

# Research on the Correlation between Book-Tax Difference and Earnings Management

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## Abstract

Book-tax differences of listed companies presented an expanding trend since the implement of the new accounting standards and the earnings management of the management layers may have influence on the fluctuation of book-tax difference. This essay got the abnormal book-taxable income difference by using regression analysis and replaced earning management with the combination of total accruals and discernable accruals to construct an estimation model for the correlation between book-tax difference and earnings management. Considering the effects earnings management had on the expanding trend of abnormal book-taxable income difference, this research took the financial data of China's listed companies in 2009 to 2013 as the original data, and the results revealed that the book-tax differences of China's listed companies were expanding and there was positive correlation between them and earnings management. Tax avoidance was one important element influencing book-tax income differences.

*Keywords: Book-Tax Differences, accounting profit, income tax, earnings management*

## 1. Introduction

The gap between the total profits and the taxable income has enlarged since the implement of the new accounting standards. The difference is aroused mainly by institutions, enterprise earnings management and enterprise tax avoidance etc. In spite of the institution reason caused by the separate of tax system and accounting system, book-tax difference is closely related with the earnings management and tax avoidance of listed companies.

When the listed companies are doing the earnings management to adjust and increase the accounting profits, they would consider the following cost of income tax. The management layer may use non-taxable items to manage the earnings, which means that not all earnings management that adjusting and increasing the accounting profits would inevitably lead to the growth of income tax.

The consideration to avoid tax in earnings management is probably one significant element influencing the amount of book-taxable income difference, causing the function mechanism of earnings management in the fluctuation of book-tax difference being a research hotspot and the focus of tax researchers.

## 2. Research status of book-tax difference and earnings management

The gap between accounting income and taxable income in America had been increasing in the 90s. Studies on American listed companies revealed that the act of tax avoidance was probably one of the reasons for book-tax difference.

Mills (2001) pointed out when concerning the influence tax cost and non-tax cost had on the book-tax difference that companies which had high debt and financial problems tended to have greater book-taxable income difference. When they had financial problems or significant profit reductions, listed companies would do earnings management aiming to increase the accounting income.

Academic circles abroad have an earlier start and better development in the study of influencing factors of book-taxable income difference and the correlation between book-taxable income difference and earnings management. They have more diversified theoretical researches, empirical researches and conclusions, which closely related with their emphases on fairness, earlier economic start and relatively perfect discipline and theoretical development.

China has its unique tax and accounting systems, law and economic environment different from foreign countries. Repeated reforms of China's accounting standards successfully make it closer with the international ones while inevitably separate with the tax system.

Some scholars understand the book-tax difference caused by the moderate separation of China's accounting and tax systems while consider the unduly difference between the accounting and taxing as the result of the enterprises' earnings management.

Most scholars hold that earnings management and the intention of tax avoidance are the main reasons for the expansion of book-tax difference and it is more evident because there are more tax avoidances. The increase in the act of earnings management also to a certain extent explains the expansion of book-taxable income difference.

In the research on book-tax difference and earnings management, Yue'e Long and Kangtao Ye (2013) built the measuring formula of income tax book-tax difference using balance sheet liability method and divided the difference into the upward earnings management book-tax difference and the downward earnings management book-tax difference.

Using the listed companies in Shanghai and Shenzhen in 2008 to 2010 as the research sample, they respectively study the influence the two different book-tax differences had on earnings management. The results revealed that listed companies having greater book-tax differences tended to apply upward earnings management to exaggerate performance and valued the revised book-tax difference of those with downward earnings management to avoid underestimation.

Sorting through the current researches on book-tax difference and earnings management, it can be found that the quantitative methods of book-tax difference are diversified, causing the divergence in researches. Empirical studies after the application of new accounting standards are also insufficient.

Selecting China's listed companies as the study object and taking their financial data in 2009 to 2013 as the original data, this essay quantized non-systematically caused book-tax difference and built a correlation estimation model of book-tax difference and earnings management to improve the research's accuracy and pertinence and to complete the study of the relation between book-tax difference and earnings management.

### 3. Research model of the correlation degree between book-tax difference and earnings management

Book-tax difference refers to the difference between the accounting total profit and taxable income. The complicity of tax laws, confidentiality of tax returns, the diversified tax rates and the combined tax system of group companies all caused the difficulty in accurately determining the book-tax difference, and the many measurement errors exit in the index measures also weakened the validity of the research conclusion.

Using listed companies with determined tax rates as research object, this research improves the accuracy of quantized book-tax difference using combined statements, parent company statements and tax returns as main data resources.

Here is the formula calculating total amount of book-tax difference:

$$TBTD = TP - ATI = TP - \frac{ITE}{r} \quad (1)$$

In the above formula,  $TBTD$  is the total amount of book-taxable income difference,  $TP$  is the total profit,  $ITE$  is the current should-pay income tax, and  $r$  is the tax rate.

The total profit get from the accounting method subtracting costs and expenses can be found directly from the statements of listed companies. Since this research method can only get the listed companies' yearly actual amount of income tax expenses rather than the enterprises' current taxable income, the former replace the later to simplify the procedure.

Certain book-tax difference caused by system that has nothing to do with earnings management is unavoidable due to China's departed accounting and tax systems.

Eliminating the differences caused by system to ensure the accuracy, this research uses regression analysis to depart the normal book-taxable income difference with earnings management to get the separated abnormal book-taxable income difference.

Here is the formula:

$$ATD_i = \alpha_0 + \alpha_1 ret + \alpha_2 inst + \alpha_3 rev + \alpha_4 fset + \alpha_5 AR + \alpha_6 SI + \alpha_7 LI + \varepsilon \quad (2)$$

In the above formula,  $ATD$  is the book-taxable income difference cause by the system,  $ret$  is the enterprise's final investment income,  $inst$  is the enterprise's financial expense,  $rev$  is the prime business income,  $fset$  is the fixed asset,  $AR$  is the final account receivable,  $SI$  is the enterprise's short-term investment, and  $LI$  is the long-term investment.

Here is the formula calculating the abnormal book-taxable income difference caused by non-systemic factors:

$$UTBTD_i = TBTD_i - ATD_i \quad (3)$$

In this formula,  $UTBTD_i$  is the abnormal book-taxable income difference of the sample company  $i$ ,  $TBTD_i$  is the total amount of its book-taxable income difference, and  $ATD_i$  is its normal book-taxable income difference. In the current researches on earnings management of listed companies, discretionary accruals are generally used to as the surrogate variable of earnings management. Replacing with single index variables is easy to exaggerate the extent of the enterprise's earnings management and then to degrade the accuracy.

Thus in this research, a combination of total accruals and discretionary accruals is used to replace earnings management. Here is the formula for the sample company's total accruals:

$$TAC = \Delta ASSET - \Delta CASH - \Delta CD \quad (4)$$

In this formula,  $TAC$  is the company's total accrual,  $\Delta ASSET$  is the company's annual total assets change,  $\Delta CASH$  is the company's annual monetary capital change, and  $\Delta CD$  is the company's annual liability change.

This research is based on Jones Model, and here is the formula:

$$\frac{TAC}{TAT} = \beta_1 \cdot \frac{1}{TAT} + \beta_2 \cdot \frac{\Delta REV - \Delta REC}{TAT} + \beta_3 \cdot \frac{PPE}{TAT} + \xi \quad (5)$$

In the above formula,  $TAC$  is the company's total accrual,  $TAT$  is the general asset in the beginning of the year,  $\Delta REV$  is the listed company's increase of the prime businesses compared with last year,  $\Delta REC$  is the annual change of receivable accounts,  $PPE$  is the original value of the company's fixed assets, and  $\xi$  is the residual term.

Calculate the total accruals of the listed companies in the research sample and put them into extended Jones Model to have regression analysis and get the regression variable coefficient. Then put the independent variable of one specific listed company into the regression equation and get estimated value of the company's non-discretionary accrual. The company's discretionary accrual, which is to replace earnings management, can then get subtracting the non-discretionary accrual from its total accrual.

Here is the formula:

$$CTAC = TAC - UTAC \quad (6)$$

In the above formula,  $CTAC$  is the discretionary accrual,  $TAC$  is the company's total accrual, and  $UTAC$  is the non-discretionary accrual.

Regression model is built to check the correlation between the abnormal book-taxable income and earnings management of listed companies.

$$\frac{UTBTD}{TAT} = a_0 + a_1 \cdot \frac{CTAC}{TAT} + \rho \quad (7)$$

In the above model,  $UTBTD_i$  is the company's abnormal book-taxable income difference,  $TAT$  refers to the general assets in the beginning of the year,  $CTAC$  is the discretionary accrual, and  $\rho$  is the residual term.

The regression model can not only check the correlation between the abnormal book-taxable income and earnings management, but also get out how much management in the operational management total accruals can avoid the income tax expense and the possibility the managed earnings undertake the income tax expense.

Model is built to check the influence the increasing of tax rate has on the listed companies' motives to enlarge the accounting profits using non-taxable items:

$$\frac{UTBTD}{TAT} = a'_0 + a'_1 \cdot cr \cdot \frac{CTAC}{TAT} + \rho' \quad (8)$$

In the above formula,  $cr \cdot CTAC/TAT$  is the cross variable of the discretionary accruals and the listed company's effective income tax rate, representing the cross reference between the tax rate and discretionary accrual.  $cr$  is the effective tax rate, determined by dividing the total profit into actually paid income tax expense.

#### 4. Conclusion

This research took the listed companies from 2009 to 2013 as the research subject and got 1560 data samples from 512 companies after excluding those in the financial industry and those cannot get the parent company's financial statements or the tax returns. Financial statements and tax returns were the main data resources.

The original data in this research were mainly from the software of China Merchants Securities, CSMAR Solution, Securities Star and the websites of Shanghai and Shenzhen stock exchanges.

Chart.1 Descriptive statistics of book-tax difference from 2009 to 2013 (unit: million Yuan)

Year	Mean value	Standard deviation	median	maximum	minimum
2009	6391.08	12590.41	3515.09	121430.37	-108648.23
2010	8219.63	17261.21	4520.80	156172.89	-139733.64
2011	8778.38	20140.02	5302.13	183164.38	-163883.92
2012	9831.42	23466.82	6139.56	212093.63	-189767.99
2013	10884.45	26793.63	6976.98	241022.88	-215652.05

It can be seen from Chart.1 that the mean value of book-tax difference has grown from 6391.08 million Yuan in 2009 to 10884.45 million Yuan in 2013, accelerating at the rate of 170%. This tendency was even more evident in the late stage of financial crisis.

The standard deviations of book-tax difference revealed its high distribution discrete degree. The research selected discretionary accrual to measure earnings management. The results of the group testing of discretionary accruals are shown in Chart.2.

Chart.2 Results of CTAC group testing

Condition	Sample number	Mean value	Standard deviation
$UTBTD \geq 0$	404	0.0248374	0.0030772
$UTBTD < 0$	108	0.0023079	0.00490154
difference		0.0225295	-0.00182434
T value		3.77**	
z value		-2.14*	

From the parameter T and the value z in Chart.2, book-tax difference is evidently related with the company's earnings management. Then to have descriptive statistical analysis on the samples and the results are shown in Chart.3.

Chart.3 Results of the samples' descriptive statistical analysis

Variables	Mean value	Standard deviation	Maximum	Minimum
TAC/TAT	0.0522	0.1443	0.8315	-0.7276
CTAC/TAT	0.0236	0.1518	0.8491	-0.8474
TBTD	0.0064	0.0251	0.1329	-0.0674
ln(TAT)	24.7476	0.9901	27.1869	22.7793
cr	0.2311	0.0445	0.25	0.15

It can be seen from the Chart.3 that the income tax rate had a maximum of 25%, a minimum of 15% and a mean value of 23.1%. Book-taxable income difference accounted for 0.64% of the assets in the beginning of the period, a modest mean value with a great standard deviation of 2.51%. This modest mean value of book-taxable income may be the result of balancing the companies' positive and negative differences.

In this research, over 79% sample companies had their book-taxable income difference greater than zero, which means that their accounting profits were greater than the taxable incomes. In theory, as income tax accounting would be stricter than enterprise financial accounting in expense deduction, taxable income would often be greater than accounting profit. The data from the samples, however, showed that most companies' accounting profits were greater than taxable profits, telling that a considerable part of the listed companies' income failed to pay the enterprise income tax.

The calculating model for book-tax difference is shown in Chart.4.

Chart.4 Regression coefficients of book-tax difference calculating model

variable	Regression coefficient	t value	p value
ret	0.9573	2.2296	0.0478
inst	0.0508	7.2299	0.0418
rev	0.2114	0.2928	0.0128
fasset	0.0141	2.9606	0.6282
AR	-0.4569	-1.6302	0.0498

SI	0.0812	1.8842	0.0088
LI	-0.0792	-0.5843	0.1515

It can be seen from Chart.4 that the regression coefficient of the variable investment income is positive and significant, meaning that the higher parent company's investment is, then the greater book-taxable income difference would be.

This is largely because that most investment incomes of the listed companies need not to pay income tax. Therefore, when adding the company's accounting profits, investment income would not increase the amount of taxable income. It is the incomes of the non-taxable items that increase.

The regression results revealed that other explanatory variables were insignificant, but regression results without problems of multi-collinearity and heteroscedasticity could be applied to empirical analysis.

Regression coefficients of the earnings management quality quantification model were shown in Chart.5.

Chart.5 Regression coefficient of the earnings management quality quantification model

variables	Regression coefficient	t value	p value
1/TAT	0.0118	2.1468	0.0056
$(\Delta REV - \Delta REC)/TAT$	-0.0489	-6.9613	0.0099
PPE/TAT	-0.6079	-0.2820	0.0022
Adjust R- square	0.5178		

It can be seen from Chart.5 that the adjust R-square was 51%, which meant that the model-fitting degree met the requirement and that explanatory variables could better explain dependent variables. All variables were double tail significant with 1% confidence level, and well predict the amount of discretionary accrual.

The results of the regression analysis model of abnormal book-tax difference and earnings management was shown in Chart.6.

Chart.6 Abnormal book-tax difference and earnings management

Variables	Regression coefficient	t value	p value
Constant term	-0.0114	-2.0393	0.0047
CTAC/TAT	0.0416	0.3876	0.0203
Adjust R- square		0.41	

It can be seen from Chart.6 that under the 5% significant level, there was significantly positive correlation between the abnormal book-tax difference and earnings management, which meant that the motives China's listed companies managing accounting profits with non-taxable items were enhancing with the increase of discretionary accruals to reduce the income tax cost brought by earnings management.

From the results of regression analysis, it can be seen that with every 100 Yuan increase in accruals, 4.16 Yuan corresponding profit of the listed company need not to pay income tax. In the perspective of enterprise tax planning and shareholder wealth maximization, enterprises using book-taxable income difference to reduce the tax cost of earnings management can get desirable financing results and matters a lot. The empirical results further proved that the enterprise's consideration of tax avoidance was one important element influencing book-taxable income difference.

From the above results, we can see that the listed companies' book-tax differences had been increasing, and this trend became even more evident in the later period of financial crisis. There was evident positive correlation between listed companies' book-taxable income difference and earnings management, and those with higher effective tax rate had greater motive avoiding income tax with non-taxable items. Moreover, the consideration to avoid tax in earnings management was a significant element influencing book-tax difference.

Not considering the related transactions in parent company and its subsidiaries to control profits and to avoid tax supervision, the gap between accounting profits and taxable accruals in group companies may be even greater. Moreover, the phenomenon that listed companies doing earnings management to avoid tax may be worse,

Therefore, this essay suggests that standards setting organizations and tax regulators should pay attention to the cooperation of accounting standards and tax laws to play the supervision role of tax to accounting and the technical support of accounting to tax avoidance.

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