Non-institutional Determinants of Book-Tax Differences: Evidence from China

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Accounting income often differs from taxable income due to the different aim between accounting and taxation. Except for this institutional factor, Book-Tax Differences (BTD) often delivers some information about the influence of non-institutional factors, such as earnings management. In this article, we investigate the non-institutional factors that influence BTD. Among the main findings, it is deserved to mention that institutional investors play a negative role in BTD. In order to reduce the interest invading by institutional investor over individual investor, and to promote the capital market to run efficiently and fairly, it is emergent to improve transparency of listed company's information disclosure.

INTRODUCTION

The goal of accounting is to provide financial information to outsiders of the company, it focus on whether the information is true and relative to stakeholders' decision-making, and recognize revenues and expenses on the accrual basis. Thus, preparers of financial report have more choices in making professional judgment. While the purpose of tax authorities is to collect money timely and fully, so as to ensure proper function of the state activities. Compared to accounting standards, tax rules for recognizing and calculating taxable income are more rigidly so that there are few manipulation chances. According to the inconsistency of accounting target and tax target, most countries adopt Accounting - Taxation Separated System when treating income tax, as a result, the amounts of accounting income and taxable income are not equal at most circumstances.

In order to maximizing their interests, the corporate management is motivated to adopt the accounting policies which can increase accounting income, and in the meantime to choose the policies minimize taxable income in order to avoid taxes. No matter which way the managers choose, maximizing corporate accounting income or minimizing taxable income, it will lead to enlarging Book-Tax Difference (BTD) abnormally. We may take it for granted that BTD is the product of institutional difference, but they often do imply the inside information of the company, such as earnings management or other abnormal factors. Thus, BTD have absorbed much attention of accounting researchers. Many researchers consider that BTD can reflect the quality of earnings and regard the amounts of BTD as an important feature index, which

can measure the quality of corporate earnings（Patrick 2001; Manzon and Plesko 2002; Mills and Newberry 2001）. The institutional difference here refers to the normal BTD resulting from the inconsistency of accounting regulations and tax regulations in calculating income, and non-institutional difference means the difference between accounting income and taxable income caused by other factors which we will discuss later.

USA issued the Tax Reform Act of 1986(TRA), and tax rates decreased after the implementation of TRA. In this context, David A. Guenther (1994) investigated whether corporate management pay attention to the change of tax rates and make use of it so as to lower the tax payment. And he found that one year before TRA, corporate current accruals significantly decreased and accordingly, it proved that corporate management had done earnings management behaviors, they delayed to recognize income until a year of lower tax rates in order to reduce the tax payables. Mills and Newberry's main findings (2001) suggested that compared with private firms, if public firms are profitable, they incline to report higher accounting income (compared with taxable income), and if public firms are suffering a loss, they incline to report higher accounting losses (compared with tax losses). The results of their study suggested that public firms have stronger motives than private firms to whitewash profits, while private firms are more likely to avoid taxes. Hanlon (2005) investigated the earnings persistence of firms which have large BTD, and he found that the earnings persistence of firms with large BTD was not as good as that of firms with small BTD. Investors regard large and positive BTD as a "red flag", thereby lowering expectations of these firms' future earnings persistence. Desai, et al (2006) constructed the BTD which was not caused by accrual-basis accounting and thus proved that BTD was the result of tax avoidance.

As we see above, the empirical work to date studied BTD from the following perspectives: to prove BTD is the outcome of taxes avoiding or earnings management, and whether investors would care BTD. However, the prior researchers have failed to clearly reveal what specific non-institutional factors may prompt or restrain earnings management, thus overstate or understate the amounts of BTD. The prime concern of this paper is to find out the non-institutional factors that would exaggerate the amount of BTD. It seems a very difficult task to dig out all the non-institutional factors. Is there a method can be used to achieve this goal? Maybe Data mining can do it.

The concept of Data Mining (DM) was first put forward in the 11th International Joint Artificial Intelligence Conference of 1989, when it was known as Knowledge Discovery in Database (KDD). Data mining has been popular since 1995, because the KDD international academic conference held once a year to encourage researchers in Knowledge Discovery from Database. Data mining method has been widely used in a variety of business areas, such as banking, telecommunication, insurance, transportation and retail business (super market, for example). Data mining specifically refers to the process of extracting potentially useful information and knowledge that people don't know in advance from a lot of incomplete random data, which are noisy and fuzzy.

In 1990s, data mining began to emerge in western developed countries and it was introduced into China at the beginning of 21th century. However, in China, data mining still stays at the stage of introducing the concepts and methods of data mining, and literatures combining data mining with accounting researches are rare. The existing studies are merely limited to test and verify what kind of data mining methods is more effective to forecast information (Liu Min and Luo Hui 2004, Wang Shiguo and Zhang Junmin 2011), researches about further explaining the information from data mining are quite few. As we know, data mining is a tool, not the ultimate goal, the ultimate goal is to explain the extracted information and at last to solve practical problems. For this purpose, we focus on digging out the non-institutional determinants of BTD by means of data mining, so as to get useful information and to further explanations. Data mining is just a means to reach the goal, and our ultimate purpose is to further analyze and explain the results.

MEASURE OF BTD

In 2006, China issued new accounting standards which are in accordance with International Financial Report Standards (IFRS). Like most of other countries in treating income tax, China adopts the mode which separates accounting from taxation, and demands that the accounting effects of income tax should be measured by the Balance Sheet Liability Method. According to China's regulation of preparing financial report, taxable income cannot be obtained from financial report directly, if we want to get the taxable income, we should derive it from other relevant items in the financial report, including income tax expenses, deferred income tax assets and deferred income tax liabilities. In China, the item of income tax expenses is consist of two parts: one part is income tax that should pay to the taxation authorities in current period, and the other part is deferred income tax expenses which caused by temporary difference, reflected in the items of deferred income tax assets and deferred income tax liabilities in the Balance Sheet. In accordance with China's income tax calculation system, the temporary difference equals to the carrying amount of asset (liability) less its tax- based asset (liability). When the carrying amount of asset is greater than its tax-based asset, or the carrying amount of liability is less than its tax-based liability, the taxable temporary difference comes into being, taxable temporary difference increases the income tax expense; on the contrary, if the carrying amount of asset is less than its tax-based asset, or the carrying amount of liability is greater than its tax-based liability, the deductible temporary difference comes into being, deductible temporary difference decreases the income tax expense. Therefore, BTD can be calculated as follows:

*Income Tax Expense = taxable income*income tax rate + deferred income tax liability - deferred income tax asset*

In the formula above, all the data except "taxable income" can be obtained from financial report directly, in order to get the amount of "taxable income" ,we can change the above formula, moving the item "taxable income" from the right of the equation to the left:

Taxable Income = (income tax expense- deferred income tax liability + deferred income tax asset) / income tax rate

BTD = accounting income - taxable income

= accounting income - (income tax expense - deferred income tax liability + deferred income tax asset) / income tax rate

DATA AND DESCRIPTIVE STATISTIC

Our data comes from Juling Financial Database and CSMAR database. Our sample includes all the listed companies in Shanghai and Shenzhen Stock Market from 2008 to 2010 except the following companies: ST&PT companies; main data missing companies; Finance and Insurance industry; Agriculture, Forestry, Animal husbandry and Fishery industry. With the consideration of the accounting treatment in Finance and Insurance industry is significantly deferent from other industries, we exclude the companies of Finance and Insurance industry. Besides, the new Corporate Income Tax Law of China, which was issued in 2008, has given preferential tax to Agriculture, Forestry, Animal husbandry and Fishery. Since we don't know the exact tax rate of above industry, it will make it difficult to calculate the BTD accurately, so we also eliminate the companies of the industry.

In order to obtain non-institutional determinants of BTD, we collect all the data in the database which we think having something to do with BTD. In the end, we select eighteen indicators in total. We hope that based on correlation analyses of large amounts of data, non-institutional deciding factors of BTD can be excavated out, and multiple-regression model can be constructed finally. The indicators include two variables that indicate the growing capabilities of the company: EPS growth rate and operating profit growth rate; two liquidity indicators: stock turnover divided by stock amplitude, the proportion of

tradable A-shares to total shares(In China, some shares only can be bought by domestic citizen, A-share just refers to this type of shares); three market pricing indicators: the price to earnings ratio(PE), the price to book ratio(PB) and the price to cash flow ratio(PC); five profitability indicators: returns on net assets ratio(ROE_1), returns excluding non-recurring profit and loss on net assets(ROE_2), return on total assets(ROA_1) and net profit on total assets(ROA_2); net earnings of operating activity to total profit(NOP); one leverage indicator: the asset-liability ratio; three firm size indicators: the total stock capital, the outstanding stock capital and the total assets. In addition, we also select the shareholding ratio of institutional investor (IOP) and the daily average price of stock as indicators. The descriptions of all indicators are provided in Table 1.

TABLE 1
DESCRIPTION OF KEY VARIABLES

Variables	Indicator	Description
Growth1	The EPS growth rate	The growth indicators
Growth2	The operating profit growth rate	
Liquid1	stock turnover/ stock amplitude	The liquidity indicators
Liquid2	tradable A-shares to total shares	
PE	price to earnings ratio	The market evaluation indicators
PB	price to book value ratio	
PC	price to cash flow ratio	
ROE_1	returns on net assets ratio	The profitability and earnings quality indicators
ROE_2	returns excluding non-recurring profit and loss on net assets	
ROA_1	return on total assets	
ROA_2	net profit on total assets	
NOP	net earnings of operating activity to total profit	
LEV	asset-liability ratio	The leverage indicator
SIZE1	natural logarithm of total stock capital	The firm size indicators
SIZE2	natural logarithm of outstanding stock capital	
SIZE3	natural logarithm of total assets	
IOP	shareholding ratio of institutional investor	
Price	daily average price per year	

In order to find out which factor is the determinant of BTD, we should know the relationship between them. Table 2 is the correlation of BTD and the variables selected.

TABLE 2
THE CORRELATION OF BTD AND OTHER VARIABLES

Variables	Coe.	P-values	Variable	Coe.	P-values
Growth1	-0.05	0.00***	ROA1	0.01	0.66
Growth2	-0.02	0.36	ROA2	0.004	0.81
Liquid1	-0.22	0.00***	NP/TP	0.02	0.34
Liquid2	-0.04	0.01***	LEV	0.09	0.00***
PE	-0.14	0.00***	SIZE1	0.53	0.00***
PB	-0.06	0.00***	SIZE2	0.46	0.00***
PC	-0.01	0.71	SIZE3	0.48	0.00***
ROE1	0.02	0.33	IOP	0.21	0.00***
ROE2	0.03	0.13	Price	0.16	0.00***

P-values are given in the parentheses.

According to the correlation result of the BTD and the variables, it shows that the BTD are significantly related to eleven indicators, including the EPS growth rate (Growth1), stock turnover/ stock amplitude (Liquid1), tradable A-shares to total shares (Liquid2), price to earnings ratio (PE), price to book value ratio (PB), asset-liability ratio (LEV), the total share capital (SIZE1), the outstanding capital stock (SIZE2), the total assets (SIZE3) , the shareholding ratio of institutional investor (IOP) and daily average price of stock. From the result of the correlation analysis, we can draw the conclusion that BTD may be affected by enterprise growth, liquidity, market evaluation for the stock, capital structure, enterprise scale, the shareholding ratio of institutional investor and share price.

MODEL AND METHODOLOGY

After analyzing the correlation of BTD and all variables, we select the eight variables which are most significantly related to BTD, and construct the Cross-sectional Regression model. The eight indicators are PE、PB、LEV、$Growth_1$、IOP、Price、$Liquid_1$ and SIZE3， and then we set up three models as follows.

$$BTD_{it} = \alpha_{0+}\alpha_1 PE_{it} + \alpha_2 PB_{it} + \alpha_3 LEV_{it} + \alpha_4 Growth_{it} + \alpha_5 IOP_{it} + \alpha_6 \mathrm{Pr}ice_{it} + \alpha_7 Liquid_{it} + \alpha_8 SIZE_{it} + FIXED_{-effect1} + \xi_{it} \quad (1)$$

$$BTD_{it} = \alpha_{0+}\alpha_1 PE_{it} + \alpha_2 PB_{it} + \alpha_3 LEV_{it} + \alpha_4 Growth_{it} + \alpha_5 IOP_{it} + \alpha_6 \mathrm{Pr}ice_{it} + \alpha_7 Liquid_{it} + \alpha_8 SIZE_{it} + FIXED_{-effect2} + \xi_{it} \quad (2)$$

$$BTD_{it} = \beta_{0+}\beta_1 PE_{it} + \beta_2 PB_{it} + \beta_3 LEV_{it} + \beta_4 Growth_{it} + \beta_5 IOP_{it} + \beta_6 \mathrm{Pr}ice_{it} + \beta_7 Liquid_{it} + \xi_{it} \quad (3)$$

Model (1) controls the influences of the industry fixed effect, the year fixed effect and the firm size influence on BTD. Based on Model (1), Model (2) relaxes some conditions, it just controls the influences of the industry fixed effect and the year fixed effect, but relaxes firm size influence on BTD. Furthermore, more conditions are relaxed in Model (3) which doesn't control the influences of the industry fixed effect, the annual fixed effect and the firm size influence on BTD.

You may think it strange why we set three models similarly? The reason is that we want to examine whether the regression result still remains stable under varying conditions.

RESULTS AND ANALYSES

Empirical Results

Table 3 shows the empirical results of three models. In terms of the regression results, no matter whether the industry fixed effect, the year fixed effect or the firm size are controlled or not, PE always has a significant negative effect on BTD, which means a firm with a higher PE will have a smaller BTD.

Secondly, the PB has notable negative influence on BTD in Model (1) and Model (3), but the relation is not significant in Model (2). Thirdly, there is significant negative correlation between leverage and BTD, which means if a firm has a higher debt ratio, its BTD will be smaller. What's more, BTD have an obvious negative correlation with the EPS growth in the univariate regression analysis, but the multivariate regression analysis, taking other factors into consideration, reveals that no significant correlation is found between BTD and the EPS growth ratio. The shareholding ratio of institutional investor has a significant positive influence to BTD in all models which means a firm with a higher shareholding ratio of institutional investor will have larger BTD. We also can see the liquidity has notable negative influence on BTD in any model which implies the higher the firm's liquidity is, the smaller its BTD will be. In addition, the bigger the firm size is, the larger its BTD will be. We also find that BTD are quite distinct in different industries and years. According to our regression results, we find that BTD has a trend of increasing year by year.

Overall, except that the results of PB in Model (2) are not as significant as those in other two models on a statistical basis, the regression analysis results are stable, so it is reasonable to infer that our conclusion is convincing and reliable.

TABLE 3
THE RESULTS OF CROSS-SECTIONAL REGRESSION MODELS

Dependent Variable ： BTD						
Independent Variables	Model（1）		Model（2）		Model（3）	
	Coe.	t- stat	Coe.	t- stat	Coe.	t-stat
PE	-0.001***	-2.76	-0.001***	-2.67	-0.0003**	-2.28
PB	-0.02**	-2.00	-0.003	-0.31	-0.08***	-8.01
LEV	-0.01***	-3.83	-0.009***	-5.60	0.008***	5.54
Growth	0.00	0.43	0.00	0.44	0.00	0.60
IOP	0.01***	4.37	0.005***	4.43	0.01***	8.20
Price	0.02***	7.17	0.03***	7.23	0.04***	10.52
Liquid	-0.04***	-8.28	-0.03***	-6.97	-0.05***	-10.34
SIZE	0.57***	16.04	0.63***	18.72		
Industry-Fixed Effect	Control		Not Control		Not Control	
Year-Fixed Effect	Control		Not Control		Not Control	
SIZE	Control		Control		Not Control	
F-value	48.96		121.53		65.00	
R^2	0.33		0.30		0.15	
Number of obs.	3321		3321		3363	

t-statistics are given in the parentheses.

Further Analyses of the Results

The price to earnings ratio or the price to book-value ratio reflects that the price the market is willing to pay for earnings per share or for net assets per share. They are both the market-oriented evaluation indexes to enterprise. From our results, we notice that if PE or PB turns higher, the amount of BTD turns smaller. On one hand, it means the market has an obvious inhibition effect on the enterprise BTD; on the other hand, it also means the market can interpret the implication information from the enterprise BTD and then regard the enterprises with greater BTD as those have serious earnings management and thus give lower evaluations to them.

The leverage ratio is an index reflecting the enterprise capital structure. There are two fundraising channels for the enterprises: one is investments by owners and the other is debt financing. In debt financing, except for the payables due to the modern commercial credit that causes purchasing on credit, most are raised via loans from the banks or issuing bonds. Generally, enterprises need to sign contracts with lenders in debt financing, in which some restrictive items will be made to ensure the interest of creditors. These items often involve prohibiting the borrowers from managing earnings, such as requiring that enterprises must provide audited financial report for creditors regularly. As we know, the best loan contract is that the loan contract has the characteristic of letting entrepreneurs tell the truth, even though they don't tell the truth, creditors won't get cheated, so debt financing has formed an effective component of corporate governance mechanism. Because of this management role of loan contracts, it is not hard to understand the result of this paper that if the leverage ratio turns higher, the amount of corporate BTD turns smaller.

As we can see from the statistical result, the average shareholding ratio of institutional investors is 48% in China stock market. Besides institutional investors, most of the investors are scattered, and the scattered investors haven't the capability to form the joint force to lead the stock market, which means the institutional investors who have technology and human resources advantages play a decisive role in the operation of the China stock market. Our research result shows that the higher the shareholding ratio of the institutional investors is, the greater the BTD will be. Maybe it's a little difficult to be understood, but if we analyze from the perspective of "Rational Economic Man", it is not hard for us to interpret the phenomena. Due to the technology and HR advantages, institutional investors will use various channels to collect, integrate and analyze information, and then use the advantages to obtain the maximum benefit. Besides, in extreme cases, institutional investors and listed companies may collude with each other to loot the benefits of large numbers of scattered investors. Since scattered investors are at technology and information disadvantage, they cannot look through the information contained in BTD which may be the result of earnings management. However, institutional investors can look through the information, so they will use the disadvantage of scattered investors to maximize their own benefit. In China stock market, it is common phenomenon that institutional investors manipulate the price of stock by means of cheating uninformed scattered investors to buy at high price, and cheating them to sell at low price, so they can gain the interests as high as possible.

Let's analyze the relation between liquidity and BTD. In a liquid stock market, as long as the bargainers need, they can buy or sell large numbers of stocks quickly with paying lower transaction cost and having little effect on the market price. The liquidity not only includes the liquidity of the market, but also the liquidity of individual stocks. The higher the transparency of individual stocks is, the better the liquidity will be, so liquidity can reflect the enterprise governance quality in a way. Because outsiders of the company would regard large BTD as delivering the information of earnings management, BTD lead to information asymmetry, that's why our research result suggests the relation between BTD and liquidity is negative.

CONCLUSIONS

In this paper, we studied the non-institutional determinants of BTD. As we know, due to the different target of accounting and tax, BTD seems the product of institutional influence, but in fact, they may be the production of non-institutional factors influence. It is a pity that what kind of non-institutional decisive factors will actually affect BTD is not mentioned in the prior researches. In this paper, using the method of data mining, taking listed companies from Shanghai and Shenzhen stock for samples, we investigated the non-institutional determinants of BTD. We find that some non-institutional factors may restrain BTD, while others may play important roles in exaggerating it. According to our study, market evaluation for the company, debt covenants and company liquidity play obvious roles in restraining BTD; institutional investors won't restrain BTD, but on the contrary, they play an negative role in it, that is, the larger BTD the companies have, the more shares investors hold. That is the usual tunnel for institutional investors to plunder uninformed scattered investors. According to our research outcome, we think in order

to protect uninformed scattered investors, it is emergent that institutional investors should be supervised more tightly in Chinese stock market. What's more, increasing the transparency and timeliness of the listed company information disclosure, providing liquidity to stock markets can not only reduce information asymmetries, so as to avoid or restrain the interests invading of informed investors over uninformed investors, but also improve the allocation efficiency of resources, enhance the confidence of investors in stock market, and promote the capital market to work efficiently and perfectly.

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