

The Impact of the Environmental Protection Tax Law on Earnings Management

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Abstract. The Environmental Protection Tax Law of China was officially implemented on January 1, 2018. The pollutant discharge fee system has since been replaced by a more mandatory and restrictive tax law. The environmental fee-to-tax reform is an essential portion of the development of the green tax system in China, and it is tasked with the vital aim of promoting the sustainable development of Chinese economy. This paper takes the implementation of the EPT Law as a quasi-natural experimental material and employs the difference-indifferences model and other empirical models to examine the differences in corporate earnings management before and after the policy shock for A-share listed Chinese companies from 2015-2021. The empirical results show that the implementation of the EPT Law effectively promotes Chinese firms to conduct income-decreasing earnings management and such an impact has a greater effect on SOEs, large-size firms and firms in developed regions. Moreover, according to the mediating effect analysis, this paper also identifies that the above promotion impact can be attributed to media attention. The above results show that Chinese government still needs to further optimize this tax law and focus on the coordination between different environmental policies to facilitate sustainable development. Therefore, this paper proposes policy recommendations from four perspectives: corporate governance, accounting standards, environmental laws and regulations, and government supervision.

Keywords: Environmental Protection Tax Law; Political cost; Earnings management; Media attention.

1. Introduction

In recent years, China has achieved economic soaring, but the environmental pollution problems in China are getting increasingly severe. Therefore, environmental pollution is a non-negligible obstacle to the sustainable development of China and is reducing the economic welfare of the whole society. To further promote ecological civilization construction and achieve green growth more effectively, the Standing Committee of the 12th National People's Congress voted to adopt the Environmental Protection Tax Law of the People's Republic of China (EPT Law) in 2016 and decided to implement it on January 1, 2018, formally. The EPT Law is China's first separate tax law that focuses on environmental conservation and embodies the core of green taxation.

Earnings management is the control of information disclosure regarding corporate earnings by managers who purposefully manipulate the reported financial reporting process to gain specific benefits (Schipper, 1989). The quality of corporate earnings information can directly affect the extent of information asymmetry and influence the resource allocation efficiency of information-driven capital markets (Gomariz & Ballesta, 2014). Therefore, corporate earnings management practices can affect the level of internal corporate governance and can also adversely

affect the sound judicial environment of the capital markets and the legitimate interests of investors. Whether a firm would engage in earnings management is influenced by a variety of factors. Existing research suggests that corporate earnings management practices are motivated by external factors such as business environment (Wang et al., 2015) and national policies (Chen et al., 2008) and internal factors such as corporate governance (Xie et al., 2003) and performance appraisal systems (Bagnoil & Watts, 2000). Environmental laws and regulations, categorized as external factors, have been of high attention. However, the impact of the EPT Law, the first green tax law in China, on the corporate earnings management of Chinese listed companies has yet to be covered. This paper is thus motivated to conduct an in-depth and detailed study on this issue.

The theoretical and practical contributions of this paper are represented below. First, current research on the influence of environmental protection laws on corporate information disclosure mainly focuses on environmental information disclosure (Tang & Liu, 2019), and few studies have focused on corporate accounting information disclosure, especially earnings information. This paper innovatively puts the EPT Law and earnings management within a single framework and introduces media attention as a mediator to explore the corresponding influence mechanism. This paper can therefore enrich the study of the economic consequences of the greening of the Chances tax system. Second, the implementation of EPT law would induce firms to conduct earnings management, which results in the accounting information of firms being relatively unreliable. The accuracy of the judgment of investors and creditors may be affected, thereby influencing the allocation of resources in the capital markets. So, this paper can help participants in the financial market to assess firms' actual financial situations. Third, firms' financial statements are essential references for the regulatory authorities to carry out their supervision works and use to evaluate the policy effects of EPT law. Unreliable accounting information probably influences regulatory authorities' judgment and decisions. Therefore, this paper can help policymakers and the government to improve the efficiency of supervision and formulate more effective policies.

2. Hypothesis Development

According to the political cost hypothesis that proposed by Watts and Zimmerman (1978), potentially unfavorable government regulation or political activities such as antitrust and taxation can increase the expected costs to a firm and managers may thus reduce its earnings to minimize the likelihood of getting regulated. It has been proven that increased political costs can promote corporate earnings management and therefore result in lower-quality earnings information disclosure, particularly in the literature on developed economies. Soaring oil prices during Hurricanes Katrina and Rita caused severe public discontent with oil companies. The research of Byard et al. (2007) demonstrates that this situation led to significant remarkable growth in conducting income-decreasing earnings management in the large oil refining industry in the fourth quarter of 2005.

However, regarding the relevant literature focusing on China, there has yet to be a consensus on the validity of the political cost hypothesis. Some of these studies have supported this hypothesis, which states that enterprises choose to conduct income-decreasing earnings management when facing political costs. For example, Yao and Liu (2020) find that the 'PM2.5 explosion' raised government and public tensions, and the resulting political costs induce heavily-polluting firms to manipulate their earnings at reasonably low levels to mitigate the political costs. However, some studies that focused on the Chinese market have drawn the opposite conclusion from the political

cost hypothesis. Li et al. (2011), using the 2007 income tax reform as a background, found that the change in interest rates brought about by the income tax reform led firms have higher political costs, which in turn led to a tendency for firm management to implement income-increasing earnings management. Therefore, we develop the following hypothesis 1:

H1: Chinese firms would conduct income-decreasing earnings management in response to the implementation of the EPT Law.

Companies of different natures of enterprise property rights assume different societal roles and play different roles. Therefore, the nature of property rights considerably impacts the quality of social responsibility fulfillment and earnings information disclosure decision. Because of their special status, SOEs in China feature both for-profit and public interest legal entities. SOEs aim to not only achieve the economic goals generally pursued by businesses but also to take on more national policy-oriented tasks and achieve many non-economic goals (Xiao et al., 2022). Therefore, SOEs tend to shoulder a higher political cost than non-SOEs and thus may prefer to lower their reported earnings (Lin & Li, 2004). Therefore, the following hypothesis 2 of this paper is proposed as follows:

H2: After the implementation of the EPT Law, SOEs are more likely to conduct income-decreasing earnings management.

Firm size is one of the most essential traits of a firm. After the enactment of the EPT Law, the earnings status of firms with larger size tends to be more vulnerable to government, media, and public attention, and thus face greater political costs (Huang & Zhou, 2021). Since environmental tax is a local tax and large-size firms in each region are often the mainstay of domestic economic development, the operating conditions of large-size firms are the most important factor for local governments to consider when modifying the applied standard of environmental tax. In this concern, large-size firms may implement income-decreasing earnings management to push local governments to decide to reduce the environmental tax rate in their region (Long et al., 2021). Therefore, the following hypothesis 3 of this paper is proposed as follows:

H3: After the implementation of the EPT Law, large-size firms are more likely to conduct income-decreasing earnings management.

The execution of the EPT law complies with the path of "central decision-local implementation", so the execution of the EPT Law depends mainly on local governments. Regional natural endowments and levels of economic development vary greatly in China. It is crucial to note that regional levels of economic development and development goals can directly influence the policy choices of local governments. Therefore, variations in regional levels of economic development can lead to heterogeneity in the policy implementation of EPT Law in different regions. The well-established legal system in developed areas would enable the EPT law to be enforced more strictly in these regions than in underdeveloped ones, so companies in developed regions would be subject to higher political costs than in underdeveloped regions (Long et al., 2021). Therefore, the following hypothesis 4 of this paper is proposed as follows:

H4: After the implementation of the EPT Law, firms in economic developed regions are more likely to conduct income-decreasing earnings management.

3. Research Design

3.1 Sample Design

Since the EPT Law was formally implemented in 2018, the A-share listed companies from 2015 to 2021 would be selected as the target sample. For the purpose of ensuring the rigor of the empirical study, the following treatments are planned: 1. exclude risk warning (ST) companies; 2. exclude financial companies; 3. exclude companies who have missing value; 4. exclude companies that underwent conversion between heavy polluters and other types of companies between 2015 and 2021; 5. exclude newly listed and delisted companies between 2015 and 2021. And this paper also employs tailoring at the 1% and 99% quartiles to all continuous variables. This paper ends up with 12,852 obtained observations in total.

3.2 Variable Definition and Model Selection

(1) Dependent variable

To test the hypotheses of this paper, it is first necessary to develop an econometric model of earnings management. According to the previous studies, the modified Jones model is the widest applied and recognized for calculating accrual earnings management (Islam et al., 2010; Chai & Tung, 2002). Therefore, this model is also adopted in this paper.

(2) Independent variable

Upon checking, some provinces chose not to increase the tax rate and used the original standard of pollutant discharge fees. And the twelve regions of Guizhou, Hebei, Shanxi, Henan, Shandong, Jiangsu, Hunan, Sichuan, Hainan, Chongqing, Guangxi, and Beijing, however, have increased their tax rates compared to the original standard of pollutant discharge fees. Therefore, the grouping variable is set to tax, and if a company is registered in the twelve tax-raising regions then Tax takes 1, otherwise it takes 0. And after is set as the policy implementation variable in this paper, since this policy was officially executed on 1 January 2018, three years before the implementation of this policy (2015, 2016 and 2017) are taken as pre-policy implementation (After = 0), and four years after the implementation of this policy (2018, 2019, 2020 and 2021) are taken as post-policy implementation (After = 1).

(3) Control variables

According to Kalbuana et al. (2021), we select some firm-level control variables that include Firm scale (Size), Nature of property right (State), Return on assets (ROA), Financial leverage (Lev), Ownership concentration (Top1), Firm growth (Growth), Board independence (Indep) and Firm loss (Loss).

(4) Model selection

According to previous studies, DID model has been widely used to explore the effectiveness of policies, which controls the confounding effect of other events in time series and reveal the relationship between variables. The year 2018, which is the time for the introduction of the EPT Law, is selected as the policy time node in this paper. We apply Eq. (1) to test hypothesis 1. Y_{it} denotes to the discretionary accruals of firm i in year t . $Tax_i * After_t$ denotes whether the data belongs to the area where the environmental tax standard is adjusted after the implementation of the EPT Law. X denotes control variables. γ_t is for year fixed effect. μ_i is for regional fixed effect. v_i is for the firm fixed effect. ε_{it} is for the error term.

$$Y_{it} = a + \beta_1 * Tax_i + \beta_2 * After_t + \beta_3 * Tax_i * After_t + \sum x_{it} + \gamma_t + \mu_i + v_i + \varepsilon_{it} \quad (1)$$

Eq. (1) tests whether firms’ earning management in response to the EPT Law. β_1 estimates differences in firms’ earning management located in different provinces which have different adjustments of tax standard. β_2 estimates the impact of the adjustment of tax standard on firms’ earning management after this law. β_3 is the coefficient concerned in this paper which estimates the effect of the EPT Law on firms’ earnings management.

4. Empirical Results and Analysis

4.1 Parallel Trend Test

This paper tests the research hypothesis using a DID model, which requires the parallel trend hypothesis to be satisfied. In this paper, following Zhang et al. (2020), the parallel trend hypothesis is tested by including a series of year-by-year interaction dummy variables with the treatment variables to examine the year-to-year impacts of policy implementation for the treatment and control groups. The control group is supposed to be comparable to the treatment group preceding the policy shock and the assumption of parallel trends can thus be satisfied.

4.2 Analysis of Regression Results

(1) Full sample DID regression

To explore the influence of the execution of the EPT Law on firms’ earnings management, Eq. (1) is used in this paper for testing. Table 1 lists the regression results of the implementation of EPT Law and earnings management (DAC). Column (1) and column (2) show the regression results excluding and including control variables respectively. According to the results shown in column (2), the estimated coefficient of Tax*After is -0.00560, which is significantly negative at the 1% level. Therefore, if other conditions remain unchanged, firms in tax-raising regions conduct significantly income-decreasing earnings management after the enforcement of the EPT Law, and hypothesis 1 is verified.

Table 1. Full sample DID regression results

| | (1) | (2) |
|---------------------------------|---------------------|------------------------|
| VARIABLES | DAC | DAC |
| Tax * After | -0.00352 (-0.00391) | -0.00560*** (-0.00194) |
| Size | | 0.01126*** (-0.00299) |
| Lev | | -0.0132 (-0.00878) |
| ROA | | 0.75489*** (-0.0228) |
| Growth | | -0.00569** (-0.00259) |
| Loss | | -0.00446 (-0.00263) |
| Top1 | | 0.00475 (-0.0157) |
| Indep | | 0.013 (-0.0223) |
| State | | -0.0028 (-0.00468) |
| Region, Year, Firm Fixed Effect | Control | Control |
| Observations | 12852 | 12852 |
| R-squared | 0.228 | 0.438 |

Note: Variable Tax and variable After are omitted in Table because year fixed effect and region fixed effect are added in the regression model. *** p<0.01, ** p<0.05, * p<0.1

(2) DID regression base on nature of enterprise property rights

This paper divides the full sample into a sample group of SOEs and a sample group of non-SOEs based on the nature of their ownership in 2017 (one year before the EPT Law execution). Regression results in Table 2 show that the estimated coefficient of Tax*After is significantly and negatively correlated to DAC at the 5% level in the SOEs, but it is insignificant in the non-SOEs. This result indicates that SOEs tend to employ earnings management in terms of income reduction when faced with the higher political costs arising from the EPT Law, and hypothesis 2 is verified.

(3) DID regression base on Firm Size

In this paper, the full sample is classified into large-size firms and small-size firms based on the median firm size of all observations in 2017. According to the regression results in Table 2, the coefficient of Tax*After is significant and negative at the 10% level in the group of large-size firms but not significant in the group of small-size firms. Such a result implies that the EPT Law more significantly facilitates income-decreasing earnings management for large-size firms, and hypothesis 3 is verified.

(4) DID regression base on regional economic development

Using China's average GDP per capita in 2017 as a criterion, this paper divides the full sample into the developed region group and the undeveloped region group. The regression results shown in Table 2 demonstrate that the coefficient of Tax*After is significant and negative at the 5% level in the developed region group and that of the undeveloped region group is not significant, suggesting that firms in developed regions are more likely to conduct income-decreasing earnings management behavior in response to the implementation of EPT Law, and hypothesis 4 is verified.

Table 2. DID regression results

| | SOE | Non-SOE | Large Size | Small Size | Developed Region | Undeveloped Region |
|---------------------------------|------------|----------|------------|------------|------------------|--------------------|
| VARIABLES | DAC | DAC | DAC | DAC | DAC | DAC |
| Tax * After | -0.00726** | -0.00461 | -0.00776* | -0.00415 | -0.00586** | -0.00557 |
| | -0.00349 | -0.00362 | -0.00403 | -0.00317 | -0.00263 | -0.00378 |
| Control Variables | Control | Control | Control | Control | Control | Control |
| Region, Year, Firm Fixed Effect | Control | Control | Control | Control | Control | Control |
| Observations | 5,117 | 7,735 | 6,426 | 6,426 | 9128 | 3724 |
| R-squared | 0.33600 | 0.49500 | 0.39900 | 0.47800 | 0.45100 | 0.40600 |

Note: *** p<0.01, ** p<0.05, * p<0.1

5. Robustness Test

5.1 PSM-DID Regression

To eliminate systematic differences in the trends of earnings management between tax-rising and tax-neutral regions and to reduce the estimation bias of the DID method, the PSM-DID method is used. In this paper, the PSM-DID method is used to obtain a propensity score by applying the Logit regression on the control variables with a dummy variable of whether the region is a rising tax area.

After completing the PSM, the DID regression was conducted on the sample again in this paper to verify the robustness of the research results. The PSM-DID results are offered in the column (2) of Table 3. The coefficient of the Tax * After is -0.00534, being significantly negative at the 1% level. The regression results of PSM-DID are constant with the previous empirical results of DID regression, thus further supporting the previous research findings that the execution of EPT Law has a significant influence on the adoption of income-decreasing earnings management.

5.2 Variable Replacement

The empirical study of this paper has chosen to measure the explained variable (DAC) by the modified Jones model. Different from the modified Jones model, the Jones model does not consider the effect of changes in account receivables on non-manipulated accrued earnings (Dechow et al., 1995). To certify the robustness of the previous empirical results, the regression analysis was again conducted by changing the method of measuring explained variable (replacing the modified Jones model with the Jones model). Because the numerical value of new explained variable (NDAC) is too small, this paper use NDAC*100 instead of original NDAC. The regression results in the column (4) of Table 3 show that the coefficient of Tax*After is negative and significant at the 10% level. The result is constant with the previous empirical result of this paper and therefore it can be confirmed that the empirical findings are robust.

Table 3. Robustness test

| | (1) | (2) | (3) | (4) |
|------------------------------------|-------------|-------------|-------------|-----------|
| VARIABLES | DAC | DAC | NDAC | NDAC |
| Tax * After | -0.00397 | -0.00534*** | -0.09759** | -0.08063* |
| | -0.00373 | -0.00173 | -0.04350 | -0.04210 |
| Control Variables | Not Control | Control | Not Control | Control |
| Region, Year, Firm Fixed Effect | Control | Control | Control | Control |
| Observations | 11256 | 11256 | 12852 | 12852 |
| R-squared | 0.229 | 0.436 | 0.628 | 0.646 |

Note: *** p<0.01, ** p<0.05, * p<0.1

6. Further Research

6.1 Meditation Analysis

How does EPT Law induce firms to conduct income-decreasing earnings management? Yu et al. (2012) suggest that the amount of media attention given to a firm is positively correlated with the public interest in that firm, and thus firms with high media attention tend to be well-known to the market. Since the execution of EPT Law will raise firms' tax burden, the market expects firms affected by the EPT Law will face reduced profitability in the short term. Mo (2015) argues that enterprises with high media attention need to modify their accrual earnings to meet market expectations and reduce the likelihood of being regulated. Therefore, this paper expects that firms facing higher media attention will engage in income-decreasing earnings management to satisfy market expectations that the affected firms should be exposed to a reduction in profitability due to the EPT Law.

According to the above empirical findings, the EPT Law can significantly drive Chinese firms to conduct income-decreasing management. To investigate the corresponding influence mechanism, this paper introduces the mediating variable of media attention to conduct a mediating effect analysis. Drawing on Su and Fan (2021), this paper selects traditional media (eight authoritative financial newspapers) and online media as media coverage channels. In this paper, the total annual number of times a company's abbreviation and full name are reported in both traditional and online media is used as data for the company's media attention.

According to Wen and Ye (2014), this paper explores the mechanism of the EPT Law using the new mediation analysis. Multilevel models are shown below.

$$Y_{it} = a + \beta_1 * Tax_i + \beta_2 * After_t + \beta_3 * Tax_i * After_t + \sum x_{it} + \gamma_t + \mu_i + v_i + \varepsilon_{it} \quad (1)$$

$$Media_i = a + \beta_4 * Tax_i + \beta_5 * After_t + \beta_6 * Tax_i * After_t + \sum x_{it} + \gamma_t + \mu_i + v_i + \varepsilon_{it} \quad (2)$$

$$Y_{it} = a + \beta_7 * Media_i + \beta_8 * After_t + \beta_9 * Tax_i + \beta_{10} * Tax_i * After_t + \sum x_{it} + \gamma_t + \mu_i + v_i + \varepsilon_{it} \quad (3)$$

Firstly, according to the previous results in part 4, the estimated β_3 is significantly negative at the 1% level, which means that the EPT Law has a significant effect on corporates' earnings management. Secondly, the regression results of Eq2 in Table 4 column (1) represent that the coefficient of Tax*After (β_6) is insignificant, which fails to prove that the EPT Law significantly affects media attention. The regression results of Eq3 are shown in column (2). β_7 is significant at the 10% level, suggesting that media attention has a significant effect on corporates' earnings management. Because β_6 is insignificant and β_7 is significant, it is necessary to carry out the Bootstrap test. Thirdly, the results of the Bootstrap test are shown in Table 5. And the `_bs_1` represents the indirect effect, which is significant at the 5% level. Fourthly, β_{10} in Eq3 is insignificant, indicating that the direct effect is insignificant and there is only the mediated effect. Therefore, the mediated effect of media attention is established. The EPT Law affects corporates' earnings management by influencing media attention.

Table 4. Meditation Analysis

| | (1) | (2) |
|---------------------------------|---------|------------|
| VARIABLES | Media | DAC |
| Tax*After | 24.8 | -0.00552 |
| | -152.4 | -0.00351 |
| Media | - | -3.68E-07* |
| | - | -2.07E-07 |
| Control Variables | Control | Control |
| Region, Year, Firm Fixed effect | Control | Control |
| Observations | 11,452 | 11,452 |
| R-squared | 0.532 | 0.431 |

Table 5. Bootstrap Test

| | |
|-------|-----------|
| _bs_1 | -0.0133** |
| | (-2.82) |
| _bs_2 | -0.0235 |
| | (-0.40) |
| N | 11452 |

Note: *** p<0.01, ** p<0.05, * p<0.1

7. Conclusion and Recommendations

This paper takes the application of the EPT Law as the material of quasi-natural experiments to test the effect of the EPT Law on corporate earnings management using DID, PSM-DID, and mediating effects analysis. And the empirical studies of this paper reveal that the EPT Law can promote Chances firms to conduct income-decreasing earnings management. And such an impact has a greater effect on SOEs, firms with large-size and in developed regions. In addition, through mediating effects analysis, this paper also identifies that the EPT Law can induce Chinese firms to conduct income-decreasing earnings management by affecting enterprises' media attention.

According to the research results, this paper derives the following four policy recommendations from the perspectives of corporate management, accounting standards, environmental regulations, and government supervision, respectively. First, enterprises should improve their internal governance structures and establish appropriate appraisal systems to minimize the damage to shareholders' interests caused by managers' earnings management behaviors. Secondly, accounting standards should be improved continuously so as not to give managers the opportunity to take advantage of surplus management. Environmental accounting information should also be included in the accounting statement system, so that the disclosure of accounting information of enterprises becomes more transparent. Third, environmental regulations should establish an effective social supervision system in terms of legislation and pay higher attention on earnings disclosure of SOEs, large-size enterprises and enterprises in developed regions. Fourth, the regulatory authorities should increase the supervision of the quality of corporate earnings information and urge enterprises to improve the quality of accounting information disclosure through effective internal and external measures aimed at achieving sustainable growth of the social economy as a whole.

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