

# The Impact of Digitization of Tax Collection and Administration on Earnings Management of Companies

Jiawen Zhang \*

School of Finance and Taxation, Zhejiang University of Finance and Economics, Hangzhou, China

\* Corresponding author: Jiawen Zhang (Email: zhangjiawenzjw0805@163.com)

---

**Abstract:** In recent years, the rapid development of information technology has promoted the reform of China's tax model to standardization and informatization. Based on the basic perspective of information asymmetry, this paper constructs a difference-in-differences model with the Golden Tax Project Phase III which has been put into practice as the policy background and A-share listed companies as samples to empirically test the impact of digitization of tax collection and administration on the degree of real earnings management of enterprises. The results show that the construction of the Golden Tax Project Phase III has a significant inhibitory effect on real earnings management. And corporate tax avoidance plays an intermediary effect.

**Keywords:** Golden Tax Project Phase III, Tax collection and administration, Real earnings management.

---

## 1. Introduction

As an essential means of external corporate governance, tax collection and administration could affect the earnings management behavior of the management. Studies have shown that high-intensity tax collection and administration could restrain earnings management behavior and reduce the marginal income of tax avoidance [1]. In recent years, with the gradual deepening of domestic market capitalization, earnings management has become more frequent and widespread in listed companies, and the business model and accounting model have become increasingly complex. These changes force the tax authorities to change the traditional tax model. Therefore, in China, the tax information management system has been built to achieve comprehensive, efficient and strict monitoring of tax revenue and promote the modernization and standardization process of tax collection and administration. At present, the Golden Tax Project Phase III (GT\_III) has been fully put into operation, and its impact on the internal governance of enterprises is a problem worthy of attention.

## 2. Literature Review

### 2.1. Tax Collection and Administration

Bird and Zolt argue that, with the help of information technology, developing countries need to re-examine their tax systems and institutions [2]. The GT\_III based on computer network has been fully opened in China. This greatly improves the level of tax collection and management of tax departments, and also realizes the co-construction and sharing of tax data. The research on the effect of tax measures on corporate behavior could be mainly summarized as tax burden and corporate governance. First of all, strict tax measures could indeed curb corporate tax avoidance, improve corporate tax compliance, promote the implementation of preferential tax policies, and enable more qualified enterprises to reduce their tax burdens [3]. Second, tax collection and management effectively improve the quality of financial reports by increasing the costs of earnings management [4].

### 2.2. Real Earnings Management

In Watts and Zimmerman's study, earnings management is divided into two categories. Accrued earnings management refers to a manipulative behavior of enterprise management to make accrued earnings reach the expected level by using accounting means such as professional judgment in the preparation of financial statements, while real earnings management is the process of planning real transaction activities to manipulate profits and change the results of financial reports [5]. The research on earnings management mainly focuses on the following three aspects: First of all, it is based on the study of corporate internal governance mechanism. In order to avoid losses, company executives generally manipulate real business activities to achieve the predetermined earnings target, and perfect internal control system, equity checks and balances, independent director connection, etc., can effectively prevent management from manipulating profits. The second is based on the study of external supervision mechanism. Capital market discipline and external audit supervision can play a role. In addition, media supervision is an important alternative mechanism to the law restricting the effective earnings management of listed companies [6]. The GT\_III is based on the study of economic consequences. Improving the quality of earnings can improve the financing efficiency of the company. However, although the earnings management behavior of the enterprise will have a positive impact on the term of debt financing, it will increase the borrowing risk of creditors, which is not beneficial to the development of the capital market [7].

It can be seen from the literature review that there are few literatures on the influence of tax collection and administration on earnings management behavior of enterprises from the perspective of GT\_III. This paper explores whether the GT\_III based on big data technology can play a crucial role in earnings management and governance. This is of great significance for discussing the role of big data technology in the field of tax on the internal governance of companies. What is more noteworthy is that digital development is a deepening process. Therefore, the intervention of the digital economy in the tax system will inevitably play an important role in the internal governance

of enterprises, decision-making behaviors and even the overall market environment. The digital economy also monitors and urges management behavior from a more active and transparent perspective.

### 3. Method

#### 3.1. Theoretical Analysis and Research Hypothesis

From the perspective of information asymmetry, tax avoidance activities are usually highly secretive and professional, which makes it difficult for the outside world to accurately understand the real tax avoidance situation of enterprises. Then the tax collection and administration system based on information technology construction, that is, the GT\_III, aims to enhance the tax department's tax source monitoring ability, improve the consistency and accuracy of data, and reduce the degree of information asymmetry. This makes it urgent for taxpayers to change earnings manipulation methods, increase tax avoidance, and then reduce the real earnings management behavior. Therefore, the following hypothesis is proposed:

- (1) The digitization of tax collection and administration reduces the real earnings management of companies;
- (2) Corporate tax avoidance plays an intermediary effect, which means that the digitization of tax collection and management improves corporate tax avoidance, and then inhibits the real earnings management degree of enterprises.

#### 3.2. Research Design

This paper takes A-share listed companies from 2010 to 2015 as the research object. All sample data are from CSMAR database. In order to ensure the validity of the data, not only ST company and specific financial and insurance industry samples were excluded, but also the observed values of enterprises with missing key variables were eliminated, and the continuous variables were winsorized at the level of 1% and 99%. Through screening, 6984 sample observations were obtained in this paper.

In this paper, the first batch of listed companies selected for the GT\_III pilot are selected as the processing group, the

last batch of listed companies selected as the control group, and the data of the processing group and the control group from 2010 to 2015 are used as samples to build the following difference-in-differences model.

$$em = \alpha_0 + \alpha_1 Place \times Post + \sum akControl + \varepsilon \quad (1)$$

Explained variable: Real earnings management (em). Based on Roychowdhury's research, this paper builds a model from three aspects: sales manipulation, discretionary expense manipulation and production manipulation [8]. The specific formula is as follows.

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{REV_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (2)$$

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{REV_{i,t}}{A_{i,t-1}} + \beta_3 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \beta_4 \frac{\Delta REV_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (3)$$

$$\frac{DISEXP_{i,t}}{A_{i,t-1}} = \delta_0 + \delta_1 \frac{1}{A_{i,t-1}} + \delta_2 \frac{REV_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (4)$$

$$TREM_{i,t} = (-1)ACFO_{i,t} + A\_PROD_{i,t} + (-1)A\_DISEXP_{i,t} \quad (5)$$

Where,  $REV_{i,t}$  is the operating income of company  $i$  in year  $t$ . According to the formula calculation, the regression residual of each formula is obtained, and then the comprehensive value calculated according to the (5) reflects the real earnings management degree of listed companies.

Explanatory variable: The first batch of pilot enterprises (PLACE), if the company is located in Chongqing, Shandong, Shanxi, PLACE value is 1; In 16 provinces and cities such as Liaoning, the value of PLACE is 0. The value of the pilot start time (POST) is 1 after the GT\_III pilot (2013-2015) and 0 (2010-2012).

Mediating variable: TAX avoidance degree (D\_tax), based on Liu Xing's research[9], the calculation formula is as follows.

$$D\_tax = Nrate - Erate \quad (6)$$

Where, Nrate represents the nominal income tax rate and Erate represents the effective income tax rate.

Control variables: Based on the research of Ye K.T.[10], this paper controls the following variables, as shown in Table 1.

**Table 1.** Definition of Variable

	Name	Symbol	Explanation
Explained variable	Real earnings management	em	According to the practice of Roychowdhury (2006).
Explanatory variable	The first batch of pilot enterprises	Place	if the company is located in Chongqing, Shandong, Shanxi, Place value is 1; In 16 provinces and cities, the value of Place is 0.
	The value of the pilot start time	Post	The value is 1 (2013-2015), and 0 (2010-2012).
Mediating variable	The degree of tax avoidance	D_tax	Nominal income tax rate-actual income tax rate.
Control variables	Ownership concentration	Hold	The shareholding ratio of the largest shareholder.
	Scale of company	Size	Ln (total assets)
	Asset-liability ratio	Lev	Total beginning liabilities/ Total beginning assets
	Loss or not	Loss	Dummy variable, net profit less than 0 take 1, otherwise take 0.
	Tobin's Q ratio	TQ	Total market value / total assets
	Asset turnover ratio	Turn	Operating income/Total assets at year end
	Board size	Bsize	Number of directors.
	Proportion of independent directors	Drate	Number of independent directors/Number of directors.
	Number of executive holdings	Tstock	Ln (executive holdings+1)
	Executive compensation	Tsalary	Ln(compensation+1)
	Audit quality	Big4	The value is 1 if audited by the Big Four, and 0 if not.

## 4. Empirical Results and Analysis

### 4.1. Descriptive Statistics

The descriptive statistical results of all variables in this paper are shown in Table 2. Table 2 shows that about 12.6% of the sample enterprises are located in the first batch of pilot areas of the GT\_III. Moreover, in the research samples of this paper, the real earnings management degree and tax avoidance degree of different listed companies are quite different. Other variable indicators are also within a reasonable range.

**Table 2.** Descriptive statistics

VARIABLES	N	mean	sd	min	max
em	6,984	0.182	0.196	0.00150	1.645
Place	6,984	0.126	0.332	0	1
Post	6,984	0.500	0.500	0	1
D_tax	6,984	0.126	0.210	0.000327	2.124
Size	6,984	22.35	1.294	19.79	26.44
Hold	6,984	36.13	15.37	8.500	76.95
Lev	6,984	0.500	0.195	0.0603	0.901
Loss	6,984	0.0840	0.277	0	1
TQ	6,984	2.003	1.407	0	14.53
Turn	6,984	0.704	0.511	0.0488	3.113
Bsize	6,984	9.061	1.813	5	15
Drate	6,984	0.369	0.0522	0.286	0.600
Tstock	6,984	6.718	6.747	0	19.31
VARIABLES	N	mean	sd	min	max
Tsalary	6,984	14.73	0.836	12.34	16.98
Big4	6,984	0.0830	0.276	0	1

**Table 3.** Baseline regression result

	(1) em	(2) em
PlacexPost	-0.067*** (0.014)	-0.063*** (0.014)
Size		0.054*** (0.011)
hold		0.002*** (0.001)
LEV		0.027 (0.039)
Loss		-0.006 (0.008)
TQ		0.007*** (0.002)
Turn		0.122*** (0.023)
Bsize		0.002 (0.003)
Drate		0.036 (0.088)
Tstock		-0.000 (0.001)
Tsalary		-0.022*** (0.008)
Big4		-0.009 (0.032)
_cons	0.185*** (0.001)	-0.930*** (0.244)
N	6984.000	6984.000
r2	0.005	0.032

Standard errors in parentheses: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

### 4.2. Baseline Regression Result

Table 3 is the regression result based on (1). The first column includes only the explained variables real earnings management (em) and policy dummy variables (PlacexPost), and the second column includes company characteristics. The results show that the model is optimized gradually with the addition of control variables. In the second column, the regression coefficient of the policy dummy variable is significantly negative at the 1% level. This shows that after the implementation of the GT\_III policy, enterprises take less real earnings management, which verifies the hypothesis of this paper.

### 4.3. Mediating Effect

Table 4 shows the results of the mediation effect test based on (7), (8) and (9).

$$em = \alpha_0 + \alpha_1 Place \times Post + \sum \alpha_k Control + \varepsilon \quad (7)$$

$$D\_tax = \beta_0 + \beta_1 Place \times Post + \sum \beta_k Control + \varepsilon \quad (8)$$

$$em = \delta_0 + \delta_1 Place \times Post + \delta_2 D\_tax + \sum \delta_k Control + \varepsilon \quad (9)$$

**Table 4.** Mediating effect result

	(1) em	(2) D_tax	(3) em
PlacexPost	-0.036*** (0.008)	0.036** (0.016)	-0.035*** (0.008)
D_tax			-0.041*** (0.009)
hold	0.001*** (0.000)	-0.001*** (0.000)	0.001*** (0.000)
LEV	0.030** (0.015)	0.072*** (0.013)	0.033** (0.015)
Loss	-0.012* (0.007)	0.288*** (0.019)	0.000 (0.008)
Size	-0.002 (0.003)	0.001 (0.003)	-0.002 (0.003)
TQ	0.022*** (0.002)	-0.001 (0.002)	0.022*** (0.002)
AGE	0.052*** (0.013)	0.020 (0.013)	0.053*** (0.013)
Turn	0.073*** (0.006)	-0.007 (0.005)	0.073*** (0.006)
Bsize	-0.003* (0.001)	0.001 (0.002)	-0.002* (0.001)
Drate	0.038 (0.048)	0.091* (0.054)	0.042 (0.048)
Tstock	0.002*** (0.000)	-0.000 (0.000)	0.002*** (0.000)
Tsalary	0.005 (0.004)	-0.018*** (0.003)	0.005 (0.004)
Big4	-0.008 (0.010)	-0.019** (0.008)	-0.009 (0.010)
_cons	-0.146** (0.068)	0.233*** (0.071)	-0.137** (0.068)
N	6984.000	6984.000	6984.000
r2	0.071	0.176	0.072

Standard errors in parentheses: \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

In the second column, the coefficient of the explanatory variable (PlacexPost) is 0.033 and is significant at the 5% level. This shows that during the pilot process of GT\_III, the

tax avoidance behavior of enterprises has increased. Furthermore, in the third column, it is found that there is a negative correlation between the degree of tax avoidance ( $D_{tAX}$ ) and real earnings management. Moreover, the regression coefficient of the policy dummy variable (PlacePost) is still negative. This result reveals the mediating role of corporate tax avoidance in the relationship between tax collection and real earnings management, thus verifying the hypothesis of this paper.

## 5. Conclusion

This article analyzes that tax collection and administration affect real earnings management. First of all, the Golden Tax Project Phase III has been piloted in batches in China. This paper uses this process to measure the tax administration intensity of the tax authorities. Secondly, with the help of differential method, the paper employs the difference-in-differences model to analyze the impact of tax collection and administration on real earnings management. Finally, the paper finds that the degree of corporate tax avoidance plays an intermediary role in the relationship between tax collection and real earnings management. Combined with the research conclusions of this paper, the following enlightenment can be drawn.

### 5.1. Pay Attention to The Indirect Effects of Tax Policy

As one of the most significant external management mechanisms, tax collection and management plays a crucial role in alleviating the information gap between internal and external organizations and improving the level of corporate governance. This not only encourages the government to use tax policies to control income distribution, but also attaches great importance to the effectiveness of indirect tax policies in governance, which is conducive to the continuous deepening and development of modern tax mechanisms.

### 5.2. Promote the Construction of Intelligent Taxation in China

A good tax environment could more effectively encourage enterprises to innovate and improve their business capacity. The government needs to accelerate the establishment of a smart tax system to enhance the country's modern management capacity. The improvement of intelligent tax governance system plays a good governance role in the construction of macro tax system and micro enterprise governance.

### 5.3. Improve Internal and External Governance Mechanisms

One incentive of earnings management behavior is the high degree of information asymmetry inside and outside the enterprise. Only by improving the construction of corporate governance mechanism, and introducing and perfecting external supervision mechanism in a timely manner, can the degree of information asymmetry in the capital market be alleviated, and then promote enterprises to achieve high-quality development. Tax collection and administration from the perspective of digital economy can supervise and manage enterprise data information more efficiently, and can timely discover the earnings motivation of management.

## References

- [1] Hanlon, M., Hoopes, J. L., Shroff, N. (2014) The Effect of Tax Authority Monitoring and Enforcement on Financial Reporting Quality. *The Journal of The American Taxation Association*, 36(2): 137-170.
- [2] Bird, R. M., Zolt, E. M. (2008) Technology and Taxation In Developing Countries: From Hand To Mouse. *National Tax Journal*, 61(4): 791-821.
- [3] Tang, B., Zhang, L.F. (2019) A Research on the Impacts of Tax Informatization on Corporate Tax Compliance. *J. Taxation Research*, 07.013.
- [4] Li, Z.F., Zhu, J. (2022) The Impact of Golden Tax-III Tax Collection and Management on the Audit Fees of Listed Companies. *J. Foreign Economics & Management*, 44(01):105-118.
- [5] Watts, R. L., Zimmerman, J. L. (1990) *Positive Accounting Theory*. Prentice Hall, BeiJing.
- [6] Chen, K. J. (2017) Media Supervision, Rule of Law and Earnings Management of Listed Companies. *J. Management Review*, 29(07):3-18.
- [7] Fang, H. X., Liu, S. H. (2017) Earnings management and corporate debt maturity. *J. Research on Financial and Economic Issues*, (05):57-64.
- [8] Roychowdhury, S. (2006) Earnings Management Through Real Activities Manipulation. *Journal of Accounting and Economics*, 42(3).
- [9] Liu, X., Ye, K. T. (2013) Does Corporate Tax Avoidance Affect Investment Efficiency. *J. Accounting Research*, (06):47-53+96.
- [10] Ye, K.T., Dong, X. Y., Cui, Y. Q. (2015) Deviant Strategy and the Choice of Earnings Management Methods. *J. Accounting Research*, (10):23-29+96.