Assessing the Microeconomic Impact of Investment Promotion Tax Reduction Policy: Evidence from Japanese Electric Machinery Manufacturers

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ABSTRACT

This study investigates the impact of Japan's investment promotion tax reduction policy on individual companies' microeconomic performance, departing from traditional macroeconomic perspectives. Active from January 2014 to March 2017 as part of the economic stimulus measures during the second Abe administration, this policy is known for its positive macroeconomic effects. However, its specific influence on individual companies has not been thoroughly explored. Employing the Difference-in-Differences analysis method, the study compares the outcomes of companies that utilized the policy with those that did not. Focusing on 142 electric machinery manufacturers listed on the Tokyo Stock Exchange allows for a sector-specific examination within the broader economic context. Results indicate that companies benefiting from the tax reduction policy experienced direct positive effects on corporate taxes. While this suggests a tangible financial impact, broader business outcomes and performance improvements were not significant. This implies that although the policy may have positively affected certain financial aspects, it did not necessarily lead to substantial overall improvements in targeted companies' business performance.

Keywords: investment tax reduction policy, business performance, Difference-in-Differences analysis.

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1. INTRODUCTION

This research analyzes the impacts of the Japanese investment promotion tax system introduced by the Abe government in Japan between January 2014 and March 2017.

Investment promotion tax schemes offer tax benefits to businesses to stimulate politically particular industries, technological domains, or local economies. Governments frequently employ them as a component of their economic policies. For example, in the autumn of 2023, the Kishida administration considered a new investment promotion tax system to address high prices, wage increases, population decline, and resilient national land. Specifically, the government introduced tax reduction policies in five key areas, including semiconductors, electric vehicles, batteries, waste oil, and a new aviation fuel

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called "SAF," made from these materials. The aim is to promote domestic production of "strategic materials" crucial from both decarbonization and economic security perspectives. This mechanism involves establishing criteria for each material and deducting amounts based on production and sales volumes from corporate taxes, thereby incentivizing new investments. The tax reduction period is ten years from the plan's certification. Simultaneously, a new tax system was introduced to promote domestic research and development by companies to enhance international competitiveness. Specifically, a provision was enacted to deduct 30% of income from taxable income from patents and copyrights obtained through domestic research and development conducted after April 2024. This system will continue for seven years, starting from April 2025.

In contrast, a comprehensive investment tax reduction initiative exists called the "Productivity Improvement Facility Investment Promotion Tax System." This system aims to boost productivity across various sectors and was implemented as part of the Abenomics Growth Strategy's "Japan Revitalization Strategy" in June 2013. Initially, the system was deemed highly effective, with anticipated facility investments exceeding 20,000[1]. However, in the subsequent year of 2015, its macroeconomic influence began to wane.

According to the survey conducted by the Bank of Japan in December 2015, capital investment plans remained robust with notable growth, and there were promising signs of advancement in actual capital investment. However, leading indicators such as machinery orders (excluding ships and electric power, which are consumer-driven) declined by 10% compared to the previous quarter from July to September. While there was a positive trend in October, the overall outlook for uncertain expansion in capital investment persists.

The "Productivity Improvement Facility Investment Promotion Tax System," implemented during the second Abe administration, has sparked varying opinions regarding its effectiveness. While some argue that it incentivized significant investments by businesses in new technologies and facilities, others remain skeptical of its impact on productivity and economic growth. Assessing the true impact of this policy is a complex undertaking, as it involves a multitude of factors and constantly changing circumstances.

However, it is worth noting that there has been a significant gap in the microeconomic analysis of this policy's impact. The investment promotion tax system affects various corporate decision-making processes, such as capital structure[2] and tax avoidance behaviors[3]. However, the most notable causality lies in the impact of this tax system on corporate performance. This is because the decision of corporate managers to choose a particular policy option ultimately depends on whether it will enhance the company's performance. Therefore, this study seeks to analyze whether strategically adopting the investment promotion tax system improves corporate performance.

Consequently, the key aim of this study is to explore how individual businesses can maximize their operations' performance by utilizing the investment promotion tax system.

We researched electrical equipment manufacturers listed on the Tokyo Stock Exchange. Our analysis centered on these companies for two specific reasons. First, the electrical equipment manufacturing industry was among the most actively responsive to the investment promotion tax reduction policy at that time. By narrowing our focus to electrical equipment manufacturing companies listed on the Tokyo Stock Exchange, we aimed to

[1] Momojima（2014）and Kamio (2018).

[2] Lee and Dampha (2023).

[3] Purbasari, R., Zaenal Muttaqin and Deasy Silvya Sari (2020).

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ensure uniformity in corporate attributes such as business scope, size, and the business environment. This approach also supports the assumption of parallel trends, which will be discussed later.

This paper comprises five chapters, with this introduction being the first. Chapter 2 explains the analysis model, while Chapter 3 presents the data and methods used to conduct the analysis. Chapter 4 delves into the study's results and interpretations. Finally, Chapter 5 provides the conclusions.

2. ANALYTICAL MODEL

In this study, we use difference-in-differences (after this referred to as Obliviated DiD) analysis to analyze the operational effects of investment promotion tax systems adopted by individual companies. DiD analysis is a statistical method used to estimate causal relationships using observational data when experimental research is challenging or ethically problematic. It is precious to evaluate the effects of policy interventions, considering changes over time. The analysis is based on the following fundamental ideas[4].

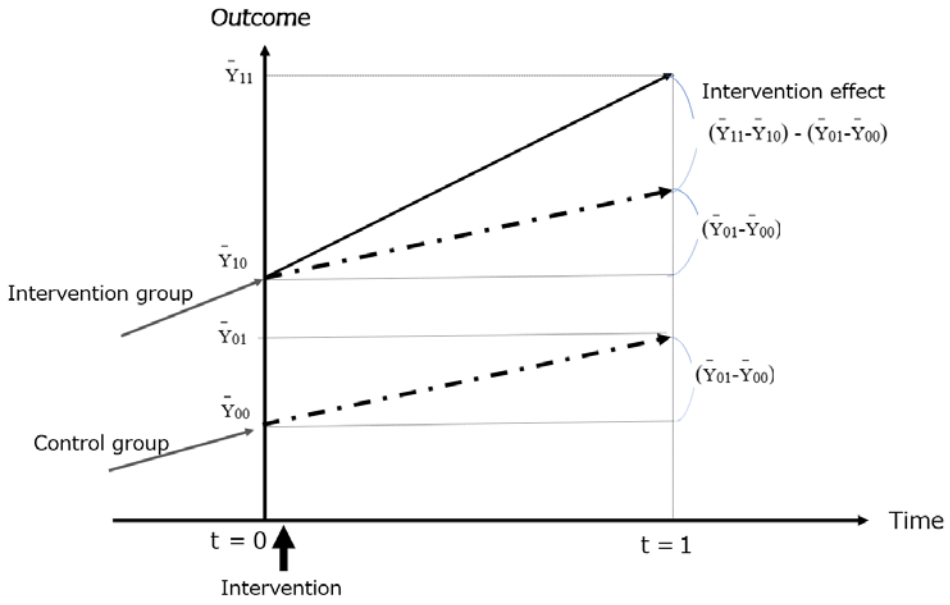

Figure 1. Conceptual diagram of difference in difference analysis.

Figure 1 shows the fundamental idea of difference-in-differences analysis. First, two groups, an intervention group and a control group, are selected for analysis. These groups must exhibit similar trends before the intervention period, an assumption referred to as the assumption of parallel trends. Subsequently, some form of treatment is applied only to the intervention group at the point of time 0, while the control group maintains its usual state without any treatment. Changes during the specified period of treatment introduction are observed at the point of time 1. In this observation, the analysis involves comparing the differences in changes before and after treatment introduction between the intervention and control groups. This comparison aims to measure the intervention effect by removing the

[4] Angrist and Pischke (2009).

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temporal variation due to the passage of time when there was no treatment.

The equation of the difference-in-differences regression model is described below.

$$Y = \alpha + \beta_1 * (\text{intervention}) + \beta_2 * (\text{time point}) + \beta_3 * (\text{intervention}) * (\text{time point}),$$

where Y is the outcome of all variables included in both intervention and control groups, intervention is a dummy variable for group assignment: intervention group = 1, control group = 0, and time point is a dummy variable: time 0 = 0, time 1 =1. Therefore, the datasets of an observed variable in the intervention group at the point of time 0 and time 1 are described respectively as (y, intervention, time point)=(Y_{01}, 1,0) and (y, intervention, time point)=(Y_{11}, 1,1), while the datasets of an observed variable in the control group at the point of time 0 and time 1 are described respectively as (y, intervention, time point)=(Y_{00}, 0,0) and (y, intervention, time point)=(Y_{01}, 0,1).

Table 1. Estimation of the effect of the intervention.

	Before intervention	After intervention	*Difference*
Intervention Group	$\alpha + \beta 1$: ($\bar{Y}_{10}$)	$\alpha + \beta 1 + \beta 2 + \beta 3$:($\bar{Y}_{11}$)	$\beta 2 + \beta 3$: ($\bar{Y}_{11}$-$\bar{Y}_{10}$
Control Group	α : ($\bar{Y}_{00}$)	$\alpha + \beta 2$:($\bar{Y}_{01}$)	$\beta 2$: ($\bar{Y}_{01}$- $\bar{Y}_{00}$)
Difference	$\beta 1$:($\bar{Y}_{10}$-$\bar{Y}_{00}$)	$\beta 1 + \beta 3$:($\bar{Y}_{11}$-$\bar{Y}_{01}$)	$\beta 3$:($\bar{Y}_{11}$-$\bar{Y}_{10}$) –($\bar{Y}_{01}$-$\bar{Y}_{00}$)

Table 1 shows the relationship between coefficients estimated in the regression equation. The outcome before the intervention in the intervention group is $\alpha + \beta_1$, which corresponds to the mean of observed variables, Y_{10}. The post-intervention outcome for the intervention group is $\alpha + \beta_1 + \beta_2 + \beta_3$, which corresponds to the mean of observed variables, $\bar{Y}_{11}$. The change in the outcome of the intervention group over the time past from time 0 to time 1 is $(\alpha + \beta_1 + \beta_2 + \beta_3) - (\alpha + \beta_1) = \beta_2 + \beta_3$, which corresponds to the mean of observed variables, $\bar{Y}_{11}$-Y_{10}. On the other hand, the change in the outcome of the control group over the time past from time 0 to time 1 is calculated as $(\alpha + \beta_2) - \alpha = \beta_2$. The difference between these two outcomes, $(\beta_2 + \beta_3) - \beta_2 = \beta_3$, which represents the intervention effect, corresponding to ($\bar{Y}_{11}$-$\bar{Y}_{10}$) - ($\bar{Y}_{01}$-$\bar{Y}_{00}$).

Parallel trends

The parallel trends assumption is a fundamental principle in DiD analysis. This assumption posits that the average trends over time for the treatment and control groups would have been parallel in the absence of treatment. In other words, before the introduction of the treatment, any differences in trends between the treatment and control groups are assumed to be constant over time. The parallel trends assumption is critical to the validity of the DiD method, as it helps control for time-varying confounders, ensuring that any observed differences in outcomes after the treatment can be attributed to the treatment itself and not

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to other evolving factors.

If the parallel trends assumption holds, it suggests that the treatment and control groups would have followed similar paths without the treatment. Therefore, any deviation from parallel trends observed after the introduction of the treatment can be attributed to the treatment effect. However, if the parallel trends assumption is violated, it is possible that unobserved factors affecting the treatment and control groups differently over time may confound the estimated treatment effect. Researchers typically assess the plausibility of the parallel trends assumption by examining pre-treatment trends and conducting robustness checks to ensure the validity of their DiD analysis.

If the assumption is strongly violated, it may raise concerns about the reliability of the estimated causal effect using the DiD method. Therefore, it is essential to take proactive measures to address any violations of the assumption of parallel trends. By doing so, researchers can increase the validity and reliability of their DiD analysis and ensure that their findings are robust against potential confounding factors.

3. DATA AND METHODS

Target of Investment Tax Reduction

Investment promotion tax reduction is an economic policy that encourages investment through reduced tax rates, favorable depreciation treatment, and tax deductions, promoting economic growth, increased employment, and industrial development. This study's targeted investment tax reduction policy is the "Industrial Competitiveness Enhancement Act," implemented during the second Abe Shinzo cabinet.

This law was enacted on December 4, 2013. From January 20, 2014, to March 31, 2016, it allowed immediate depreciation or tax deductions for machinery and facilities as well as buildings and structures newly acquired by companies. In the case of tax deductions, for investments in machinery and facilities, companies could deduct an amount equivalent to 5% of the acquisition cost of the eligible machinery and facilities from the current year's corporate tax. For investments in buildings and structures, 3% of the acquisition cost could be deducted from the current year's corporate tax. However, the maximum deduction under this tax system is within 20% of the current year's corporate tax, etc. Additionally, the acquisition cost of depreciable assets includes not only the purchase price of the fixed assets but also external incidental costs (such as transportation fees, loading charges, transportation insurance premiums, purchase fees, customs duties, and other expenses incurred for the purchase) and the amount of expenses directly required to use the asset for business purposes (internal incidental costs, such as installation costs and trial operation expenses).

Furthermore, from April 1, 2016, to March 31, 2017, companies were allowed to choose between special depreciation and tax deductions for new investments. With special depreciation, companies could depreciate 50% of machinery and facilities and 25% of buildings and structures in the fiscal year of acquisition. Alternatively, with tax deductions, companies investing in machinery and facilities could deduct an amount equivalent to 4% of the acquisition cost of the eligible machinery and facilities from the current year's corporate tax. For investments in buildings and structures, 2% of the acquisition cost could be deducted from the current year's corporate tax.

Data and Methods

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The data used for analysis was collected from a group of electrical equipment manufacturing companies listed on the Tokyo Stock Exchange. From this population, data was gathered from 142 companies that had no missing necessary data for analysis. These selected companies were able to provide continuous accounting data for sales revenue, gross profit, ordinary profit, net profit for the current period, depreciation expenses, and corporate tax payments throughout the analysis period (fiscal years 2011 to 2016). The chosen period for analysis they have covered the three years before and after the implementation of the investment tax reduction policy, enacted around January 2014. The decision to limit the analysis to companies in the electrical equipment manufacturing industry was made to facilitate the assumption of parallel trends, ensuring the uniformity of the business environment in which these companies operated.

The 142 companies under analysis were classified into the intervention group (G_1) and the control group (G_0) using the following method. The intervention group comprised companies whose average depreciation expenses increased from 2011 to 2013 to the fiscal year 2014 to 2016 and whose corporate tax burden ratio (corporate tax amount/ current profit) decreased from 2011 to 2013 to 2014 to 2016. Determining whether each company utilized the investment incentive tax system accurately from external sources is difficult without access to internal company information. Therefore, companies were considered to have utilized the investment incentive tax system if they increased their investment amount when the system was available compared to the period before its introduction and concurrently reduced their corporate tax burden ratio in both periods.

On the other hand, companies that did not meet the above-specified conditions were considered not to have utilized the tax system and were classified into the control group. Companies in the control group were those that did not increase depreciation expenses between both periods and those that increased depreciation expenses but did not decrease their corporate tax burden ratio in the same periods.

Table 2. Descriptive statistics of performance indicators.

Variable	Group	*No.of obs.*	*Mean* (lg mil.)	*Std. dev.* (lg mil.)	*Min* (lg mil.)	*Max* (lg mil.)
<Pre-intervention period: 2011-13>						
Sales revenue	Intervention	68	12.38	1.46	10.24	16.20
	Control	74	11.58	1.53	8.96	16.41
Sales margin	Intervention	68	11.14	1.47	8.95	14.91
	Control	74	10.32	1.51	8.03	15.46
Ordinary profit	Intervention	68	9.58	1.56	6.47	13.44
	control	74	8.70	1.65	4.78	13.88
Net profit	Intervention	68	8.90	1.73	3.61	13.04
	Control	74	8.18	1.61	3.71	13.50
<Post-intervention period: 2014-16>						
Sales revenue	Intervention	68	12.60	1.50	10.25	16.38

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	Control	74	11.73	1.51	9.22	16.47
Sales margin	Intervention	68	11.39	1.54	8.94	15.14
	Control	74	10.51	1.51	8.22	15.51
Ordinary profit	Intervention	68	10.07	1.69	7.41	13.93
	Control	74	9.01	1.66	5.24	13.79
Net profit	Intervention	68	9.68	1.73	6.61	13.63
	Control	74	8.48	1.75	4.89	13.40

Notes: All the pre-intervention and post-intervention variables are three-year-average of the respective periods.

In the regression approach, all the dependent variables for intervention and control group companies were set as the 2011 to 2013 average for Y_{01} and Y_{00} and the 2014-2016 average for Y_{11} and Y_{01}. All data were transformed into logarithmic values in a million yen. As explained earlier, independent variables were set as 0 or 1. Namely, the datasets of observed variables before the intervention in the intervention group were set as (2011-13 average,1,0) and the ones after the intervention as (2014-16 average, 1,1). On the other hand, the datasets of observed variables in the control group before the intervention were set as (2011-13 average, 0, 0) and the ones after intervention as (2014-16 average, 0,1). All the data were input into the regression analysis model. This analysis focused on four performance indicators adopted: sales revenue, gross profit from sales revenue, ordinary profit, and net profit for the current period.

Meanwhile, for each of the four performance indicators, the average values for the intervention group companies from 2011 to 2013 and from 2014 to 2016 were calculated respectively as Y_{10}'s average and Y_{11}'s average. Similarly, the average values for the control group companies for the same periods were calculated as Y_{00}'s average and Y_{01}'s average. It is worth noting that Y_{10}'s average corresponds to the estimated value of $(\alpha + \beta_1)$ obtained from the regression analysis, and Y_{11}'s average aligns with the value of $(\alpha + \beta_1 + \beta_2 + \beta_3)$. Likewise, Y_{00}'s average corresponds to the estimated value of α from the regression analysis, and Y_{01}'s average aligns with the value of $(\alpha + \beta_2)$. These comparisons were made to confirm the consistency of the calculated averages with the estimated parameters from the regression analysis.

4. RESULTS AND DISCUSSION

The results of the regression model analysis are presented in Table 3. First, focusing on the sales figures, the estimated values of the constant term (α) representing the average for the control group during the period before the introduction of the investment promotion tax system, and β_1, representing the average for the intervention group during the same period, are statistically significant at the 1% level. However, the coefficients β_2, indicating the change in the average value for the control group during the period after the introduction of the investment promotion tax system, and β_3, representing the change in the average value for the intervention group (utilization effect of the investment promotion tax), are not statistically significant.

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Similarly, for gross and ordinary profit, the estimated values concerning the averages for the control and intervention groups during the period before the introduction of the investment promotion tax system are statistically significant at the 1% level. Nevertheless, the coefficients β_2 and β_3, indicating the change in average values after introducing the investment promotion tax system, are not statistically significant. Finally, similar results were obtained for net profit for the current period. The estimated values of the constant term (α), representing the average for the control group during the period before the introduction of the investment promotion tax system, and β_1, representing the average for the intervention group during the same period, are statistically significant at the 1% and 3% levels, respectively. However, the coefficients β_2 and β_3, indicating the change in average values after introducing the investment promotion tax system, are not statistically significant, even at the 10% level.

Table 3. Results of regression model analysis.

Sales Revenue

Variable	*Coefficient*	*t-value*	*p-value*
β 1	0.799	3.167	0.002
β 2	0.149	0.604	0.547
β 3	0.070	0.196	0.845
α	11.585	66.345	0.000

Sales Gross Profit

Variable	*Coefficient*	*t-value*	*p-value*
β1	0.817	3.231	0.001
β2	0.192	0.777	0.438
β3	0.066	0.184	0.854
α	10.319	58.996	0.000

Ordinary Profit

Variable	*Coefficient*	*t-value*	*p-value*
β 1	0.881	3.195	0.002
β 2	0.311	1.152	0.250
β 3	0.178	0.456	0.649
α	8.699	45.607	0.000

Net Profit

Variable	*Coefficient*	*t-value*	*p-value*
β1	0.717	2.501	0.013
β2	0.291	1.039	0.300
β3	0.490	1.210	0.227
α	8.184	41.280	0.000

The results from regression analyses related to each performance indicator, organized in correspondence with Table 1, are presented in Table 4. As indicated in Table 1, the value in the cell at the Pre-intervention average of the Control Group companies (CG 74 companies) in each performance indicator is the estimated value of the constant term (α), and the value in the cell at the same column of *difference* in each performance indicator is the estimated value of β_1. All these estimated values are statistically significant at the 1 % level. On the other hand, the value in the cell at the rightmost column of the control Group companies represents the estimated value of β_2, and the bottom cell at the rightmost column contains the estimated value of β_3. These estimated values are not statistically significant, indicating a lack of reliability.

Based on these results, it can be concluded that the investment promotion tax system implemented since 2014 has not significantly affected operational outcomes (sales, sales gross profit margin, ordinary profit, and net profit for the current period). In other words, there is no observable improvement in the financial performance of companies that adopted

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the tax reduction policy compared to those that did not.

This conclusion can also be intuitively understood by comparing the average values of each performance indicator for the intervention group (companies that implemented the policy) and the control group (companies that did not) before and after the policy implementation, as shown in the rightmost column of Table 4.

Taking sales revenue as an example, the difference in average values between the two groups during the pre-intervention period (2011-2013) is 0.799 (natural logarithm, in million yen), while the difference during the post-intervention period (2014-2016) is 0.869. The increase in average sales revenue between the two groups is only 0.070 in the post-implementation period. This slight increase represents the effect (β_3) of the investment promotion tax system on sales, but the statistical reliability of this value is low. The marginal impact is evident in the intervention group's inability to significantly increase sales revenue during the post-implementation period, with an increase of only 0.219 (in the same unit) or 1.77% from the average value during the pre-implementation period. Moreover, this increase and the control group's increase of 0.149 (in the same unit) in the post-intervention period are not statistically significant.

Similar observations apply to gross profit and ordinary profit. However, if we tolerate the low reliability and analyze it, the value of β_3 for net profit is relatively more prominent than the estimated values for the other three performance indicators, and its reliability is also smaller (t-value = 1.210, p-value = 0.227). From this, it can be inferred that the managerial impact of companies choosing the investment promotion tax system is most reflected in the net profit indicator among the four performance indicators. This also suggests that many companies utilizing this tax reduction policy may have opted for tax deductions when given the choice between immediate depreciation and tax deductions.

Table 4. The effects of intervention: The difference in differences.

	Pre-intervention Av. (Standard deviation)	Post-intervention Av. (Standard deviation)	*Difference* (t-value, p-value)
<Sales revenue>			
IG 68 companies	12.384	12.602	0.219
	(1.446)	(1.494)	(0.862, 0.390)
CG 74 companies	11.585	11.734	0.149
	(1.159)	(1.503)	(0.596, 0.552)
Difference	0.799	0.869	0.070
(t-value, p-value)	(3.182, 0.018)	(3.427, 0.001)	(0.196, 0.845)
<Sales gross margin>			
IG 68 companies	11.136	11.394	0.258
	(1.456)	(1.525)	(1.002, 0.318)
CG 74 companies	10.319	10.511	0.192
	(1.495)	(1.499)	(0.775, 0.439)

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Difference	0.817	0.883	0.066
(t-value, p-value)	(3.269, 0.001)	(3.452, 0.001)	(0.184, 0.854)
<Ordinary profit>			
IG 68 companies	9.580	10.069	0.489
	(1.544)	(1.675)	(1.756, 0.081)
CG 74 companies	8.699	9.010	0.311
	(1.643)	(1.648)	(1.141, 0.256)
Difference	0.881	1.059	0.178
(t-value, p-value)	(3.261, 0.001)	(3.766, 0.001)	(0.456, 0.649)
< Net profit>			
IG 68 companies	8.901	9.682	0.782
	(1.715)	(1.719)	(2.635, 0.009)
CG 74 companies	8.184	8.475	0.292
	(1.604)	(1.736)	(1.053, 0.294)
Difference	0.717	1.207	0.490
(t-value, p-value)	(2.55 4, 0.012)	(4.129, 0.001)	(1.210, 0.227)

As mentioned in the analysis model section, it is crucial to assume parallel trends when conducting difference-in-differences analysis in this study. The assumption of parallel trends implies that the four performance indicators (sales revenue, gross profit, ordinary profit, and net profit for the current period) of intervention and control group companies exhibit similar movements in the pre-intervention period.

However, corporate performance is influenced by individual factors such as managerial actions and the business environment, and it does not follow a constant trend. Therefore, this study focuses on limiting the analysis to companies in the electrical equipment manufacturing industry and publicly listed companies to ensure the uniformity of the business environment. It is essential to confirm no significant differences in the magnitude of performance indicator fluctuations related to individual factors for each company.

To achieve this, we measured the coefficient of variation of performance indicators for each company from 2011 to 2013, three years before the introduction of the investment promotion tax system. We compared the mean and standard deviation of the intervention and control groups. The coefficient of variation is a statistical value obtained by dividing the standard deviation by the mean, indicating the magnitude of performance indicator fluctuations before introducing the investment promotion tax system.

Based on these measurement results, we conducted a significance test for the mean values of each performance variable. The test results are summarized in Table 5, with the null hypothesis stating that the mean values of performance indicators for the intervention and control groups are equal. However, none of the tests for the four performance indicators yielded sufficient t-values (the 5 % significance level) to reject the null hypothesis, indicating no significant difference in the mean values of the respective performance indicators between the intervention group and the control group.

In other words, it is not possible to assert that there is a substantial difference in the mean values of each performance indicator between the two groups. Therefore, it can be

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cautiously concluded that the assumption of parallel trends is secured to a certain extent. In conclusion, there is no definitive evidence of a significant difference in the fluctuations of performance indicators for intervention group companies and control group companies in the three years before the introduction of the investment promotion tax system.

Table 5. The coefficient of variation of performance indicators.

	G1:68 coms' average (Standard deviation)	G0:74 coms' average (Standard deviation)	t-value (p-value)
Sales revenue	0.047	0.067	1.389
	(0.060)	(0.074)	(0.167)
Sales gross profit	0.056	0.087	1.841
	(0.075)	(0.098)	(0.068)
Ordinary profit	0.569	0.467	0.432
	(0.373)	(0.411)	(0.667)
Net profit	7.458	1.593	0.857
	(1.562)	(0.795)	(0.398)

5. CONCLUSION

The present study used a Difference-in-Differences analysis method to examine the micro-level effects of investment promotion tax incentives implemented from January 2014 to March 2017. Based on data from 142 electric machinery manufacturers listed on the Tokyo Stock Exchange, the micro-level effects of the investment promotion tax incentives showed increased net profit due to the corporate income tax deduction. However, no increased revenue, gross, or ordinary profit was observed. From these results, it can be concluded that the investment promotion tax incentives do not necessarily expand the outcomes of individual companies' business activities but contribute to the expansion of after-tax profits through simple tax reduction measures.

The contribution of this study lies in attempting to measure the effects on the outcomes of individual companies' business activities rather than focusing on the macroeconomic effects of investment promotion tax incentives. Additionally, using the Difference-in-Differences analysis method in this measurement is considered novel and adds value to the study. However, it is crucial to note that the conclusions of this study are based on analysis data from those 142 electric machinery manufacturers mentioned above. While this is significant evidence for the micro-level effects of investment promotion tax incentives, the conclusions may not generalize broadly. Furthermore, as a technical issue in the Difference-in-Differences analysis, the assumption of parallel trends between the intervention group and the control group regarding management outcomes is not necessarily strictly fulfilled, highlighting a weakness in this study. These issues pose challenges for future research endeavors.

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