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by

Athiphat Muthitacharoen, Archawa Paweenawat
and Krislert Samphantharak

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The Double-Edged Sword:
Unintended Consequences of SME Promotion Policy*

Athiphat Muthitacharoen Archawa Paweenawat

Krislert Samphantharak

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Abstract

This paper investigates the unintended consequences of size-dependent regulations in small and medium-sized enterprise (SME) promotion policies. We use data from all registered Thai firms to analyze the effects of an introduction of a revenue cap for the SME tax incentive program qualification. Our study shows a marked bunching of firms just below the cap, illustrating its tax salience. We provide evidence suggesting that a significant of the observed bunching is due to real operation responses. A difference-in-differences analysis indicates that eligible firms just under the threshold exhibit a significant decline in revenue growth compared to those just above it. This adverse effect is more pronounced among firms with lower pre-policy profitability. We also document substantial negative effects on investment and profitability but find no significant impact on firm survival—challenging the common assertion that government support enhances SME survival. In addition, our findings indicate a marked reduction in the presence of large firms, suggesting the broader implications on the firm size distribution in the economy. We highlight the double-edged nature of size-based SME policies: while intended to help smaller businesses, the measures might inadvertently suppress growth for firms near the threshold and potentially create resource misallocation. This study underscores the need for a careful policy design that supports SMEs without impeding their potential for growth.

Keywords: Size-dependent policy, SMEs, Bunching, Tax incentives, Corporate tax

JEL Classifications: G3, H2, K3, L2, L5

* Muthitacharoen: Faculty of Economics, Chulalongkorn University, Thailand athiphat@gmail.com; Paweenawat: Puey Ungphakorn Institute for Economic Research (PIER), Bank of Thailand archawap@bot.or.th; Samphantharak: University of California San Diego and PIER krislert@ucsd.edu. We thank Ben Olken for his valuable suggestions. The paper also benefits from comments from participants at the 2020 Econometric Society World Congress, the ADBI Conference on SME Performance Under Uncertainty, the 80th Annual Congress of the International Institute of Public Finance, and the seminars at the University of Tokyo and the ADB. The opinions expressed in this study are those of the authors and should not be attributed to Puey Ungphakorn Institute for Economic Research or the Bank of Thailand. This paper was previously circulated for comments under the title "Tax Incentives to Appear Small: Evidence from Thai Firms and Corporate Groups".

1. Introduction

Governments around the world recognize the vital role that small and medium-sized enterprises (SMEs) play in economic growth, job creation, and innovation. As such, there is a concerted effort to implement supportive policies that bolster the vitality and sustainability of SMEs. However, the practical execution of these policies presents a complex challenge, primarily due to the necessity of defining what constitutes an SME (Bergner et al., 2017). This definition, while seemingly straightforward, is crucial as it influences eligibility for support programs but also inherently ad hoc. It introduces incentives that may not only shape firms' behavior in unexpected ways (Benedek et al., 2017; Tsuruta, 2020; Hosono, Hotei, and Miyakawa, 2023) but also potentially impact the distribution of firms across the economy and lead to resource misallocation, as suggested by Hsieh and Olken (2014) and Bachas et al. (2019).

Crafting SME criteria requires a delicate balancing act. On the one hand, the criteria must be sufficiently inclusive to ensure broad access to the intended supports, making sure assistance is not overly burdensome to obtain. On the other hand, they must be specific enough to ensure that the assistance genuinely benefits small businesses, targeting the support to those firms that need it most. Achieving this balance is fundamental to fostering an environment conducive to SME growth without inadvertently prompting adverse behavioral changes.

This study examines the implications of Thailand's implementation of a revenue-based threshold for SME tax incentives. We use administrative data containing annual financial statements from 2004 to 2017 encompassing the universe of registered firms in Thailand. Our analysis focuses on the introduction of the 30-million-baht revenue cap as a criterion for the SME tax scheme in 2011.[1] This policy's distinct requirement—that firms must never exceed this revenue threshold in the past—along with its unanticipated nature, provides an exogenous policy shift. It facilitates the identification of the impacts of size-based regulation on SME growth and explores its broader implications on firm size distribution within the economy.

We first employ the bunching method developed by Kleven and Waseem (2013) to examine the salience of the tax regulation. We then utilize the difference-in-differences (DID) approach to

[1] The threshold is around 0.9 million USD using the average exchange rate during 2004–2017 (1 USD = 34.3 THB). Note that the exchange rate for THB ranged between 26.8 and 41.6 baht per USD during that time.

investigate its effects on growth, investment, profitability, and survival. In addition, we examine the broader influence of the SME tax incentive on the presence of large firms.

For the DID analysis of the growth implications, the treatment group consists of firms slightly below the threshold in the year preceding the policy announcement (2010), specifically those with revenue between 25 and 30 million baht. In contrast, the control group includes firms just above this range, with revenue between 30 and 35 million baht. To ensure comparability between the treatment and the control groups, we focus only on firms whose revenues remained under the 30-million-baht threshold in all preceding years (2004–2009). The key distinction between the two groups is their revenue position relative to the threshold in the year prior to the policy announcement, despite having similar past revenue.

It is crucial to underscore that the categorization of firms into treatment and control groups in our analysis is exogenous, based on whether a firm's revenue was above or below the threshold in the year before the policy was announced. To support our identification strategy, we conduct an event-study estimation around the cap introduction. The results indicate that the estimated effects are much larger than the pre-trend coefficients and lie outside their 95% confidence intervals, supporting our identification strategy. Additionally, we include firm-, year-, and sector-year fixed effects to account for any unobserved factors that might influence the outcome variables.

We document three sets of empirical findings. First, we find that the cap introduction created a salient tax notch for SMEs. Specifically, we identify a strong response to the revenue cap, as indicated by a significant bunching just below the threshold that did not exist before the cap introduction. This bunching is mainly driven by firms with positive earnings before interest and taxes (EBIT). In contrast, there is no bunching among firms with negative or zero EBIT, which have a weaker incentive to bunch. We also note the smooth distribution of the revenue-variable cost ratio around the notch and the persistence of significant bunching even when excluding firms reporting revenue in multiples of 1,000. This strongly suggests that a significant part of the observed effect is attributed to the real operation response.

Second, our DID analysis reveals that although the SME tax incentive alleviate the tax burden, the associated revenue cap significantly hampers growth, investment, and profitability. The adverse

effect on growth is more pronounced among firms with limited growth potential, suggesting that these firms might prefer retaining tax incentives for SMEs over pursuing expansion. Additionally, we find no significant effect of the tax incentive on firm survival. This is particularly significant as it implies that the prevailing belief that government support for SMEs enhances their survival may not consistently hold true (OECD, 2021).

Finally, we illustrate the broader implications of the SME tax incentive. Our sector-province analysis indicates a marked reduction in the presence of large firms after the policy introduction. This suggests that the SME tax incentive may hinder the progression of SMEs into larger enterprises and significantly affect the economy's firm size distribution.

Overall, our findings highlight the critical need for a careful design of policies that intend to support SMEs. With the inherent challenges these entities face in competing with larger firms, government interventions may be necessary to establish a level playing field for fair competition. However, SME promotion policies can bring unintended consequences. Our research highlights the double-edged nature of such measures: while they provide short-term financial relief, they concurrently restrict business expansion and curtail longer-term potential. Moreover, these policies might also cause a meaningful distortion in the structural composition of firms in the economy.

The remainder of this paper is organized as follows. Section 2 discusses related studies. Section 3 provides an institutional background of the policy. We describe the data used in the analysis of this study in Section 4. Sections 5, 6, and 7 discuss the empirical strategy and the results for each of the bunching and difference-in-differences analyses. Section 8 concludes and discusses policy implications.

2. Related Studies

This study is directly related to the literature that studies how size-dependent regulations influence firm size. Key theoretical contributions in this area include Keen and Mintz (2004), Gourio and Roys (2014), and Garicano et al. (2016). For instance, Garicano et al. (2016) shows that France's size-dependent labor regulations have significant effects on the productivity distribution.

Empirically, much focus has been on firm responses to thresholds or notches created by tax systems. Examples include bunching or other behavioral changes to avoid complying with value added

tax regulations (Onji, 2009; Harju et al., 2019; Liu et al., 2021; Muthitacharoen et al., 2021), to benefit from lower tax rates in the corporate income tax system (Bachas and Soto, 2021), and to stay below the enforcement radar (Almunia and Lopez-Rodriguez, 2018). Within this domain, studies pertinent to our work include Tsuruta (2020) and Hosono et al. (2023), both investigating responses to changes in Japan's capital-based threshold for SMEs. Tsuruta (2020) investigates how Japanese firms increase capital in response to relaxed capital-based SME thresholds. The study is particularly significant for its finding that firms tend to restrain their capital increase—a strategic decision to maintain their SME status. In a similar Japanese context, Hosono et al. (2023) examines firms downsizing to benefit from tax exemptions under specific thresholds. Its findings provide pivotal insights, indicating that size-dependent tax policies can significantly influence firm growth, not only through direct incentives to preserve SME status but also via the financial constraint channel.

While these studies provide valuable insights, there remains a significant gap in understanding the effects of SME promotion policies, especially those based on revenue or turnover, a regulation commonly observed in EU and OECD countries (OECD, 2015; Bergner et al., 2017). There are at least two reasons why firms may react to the turnover-based SME policy in a different manner from the capital-based thresholds considered in Tsuruta (2020) and Hosono et al. (2023). First, adjustments in capital stock are typically associated with strategic planning and structural changes, whereas revenue responses are more immediate. Consequently, turnover-based SME regulations might prompt more pronounced responses than those influenced by capital-based criteria. Second, under turnover-based thresholds, particularly those accounting for historical revenue, firms face the challenge of balancing growth aspirations with the risk of permanently losing SME benefits. This complex scenario calls for a focus on long-term sustainability and careful progression, rather than immediate reactions to policy shifts. The goal of this paper is to address this gap in the literature by studying the impacts of a turnover-based SME policy on firms' growth.

We extend this body of literature in two ways. First, our analysis provides clear identification strategies that indicate the impact of an introduction of a turnover-based cap on growth and investment. Our study demonstrates that turnover-based thresholds, while seemingly straightforward, can have profound implications on both growth and investment. To provide a context, Tsuruta (2020) finds that

relaxing capital stock criteria for SMEs led to a 0.15% increase in asset growth, against the average asset growth of 1.9% during their study period. In contrast, our findings indicate that introducing a revenue cap triggers a substantial 6.0 percentage point reduction in fixed asset growth, representing 73.4% of the treated pre-policy mean. This stark divergence underscores the profound effects that turnover-based thresholds can have on firm behavior.

Second, our study expands upon the insights of Hsieh and Olken (2014), which observed that size-dependent regulations in India, Indonesia, and Mexico did not lead to economically meaningful bunching around thresholds, while acknowledging that the impact might vary across firms. We contribute to this discourse by illustrating that, in Thailand, the size-dependent tax regulation profoundly affects firm growth, especially for those with lower growth potential. This consequently influences the presence of large firms in the economy. Our findings underscore the potential of size-dependent tax policy to significantly shape the structural composition of the business landscape and to cause resource misallocation (Bachas et al., 2019).

3. Policy Background

All registered Thai firms are subject to corporate income taxation, generally levied as a flat-rate tax on net profit. In 2008, the government initiated a preferential tax scheme targeted at SMEs. To be eligible, a firm's registered capital must not exceed 5 million baht. This scheme, aimed at alleviating financial strains and enhancing survival and competitiveness, provides SMEs with reduced tax rates on their taxable income. The structure of this preferential tax scheme is progressive, with tax rates starting at 0% and gradually increasing as a function of net profit.

In 2011, the SME tax scheme underwent a significant revision in its qualification criteria. The government introduced an annual revenue cap of 30 million baht, coupled with the requirement that a firm's revenue must not have exceeded this limit in any previous year. This created an important tax notch within the corporate income tax system. It marks a departure from the earlier criteria based solely on registered capital levels, which were relatively easier to fulfill. Announced in 2011 and set to take effect in 2012, the policy change may have prompted some firms to adjust their behavior immediately following the announcement in 2011.

To demonstrate the magnitude of the tax incentive for SMEs, consider the tax liabilities for a hypothetical firm whose profit matches the mean of the baseline sample (1.8 million baht). Prior to the policy change, from 2008 to 2010, this firm consistently faced an annual tax liability of 327,500 baht. However, following the 2011 policy change, the firm's tax burden averaged approximately 240,000, during the 2012-2018 period.[2]

From the government's perspective, the revised policy, by including both current and historical revenue considerations, enables them to more accurately target and ensure that benefits are directed towards those firms genuinely in need. However, for SMEs, this policy shift compels them to strike a critical balance between growth potential and the risk of permanently losing the benefits of SME status. This poses significant challenges and potentially contradicts the government's initial intentions.

4. Data

This study analyses corporate profile and financial statements (CPFS) data of the universe of registered Thai firms from 2004 to 2017. Every registered firm in Thailand is legally required to submit its annual financial statements to the Department of Business Development (DBD). The CPFS database has various financial information including assets, liabilities, revenues, and expenses. It also contains additional firm information such as registration year, registration type, operation status, and primary industry. We exclude holding companies from our analysis as they do not directly engage in production activities.[3]

Table 1 shows summary statistics for each analysis performed later in this study: the main bunching analysis (Panel A), and the difference-in-differences analyses for revenue growth, fixed assets growth, profitability, survival likelihood, tax burden and presence of large firms (Panels B–G).

[2] Table A1 in the supplementary appendix provides the details about the SME tax incentive scheme and the tax burden for the hypothetical firm.

[3] For more details, see Banternghansa et al. (2019).

Table 1. Descriptive statistics

Variables	N	Mean	Median	S.D.
Panel A: Bunching analysis				
Revenue	599,627	26,160,208	24,442,722	8,322,355
Panel B: Difference-in-differences analysis for revenue growth				
Revenue growth	74,321	0.035	0.013	1.059
Treat (0/1)	74,321	0.412	0.000	0.492
Post (0/1)	74,321	0.679	1.000	0.467
Age	74,321	14.101	12.000	9.122
Panel C: Difference-in-differences analysis for fixed assets growth				
Fixed assets growth	71,440	-0.037	-0.076	1.295
Treat (0/1)	71,440	0.408	0.000	0.491
Post (0/1)	71,440	0.686	1.000	0.464
Age	71,440	14.306	12.000	9.117
Panel D: Difference-in-differences analysis for profitability				
ROA	65,592	0.081	0.067	0.243
Treat (0/1)	65,592	0.409	0.000	0.492
Post (0/1)	65,592	0.663	1.000	0.473
Age	65,592	13.850	12.000	9.146
Panel E: Difference-in-differences analysis for tax burden				
Tax burden	72,303	0.024	0.010	0.131
Treat (0/1)	72,303	0.414	0.000	0.492
Post (0/1)	72,303	0.667	1.000	0.471
Age	72,303	14.132	12.000	9.142
Panel F: Difference-in-differences analysis for survival				
Survival	76,726	0.886	1.000	0.318
Treat (0/1)	76,726	0.413	0.000	0.492
Post (0/1)	76,726	0.679	1.000	0.467
Age	76,726	14.013	12.000	9.174
Panel G: Difference-in-differences analysis for presence of large firms				
# firms > 35 mil. baht (log)	17,540	1.723	1.386	1.571
# firms > 40 mil. baht (log)	16,950	1.703	1.386	1.558
# firms > 45 mil. baht (log)	16,441	1.684	1.386	1.547
# firms > 50 mil. baht (log)	15,942	1.671	1.386	1.536
Exposure	18,174	0.830	1.000	0.251
Post (0/1)	18,174	0.691	1.000	0.462

Note: The table describes summary statistics of data used in the analyses. Profitability is defined as EBIT divided by lagged total assets and is winsorized at the 1% level. Tax burden is defined as tax liability divided by lagged total assets
Source: Authors' estimate.

5. Bunching Analysis

5.1 Measuring Bunching

Following Kleven and Waseem (2013), we measure bunching at the SME tax notch by comparing the actual distribution to the counterfactual distribution in the absence of the tax notch. This can be written as

$$b = \frac{\sum_{j=y_L}^{y^*}(c_j - \hat{c}_j)}{\frac{\sum_{j=y_L}^{y^*}\hat{c}_j}{N_j}}, \quad (1)$$

where y^* is the SME threshold, y_L is the lower limit of the excluded region, c_j is the actual number of firms in each revenue bin j (width of 100,000 baht), $\hat{c}_j$ is the counterfactual number in each revenue bin in the absence of the tax notch, and N_j is the number of bins within the interval $[y_L, y^*]$. The bunching parameter b reflects the size of excess bunching relative to the average height of the counterfactual distribution to the left of the notch.

The counterfactual distribution of reported revenue is estimated by fitting a 5th degree polynomial equation and excluding the areas around the notch where bunching occurs.[4] The equation can be written as

$$\mathrm{c}_j = \sum_{i=0}^{p}\beta_i(z_j)^i + \sum_{i=z_L}^{z_U}\gamma_i \mathbf{1}[z_j = i] + v_j, \quad (2)$$

where c_j denotes the number of firms in bin j, z_j denotes the revenue level of bin j, p denotes the polynomial order, $[z_L, z_U]$ denotes the excluded region, and v_j denotes the error term. The predicted value $(\hat{c}_j)$ from this equation represents the counterfactual distribution that is used in equation (1). Note that the lower limit of the excluded region (y_L) is set where the bunching begins, and the upper limit is estimated in an iterative procedure to ensure that the excess mass below the notch equals the missing mass above.

5.2 Bunching at the Tax Notch

[4] We also estimate the polynomial equations of the 4th, 6th, and 7th degree. The results are consistent and are available upon request.

To determine whether firms responded to the SME tax notch, Panels A–B of Figure 1 show histograms of revenue around the SME threshold with a bin width of 100,000 baht. There is a sharp bunching just below the 30-million-baht threshold during the post-policy period (2012–2017), which did not exist before the introduction of the tax incentive in 2012. These findings suggest that firms responded strongly to the SME tax incentives.

We provide bunching estimates and their corresponding standard errors for all sector and each major sector are available in the supplementary appendix (Table A2). The overall bunching estimate is 2.62, i.e., the total excess bunching mass is approximately 2.62 times the average height of the counterfactual over the excluded range. While the bunching is large and statistically significant across all major sectors, it appears to be most pronounced in the retail trade sector. One explanation is that the self-enforcement mechanism in the value-added tax system becomes less effective at the retail stage, providing a chance to manipulate reported sales.[5]

We also find that the bunching response is mainly driven by firms with positive EBIT, as shown in Panels C–D of Figure 1. There is no bunching among firms with negative or zero EBIT, which have no incentive to bunch. This result suggests that the response is consistent with the financial incentive for firms to respond to the new tax scheme.

Our analysis suggests that a significant portion of the observed bunching could be attributed to real operational responses rather than mere under-reporting. We base this conclusion on two key observations.

First, to address potential concerns about tax evasion through rounded revenue reporting (Aghion et al., 2024), we specifically exclude firms reporting revenue as exact multiples of 1,000 baht. As shown in Panel F of Figure 1, the significant bunching below the threshold persists (estimate of 2.84, standard error 0.02). This reinforces the presence of genuine operational responses.

Second, we examine the revenue-cost ratio, defined as total revenue divided by costs of goods and services sold (COGS). Such costs include salary expense which is relatively difficult to misreport due to withholding taxes. If the bunching were due to the real operation response, we would expect firms

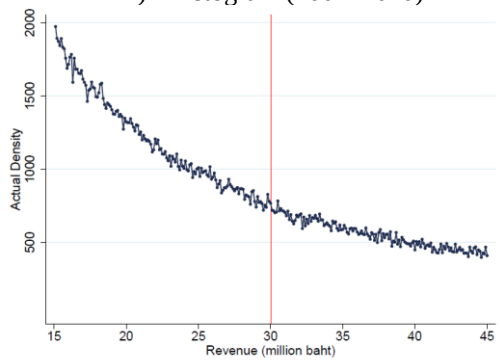
[5] See, for example, Pomeranz (2015) and Naritomi (2019).

to proportionally lower their variable inputs proportionally, leading to a smooth distribution of the revenue-cost ratio around the SME tax notch. Conversely, if the bunching resulted from non-operational factors, such as under-reporting revenue without corresponding adjustments in reported costs, the revenue-cost ratio would likely show discrepancies near the notch, as firms might reduce revenue reporting without reducing deductible input costs. Panel E of Figure 1 illustrates the average revenue-cost ratio of SMEs in bins of 2 million baht on both sides of the threshold. Although some firms may still proportionally reduce reported costs to underreport revenue, the smooth distribution of the revenue-cost ratio around the notch suggests that a substantial portion of the observed effect stems from real operational responses.

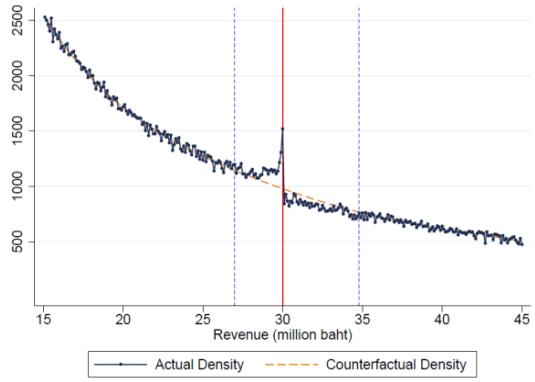
While these findings provide compelling evidence for real operational responses, we acknowledge that they are not conclusive. Some firms may underreport revenue while avoiding the use of rounded figures or proportionally reducing reported costs to match their underreported revenue. Nonetheless, our analysis strongly suggests that real operational changes significantly contribute to the observed bunching behavior. This aligns with our DID findings in the next section, which show that the policy change resulted in reduced investment in fixed assets.

Figure 1 Bunching and persistence around the SME threshold

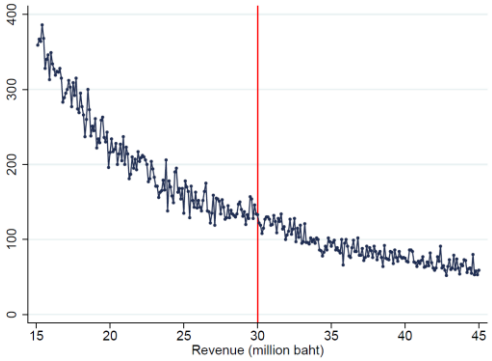
A) Histogram (2004–2010)



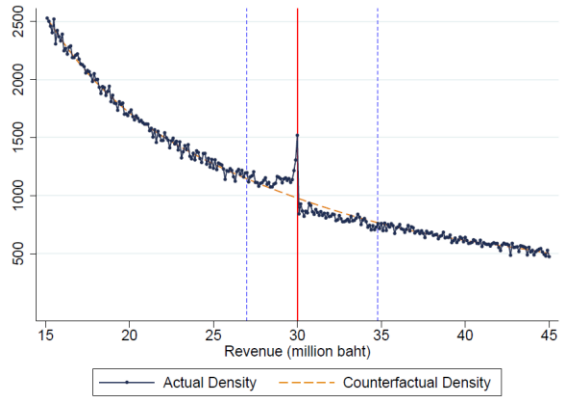
B) Histogram (2011–2017)



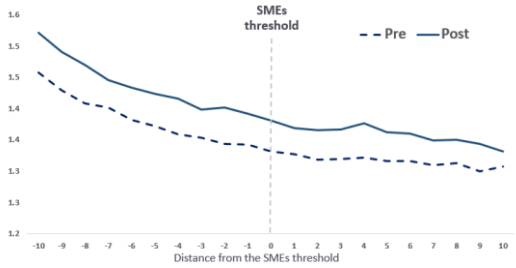
C) Histogram (2011–2017): Non-positive EBIT



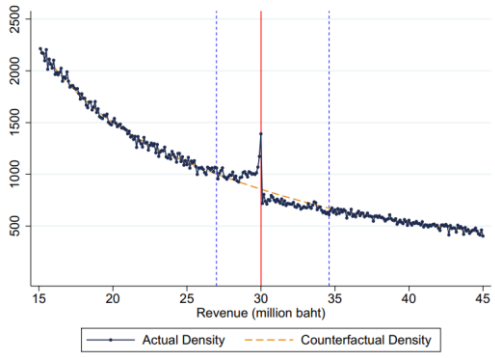
D) Histogram (2011–2017): Positive EBIT



E) Revenue-cost ratio around the SMEs threshold



F) Histogram (2011-2017): Excluding those with revenue in multiples of 1,000 baht



Note: Panels A and B show the histograms of firms' revenue by pooling data of all firms from 2004 to 2010 and from 2011 to 2017, respectively. Panels C and D focus on the 2011–2017 period and segment firms by profitability. For Panels A–D, the bin width is 100,000 baht. The red vertical line denotes the SME threshold of 30 million baht. The blue vertical dashed line denotes the lower bound and the upper bound of the excluded region (27–34.8 million baht). The orange dashed line is the counterfactual density fitted by excluding bins around the SME notch. Panel E shows the average revenue-input ratio of SMEs in bins of 2 million baht on both sides of the threshold before and after the revenue cap introduction. The revenue-input ratio is defined as total revenue divided by costs of all goods and services. Panel F shows the histograms of firms' revenue by pooling data from 2011 to 2017 when excluding those reporting revenue in multiple of 1,000.

6. Implications on Growth

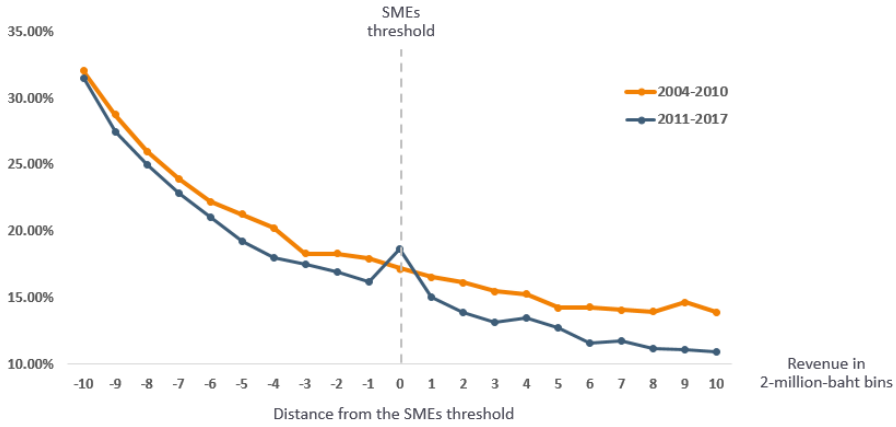
Having established the salience of the SME tax incentive and its potential real response, we further analyze how the size-dependent policy has affected firm growth. This section first illustrates the persistence of firm behavior around the threshold. It then uses a more-robust framework to demonstrate the effects of the SME promotion policy on revenue growth, investment, profitability, and survival.

6.1 Persistence

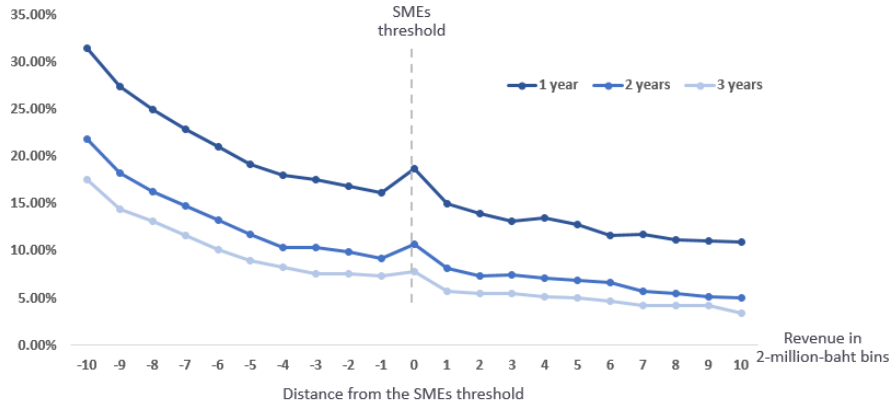
Panels A of Figure 2 shows the one-year persistence rates of firm size on both sides of the threshold, comparing before and after the revenue cap introduction. The persistence rate is defined as the proportion of firms that remain in the same revenue bin from one year to the next, where the width of each bin is 2 million baht. During 2012–2017, the persistence rate in the bin just below the threshold (28–30 million baht) is noticeably larger than that in the other bins around the threshold. This pattern is not observed before the SME tax incentive introduction. We also find that this pattern of persistence rate remains even after a few years, as shown in Panel B of Figure 2. This finding implies that firms attempted to stay below the tax notch for multiple years.

Figure 2 Growth implications of the size-dependent SME promotion policy

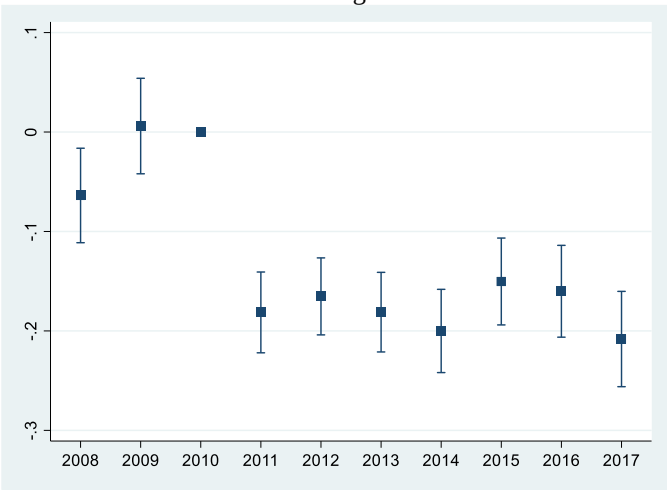
A) Persistence rate at the threshold: 1 year (2004–2010 vs. 2011–2017)



B) Persistence rate at the threshold: 1, 2, and 3 years (2012–2017)



C) Event study estimation for the effects of the size-dependent SME promotion policy on the revenue growth



Note: Panels A and B illustrate the persistence rate, defined as the probability that a firm remains in the same 2-million-baht revenue bin from one year to another. Panel C shows the event study estimation for the effects of the size-dependent SME promotion policy on the revenue growth. The year immediately before the policy change (2010) is omitted to serve as the base year. Error bars indicate 95% confidence intervals.

6.2 Revenue Growth, Investment, Profitability, Survival and Tax Burden

Next, we employ the difference-in-differences framework to evaluate the impacts of the size-dependent promotion policy on firms' revenue growth. Given that the tax incentive was initially implemented in 2008, and the revenue requirement was announced in 2011, we designate 2008–2010 as the pre-policy period and 2011–2017 as the post-policy period. We categorize firms into treatment and control groups based on their revenue proximity to the threshold in 2010, the year preceding the policy announcement. Specifically, in our baseline analysis, the treatment group includes firms with revenues within the range of 25–30 million baht in 2010, while the control group comprises those with revenues within the range of 30–35 million baht. To enhance comparability between these two groups, we confine our analysis to firms that 1) existed throughout the entire pre-policy period and 2) consistently reported revenues not exceeding the 30-million-baht threshold during all observed years prior to 2010 (2004–2009). We also conduct sensitivity analyses by adjusting the revenue range to 20–40 million baht and 27–33 million baht, examining the effects within the wider and narrower bands, respectively.[6]

The estimation equation can be written as:

$$y_{it} = \alpha_0 + \alpha_1 Post_t + \alpha_2 Post_t \cdot Treat_i + \alpha_3 Age_{it} + FirmFE + YearFE + Sector \times YearFE + \varepsilon_{it}, \quad (3)$$

where y_{it} denotes revenue growth defined as $\log(Revenue_{it}) - \log(Revenue_{i,t-1})$, $Post_t$ denotes a dummy variable that equals one for the years including and after 2011 and equals zero otherwise, $Treat_i$ denotes a dummy variable that equals one for treated firms and zero for control firms, and Age_{it} denotes firm age. We use robust standard errors clustered at the firm level. Under the identification assumption that unobserved determinants of revenue growth (ε_{it}) do not change differentially on average across the treatment and control groups around the reform, the coefficient α_2 represents the causal effect of the SME revenue cap on the revenue growth. The estimation period ranges from 2008 to 2017.

It is crucial to emphasize that our treatment group and control group assignments are exogenous, determined by whether a firm's revenue was above or below the threshold in the year preceding the

[6] Note that we do not set criteria based on registered capital as this information is only available for 2017. Nonetheless, in that year, over 90% of firms with revenue of 30 million baht or less had registered capital of 5 million baht or less.

threshold policy announcement. To support our identification strategy, we conduct an event study estimation for the effects of the revenue cap introduction (Panel C of Figure 2) on the revenue growth. The year immediately before the policy change (2010) is omitted to serve as the base year. Notably, the pre-trend coefficient for 2009 is not significantly different from zero. Although the 2008 pre-trend coefficient is statistically significant, its magnitude is relatively modest. Crucially, all estimated effects are much larger than the pre-trend coefficients and fall outside the 95% confidence intervals of these pre-trends. This supports our identification strategy, suggesting that any potential bias from pre-trends is likely small (de Chaisemartin and D'Haultfoeuille, 2023).

Our difference-in-differences analyses illustrate that the revenue cap adversely affected firm growth. As shown in Table 2, following the cap introduction, the revenue growth for treated firms declined by 20.2 percentage points relative to control firms (Column 1 of Table 2). From an economic standpoint, this decrease is noteworthy; it represents 47.1% of the treatment's pre-policy growth rate. Our findings are generally robust to alternative model specifications. The coefficient for the interaction term, $Post_t \cdot Treat_i$, is negative and statistically significant throughout the model specifications where we progressively add firm fixed effects, year fixed effects, and sector-year fixed effects to the model (Table A1 in the supplementary appendix).

The growth impact may differ across firms, depending on their business potential. Firms with limited potential might rely heavily on the SME tax incentives to survive, which could in turn limit their ambition for growth as they would like to remain eligible for the tax benefit. Conversely, firms with high potential to grow far beyond the threshold are less likely to constrain their growth as the benefit from the incentive is less than the opportunity cost of not growing.

We investigate this hypothesis by categorizing firms into two groups based on their pre-policy pre-tax return on assets (ROA). Specifically, we compute the average pre-tax ROA during the pre-policy period (2008–2010), defined as the ratio of earnings before interest and tax (EBIT) to total assets. We then classify firms into low- and high-ROA groups based on the industry-level median value of the average pre-tax ROA.

Our findings indicate that the detrimental growth effects associated with the SME promotion policy are more pronounced among firms within the low-ROA category. the revenue growth of low-ROA firms in the treatment group declines by 30.0 percentage points compared to their counterparts in the control group (Columns 2–3 of Table 2). On the other hand, this effect is substantially smaller, at 14.2 percentage points, for the high-ROA firms. Relative to the pre-policy growth rate of the treatment group, these declines correspond to 66.9% and 39.8%, respectively.

In addition, our analysis suggests broader implications of the policy beyond merely curtailing revenue growth. After the 2011 policy introduction, we find a decline in the growth rate of fixed assets by 8.5 percentage points for firms in the treatment group, compared to those in the control group (Column 4 of Table 2). This reduction corresponds to 82.4% of the treatment group's pre-policy growth rate. The adverse impact on investment aligns with the real-operation response discussed earlier.

In addition to the effects on growth, we apply the same difference-in-differences framework and explore the impact of the revenue cap on profitability, firm survival and tax burden. We define profitability as earnings before tax and interest divided by lagged total assets. Our finding indicates that, after the introduction of the policy, there is a 1.4 percentage point decline in profitability for treated firms relative to those in the control group (Column 5 of Table 2). This effect is significant at the 1% level. This decline represents 10.8% of the treatment group's pre-policy profitability.

Regarding tax burden, we examine the ratio of tax burden to lagged total asset. The results show that the revenue cap leads to a decrease in the tax burden for treated firms by 0.6 percentage points relative to the control group (Column 6 of Table 2). The effect is statistically significant and represents 16.2% of the treatment group's pre-policy tax burden. However, we find no significant effect on survival, measured as the likelihood of continuing operation into the subsequent year (Column 7 of Table 2). This finding is particularly noteworthy, as it challenges the common argument that government support for SMEs enhances their survival. Instead, our results provide no evidence to substantiate this claim.

Table 2. Effects of the size-dependent SME promotion policy on revenue growth, investment, profitability, survival and tax burden

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dep var: Revenue Growth			Dep var: Fixed assets growth	Dep var: EBIT (divided by lagged assets)	Dep var: Tax (divided by lagged assets)	Dep var: Next-year survival likelihood)
	Baseline	Low ROA	High ROA				
$Post_t$	-1.043	-4.005*	-0.582	0.414	-0.206	0.064	7.506***
	(1.446)	(2.069)	(1.003)	(1.186)	(0.198)	(0.107)	(0.470)
$Post_t \cdot Treat_i$	-0.202***	-0.300***	-0.142***	-0.085***	-0.014***	-0.006***	-0.002
	(0.018)	(0.043)	(0.021)	(0.022)	(0.005)	(0.002)	(0.003)
Age_{it}	0.006	0.162	0.030	0.028	0.029	-0.006	-0.948***
	(0.155)	(0.175)	(0.115)	(0.101)	(0.026)	(0.012)	(0.052)
Observations	74,321	17,537	40,123	71,440	65,592	72,303	76,726
R-squared	0.058	0.094	0.065	0.016	0.041	0.021	0.734
Number of firms	8,207	1,913	4,361	7,973	8,213	8,212	8,215
Firm FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Sector-Year FE	YES	YES	YES	YES	YES	YES	YES

Note: This table presents the estimated impacts of the size-dependent SME promotion policy. Sample include firms that 1) had revenue within the range of 25–30 million baht in 2010, 2) existed throughout the entire pre-policy period, and 3) consistently reported revenues not exceeding the 30-million-baht threshold during all observed years prior to 2010 (2004–2009). $Post_t$ is a dummy variable that equals one for 2011–2017, and zero for 2008–2010. Treat is a dummy variable that equals one for firms with revenues within the range of 25–30 million baht in 2010, and zero for those with revenues within the range of 30–35 million baht in 2010. $Post_t \cdot Treat_i$ is the interaction variable between $Post_t$ and $Treat_i$. Columns 1–3 presents the impacts on revenue growth. Columns 4–7 presents the estimated impacts on fixed assets growth, profitability, tax burden and survival, respectively. Standard errors are heteroscedasticity-robust and clustered at firm level. Numbers in parentheses indicate standard error. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Finally, we illustrate the robustness of our findings against variations in the threshold proximity. Columns 1–5 of Table 3 display the regression result where the treatment group comprises of firms with 2010 revenue of 20–30 million baht, while the control group consists of those with revenue 30–40 million baht. The results generally align with our baseline results. Following the revenue cap introduction, the treatment group shows a significant decline in revenue growth, investment, and profitability, relative to the control group. The effect on survival is small, while the effect on tax burden is not significant. This consistency also generally holds when we tighten the range around the threshold to 27–33 million baht, as shown in Columns 6–10 in Table 3.

These findings altogether demonstrate that while the tax incentive may alleviate the tax burden, the accompanying revenue cap effectively encourages firms to maintain their SME status. This, in turn, significantly influences their economic behaviors. SMEs restrict their revenue growth to adhere to the cap, which leads to decreased investment and profitability. However, this tax incentive has a minimal impact on their survival probability. This underscores the dual nature of such policies—they provide short-term financial relief but also constrain business expansion and limit longer-term potential.

Table 3. Effects of the size-dependent tax policy for SMEs: Robustness test (Different assumptions about the distance proximity to the threshold)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Wider revenue rage: 20–40 million baht					Narrower revenue range: 27–33 million baht				
Dep. Var.	Revenue growth	Fixed assets growth	EBIT (divided by lagged assets)	Tax burden (divided by lagged assets)	Survival probability	Revenue growth	Fixed assets growth	EBIT (divided by lagged assets)	Tax burden (divided by lagged assets)	Survival probability
$Post_t$	-0.413	0.013	-0.017	0.159	6.744***	-1.397	1.634	0.030	0.076	-0.227
	(0.685)	(0.665)	(0.112)	(0.125)	(0.433)	(2.233)	(1.870)	(0.207)	(0.157)	(1,598.636)
$Post_t \cdot Treat_i$	-0.159***	-0.060***	-0.011***	-0.032	-0.003*	-0.233***	-0.101***	-0.010	-0.005**	-0.002
	(0.012)	(0.015)	(0.003)	(0.021)	(0.002)	(0.025)	(0.029)	(0.007)	(0.003)	(0.004)
Age_{it}	-0.014	-0.007	0.013	-0.015	-0.864***	-0.047	-0.017	-0.001	-0.006	-0.091
	(0.079)	(0.070)	(0.013)	(0.013)	(0.047)	(0.236)	(0.083)	(0.028)	(0.018)	(179.269)
Observations	161,689	155,032	142,849	157,308	166,836	42,615	41,011	37,624	41,480	44,021
R-squared	0.050	0.011	0.034	0.003	0.731	0.070	0.022	0.057	0.034	0.736
Number of firms	17,846	17,319	17,856	17,853	17,858	4,716	4,587	4,719	4,719	4,721
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Sector-Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Note: This table presents the robustness test on different assumptions about the distance proximity to the threshold. Sample include firms that 1) had revenue within the range of 25–30 million baht in 2010, 2) existed throughout the entire pre-policy period, and 3) consistently reported revenues not exceeding the 30-million-baht threshold during all observed years prior to 2010 (2004–2009). $Post_t$ is a dummy variable that equals one for 2011–2017, and zero for 2008–2010. For columns 1–5, $Treat_i$ is a dummy variable that equals one for firms with revenues within the range of 20–30 million baht in 2010, and zero for those with revenues within the range of 30–40 million baht in 2010. For columns 6–10, $Treat_i$ is a dummy variable that equals one for firms with revenues within the range of 27–30 million baht in 2010 and equals zero for those with revenues within the range of 30–33 million baht in 2010. $Post_t \cdot Treat_i$ is the interaction variable between $Post_t$ and $Treat_i$. Standard errors are heteroscedasticity-robust and clustered at firm level. Numbers in parentheses indicate standard error. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.
Source: Authors' estimate.

7. Implications on the Presence of Large Firms

A crucial aspect of the SME tax regulation is its potential effect on the distribution of firm sizes in the economy. Our investigation extends to examining whether this regulation acts as a deterrent against the presence of large firms. We conduct our analysis at the ISIC2-province level. Our identification is based on the policy exposure, defined as the revenue share of firms that were eligible for the SME scheme in the year preceding the policy announcement (2010). We consider four outcome variables: (log of) number of firms larger than 35, 40, 45 and 50 million baht. The equation can be written as:

$$y_{it} = \alpha_0 + \alpha_1 Post_t + \alpha_2 Exposure_i + \alpha_3 Post_t \cdot Exposure_i + UnitFE + YearFE + Sector \times YearFE + \varepsilon_{it}, \quad (4)$$

where y_{it} denotes the outcome variable defined above at the ISIC2-province level, $Post_t$ denotes a dummy variable that equals one for the years including and after 2011 and equals zero otherwise, and $Exposure_i$ denotes the policy exposure variable computed in the year prior to the policy announcement. The estimation period ranges from 2004 to 2017. We incorporate fixed effects for ISIC2-province units, years, and sector-year interactions.

Our findings indicate a pronounced negative effect of the SME policy on the proliferation of large firms. Specifically, a one-percentage point increase in the pre-policy SME share results in a 13.1% decline in the number of firms exceeding 35 million baht in revenue (Column 1 of Table 4). This effect amplifies for higher revenue levels (40, 45, and 50 million baht), suggesting a consistent and monotonically increasing impact (Columns 2–4 of Table 4). This pattern of findings persists across both the manufacturing and service sectors (Columns 5–6 of Table 4) and is also observed when analyzing the share of the number of firms with revenue over 50 million baht compared to all firms above 10 million baht (Column 7 of Table 4). These results underscore the unintended consequence of the SME policy, potentially reshaping the firm size distribution and, by extension, the structural composition of firms in the economy.

Table 4. Effects of the size-dependent SME promotion policy on the revenue growth on the presence of large firms

Dep. Var. = Firm Numbers (log)	(1) Above 35m baht	(2) Above 40m baht	(3) Above 45m baht	(4) Above 50m baht	(5) Above 50m baht (Manuf.)	(6) Above 50m baht (Service)	(7) Share of firms above 50m baht
$Post_t$	0.456***	0.438***	0.436***	0.391***	0.391***	0.505***	0.003
	(0.112)	(0.122)	(0.128)	(0.112)	(0.113)	(0.104)	(0.055)
$Post_t \cdot Exposure_i$	-0.131***	-0.149***	-0.170***	-0.174***	-0.174***	-0.192**	-0.042**
	(0.033)	(0.034)	(0.034)	(0.033)	(0.040)	(0.084)	(0.019)
Observations	17,540	16,950	16,441	15,942	9,013	4,862	23,237
R-squared	0.268	0.267	0.272	0.273	0.236	0.316	0.056
Unit FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Sector-Year FE	YES	YES	YES	YES	YES	YES	YES

Note: This table presents the estimated impacts of the size-dependent SME promotion policy on the presence of large firms. The analysis is at sector-province level. $Post_t$ is a dummy variable that equals one for 2011–2017 and equals zero for 2008–2010. $Exposure_i$ is the policy exposure variable computed in the year prior to the policy introduction. $Post_t \cdot Exposure_i$ is the interaction variable between $Post_t$ and $Exposure_i$. Standard errors are heteroscedasticity-robust and clustered at the unit level (sector-province). Numbers in parentheses indicate standard error. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.
Source: Authors' estimate.

8. Conclusion

This study examines the implications of size-dependent government regulation, focusing on Thailand's introduction of a 30-million-baht revenue cap for SMEs in 2011. We have illustrated how this policy, while designed to support SMEs, has led to unintended outcomes with broader implications on growth and firm-size distribution. Our first key findings highlight the pronounced responses of firms to the revenue cap. We find a significant bunching of firms just below the threshold, primarily driven by those with positive EBIT. This suggests that the cap serves as a salient regulation, leading firms to adjust their behaviors accordingly. The impact is also persistent and remains for multiple years. Second, the regulation considerably impeded the growth and investment of firms positioned just below the threshold, with more pronounced effects on those with lower growth potential. It is important to note that this effect appears to primarily affect firms near the threshold, as our analysis does not extend to smaller firms below the cap. Finally, our findings suggest that the SME tax incentive may have reshaped the firm size distribution within the Thai economy, particularly by diminishing the emergence of large enterprises after the policy's introduction. Altogether, our research sheds light on the critical implications of turnover-based SME regulations. It underscores the necessity of crafting policies that not only provide critical support to SMEs but also carefully avoid creating growth disincentives.

Declaration of competing interest

The authors declare no conflict of interest.

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Supplementary appendix

Table A1. SME tax incentive scheme

Year	General tax rate (%)	SME scheme		
		Registered capital requirement (5 mil. baht)	Revenue requirement (30 mil. baht)	Illustrative tax liability for a hypothetical firm with sample-mean profit (Baht)
2004	30	-	-	540,000
2005	30	-	-	540,000
2006	30	-	-	540,000
2007	30	-	-	540,000
2008	30	Yes	**No**	327,500
2009	30	Yes	**No**	327,500
2010	30	Yes	**No**	327,500
2011	30	Yes	**No (Announced)**	327,500
2012	23	Yes	**Yes**	311,500
2013	20	Yes	**Yes**	265,000
2014	20	Yes	**Yes**	265,000
2015	20	Yes	**Yes**	150,000
2016	20	Yes	**Yes**	150,000
2017	20	Yes	**Yes**	225,000
2018	20	Yes	**Yes**	225,000

Note: This table describes the SME tax incentive scheme from 2004 to 2018. During 2008–2011, firms are considered SMEs and qualified for the reduced tax rates if they have registered capital not over 5 million baht. Since 2012, SMEs must have registered capital not over 5 million baht and have revenue not over 30 million baht. The introduction of the 30-million-baht revenue requirement was announced on 21 December 2011. The sample-mean profit is around 1.8 million baht.

Table A2. Bunching estimates by major sectors (2011–2017)

	N	Bunching estimate	SE
All sectors	340,837	2.622	0.015
Manufacturing	108,139	2.747	0.032
Services	89,802	2.102	0.021
Wholesale	87,765	2.363	0.029
Retail	54,988	3.669	0.076

Note: This table shows the bunching estimates around the SME threshold for 2011–2017. The estimation methodology is based on Kleven and Waseem (2013).
Source: Authors' estimate.

Table A3. Effects of the size-dependent SME promotion policy on revenue growth: Robustness test (incremental inclusion of fixed effects)

Dep. Var. =	(1)	(2)	(3)	(4)
Revenue Growth	Adding fixed effects incrementally			Baseline
$Post_t$	-0.306***	-0.369***	-0.542*	-0.413
	(0.008)	(0.015)	(0.312)	(0.685)
$Post_t \cdot Treat_i$	-0.157***	-0.157***	-0.159***	-0.159***
	(0.012)	(0.012)	(0.012)	(0.012)
Age_{it}				-0.014
				(0.079)
Observations	161,690	161,690	161,689	161,689
R-squared	0.033	0.036	0.050	0.050
Number of firms	17,846	17,846	17,846	17,846
Firm FE	YES	YES	YES	YES
Year FE	NO	YES	YES	YES
Sector x Year FE	NO	NO	YES	YES

Note: This table presents the robustness test about the incremental inclusion of fixed effects. Sample include firms that 1) had revenue within the range of 25-30 million baht in 2010, 2) existed throughout the entire pre-policy period, and 3) consistently reported revenues not exceeding the 30-million-baht threshold during all observed years prior to 2010 (2004–2009). $Post_t$ is a dummy variable that equals one for 2011–2017, and zero for 2008–2010. Treat is a dummy variable that equals one for firms with revenues within the range of 25–30 million baht in 2010, and zero for those with revenues within the range of 30–35 million baht in 2010. $Post_t \cdot Treat_i$ is the interaction variable between $Post_t$ and $Treat_i$. Standard errors are heteroscedasticity-robust and clustered at firm level. Numbers in parentheses indicate standard error. ***, **, * denotes significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimate.