate taxable income, as demonstrated by the bunching firms around the taxable income threshold. If so, firms can keep growing its assets while maintaining taxable income below the threshold. To further analyze whether the SMPE tax benefit deters firms from expanding, we next examine the effect of the total assets threshold. In columns 4-6 of Table 11, we find that when a firm's total assets get into the 3% closeness, its growth rate of fixed assets slows down significantly. Interestingly, we do not find any significant slow down of fixed asset growth if we enlarge the range of closeness to 5% and 10%. Consistent with our conjecture, the total assets threshold is more difficult to manipulate and firms do slow down expansion in fear of losing the SMPE tax benefit. Because there are few firms in our benchmark treatment groups around the total assets threshold, excluding these few observations does not affect our benchmark estimation result for the impact of the tax cuts on firms' investment and TFP. Taken together, these results indicates that a threshold-based tax cut, especially that linked to total assets, may distort firms' real investment decision when they get close to the threshold.

6 Conclusion

What will small firms do when they receive a corporate tax cut? Our study sheds light on this question by utilizing a large cut in the corporate tax rate for qualified small- and micro-profit firms in China, where the qualifying taxable income threshold rose 10-fold during a short period of time. What we find for firms with positive taxable income is broadly consistent with the prediction in Blanchard et al. (1994) that small firms prioritize tax savings on investment and enhancing productivity,

and the enhanced cash flow increases small firms' debt capacity. Consistent with the view that the tax cut affects small firms' behavior mainly by enhancing their cash flow, we find a larger increase in firms' investment and productivity as the amount of tax saving increases. The importance of the cash flow channel is also supported by our finding that the majority of loss-making SMPEs did not respond to the tax cut.

In addition, we find that lowering the corporate income tax rate encouraged entry of small firms. Despite these benefits, the threshold-based tax incentive does cause behavioral responses, as it leads to bunching and creates disincentives for expansion once a firm gets close to the size threshold. One important issue we have not examined is how the tax cut affects the survival probability of small firms, which requires a longer data span and a proper indicator for exit. We thus leave this for future research.

References

Ackerberg, D. A., Caves, K., and Frazer, G. (2015). Identification properties of recent production function estimators. *Econometrica*, 83(6):2411–2451.

Agrawal, A., Rosell, C., and Simcoe, T. (2020). Tax Credits and Small Firm R&D Spending. *American Economic Journal: Economic Policy*, 12(2):1–21.

Arnold, J. M., Brys, B., Heady, C., Johansson, Å., Schwellnus, C., and Vartia, L. (2011). Tax policy for economic recovery and growth. *The Economic Journal*, 121(550):F59–F80.

Atanassov, J. and Liu, X. (2020). Can corporate income tax cuts stimulate innovation? *Journal of Financial and Quantitative Analysis*, 55:1415 – 1465.

Ayyagari, M., Demirguc-Kunt, A., and Maksimovic, V. (2014). Who creates jobs in developing countries? *Small Business Economics*, 43(1):75–99.

Bai, C.-E., Hsieh, C.-T., and Song, Z. (2016). The Long Shadow of China's Fiscal Expansion. *Brookings Papers on Economic Activity*, 47(2):129–181.

Beck, T. and Demirguc-Kunt, A. (2006). Small and medium-size enterprises: Access to finance as a growth constraint. *Journal of Banking & Finance*, 30(11):2931–2943.

Beck, T., Demirgüç-Kunt, A., and Maksimovic, V. (2008). Financing patterns around the world: Are small firms different? *Journal of Financial Economics*, 89(3):467–487.

Benedek, M. D., Deb, M. P., Gracia, M. B., Saksonovs, M. S., Shabunina, M. A., and Budina, M. N. T. (2017). *The right kind of help? Tax incentives for staying small*. International Monetary Fund.

Blanchard, O. J., de Silanes, F. L., and Shleifer, A. (1994). What do firms do with cash windfalls? *Journal of Financial Economics*, 36(3):337–360.

Brandt, L., Van Biesebroeck, J., Wang, L., and Zhang, Y. (2017). WTO accession and performance of chinese manufacturing firms. *American Economic Review*, 107(9).

Calonico, S., Cattaneo, M. D., and Titiunik, R. (2014). Robust nonparametric confidence intervals for regression-discontinuity designs. *Econometrica*, 82(6):2295–2326.

Chemmanur, T. J., Krishnan, K., and Nandy, D. K. (2011). How Does Venture Capital Financing Improve Efficiency in Private Firms? A Look Beneath the Surface. *The Review of Financial Studies*, 24(12):4037–4090.

Chen, Z., Jiang, X., Liu, Z., Suarez Serrato, J. C., and Xu, D. Y. (2019). Tax policy and lumpy investment behavior: Evidence from china's vat reform. *Working Papers*.

Chen, Z., Liu, Z., Suárez Serrato, J. C., and Xu, D. Y. (2021). Notching r&d investment with corporate income tax cuts in china. *American Economic Review*, 111(7):2065–2100.

Cui, W. (2007). The prospect of new partnership taxation in china. *Tax Notes International*, 46.

Cui, W. (2014). China's Business-Tax-to-VAT Reform: an Interim Assessment. *British Tax Review*, 2014(5):617–641.

Cui, W., Hicks, J., and Xing, J. (2020). Cash on the table? imperfect take-up of tax incentives and firm investment behavior. *Working Paper*.

De Loecker, J. and Warzynski, F. (2012). Markups and firm-level export status. *American Economic Review*, 102(6):2437–71.

Dechezleprêtre, A., Einiö, E., Martin, R., Nguyen, K.-T., and Van Reenen, J. (2016). Do tax incentives for research increase firm innovation? an rd design for r&d. Technical report, National Bureau of Economic Research.

Decker, R., Haltiwanger, J., Jarmin, R., and Miranda, J. (2014). The Role of entrepreneurship in US job creation and economic dynamism. *Journal of Economic Perspectives*, 28(3):3–24.

Fan, Z. and Liu, Y. (2020). Tax Compliance and Investment Incentives: Firm Responses to Accelerated Depreciation. *Journal of Economic Behavior and Organization*, 176.

Feng, L., Li, Z., and Swenson, D. L. (2012). The Connection between Imported Intermediate Inputs and Exports: Evidence from Chinese Firms. *NBER Working Paper*, 18260.

Fuest, C., Peichl, A., and Siegloch, S. (2018). Do higher corporate taxes reduce wages? micro evidence from germany. *American Economic Review*, 108(2):393–418.

Gemmell, N., Kneller, R., McGowan, D., Sanz, I., and Sanz-Sanz, J. F. (2018). Corporate taxation and productivity catch-up: Evidence from european firms. *The Scandinavian Journal of Economics*, 120(2):372–399.

Hall, B. H. and Ziedoins, R. H. (2001). The patent paradox revisited: an empirical study of patenting in the u.s. semiconductor industry, 1979-1995. *RAND Journal of Economics*, 32(1):101–128.

Hall, R. E. and Jorgenson, D. W. (1967). Tax policy and investment behavior. *The American Economic Review*, 57(3):391–414.

Haltiwanger, J., Jarmin, R. S., Kulick, R., and Miranda, J. (2016). *High Growth Young Firms: Contribution to Job, Output, and Productivity Growth*, pages 11–62. University of Chicago Press.

Harju, J., Koivisto, A., and Matikka, T. (2020). The effects of cporporate taxes on small firms. *VATT Working Papers*, 129.

Horvath, A. and Lang, P. (2021). Do loan subsidies boost the real activity of small firms? *Journal of Banking & Finance*, 122:105988.

Ivanov, I., Pettit, L., and Whited, T. M. (2020). Taxes depress corporate borrowing: Evidence from private firms. *Available at SSRN 3694869*.

Koga, T. (2003). Firm size and r&d tax incentives. *Technovation*, 23(7):643–648.

Krishnan, K., Nandy, D. K., and Puri, M. (2015). Does financing spur small business productivity? evidence from a natural experiment. *The Review of Financial Studies*, 28(6):1768–1809.

Levine, O. and Warusawitharana, M. (2021). Finance and productivity growth: Firm-level evidence. *Journal of Monetary Economics*, 117:91–107.

Levinsohn, J. and Petrin, A. (2003). Estimating Production Functions Using Inputs to Control for Unobservables. *The Review of Economic Studies*, 70(2):317–341.

Liu, Y. and Mao, J. (2019). How Do Tax Incentives Affect Investment and Productivity? Firm-Level Evidence from China. *American Economic Journal: Economic Policy*, 11(3):261–91.

Lokshin, B. and Mohnen, P. (2012). How effective are level-based R&D tax credits? Evidence from the Netherlands. *Applied Economics*, 44(12):1527–1538.

Maffini, G., Xing, J., and Devereux, M. P. (2019). The Impact of Investment Incentives: Evidence from UK Corporation Tax Returns. *American Economic Journal: Economic Policy*, 11(3):361–389.

OECD (2015). *Taxation of SMEs in OECD and G20 Countries*.

Olley, G. S. and Pakes, A. (1996). The dynamics of productivity in the telecommunications equipment industry. *Econometrica*, 64(6):1263–1297.

Pham, A. (2020). Effects of Temporary Corporate Income Tax Cuts: Evidence from Vietnam. *Journal of Development Economics*, 146.

Rajan, R. G. and Zingales, L. (1998). Financial dependence and growth. *American Economic Review*, 88(3).

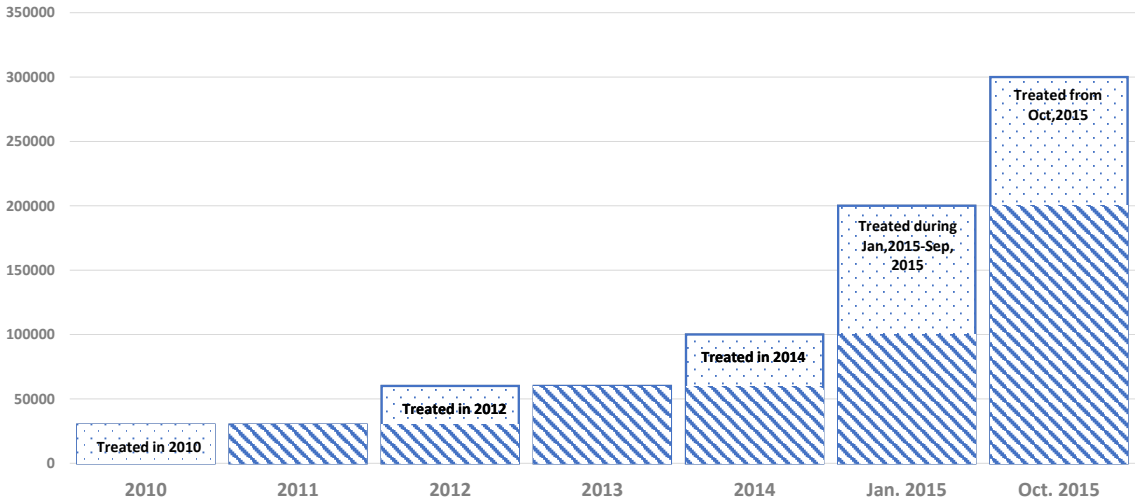
Romero-Jordán, D., Sanz-Labrador, I., and Sanz-Sanz, J. F. (2020). Is the corporation tax a barrier to productivity growth? *Small Business Economics*, 55(1):23–38.

Rotemberg, M. (2019). Equilibrium effects of firm subsidies. *American Economic Review*, 109(10):3475–3513.

Song, Z. and Wu, G. (2015). Identifying capital misallocation. *Working Paper*.

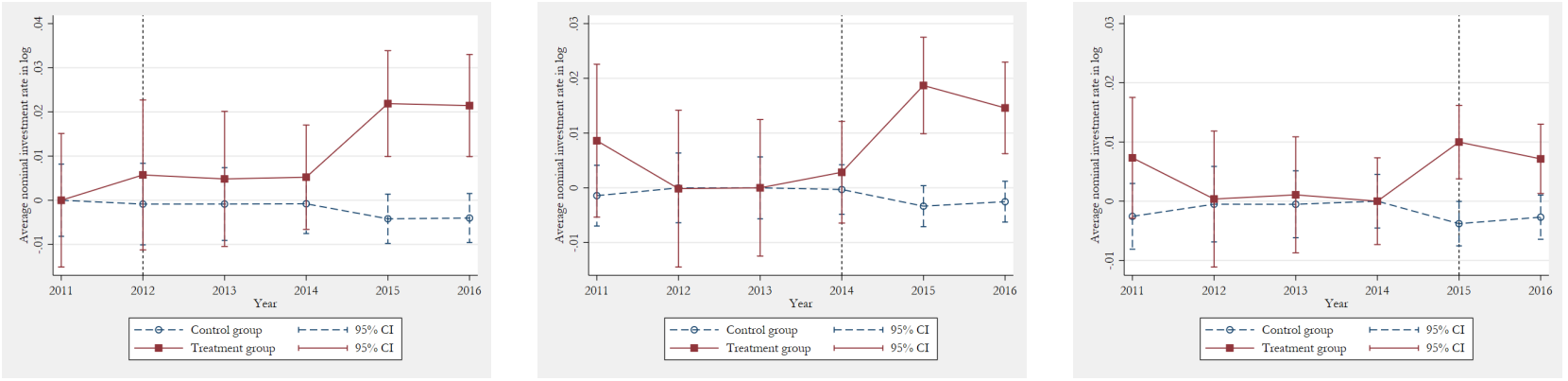
Tsuruta, D. (2020). Sme policies as a barrier to growth of smes. *Small Business Economics*, 54(4):1067–1106.

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.

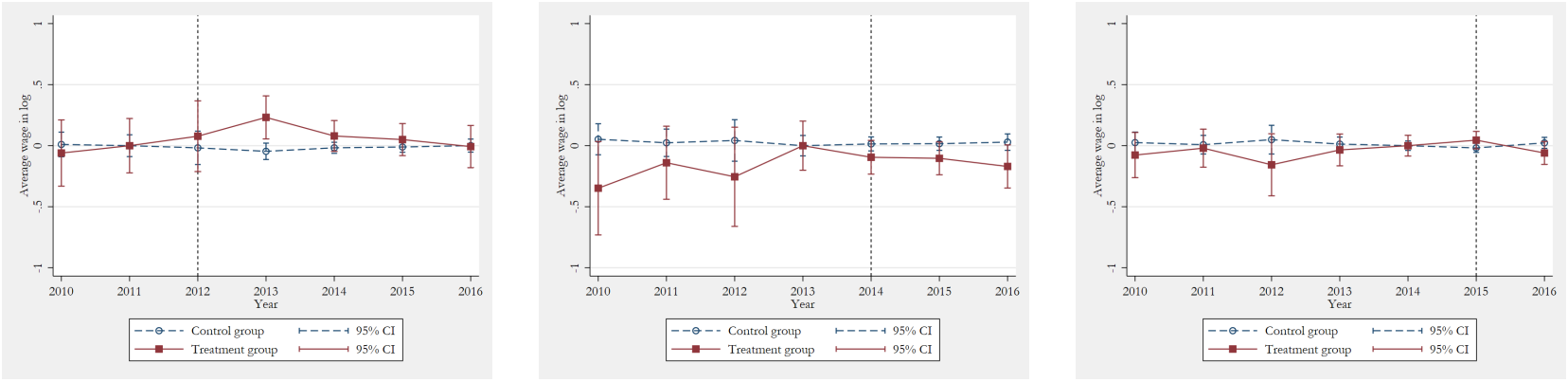
Figure 2: The dynamic effects of corporate tax cuts on fixed assets growth



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

Notes: This figure plots the estimated dynamic effects of the corporate income tax cut on firms' investment rate for the 2012, 2014 and 2015 cohorts, respectively. The point estimates, which represent the conditional means of firms' investment rate by year, and their corresponding confidence intervals are obtained by estimating the following specification: $\Delta log(\text{Fixed asset})_{i,t,c} = \sum \beta_{t,c} year_{t,c} + \gamma_c X_{i,t,c} + \varphi_{i,c} + \varepsilon_{i,t,c}$, for the treatment groups and the control groups, and for each of the reform cohorts respectively. The dependent variable – investment rate is proxied by the annual change in the log of fixed assets; $year_{t,c}$ 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; $X_{i,t,c}$ includes firm-level sales in log and the interactions between firms' initial sizes and the time trends; $\varphi_{i,c}$ is firm-fixed effects. Robust standard errors are two-way clustered at the firm and year-industry level.

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

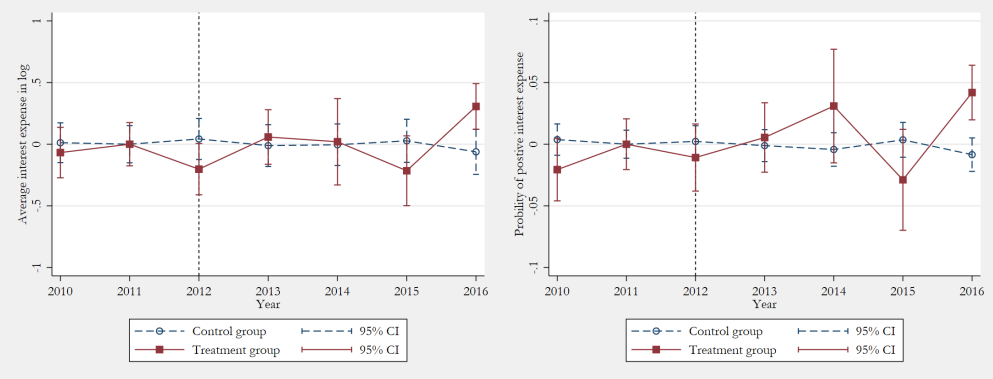


(a) 2012 (b) 2014 (c) 2015

Notes: This figure plots the estimated dynamic effects of the corporate income tax cut on firms' expenditure on wage (in log) for the 2012, 2014 and 2015 cohorts, respectively. The point estimates, which represent the conditional means of firms' wage (in log) by year, and their corresponding confidence intervals are obtained by estimating the following specification: $log(wage)_{i,t,c} = \sum \beta_{t,c} year_{t,c} + \gamma_c X_{i,t,c} + \varphi_{i,c} + \varepsilon_{i,t,c}$, for the treatment groups and the control groups, and for each of the reform cohorts respectively. $year_{t,c}$ 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; $X_{i,t,c}$ includes firm-level sales in log and the interactions between firms' initial sizes and the time trends; $\varphi_{i,c}$ is firm-fixed effects. Robust standard errors are two-way clustered at the firm and year-industry level.

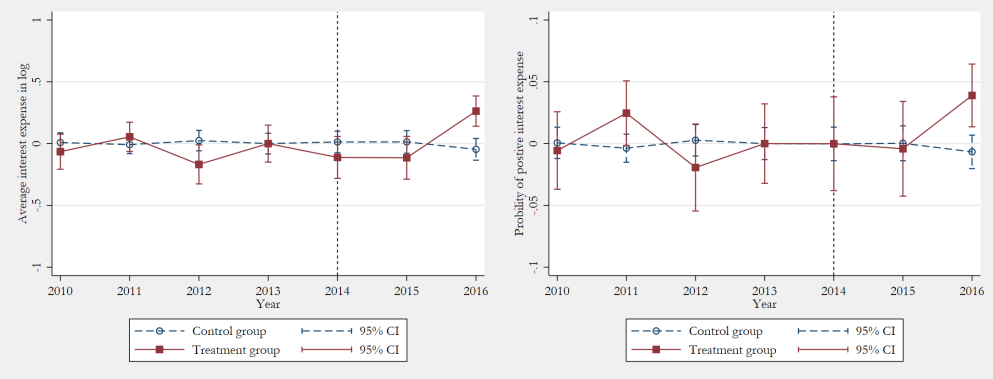
Figure 4: The dynamic effects of corporate tax cuts on interest expense

A. The 2012 cohort



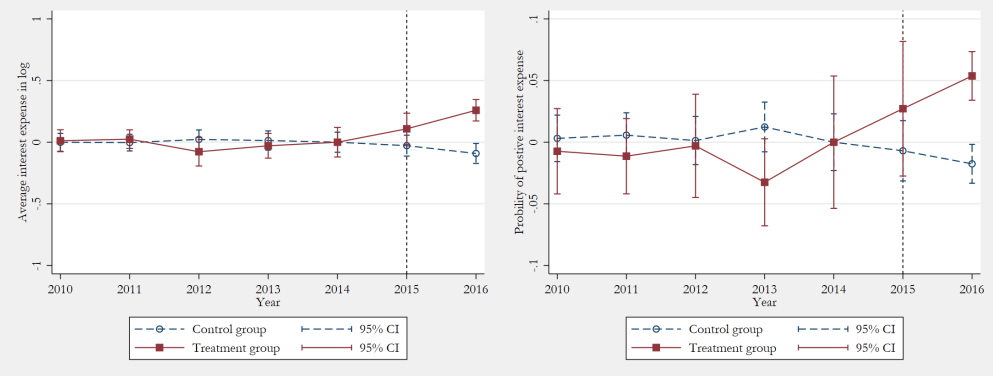
(a) Interest expense (b) Interest exps. dummy

B. The 2014 cohort



(c) Interest expense (d) Interest exps. dummy

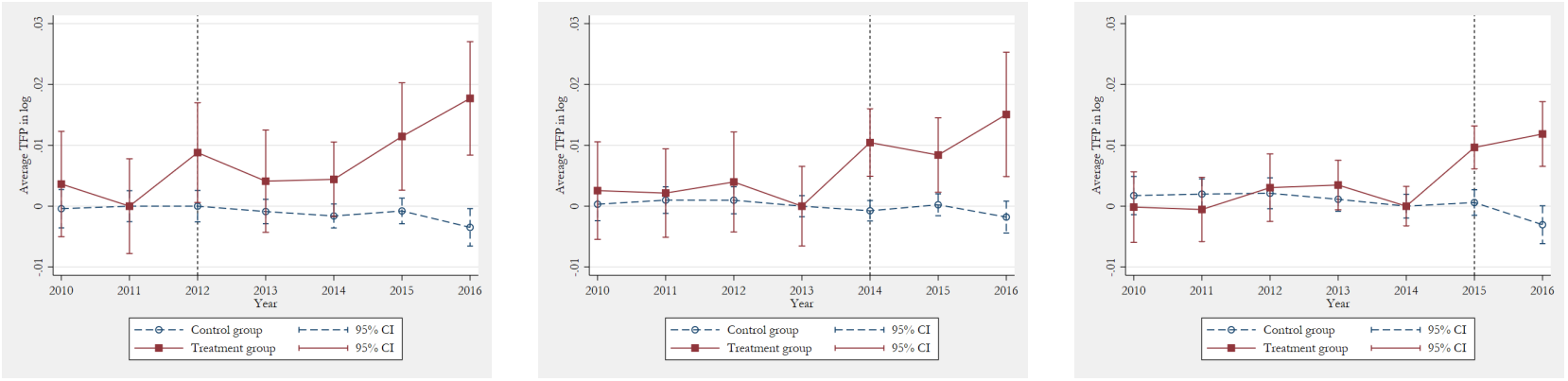
C. The 2015 cohort



(e) Interest expense (f) Interest exps. dummy

Notes: The left pane plots the estimated dynamic effects of the corporate income tax cut on firms' interest expense (in logs) for the 2012, 2014 and 2015 cohorts, respectively. And the right panel plots the estimated dynamic effects of the corporate income tax cut on the probability of firm having positive interest expense. The point estimates, representing the conditional means of firms' interest expense in log and interest expense dummy by year, and their corresponding confidence intervals are obtained by estimating the following specification: $Y_{i,t,c} = \sum \beta_{t,c} year_{t,c} + \gamma_c X_{i,t,c} + \varphi_{i,c} + \varepsilon_{i,t,c}$, for the treatment groups and the control groups, and for each of the reform cohorts respectively. $year_{t,c}$ 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; $X_{i,t,c}$ includes firm-level sales in log and the interactions between firms' initial sizes and the time trends; $\varphi_{i,c}$ is firm-fixed effects. Robust standard errors are two-way clustered at the firm and year-industry level.

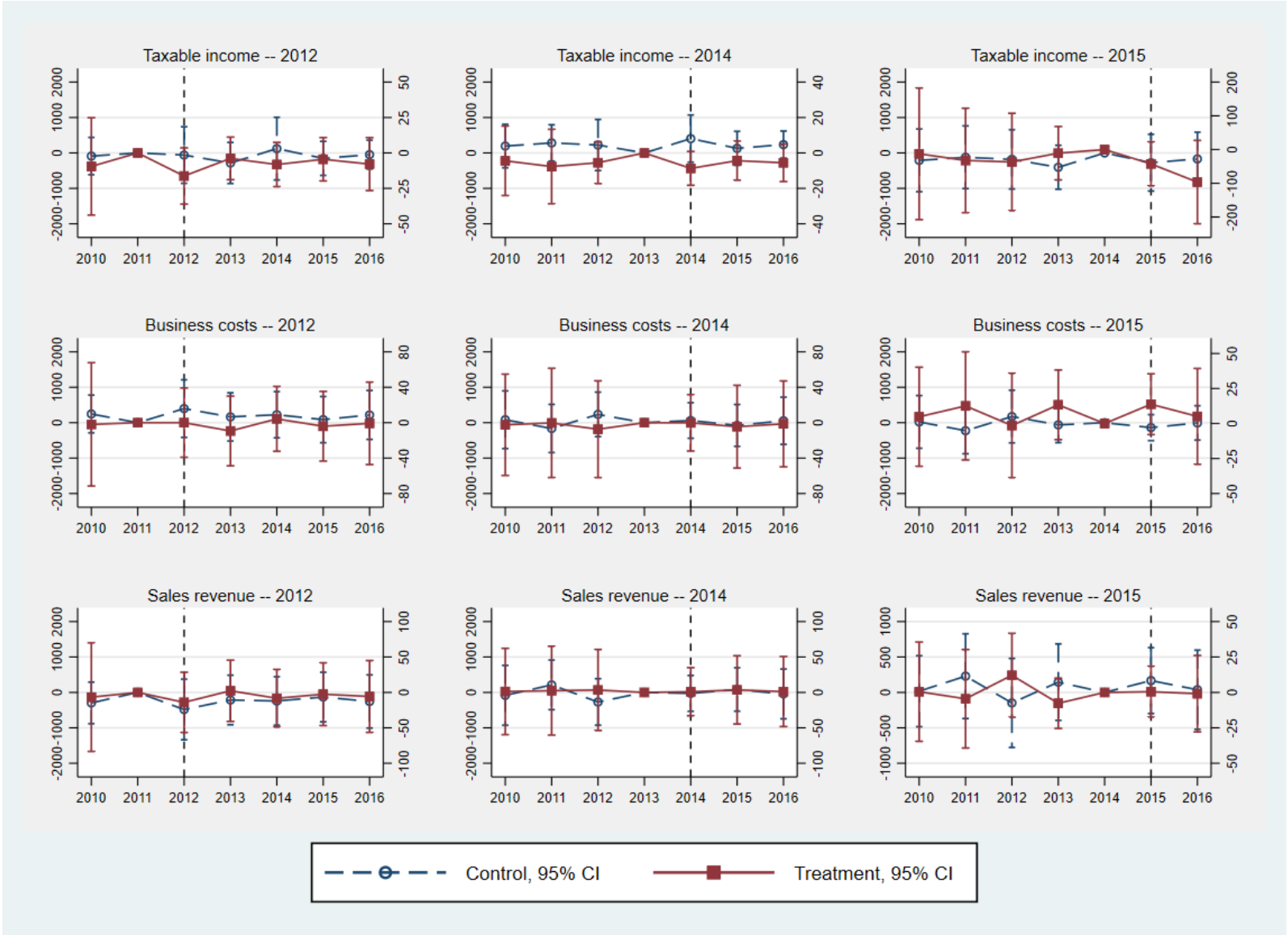
Figure 5: The dynamic effects of corporate tax cuts on TFP



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

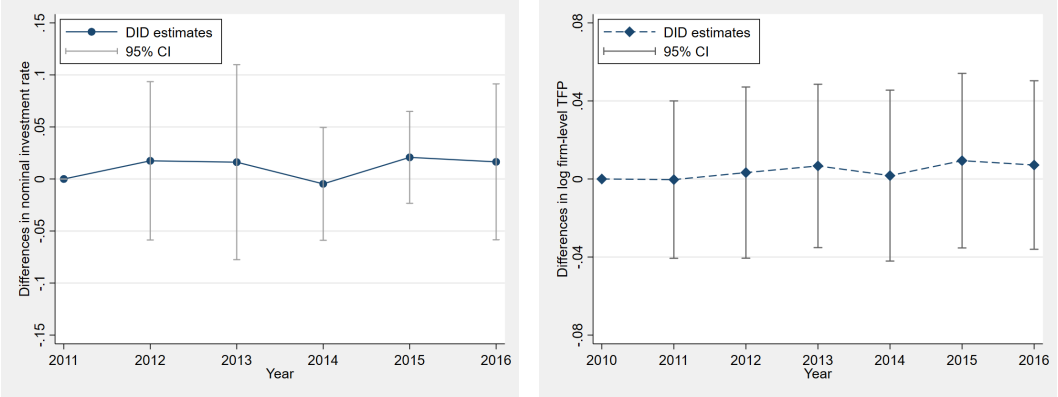
Notes: This figure plots the estimated dynamic effects of the corporate income tax cut on firms' TFP for the 2012, 2014 and 2015 cohorts, respectively. The point estimates, which represent the conditional means of firms' TFP in log by year, and their corresponding confidence intervals are obtained by estimating the following specification: $log(TFP)_{i,t,c} = \sum \beta_{t,c} year_{t,c} + \gamma_c X_{i,t,c} + \varphi_{i,c} + \varepsilon_{i,t,c}$, for the treatment groups and the control groups, and for each of the reform cohorts respectively. TFP is estimated using the Olley and Pakes (1996) method. $year_{t,c}$ 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; $X_{i,t,c}$ includes firm-level sales in log and the interactions between firms' initial sizes and the time trends; $\varphi_{i,c}$ is firm-fixed effects. Robust standard errors are two-way clustered at the firm and year-industry level.

Figure 6: Inter-temporal shifting behavior



Notes:This figure plots the conditional means of taxable income, business costs and sales revenue (in 1,000 RMB) of the control (left-y axis) and treatment (right-y axis) group firms for the 2012, 2014 and 2015 cohorts, respectively. The year preceding the rate change year is used as the base year.

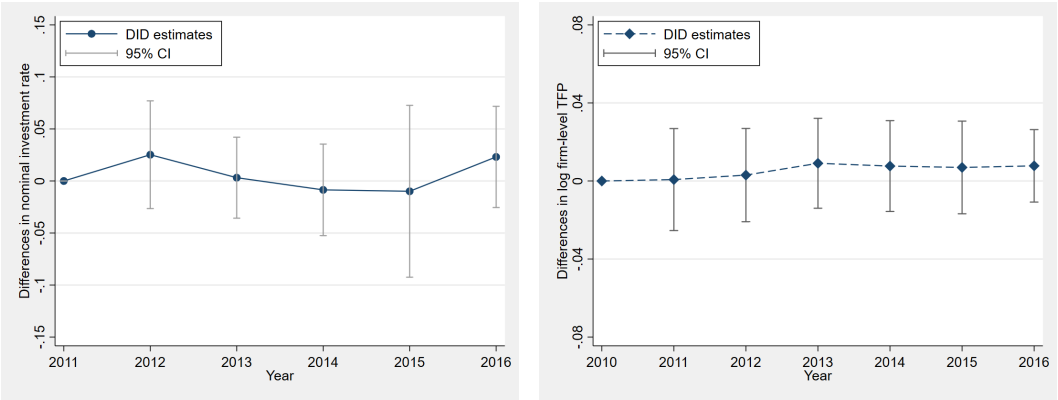
Figure 7: The relative performance of loss-making firms



(a) Investment rate (b) Log TFP

Notes: This figure plots the average investment rate and TFP of loss-making firms relative to our control firms over the sample period. The point estimates, representing the conditional average differences in investment rate and TFP (in logs) between the treatment group and the control group, and their corresponding confidence intervals are obtained by estimating the following specification: $Y_{i,t,c} = \sum \beta_{t,c} year_{t,c} \times T_{i,c} + \gamma_c X_{i,t,c} + \varphi_{i,c} + \varphi_{s,t,c} + \varepsilon_{i,t,c}$, for the treatment groups and the control groups, respectively. $year_{t,c}$ 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; $T_{i,c}$ is indicator for treated firms; $X_{i,t,c}$ includes firm-level sales in log and the interactions between firms' initial sizes and the time trends; $\varphi_{i,c}$ is firm-fixed effects, and $\varphi_{s,t,c}$ is industry-year-fixed effects. Robust standard errors are two-way clustered at the firm and year-industry level.

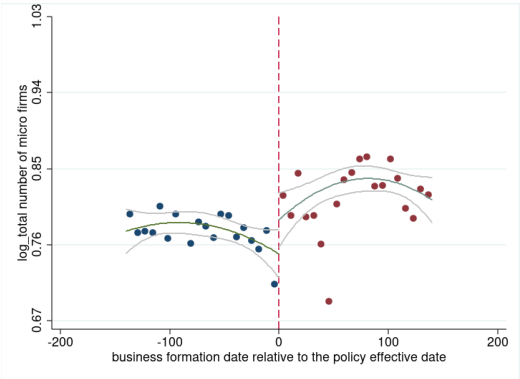
Figure 8: The effect of corporate tax cuts on all SMPEs



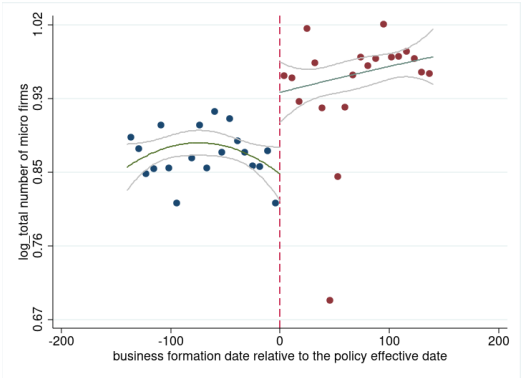
(a) Investment rate (b) Log TFP

Notes: This figure plots the average investment rate and TFP of all SMPEs in our sample relative to large firms over the sample period. The point estimates, representing the conditional average differences in investment rate and TFP (in logs) between the treatment group and the control group, and their corresponding confidence intervals are obtained by estimating the following specification: $Y_{i,t,c} = \sum \beta_{t,c} year_{t,c} \times T_{i,c} + \gamma_c X_{i,t,c} + \varphi_{i,c} + \varphi_{s,t,c} + \varepsilon_{i,t,c}$, for the treatment groups and the control groups, respectively. $year_{t,c}$ 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; $T_{i,c}$ is indicator for treated firms; $X_{i,t,c}$ includes firm-level sales in log and the interactions between firms' initial sizes and the time trends; $\varphi_{i,c}$ is firm-fixed effects, and $\varphi_{s,t,c}$ is industry-year-fixed effects. Robust standard errors are two-way clustered at the firm and year-industry level.

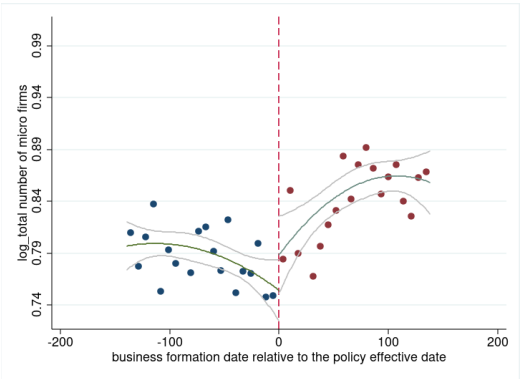
Figure 9: The effect of corporate tax cuts on firm registration



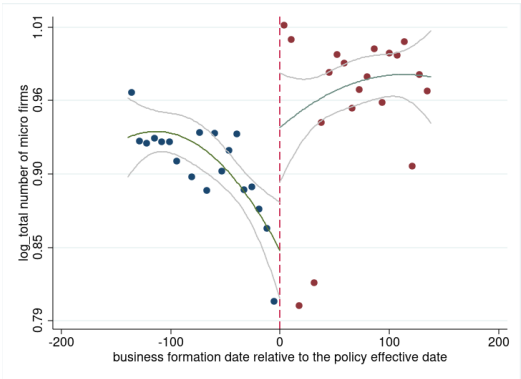
(a) 2010: unconstrained industries



(b) 2010: constrained industries



(c) 2012: unconstrained industries



(d) 2012: constrained industries

(e) 2015: unconstrained industries

(f) 2015: constrained industries

Note: From top left to the bottom right, each panel plots the average number of newly registered firms (in logs) within 140 days around the policy effective date for financially constrained and unconstrained industries in 2010, 2012 and 2015, respectively. The fitted line on both side are separately estimated with a local linear regression. 95% confidence intervals are plotted around the fitted line.

Table 1: Construction of the treatment groups

	Below employment & total assets thresholds (1)	Within the qualifying bracket of taxable income (2)	Reduction in tax rate relative to previous years (3)	Exempt from later rate changes (4)	Outside of the exclusion range (5)
2012	21,534	1,766	1,038	812	758
2014	20,788	1,711	813	631	592
2015	19,884	2,519	1,520	1,192	1,153

Notes: This table illustrates the step-by-step procedures we take to construct our treatment groups. In each column, we add one criteria. Column (1) requires that treated firms' total assets are below 30 million RMB and their reported employees at registration are not greater than 100. Column (2) requires treated firms' taxable income to fall within the qualifying ranges of the rate changes of each year. Column (3) restricts the number of firms paying higher than 10% income tax rate during the years prior to the rate change year. Column (4) further exclude firms that are qualifying for later rate changes based on their taxable income and total asset status from the treat firms of each cohort. Lastly, column (5) drops firms that are within the exclusion range of taxable income for each cohort.

Table 2: Summary statistics for key variables

	Obs	Mean	Median	SD	Min	Max
A: Treated firms of 2012						
log(TFP)	3,448	7.038	7.055	0.459	5.978	8.157
log(Fixed assets)	4,501	14.090	14.132	1.159	11.052	16.500
Δlog(Fixed assets)	3,779	0.051	0.003	0.235	-1.001	1.125
log(Interest exps.)	2,767	1.203	0	2.085	0	6.500
Interest exps. dummy	2,767	0.284	0	0.451	0	1
log(Total assets)	3,309	15.157	15.157	0.903	13.108	17.127
log(Sales)	4,557	15.002	15.059	1.032	11.592	17.311
log(Business costs)	4,554	14.823	14.882	1.067	11.244	17.209
log(Wages)	3,495	12.835	12.902	1.088	9.349	14.991
log(Fixed assets/wage)	3,388	1.287	1.285	1.184	-1.674	4.791
Net profit/Fixed assets	3,232	0.014	0.012	0.137	-0.631	0.605
Taxable income (1,000 RMB)	4,680	53.532	40.547	68.079	0.000	450.329
Net profit (1,000 RMB)	4,675	-1.123	25.200	175.863	-963.132	564.330
B: Treated firms of 2014						
log(TFP)	2,916	7.048	7.069	0.437	6.025	7.964
log(Fixed assets)	3,673	14.323	14.329	1.083	11.483	16.517
Δlog(Fixed assets)	3,098	0.071	0.008	0.214	-0.693	1.159
log(Interest exps.)	2,170	1.360	0	2.172	0	6.475
Interest exps. dummy	2,170	0.317	0	0.465	0	1
log(Total assets)	2,758	15.446	15.445	0.761	13.592	17.022
log(Sales)	3,736	15.457	15.483	0.820	13.154	17.420
log(Business costs)	3,737	15.278	15.309	0.846	12.979	17.344
log(Wages)	2,931	13.204	13.256	0.914	10.309	15.061
log(Fixed assets/wage)	2,880	1.146	1.080	1.111	-1.446	4.668
Net profit/Fixed assets	3,112	0.053	0.028	0.115	-0.275	0.602
Taxable income (1,000 RMB)	3,765	111.547	84.265	104.957	0.000	661.178
Net profit (1,000 RMB)	3,765	61.629	64.448	154.396	-682.785	620.696
C: Treated firms of 2015						
log(TFP)	5,988	7.090	7.097	0.437	6.010	8.142
log(Fixed assets)	7,321	14.579	14.646	0.986	11.842	16.626
Δlog(Fixed assets)	6,188	0.092	0.027	0.226	-0.619	1.234
log(Interest exps.)	4,503	1.538	0	2.306	0	6.669
Interest exps. dummy	4,503	0.337	0	0.473	0	1
log(Total assets)	5,443	15.762	15.785	0.686	14.076	17.187
log(Sales)	7,427	15.872	15.839	0.659	14.228	17.514
log(Business costs)	7,425	15.688	15.654	0.686	13.895	17.397
log(Wages)	5,919	13.543	13.570	0.768	11.225	15.149
log(Fixed assets/wage)	5,851	1.071	1.060	1.004	-1.558	3.798
Net profit/Fixed assets	6,744	0.088	0.046	0.147	-0.206	0.906
Taxable income (1,000 RMB)	7,430	208.637	164.677	162.941	0.000	1,058.513
Net profit (1,000 RMB)	7,430	162.348	133.070	183.518	-434.114	1,058.832
D: Control firms						
log(TFP)	17,039	7.213	7.195	0.491	6.032	8.675
log(Fixed assets)	19,984	16.193	16.163	1.198	13.188	19.237
Δlog(Fixed assets)	16,917	0.111	0.050	0.221	-0.530	1.196
log(Interest exps.)	14,242	3.460	4.300	3.255	0	9.577
Interest exps. dummy	14,242	0.570	1	0.495	0	1
log(Total assets)	14,187	17.382	17.270	1.097	15.259	20.962
log(Sales)	20,093	17.520	17.385	1.022	15.631	20.743
log(Business costs)	20,092	17.302	17.175	1.043	15.224	20.571
log(Wages)	16,940	15.026	14.991	1.037	12.530	17.879
log(Fixed assets/wage)	16,837	1.225	1.223	0.901	-1.282	3.615
Net profit/Fixed assets	18,978	0.175	0.076	0.333	-0.108	2.311
Taxable income (1,000 RMB)	20,119	3,223.683	1,169.119	7,005.421	307.125	51,983.983
Net profit (1,000 RMB)	20,119	3,166.064	965.223	7,734.989	-1,103.995	57,760.020

Notes: This table reports the summary statistics for key variables in our analyses.

Table 3: The impact of the SMPE tax cuts on firm-level investment

Dependent variable: $\Delta\log$(Fixed Assets)			
	(1) 2012	(2) 2014	(3) 2015
$T_{i,2012} \times Post_{2012}$	0.022**		
	(0.010)		
$T_{i,2014} \times Post_{2014}$		0.016*	
		(0.008)	
$T_{i,2015} \times Post_{2015}$			0.012**
			(0.005)
Controls	Y	Y	Y
Firm FE	Y	Y	Y
Year-sector FE	Y	Y	Y
Observations	17,118	16,761	19,325

Notes: In this table, we report the estimated effect of the lower corporate tax rate for SMPEs on treated firms' investment. The dependant variable is the annual change in the natural logarithm of nominal fixed assets. The treated group for each rate change is constructed as explained in Section 3. The control group consists of large companies that always pay corporate tax at a rate of 25%. We control for firm sales, and the interaction between initial firm size and polynomials of time trends in all columns. Robust standard errors are two-way clustered at the firm and year-industry level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 4: Effects of the SMPE tax cuts on total wage and capital-wage ratio

	log(Wage) (1)	log($\frac{\text{Fixed assets}}{\text{Wage}}$) (2)	log($\frac{\text{Real fixed assets}}{\text{Real wage}}$) (3)
$T_{i,2012} \times Post_{2012}$	0.182	0.077**	0.090**
	(0.138)	(0.036)	(0.035)
Observations	20,714	20,055	20,055
$T_{i,2014} \times Post_{2014}$	0.099	0.106***	0.116***
	(0.125)	(0.033)	(0.033)
Observations	20,127	19,589	19,589
$T_{i,2015} \times Post_{2015}$	0.070	0.063***	0.084***
	(0.077)	(0.021)	(0.021)
Observations	23,210	22,558	22,558
Firm FE	Y	Y	Y
Year-sector FE	Y	Y	Y

Notes: In this table, we report the estimated effects of the SMPE tax rate changes on firm-level wage, capital-wage ratio, and real capital-real wage ratio. In all estimations, we control for firm sales, and the interaction between initial firm size and polynomials of the time trends. Robust standard errors are two-way clustered at the firm and year-industry level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 5: The impact of the SMPE tax cuts on interest expense

	Log(Interest expense)			I(Interest expense>0)		
	(1)	(2)	(3)	(4)	(5)	(6)
$T_{i,2012} \times Post_{2012}$	0.144			0.040*		
	(0.113)			(0.021)		
$T_{i,2014} \times Post_{2014}$		0.257**			0.038*	
		(0.117)			(0.020)	
$T_{i,2015} \times Post_{2015}$			0.433***			0.072***
			(0.087)			(0.017)
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Year-sector FE	Y	Y	Y	Y	Y	Y
Observations	16,655	16,302	18,371	16,655	16,302	18,371

Notes: In this table, we report the estimated effect of the lower corporate tax rate for SMPEs on treated firms' interest expense. In columns 1-3, the dependent variable is log(interest expense + 1). In columns 4-6, the dependent variable is a dummy variable that equals 1 if interest expense in year t is positive. Robust standard reported in the parentheses are clustered at the firm and year-industry level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 6: The impact of the SMPE tax cuts on firm-level TFP

Dependent variable: Firm-level TFP in logs			
	(1) 2012	(2) 2014	(3) 2015
$T_{i,2012} \times Post_{2012}$	0.015***		
	(0.004)		
$T_{i,2014} \times Post_{2014}$		0.015***	
		(0.004)	
$T_{i,2015} \times Post_{2015}$			0.017***
			(0.004)
Controls	Y	Y	Y
Firm FE	Y	Y	Y
Year-sector FE	Y	Y	Y
Observations	20,349	19,846	22,915

Notes: In this table, we report the estimated effect of the lower corporate tax rate for SMPEs on treated firms' total factor productivity. The dependant variable is firm-level TFP (in logs), estimated by the ACF method. The treated group for each rate change is constructed as explained in Section 3. The control group consists of large companies that always pay corporate tax at a rate of 25%. We control for firm sales, and the interaction between initial firm size and polynomials of time trends in all columns. Robust standard errors are two-way clustered at the firm and year-industry level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 7: The impact of SMPE tax cuts on investment and TFP: the role of tax savings

	2012		2014		2015	
	TFP	Δlog(Fixed Assets)	TFP	Δlog(Fixed Assets)	TFP	Δlog(Fixed Assets)
	(1)	(2)	(3)	(4)	(5)	(6)
$Savings_{i,2012} \times Post_{2012}$	0.003***	0.005**				
	(0.001)	(0.002)				
$Savings_{i,2014} \times Post_{2014}$			0.002***	0.002*		
			(0.001)	(0.001)		
$Savings_{i,2015} \times Post_{2015}$					0.001***	0.001***
					(0.000)	(0.000)
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Year-sector FE	Y	Y	Y	Y	Y	Y
Observations	20,349	17,118	19,846	16,761	22,915	19,325

Notes: In this table, we report the estimated effect of the actual amount of tax savings on treated firms' total factor productivity and investment. The dependant variable is firm-level TFP (in logs) in the odd numbered columns, and firm-level investment rate in the even numbered columns. Tax savings are measured in 1,000 RMB. The treated group for each rate change is constructed as explained in Section 3. The control group consists of large companies that always pay corporate tax at a rate of 25%. We control for firm sales, and the interaction between initial firm size and polynomials of time trends in all columns. Robust standard errors are two-way clustered at the firm and year-industry level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 8: How widespread are loss-making firms? SMPEs versus non-SMPEs

	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: Effects of the SMPE tax cuts on firm entry

	2010		2012		2015	
	(1) L	(2) H	(3) L	(4) H	(5) L	(6) H
D_t	0.053	0.192***	0.088*	0.180**	0.021	0.085
	(0.057)	(0.064)	(0.052)	(0.081)	(0.108)	(0.113)
Day-of-the-week FE	Y	Y	Y	Y	Y	Y
Industry-month FE	Y	Y	Y	Y	Y	Y
Prefecture FE	Y	Y	Y	Y	Y	Y
Order Loc. Poly. (p)	2	2	2	2	2	2
BW	110	83	87	87	131	126
N(effective)	3,309	4,434	2,768	5,121	5,989	8,178

Note: In this table, we report the RDD estimation results based on Equation 3. "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 date and the policy effectiveness date. Estimates reported are obtained using a local quadratic RD estimator with bandwidth selection as per Calonico et al. (2014). The dependent variable takes the log form of total number of micro and unclassified firms by industry, prefecture, and entry date. Standard errors clustered by industry-month are in parentheses. * p <0.1, ** p <0.05, *** p <0.01.

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: Growth of fixed assets and distance to the SMPE threshold

	ΔTaxable income threshold			ΔTotal assets threshold)		
	(1)	(2)	(3)	(4)	(5)	(6)
Within 3%	0.006			-0.011**		
	(0.004)			(0.005)		
Within 5%		0.0042			-0.004	
		(0.004)			(0.004)	
Within 10%			-0.000			-0.000
			(0.003)			(0.003)
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Year-sector FE	Y	Y	Y	Y	Y	Y
Observations	145,672	145,672	145,672	121,402	121,402	121,402

Notes: We examine whether the growth rate of fixed assets and total assets slow down when an SMPE gets closer to the SMPE threshold. We use the full sample of firms in the tax return for this exercise. We examine the distance to the taxable income threshold in columns 1-3, and the distance to the total assets threshold in columns 4-6. "Within 3%" is an indicator that equals 1 when an SMPE's taxable income (or total assets) is within the range $[(1-3\%) \times S_t, S_t]$, where S_t is the SMPE taxable income (or total assets) threshold in year t. "Within 5%" and "Within 10%" are defined similarly. Robust standard reported in the parentheses are clustered at the firm and year-industry level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

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 Annual Survey of Industrial Firms (ASIF) database provided by the National Bureau of Statistics of China.[29]

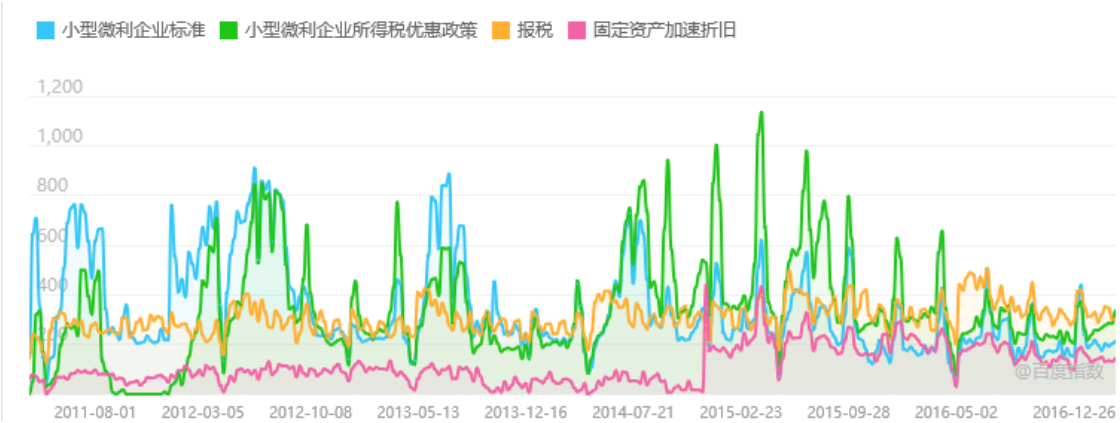
Last, we use the Brandt-Rawski deflator [30] in the place of the investment price index, and set the annual depreciation rate to be 9% following the convention in the literature. We also experiment with a depreciation rate of 5% which is used in Song and Wu (2015), and obtain nearly identical estimates of firm-level TFP.

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

[30] 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

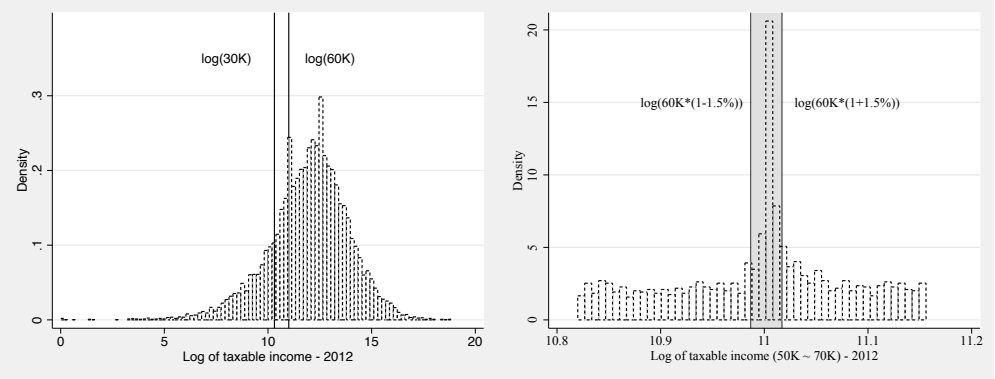
Figure B1: Salience of the tax rate cuts for SMPEs



Notes: This figure plots the Baidu search intensity for the key words (all in Chinese): qualifying thresholds for SMPEs (blue), preferential corporate income tax 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.

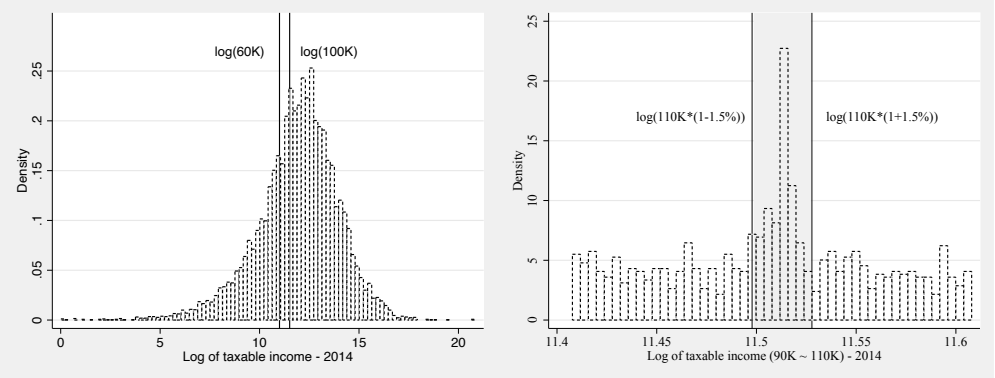
Figure B2: The distributions of taxable income around the SMPE qualifying thresholds

A. The 2012 cohort



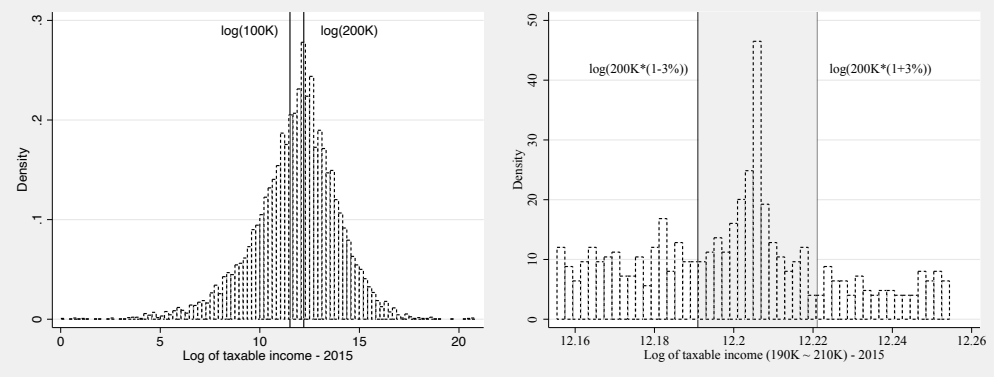
(a) Distribution (b) Range of exclusion

B. The 2014 cohort



(c) Distribution (d) Range of exclusion

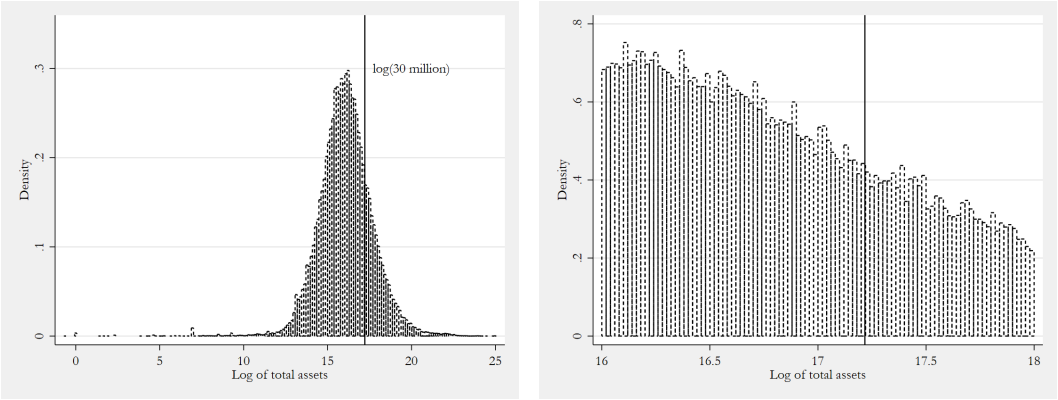
C. The 2015 cohort



(e) Distribution (f) Range of exclusion

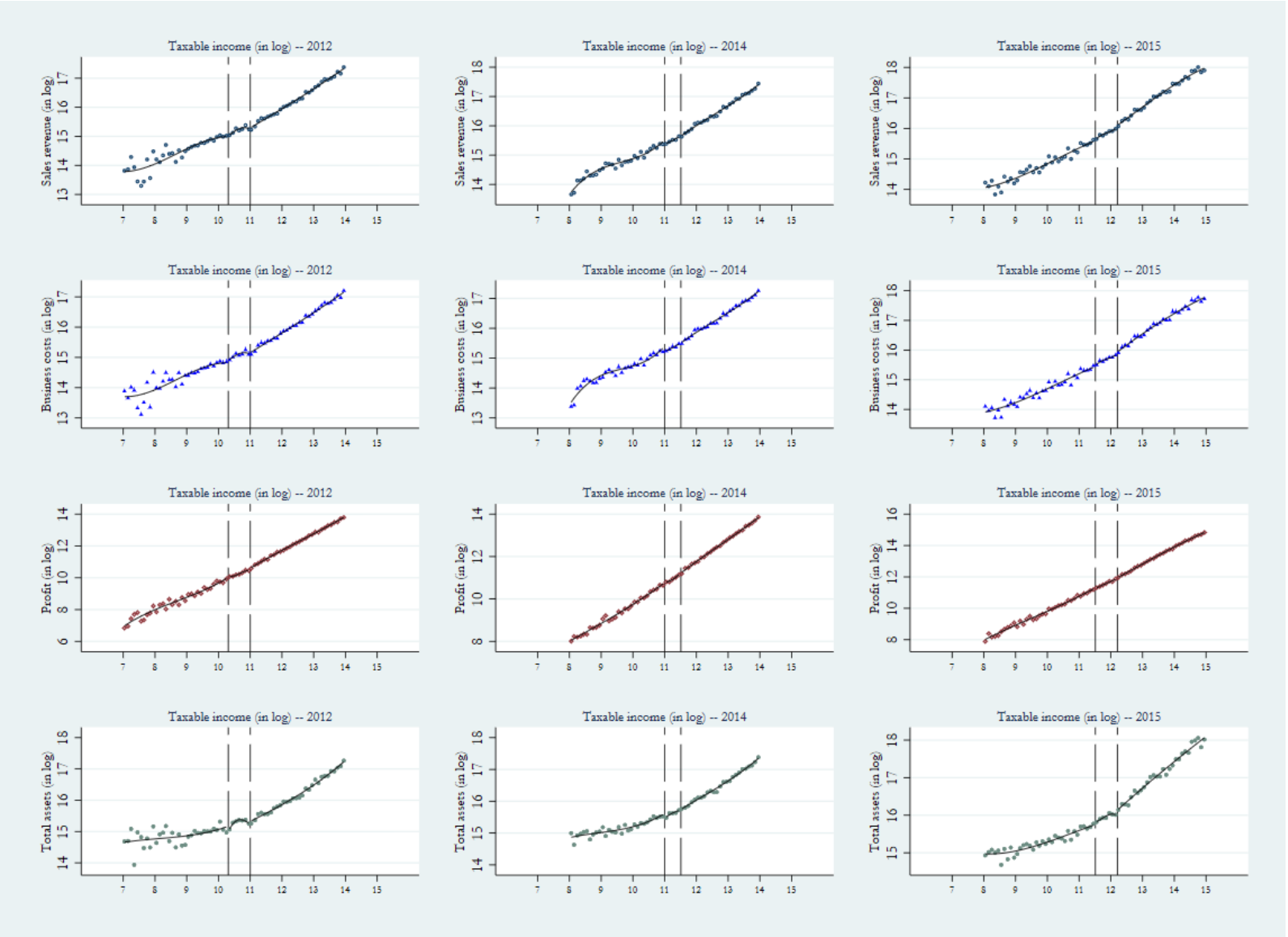
Notes: This figure plots the distributions of taxable income around the 2012, 2014 and 2015 SMPE qualifying thresholds based on confidential corporate tax returns.

Figure B3: The distributions of total assets around the SMPE qualifying thresholds



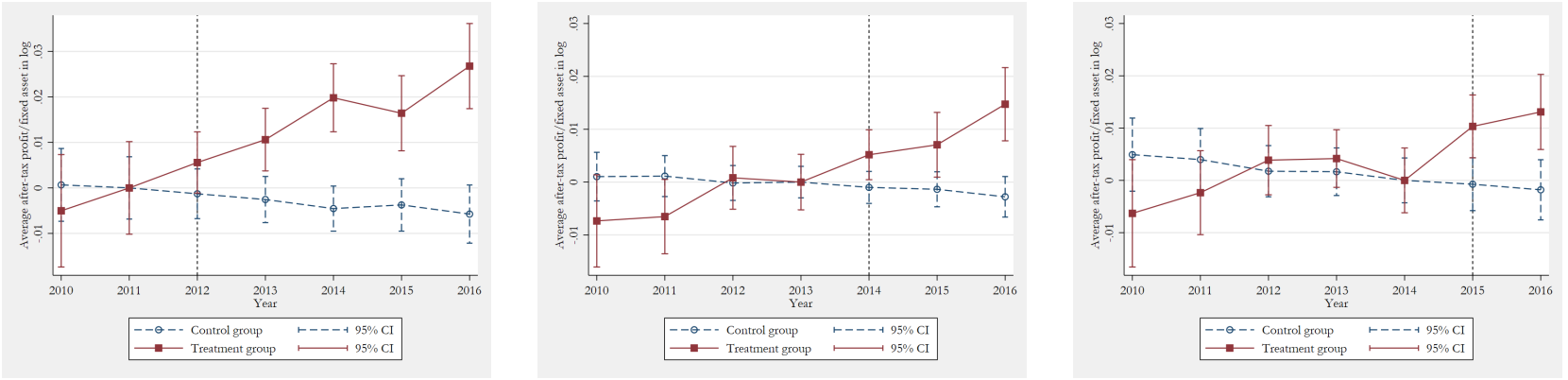
Notes: The left panel plots the distributions of total assets around the SMPE qualifying threshold for the full sample of firms in the tax return. The right panel magnifies the distribution closer to the threshold for a clearer inspection.

Figure B4: Distribution of variables against taxable income



Notes: This figure plots the distribution of sales, business costs, profits and total assets against firms' taxable income (all in logs) in the rate change years 2012, 2014 and 2015, respectively.

Figure B5: The dynamic effects of SMPE tax cuts on after-tax profit



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

Notes: This figure plots the estimated dynamic effects of the corporate income tax cut on firms' after-tax profit (scaled by fixed assets) for the 2012, 2014 and 2015 cohorts, respectively. The point estimates, which represent the conditional means of firms' after-tax profit/fixed asset (in log) by year, and their corresponding confidence intervals are obtained by estimating the following specification: $log(\text{After-tax profit})_{i,t,c} = \sum \beta_{t,c} year_{t,c} + \gamma_c X_{i,t,c} + \varphi_{i,c} + \varepsilon_{i,t,c}$, for the treatment groups and the control groups, and for each of the reform cohorts respectively. $year_{t,c}$ 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; $X_{i,t,c}$ includes firm-level sales in log and the interactions between firms' initial sizes and the time trends; $\varphi_{i,c}$ is firm-fixed effects. Robust standard errors are two-way clustered at the firm and year-industry level.

Table B1: The impact of the SMPE tax cuts on firm-level TFP – OP approach

Dependent variable: Firm-level TFP in logs			
	(1) 2012	(2) 2014	(3) 2015
$T_{i,2012} \times Post_{2012}$	0.031***		
	(0.007)		
$T_{i,2014} \times Post_{2014}$		0.035***	
		(0.007)	
$T_{i,2015} \times Post_{2015}$			0.028***
			(0.007)
Controls	Y	Y	Y
Firm FE	Y	Y	Y
Year-sector FE	Y	Y	Y
Observations	16,752	16,318	18,785

Notes: In this table, we report the estimated effect of the lower corporate tax rate for SMPEs on treated firms' total factor productivity. The dependant variable is firm-level TFP (in logs), obtained by estimating the production function using Olley and Pakes (OP, 1996) methodology. The treated group for each rate change is constructed as explained in Section 3. The control group consists of large companies that always pay corporate tax at a rate of 25%. We control for firm sales, and the interaction between initial firm size and polynomials of time trends in all columns. Robust standard errors are two-way clustered at the firm and year-industry level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B2: The impact of the SMPE tax cuts on firms' after-tax profit

Dependent variable: log(After-tax profit/Fixed assets)			
	2012	2014	2015
$T_{i,2012} \times Post_{2012}$	0.023***		
	(0.006)		
$T_{i,2014} \times Post_{2014}$		0.018***	
		(0.006)	
$T_{i,2015} \times Post_{2015}$			0.016***
			(0.005)
Controls	Y	Y	Y
Firm FE	Y	Y	Y
Year-sector FE	Y	Y	Y
Observations	24,213	23,495	27,147

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 and in logs). We control for firm sales, and the interaction between initial firm size and polynomials of time trends in all columns. Robust standard errors are two-way clustered at the firm and year-industry level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B3: Robustness check: excluding more bunching firms

	2012		2014		2015	
	5%	10%	5%	10%	5%	10%
	(1)	(2)	(3)	(4)	(5)	(6)
A: Firm-level TFP in logs						
$T_{i,C} \times Post_C$	0.015***	0.015***	0.015***	0.015***	0.017***	0.017***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	20,221	20,017	19,772	19,573	22,795	22,492
B: Δ log(Fixed Assets)						
$T_{i,C} \times Post_C$	0.022**	0.022**	0.015*	0.017**	0.012**	0.009*
	(0.010)	(0.011)	(0.008)	(0.009)	(0.005)	(0.005)
Observations	17,009	16,837	16,697	16,529	19,220	18,963
C: Δ log(Real Capital)						
$T_{i,C} \times Post_C$	0.021**	0.020**	0.015*	0.016*	0.011*	0.008
	(0.009)	(0.009)	(0.009)	(0.009)	(0.005)	(0.006)
Observations	17,009	16,837	16,697	16,529	19,220	18,963
D: After-tax cash flow						
$T_{i,C} \times Post_C$	0.021***	0.021***	0.018***	0.019***	0.016***	0.014***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)
Observations	24,048	23,780	23,411	23,140	27,006	26,635
Controls	Sales (in logs), and initial employment and capital (in logs) interacted with polynomials of time trends					
Firm FE	Y	Y	Y	Y	Y	Y
Year-sector FE	Y	Y	Y	Y	Y	Y

Notes: This table applies different exclusion criteria on the treated firms. Treatment groups for regressions in columns (1), (3) and (5) exclude firms within the 5% range of the upper qualifying taxable income threshold for each rate change cohort. Treatment groups for regressions in columns (2), (4) and (6) exclude firms within the 10% range of the upper qualifying taxable income threshold for each rate change cohort. Robust standard errors are two-way clustered at the firm and year-industry level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B4: 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 1K RMB)	932,741	4,187	600
B. Small-firm entries			
Employees	135,727	41.70	21
Capital (in 1K RMB)	135,727	9,703	2,100
C. Medium/Large-firm entries			
Employees	9,192	413.9	240
Capital (in 1K RMB)	9,192	100,951	23,800
D.Unclassifid-firm entries			
Employees	264,280	8.95	6
Capital (in 1K 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 B5: Shareholder structures: SMPEs and non-SMPEs

	No. obs.	Owned by a single investor		Largest investor	
		Individuals(%)	Corp.(%)	Individuals(%)	Corp.(%)
All firms	563,782	36.40	5.39	87.60	10.38
Micro and unclassified	497,450	38.92	4.67	89.25	8.74
Others	66,332	17.48	10.75	75.25	22.64
Firms registered in 2010					
All firms	34,040	29.22	4.16	91.70	8.07
Micro and unclassified	30,409	31.15	3.65	92.86	6.89
Others	3,631	13.08	8.43	81.91	17.96
Firms registered in 2012					
All firms	26,832	29.58	4.17	91.32	8.39
Micro and unclassified	25,730	30.33	3.96	91.77	7.93
Others	1,102	12.07	9.07	80.76	18.97
Firms registered in 2014					
All firms	37,209	41.95	2.69	94.27	5.38
Micro and unclassified	35,900	41.91	2.61	94.36	5.29
Others	1,309	42.93	4.74	91.75	8.02
Firms registered in 2016					
All firms	56,545	59.17	2.40	93.80	4.58
Micro and unclassified	55,638	58.89	2.39	93.77	4.58
Others	907	76.30	3.31	95.59	4.08

Note: This table summarizes the investor structures for all manufacturing firms registered before 2017. To obtain these statistics, we match the investor dataset with the tax registration dataset. Firms in the tax registration dataset are classified into "micro", "unclassified", "small", "median", or "large". Columns 3 and 4 present the percentage of firms that are owned by one individual or a single corporation. Columns 5-6 summarize the percentage of firms with multiple investors whose largest shareholder is either an individual or a corporation.

Table B6: The impact of SMPE tax cuts on investment and TFP – potential subsidiaries

	log(TFP)			Δlog(Fixed Assets)			log(After-tax profit/Fixed assets)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$T_{i,2012} \times Post_{2012}$	0.016***			0.022**			0.034***		
	(0.004)			(0.010)			(0.005)		
$T_{i,2012} \times Post_{2012} \times$	-0.033*			0.019			0.033		
$Corp.owned_i$	(0.018)			(0.043)			(0.023)		
$T_{i,2014} \times Post_{2014}$		0.016***			0.016*			0.028***	
		(0.004)			(0.008)			(0.005)	
$T_{i,2014} \times Post_{2014} \times$		-0.007			0.008			-0.017	
$Corp.owned_i$		(0.009)			(0.011)			(0.017)	
$T_{i,2015} \times Post_{2015}$			0.017***			0.012**			0.017***
			(0.004)			(0.005)			(0.004)
$T_{i,2015} \times Post_{2015} \times$			-0.010			0.015			-0.019
$Corp.owned_i$			(0.012)			(0.010)			(0.018)
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year-sector FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	20,344	19,841	22,904	17,113	16,756	19,314	24,238	23,502	27,156

Notes: This table reports the triple DID estimation results when distinguish potential subsidiaries from others in the treatment groups. $Corp.owned_i$ is a dummy that equals 1 if a treated firm is wholly owned by a single corporation, and 0 otherwise. We use the same sample and control for the same set of variables as in the baseline estimations. Robust standard errors are two-way clustered at the firm and year-industry level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table B7: The impact of the SMPE tax cuts on firm entry: placebo test

	2013		2014		2015		2016	
	L	H	L	H	L	H	L	H
D_t	0.142	0.145	0.072	0.140	0.011	0.140	-0.049	0.077
	(0.094)	(0.107)	(0.091)	(0.123)	(0.117)	(0.123)	(0.094)	(0.126)
Fixed-effects	day-of-the-week, industry-month, prefecture							
N_left(effective)	1321	2075	1709	2388	2370	2927	2928	3517
N_right(effective)	1371	2245	1852	2362	2502	2845	3063	3688
Order Loc. Poly. (p)	2	2	2	2	2	2	2	2
BW Bias (b)	133	137	154	136	162	138	163	143

Note: In this table, we conduct placebo tests utilizing January 1st as the "policy date" for 2013-2016. The running variable is the number of days between the firm's registry date and the policy effectiveness date. "L" stands for low external financial dependence and "H" stands for high external financial dependence. Estimates reported are obtained using a local quadratic RD estimator with optimal bandwidth selection as per Calonico et al. (2014). The dependent variable takes the log form of total number of micro and unclassified firms by industry, prefecture, and entry date. Standard errors clustered by industry-month date are in parentheses. * p <0.1, ** p <0.05, *** p <0.01.