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The Effect of Book-Tax Difference on Earnings Quality: Empirical Evidence from KOSPI companies in Korea

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A B S T R A C T

This paper investigates the role of temporary Book-Tax Differences(BTD) as a proxy for earnings quality using various measures to provide alternative indicators of earnings quality. Hence, it combines most frequently used hypotheses with some modifications. First, we partition total temporary BTD into its components such as large positive, large negative and small temporary BTDs. Then, we analyze the association between large temporary BTDs with discretionary accruals. Following that, the persistence of earnings will be examined when there are large positive and large negative BTDs. Lastly, the association between large temporary BTDs and future earnings will be studied to find the impact of large temporary BTDs on future earnings. Overall, the evidence suggests that temporary BTD can be a good choice for investors to analyze a particular company's earnings quality.

Keywords: Book Tax Difference, Temporary Book Tax Differences, Discretionary Accruals, Earnings Persistence, Future Earnings Change

I. Introduction

Companies, especially the big and publicly traded ones are subject to numerous points of scrutiny. Generally, a country's Securities and Exchange Commission(SEC) require publicly listed companies and corporations to submit accurate income reports, also known in other pieces of literature as book reports, on a quarterly and annually. The purpose of which is to maintain a stable regulatory framework for businesses that are capable of protecting the companies, their creditors, and the institutional and retail investors. The list of regulatory bodies whose policies the companies have to abide with does not end with the SEC. There is also the Bureau of Internal Revenue-or any tax regulatory agency for a particular country. Companies regardless whether they are privately or publicly- owned have to submit income tax reports to the said tax collection bureau aside from diligently and timely paying their corporate income tax obligations. The documents that would be submitted to the SEC would look more like a book or financial report while those submitted to the government's tax collection and the regulatory department would contain more tax accounting data.

Book-Tax Differences(BTD, otherwise known as Tax Book Differences and Book-Tax Income Differences in other previously published studies) perform an

important role in that they serve as a proxy for earnings. Because of the differences between the implementing rules and regulations of bodies like the SEC and the government's tax collection and regulatory department, companies are essentially being given the flexibility to improve the attractiveness of their earnings in a way that would favor the company, in a legal way that is. The purpose of the BTD comes into play when these differences get considered.

The problem that this paper aims to solve is the relationship between BTD and earnings quality. BTD refers to the difference between a company's book income and tax income. This difference is primarily caused by the divergence of mechanisms by which regulatory agencies require companies to report their earnings. Regulatory agencies that are focused on tax accounting put more emphasis on the tax-aspect, i.e. on maximizing the amount of taxes owed by a company. Those that are focused on investment-related accounting(i.e. book income) put more emphasis on the accuracy and transparency of the reports that they receive. It is not uncommon for-profit institutions to use this accounting loophole to legally evade taxes. In fact, there is already a long list of companies, some of which still operate today but a good number had already gone bankrupt, that utilize this method of financial maneuvering.

The research question that this research tries to answer asks whether there is a relationship between BTD and earnings quality. It is worth noting that this is a well-researched topic because the existence of BTDs especially in an age where people and regulatory agencies place a high level of priority on the transparency and accuracy of data being presented to the public and the government has long been a hotly debated topic. More than one and a half decade ago, a lot of policy changes have happened. The outcome of the new policies that were enacted and the existing ones that were amended has led to an environment where it is tougher to make improper adjustments on book and tax income. It is therefore worth revisiting the theory about the relationship between BTD and earnings quality.

The significance of this study is anchored on the general consensus among previously published studies (discussed in Chapter 2) that suggest that there is a strong correlation between a firm's BTD and earnings quality. This alone signals that BTD, as a variable in itself, is something that is worth looking into, be it by someone who is doing a tax income or book income analysis of a business. It cannot be denied, however, that BTD is one of the most overlooked indicators of earnings quality, despite the fact that researchers in the field of financial and tax accounting know that it can be used as a good proxy for earnings quality. This can be evidenced by the lack of databases and other data sources that compile the BTD of each company.

II. Literature Reviews and Hypothesis

Book income and taxable income are both important factors when it comes to assessing the operational performance of businesses because they supposedly provide a broad and accurate picture of how profitable a particular business is. This is, in fact, one of the well-researched aspects of finance. For example, in a study by Revsine et al.(2002), it has been found that discrepancies in a company's tax income reports can be considered a manifestation of deterioration in the firm's earnings quality. In a more recent study conducted by Deslandes & Landry(2007), the same argument was presented about the relationship between tax income discrepancies and the quality of a company's earnings.

This leads to the question of how exactly tax and financial analysts can use these two variables in assessing earnings quality. The answer lies in the fact that manifestations that a firm engaged in certain financial maneuverings would almost always be reflected in their taxable income and tax payments. The general principle is that the higher a company's earnings are, the higher its tax liabilities would be. It is therefore unusual for a firm that has a lot of earnings to post an unusually small or disproportionate

amount of tax liabilities.

It is worth noting, however, that the way how taxable income is measured is different from the way how a traditional book income is measured. Taxable income is subject to a higher volume and more stringent sets of regulation; this is due to the implementing rules and regulations of government agencies like the government's tax collection and regulatory department. Violation of such rules and regulations would typically lead to penalties such as fines and depending on the seriousness of the violation, prosecutorial and or criminal charges may also be filed.

It, therefore, makes sense for companies to exercise a lower level of creativity and flexibility in making taxable income report changes because they are subjecting not only the firm's financial stability but also its credibility by opting to do so. Firms can generally exercise a higher degree of freedom in reporting their book income. This may be due to the reality that the implementing rules and regulations of the entities monitoring book income reports are just laxer compared to their counterparts that are responsible for doing the same thing for taxable income reports. The bottom line is that discrepancies between the taxable income and book income reports can be considered as a yellow flag that may indicate the presence of financial statement manipulations, inferior quality of reported earnings, or an overly aggressive tax planning behavior by the firm.

A. Book-Tax Difference

BTDs exist because of the differences between how book income and tax income recognizes certain items be it in terms of their nominal value or data of recognition. Depreciation recognition differences between book income and taxable income are arguably the most commonly used example when explaining the mechanic of BTDs. Revenue or any item in a financial statement may be recognized in one period in the tax income report but in a different period in the same company's book income report.

The result is a difference in the book and tax income, hence the term book-tax difference.

If there are temporary BTDs, there are also permanent BTDs. The same principle applies in terms of the differentials. The difference with the latter, however, is that the differences do not even out even in the long run, hence the term permanent. The items such as revenues and expenses(e.g. depreciation) create differences between the tax and book income reports that are irreversible. Examples of items that typically contribute to permanent BTDs include, but may not be limited to nontaxable revenues and other nondeductible expenses. Because they are nontaxable and or nondeductible, their exclusion from the taxable income report becomes permanent; this, despite the fact that such items are required to be included in the book report.

It has long been theorized that because of the more stringent regulations and stricter enforcement of the policies of tax authorities, taxable income reports should be considered more reliable than book income reports. For example, Shackleford & Shevlin (2001) examined this as a possibility; they concluded that there is indeed a tendency for taxable income reports to be more reliable compared to other types of reports, based on the results of their empirical study. A more popular study in the research community centered on BTDs would be that of Lev & Nissim(2002). They focused on taxable income and earnings quality (including equity values and future earnings) as the main variables in their study. They used a ratio called the tax-based fundamental, which can be computed by dividing taxable income by book income. They argued that the tax-based fundamental (which is essentially the Book to Tax revenue differential, i.e. the BTD) can be used as a tool to describe the company's fundamentals(e.g. earnings); and that it may also be used as a predictor of earnings growth, stock returns, and price to earnings ratios. The results and findings of their research showed that the said ratio could indeed predict subsequent five-year changes in earnings, and equity values(i.e. stock returns). There is a lot of other studies about this topic and the general consensus among the researchers

in those studies is that taxable income can indeed be used as a benchmark to assess a firm's quality of earnings.

B. Hypothesis

It is worth iterating that this study only focused on temporary tax differences. Temporary tax differences are a much more reliable measure of BTDs and its impact on earnings quality compared to permanent BTDs. This is because permanent BTDs are not driven by the accounting accruals process. Additionally, permanent differences are created by tax planning activities or rule differences between policies like GAAP and Tax Laws and therefore less frequently reflect earnings management activities.

Hypothesis 1 : Discretionary accruals for the firm years with large positive or large negative temporary BTDs are higher than discretionary accruals for the firm years with small temporary BTDs

As the first hypothesis indicates, we expect that firms with relatively large negative and positive temporary book-tax differences, as a result of more discretion in the provisions process, have lower earnings quality. Understanding how this hypothesis was framed, it would be known that there are three key variables, namely, discretionary accruals, and large positive and negative BTDs and control variables as well. The dependent variable, in this case, would be the discretionary accruals(or at least its size). Discretionary accruals are mentioned as one of the reliable indicator of earnings quality in the previous literature. The assumption being presented in this hypothesis is that larger differences in temporary BTDs(be it positive or negative) can lead to larger discretionary accruals. Larger discretionary accruals mean low earnings quality because there is more discretion involved in provisions process.

Hypothesis 2 : Persistence of earnings for the firm-years with large negative or large positive temporary BTD is lower than persistence of earnings for the firm-years with small temporary BTDs.

Hanlon(2005) indicates that persistence of earnings can be tremendously useful while assessing a particular firm value. If large temporary book-tax differences present evidence of management discretion in the accrual process, the accruals for these firms should exhibit greater future reversals and, thus, a lower persistence in accruals and earnings. Following prior research, we posit the following hypotheses in the alternative form: Hanlon(2005) paper was the model used to validate this hypothesis. Hanlon(2005) used large positive and negative BTDs whereas this paper uses large positive and negative temporary BTDs. One year Forward pretax income was used as a dependable variable scaled by average total assets.

Hypothesis 3 : There is a negative association between future earnings and large positive or negative temporary book-tax differences.

The last hypothesis was based on the research which has been done by Jackson(2015). However, there are some slight differences which can be noticed in the hypothesis. In his research Jackson(2015) considered total temporary differences but this hypothesis takes into account the large positive and negative temporary differences. The management discretion can be served as a notice of management's private information about upcoming performance. Let take an example of a bad performing firm that gives valuation allowance against deferred tax assets. As a result, this phenomenon leads to positive temporary differences. Moreover, this can carry some information about the future decrease in firm's economic performance, proposing a negative relationship between temporary differences and future changes of pretax earnings. Hanlon(2005) finds that the pretax earnings of firms with large temporary BTDs are less persistent. In this hypothesis, it is predicted that large positive and negative temporary book-tax differences are negatively associated with future earnings.

Ⅲ. Study design and sample selection

A. Data Consolidation

Numerous research designs were used for this study. Most of these research designs were replicated from previously published studies that made use of the same theoretical framework. The quantitative research designs were used, using a sample of 3,755 firm-years(2011 to 2015), all of which were from South Korea. Hanlon(2005), Jackson(2015) and Park(2013) studies were used as a guide in setting research designs for the hypotheses. It is worth noting that Hanlon(2005) study was, in turn, based on Lev & Nissim(2004) study. Hanlon(2005), however, did some modifications in Lev & Nissim(2004) research design citing difficulties in interpreting their coefficients and lack of congruency in the availability of data. Jackson(2015), however, was based on Hanlon(2005), but certain modifications were also made due to the same reasons that were cited in her study: lack of congruency in the availability of data.

Most previously published studies made use of Compustat data, featuring financial information related to predominantly US companies. In this research, however, the source of data was one of the prominent South Korean database websites "fnguide.com". For all the three research hypotheses, data obtained from a total of 751 KOSPI firms were used. The data time frame covers from 2011 to 2015, which means that there was a total of five-year observation period for the researchers to examine. In total, there were 3,755 firm-years that have been examined, with a five-year observation period for each of the 751 South Korean firms. The size of the present study sample population is significantly smaller compared to that in previously published studies where Compustat data were used and analyzed. This potential limitation, however, was offset by the fact that a five year recent(as recent as 2015) observation time frame was used. The main reason of using South Korean data is that the time frame covers the years of observation after the world economic crisis which makes it worth to revisit analysis of BTD and earnings quality. To deal with the impact of extreme values, we deleted the observations in which any variables account for beyond the highest and lowest 1% of the distribution of that particular variable. And, winsorizing took a place as a method to replace the deleted observations.

B. Discretionary Accruals, Large Positive Temporary BTD(T-BTD(LP)), Large Negative Temporary BTD (T-BTD(LN)),

For the first hypothesis, the goal was to determine the type of relationship between large temporary BTDs and discretionary accruals and other control variables. There were three key variables involved in this hypothesis: Discretionary accruals, large positive and large negative temporary BTDs.

Jackson(2015), he recognized Deferred Tax Expenses (DEF) as the temporary component of BTDs scaled by assets. DEF captures temporary differences while TAX captures total BTDs. Due to the lack of the data about DEF in "Fnguide" It was required to compute DEF following the computation done by Park(2013). To get DEF, the differed tax liability should be subtracted from differed tax asset. Using Jackson's model, temporary BTD can be computed by dividing Differed Tax Expense to average asset.

This was modified because what was needed in the present study was only the temporary component of the BTDs. Jackson(2015), in contrast, he needed to compute for the Total BTD, and divide it into two: Permanent and Temporary, hence the murkier equations.

The next step involved characterizing the largeness or the smallness of the temporary BTDs. For this, we used Hanlon(2005) as a reference. To identify the firm-year observations with large positive and large negative temporary BTDs, all of the 3,755 firm-year items were ranked using the variable TBTD/Asset or Temporary BTD/Average Assets for the entire firm-year data. The average assets were the mean of the total assets of all firm-year observations − this was done in order to establish cross-sectional reliability in the findings, which was the same rationale

used in Hanlon(2005) study. After computing for the TBTD/At, the firm-year observations were ranked (using the TBTD/At as the indicator variable) into quintiles. Those in the upper quintiles were considered as firms with large TBTDs while those in the lower quintiles were considered as firms with small TBTDs. 124 Firm-year TBTD observations with missing values were excluded from the analysis. There were 2518 firm-year observations that had positive TBTDs. There were 1115 firm-year observations that had negative TBTDs. Each of these two groups was divided into two. The upper 70% of the positive TBTD group, for example, were considered to be members of the large positive temporary BTD (LPTBTD) group. The lower 70% of the negative TBTD group, for example, were considered to be members of the large negative temporary BTD (LNTBTD) group.

Lastly, for H1, discretionary accruals also had to be computed. This was done using the approach used in Kothari et al(2005). This was also the method of measuring discretionary accruals that was used in Guenther et al(2013). The first step involved measuring the Total Accruals(TA). This was done by computing for the difference between pretax income (or Income before extraordinary items) and cash flows from operating activities. The Modified Jones Model (MJM) was then used to compute for the discretionary accruals using regression analysis. The MJM is the most commonly used model to compute for the discretionary accrual Bartov & Gul(2000). This can be expressed using the equation below:

$$\mathrm{TNA} = \alpha_0 + \alpha_1\left(\frac{1}{ATA}\right) + \alpha_2\left(\frac{\triangle Sales - \triangle Rec}{ATA}\right) + \alpha_3\left(\frac{PPE}{ATA}\right) + \epsilon \tag{1}$$

TNA is total net accruals. ATA is the average total assets (Cross-Sectional, in Firm-Years). $\triangle$ Sales can be defined as change in sales. $\triangle$ Rec accounts for change in accounts receivable. $\triangle$ PPE is property, plant, and equipment.

As shown above, there were numerous variables that were added using the Modified Jones Model. The residual of this regression equation was the one used as the Discretionary Accrual. It is worth noting that the Modified Jones Model may or may not be perfect but it is nonetheless the most commonly used because it factors in the variables that have the highest potential impact on the TNA and therefore the discretionary accrual.

After obtaining the discretionary accrual and all of the previously mentioned variables, a regression analysis was conducted to check whether there is a relationship between the variables namely discretionary accrual and the size of the temporary BTD.

$$\mathrm{DA} = \alpha_0 + \alpha_1 LPTBTD + \alpha_2 LNTBTD + \alpha_3 ROA + \alpha_4 DIV \\ + \alpha_5 RND + \alpha_6 MTB + \alpha_7 SIZE + YEAR + \epsilon \tag{2}$$

DA stands for discretionary accruals scaled by average asset. LPTBTD is large positive temporary BTD. LNTBTD is large negative temporary BTD.

So far, multiple research papers based on BTD and Earnings quality made a use of control variables presented by Lev & Nissim(2004). Following Lev & Nissim(2004), We control predictors of earnings changes with the following variables: The first control variable namely Return On Asset(ROA) was added due to its control over short and long-term trends in future earnings. Moreover, Dividend(DIV) scaled by average assets was another control variable which has a potential to represent the level of confidence in upcoming earnings strength. In addition to this, Research and Development(RND) ratio was included as a control variable to the research designs because it carries incremental information about expected sales growth because of new investments and it can also spot on growing firms. Furthermore, taking into account its ability to capture market expectations of upcoming growth, Market to Book(MTB) was taken as a control variable to the above-outlined research designs. Lastly, We took into account size(SIZE) of a particular firm and year(YEAR).

C. Persistence of Earnings, LPTBTD and LNTBTD

The focus of this section was on the persistence of earnings in the presence of variations in BTDs(e.g. large positive and large negative). The general consensus

from the literature review that was conducted earlier is that persistence of earnings can be directly affected by the size and nature(i.e. positivity or negativity) of the BTDs. It is important to note that just like in H1, H2 also focused on temporary BTDs only. This is because permanent BTDs are not driven by the accounting accruals process. Additionally, permanent differences are created by tax planning activities or rule differences between policies like GAAP and Tax Laws and therefore less frequently reflect earnings management activities.

So far, temporary BTDs were already computed in H1. The only variable that is different in H2 is the persistence of earnings. Hanlon(2005) study was used as the model for measuring earnings persistence. In the present study, most of the variables were scaled by average total assets in order to arrive at findings that are reliable in terms of cross-sectional compatibility (with the data used). The goal in Hanlon(2005) was to test whether the firm-years with large negative and positive BTDs had lower earnings persistence. The present study's goal is different in that it developed focuses only on temporary BTDs, and includes large positive and large negative temporary BTDs.

Hanlon(2005) used the following equation to test her hypothesis:

$$PTBI_{i,t+1} = \beta_0 + \beta_1 LNBTD + \beta_2 LPBTD + \beta_3 PTBI + \beta_4 PTBI \times LNBTD + \beta_5 PTBI \times LPBTD + \epsilon \qquad (3)$$

It can be seen that Hanlon(2005) made use of an indicator variable to characterize whether the firm has a large positive or large negative BTD. The same strategy was done in this study only that it is now used a large positive and a large negative Temporary Book-Tax Difference. With that, the equation for the Persistence of Earnings would now look like:

$$PTBI_{i,t+1} = \beta_0 + \beta_1 LNBTD + \beta_2 LPBTD + \beta_3 PTBI + \beta_4 PTBI \times LNBTD + \beta_5 PTBI \times LPBTD + \epsilon \qquad (4)$$

$PTBI_{i,t+1}$ is one year forward pretax book income. LPTBTD is large positive temporary book tax difference. LNTBTD is large negative temporary

book tax difference. $PTBI_{i,t}$ is current year pretax book income. $PTBI_{i,t} \times LPTBTD$ is interaction variable between pretax book income and LPTBTD. $PTBI_{i,t} \times LNTBTD$ is Interaction variable between pretax book income and LNTBTD.

The following equation was used to compute for one year ahead value of pre-tax book income:

$$PTBI_{i,t+1} = \beta_0 + \beta_1 PTBI_{i,t} + \epsilon \qquad (5)$$

The present equation now has one major key difference from the one that Hanlon(2005) used: It now focuses on the use of temporary BTDs instead of both the permanent and temporary BTDs. In order to do this; the firm-years that were used were divided into two clusters, based on their TBTD/A coefficient. In the equation 5, β_3 would reflect the persistence of the earnings for all the firm-year observations. β_4 and β_5 would reflect the persistence of earnings of the firm-years with large positive and large negative temporary BTDs. If LPTBTD and LNTBTD are associated with less persistent accruals, then the regression coefficient for β_4 and β_5 would also be < 0 in order for us to suggest and prove that large negative and large positive temporary BTDs indeed lead to less persistent accruals. This kind of finding would be consistent with the second hypothesis because this would mean that LNTBTD and LPTBTD lead to lower(or less) persistence of earnings as represented by PE. A regression coefficient that is < 0 would be any negative integer or number.

D. Future Changes of Earnings, LPTBTD, LNTBTD

This section here represents the research design that was used to answer the third hypothesis. Temporary BTDs were already computed in the previous hypotheses and so the same method of computation used for the last hypothesis too. The research model used to prove above mentioned hypothesis bears some similarities as Jackson(2015) used for his hypothesis. However, Jackson(2015) used total temporary BTD

and total permanent BTD in contrast, in this research, instead of total temporary, large positive and negative temporary BTDs are used as main independent variables. When it comes to future changes of pretax earnings, like Jackson(2015), this paper uses Net Income, Pretax Income, and Tax Expense as proxies for the future changes in earnings. Jackson(2015) took delta values of dependable variables(net income, pretax income, and tax expense) and separated into three periods of total 1 year, 3 years and 5 years. But, in this research design, we used total 5-year firm values of each dependable variable.

The following models belong to Jackson(2015) the research design :

$$\triangle NI_{t+1,3,5} = \alpha_0 + \alpha_1 PERM_t + \alpha_2 TEMP_t + \epsilon \ (6)$$

$$\triangle PRETAX_{t+1,3,5} = \alpha_0 + \alpha_1 PERM_t + \alpha_2 TEMP_t + \epsilon \ (7)$$

$$\triangle TAXEXP_{t+1,3,5} = \alpha_0 + \alpha_1 PERM_t + \alpha_2 TEMP_t + \epsilon \ (8)$$

Applying all of modifications which has been made in this research, we came up the following research design for my third hypothesis:

$$NI_{i,t} = \alpha_0 + \alpha_1 LPTBTD_{i,t} + \alpha_2 LNTBTD_{i,t} \\ + Controls + \epsilon \qquad (9)$$

$$PRETAX_{i,t} = \alpha_0 + \alpha_1 LPTBTD_{i,t} \qquad (10) \\ + \alpha_2 LNTBTD_{i,t} + Controls + \epsilon$$

$$TAXEXP_{i,t} = \alpha_0 + \alpha_1 LPTBTD_{i,t} \qquad (11) \\ + \alpha_2 LNTBTD_{i,t} + Controls + \epsilon$$

According my third hypotheses, We are expecting to see negative value in my regression analysis. In this case, Y1 and Y2 of each research model should have negative values which eventually support the third hypothesis.

Ⅳ. Results of the empirical analysis

<Table 1> represents descriptive statistics for the whole sample. The statistics provide information about the number of observations, mean values of the observations related to LPTBTD, SMALLTBTD and LNTBTD respectively. In addition to this, we included the maximum, minimum and median values of each variable partitioned by LPTBTD, SMALLTBTD, and LNTBTD. It can be noticeable from the sample description that the mean values of three subsamples (LPTBTD, SMALLTBTD, and LNTBTD) partitioned according to the level of Temporary Book-Tax Differences, show promising result supporting suggested hypotheses above. For example, the mean of discretionary accruals for the firm years with small temporary BTDs is much less than those of with large positive or negative temporary BTDs.

To be more precise, the mean value of discretionary accruals which belong to SMALLTBTD accounts for -2.491 whereas means of discretionary accruals with LPTBTD and LNTBTD are -1.664 and -2.124 respectively. This means that Companies with SMALLTBTD tend to have less amounts of discretionary accruals compare to the companies with LPTBTD and LNTBTD. However, the cross-sectional regression is the one which is able to provide a final support. When it comes one year forward pretax book income (PTBIt+1), statistics show that firms with SMALLTBTD tend to have the higher mean of PTBIt+1 compare to companies with LPTBTD and LNTBTD. More exactly, the mean of PTBIt+1 with SMALLTBTD equals 0.019 while the mean of PTBIt+1 with LPTBTD and LNTBTD are 0.018 and 0.015 respectively. Same is true with the mean values of pretax income and net income(PTINC and NTINC). However, according to the statistics, the mean of income tax expense(INCTE) tend to be higher when there is LPTBTD. This is something that contradicts the third hypothesis. Again, the regression result is required to come up with the conclusion.

<Table 2> illustrates Pearson Correlation Matrix of total variables. As it is obviously seen from the

Table 1. Descriptive statistics

			LPTBTD			
Variable	Obs	Mean	Std. Dev.	Min	Max	Median
DA	1,706	-1.664	2.546	-17.93	0.399	-0.832
$PTBI_{t+1}$	1,720	0.018	0.068	-0.094	0.489	0.002
PTINC	1,761	1031	3330	-4470	2443	1440
NTINC	1,761	8052	2834	-4940	2111	1080
INCTE	1,761	2371	7250	-4940	2112	2431
ROA	1,670	-0.25	8.073	-3226	4740	-0.44
DIV	1,761	0.001	0.001	-27.95	26.05	0.001
RND	1,761	0.005	0.012	0	0.006	0.001
MTB	1,700	0.946	2.608	0	0.085	0.74
PTBI	1,761	0.02	0.064	-98.83	6.92	0.002
SIZE	1,761	20.17	1.593	16.68	25.96	19.92
			SMALLTBTD			
Variable	Obs	Mean	Std. Dev.	Min	Max	Median
DA	1,067	-2.491	3.913	-17.93	0.399	-1.045
$PTBI_{t+1}$	1,073	0.019	0.069	-0.094	0.489	0.003
PTINC	1,095	1060	3790	-4470	2440	1200
NTINC	1,095	8070	3170	-4940	2100	8991
INCTE	1,095	1700	5900	-3226	4740	1302
ROA	1,068	-1.359	9.675	-27.95	26.05	-0.795
DIV	1,095	0	0.001	0	0.006	0
RND	1,094	0.006	0.014	0	0.085	0.001
MTB	1,029	1.254	1.187	-3.9	6.92	0.9
PTBI	1,095	0.02	0.073	-0.089	0.474	0.002
SIZE	1,095	20.21	2.089	15.85	26.43	19.73
			LNTBTD			
Variable	Obs	Mean	Std. Dev.	Min	Max	Median
DA	743	-2.124	2.953	-17.93	0.399	-0.973
$PTBI_{t+1}$	759	0.015	0.057	-0.094	0.489	0.002
PTINC	775	4110	2520	-4470	2440	8463
NTINC	775	2770	2200	-4940	2110	6621
INCTE	775	1910	5730	-3226	4740	1388
ROA	743	-0.122	9.576	-27.95	26.05	-0.1
DIV	775	0.001	0.001	0	0.006	0
RND	775	0.009	0.018	0	0.085	0.001
MTB	744	1.469	1.691	-24.57	6.92	1.04
PTBI	775	0.007	0.049	-0.089	0.474	0.001
SIZE	775	20.09	1.671	16.02	24.6	19.86

The sample amount differs because of missing observations in each particular variable. The following variables were used in descriptive statistics: DA = Discretionary Accruals scaled by average asset, $PTBI_{t+1}$ = One year ahead Pretax Book Income, PTINC = Pretax Book Income, NTINC= Net Income, INCTE= Income Tax Expense, ROA= Return on Asset, DIV= Dividends scaled by average asset, RND = R&D expenditures scaled by total sales, MTB= Market to Book Ratio, PTBI = Pretax Book Income scaled by average asset, SIZE = Size of a particular company.

Table 2. Correlation

	DA	PTBIt+1	PTINC	NTINC	INCTE	LPTBTD	LNTBTD	ROA	DIV	RND	MTB	PTBI	LPTBTDPTBI	LNTBTDPTBI	SIZE
DA	1														
PTBIt+1	0.161***	1													
PTINC	0.175***	0.647***	1												
NTINC	0.159***	0.616***	0.967***	1											
INCTE	0.194***	0.57***	0.783***	0.725***	1										
LPTBTD	0.108***	0.002	0.036***	0.038***	0.044***	1									
LNTBTD	-0.018	-0.017	-0.077***	-0.076***	-0.012	-0.505***	1								
ROA	0.043***	-0.018	0.066***	0.069***	0.028**	0.033**	0.025	1							
DIV	0.052***	-0.003	0.01	0.013	0.022	0.165***	-0.083***	0.035**	1						
RND	-0.039**	0.097***	0.057***	0.057***	0.07***	-0.057***	0.09***	-0.018	-0.043***	1					
MTB	-0.103***	0.072***	0.041***	0.043***	0.048***	-0.094***	0.079***	0.069***	-0.027*	0.092***	1				
PTBI	0.175***	0.646***	0.987***	0.967***	0.782***	0.036**	-0.078***	0.067***	0.01	0.057***	0.041**	1			
LPTBTDPTBI	0.117***	0.375***	0.64***	0.622***	0.623***	0.183***	-0.092***	0.045***	0.032**	0.001	0.03*	0.64***	1		
LNTBTDPTBI	0.004	0.098***	0.25***	0.256***	0.174***	-0.017	0.035**	0.138*	-0.003	0.059***	0.084***	0.252***	-0.003	1	
SIZE	0.681***	0.47***	0.517***	0.476***	0.509***	0.003	-0.023	-0.074***	0.009	-0.039**	-0.054***	0.516***	0.292***	-0.017	1

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graph that discretionary accruals are positively correlated with LPTBTD and it is highly significant(0.1085). Unfortunately, the correlation coefficient between LNTBTD and discretionary accruals is not significant, but the value is positive. Furthermore, there can be seen a significant correlation values between interaction variables (LPTBTDPTBI and LNTBTDPTDI) and PTBIt+1. Finally, it can be found that LPTBTD shows negative correlation coefficients when it comes to future earnings(pretax income, net income, and income tax expense) whereas LPTBTD is significantly correlated with future earnings but its values are positive.

A. Main analysis

1. The association between Discretionary Accruals and Large Temporary BTDs

<Table 3> illustrates the cross-sectional regression results for the first hypothesis. The predicted sign of the first hypothesis is fully supported by regression results where LPTBTD and LNTBTD have statistically significant positive coefficients, being 0.736 and 0.584 respectively. This regression outcome has once again supported that discretionary accruals tend to be higher when there are LPTBTD and LNTBTD. Likewise, the highest variance inflation factor(VIF) equals for 1.38, signifying multicollinearity is not an issue in the regression analysis. There was a total of 3236 year observations out of 3755 observations. When it comes to the explanatory power of the analysis, this regression model explains almost 50% of the variability of the response data around its mean. Relying on the results, it can be concluded that companies tend to have higher discretionary accruals when there are large positive temporary BTDs and large negative temporary BTDs. At the same time, it can be suggested that firm-years with higher discretionary accruals will have lower earnings quality. Consistent with Park(2013) who found the statistically significant positive relationship between differed tax expense (temporary BTDs) and discretionary accruals, this research proved that there is a positive association

Table 3. The effect of LPTBTD and LNTBTD on the Discretionary Accruals

DA	Coef.	P>|t|	VIF
LPTBTD	0.736***	0	1.38
LNTBTD	0.584***	0	1.35
ROA	0.038***	0	1.03
DIV	82.34**	0.047	1.03
RND	-0.53	0.841	1.02
MTB	-0.095***	0	1.02
SIZE	1.213***	0	1.01
Year Dummy	Yes		
Num of obs	3,236		
Adj R-squared	0.493		
F(stat)	287.1		
Mean VIF	1.28		

DA stands for discretionary accruals scaled by the average asset. LPTBTD and LNTBTD are the partitioned components of Temporary BTDs where upper 70% of positive temporary BTDs are LPTBTD and lower 70% of negative temporary BTDs are LNTBTD. ROA is the return on asset. DIV is current dividends scaled by a total asset. RND is the research and development expenditures scaled by total sales. MTB is the ratio of market price to book price. Size is the size of a particular company. The year is a dummy variable for a year. *, **, *** represent statistical significance at the 10%, 5% and 1% levels(two-tailed test). VIF is the variance inflation factor which was conducted to deal with multicollinearity.

between discretionary accruals and large temporary BTDs.

2. The association between Earnings persistence and Large Temporary BTDs

OLS Regression outcome related to the earnings persistence and large temporary BTDs can be found in <Table 4>. As it is expected, the coefficients of interaction terms PTBILPTBTD and PTBILNTBTD are significantly negative in both settings, consistent with the second hypothesis stating that persistence of earnings for the firm-years with large negative or large positive temporary BTDs is lower than firm-years with small temporary BTDs. More precise, the coefficients for interaction terms namely PTBILPTBTD and PTBILNTBTD are -0.147 and -0.185 respectively. Adjusted R^2 of the regression tend to have more than 50% of explanatory power. There was a total of 501 observations missing in the regression analysis. The same result was obtained in the research done

by Hanlon(2005) but she used total BTD partitioned into large positive and negative. However, this research took only temporary part of BTD which is why large positive and negative BTDs were used in regression analysis. This research found that companies with large positive or negative temporary BTDs tend to be less persistent with their earnings. Multicollinearity doesn't seem to be a problem in this regression model since the highest VIF equals for 2.64.

According to the results, it can safely be stated that firm-years with large temporary BTDs are less persistent.

The final <Table 5> provides results of cross-sectional regression analysis for large temporary BTDs and future earnings. As it indicated, three types of earnings were considered in the regression model. Consistent with the findings of Lev & Nissim(2004) we found a negative relationship between large temporary BTDs and net income. However, Lev & Nissim(2004) used total temporary BTDs whereas this paper uses only large temporary BTDs. we found that both LPTBTD and LNTBTD are negatively associated with net income, but only LNTBTD's coefficient is statistically significant while LPTBTD's value is not statistically significant. The explanatory power of regression model in the first column is slightly more than 27%. The second column represents

Table 4. The effect of LPTBTD and LNTBTD on the Pretax Book Income

$PTBI_{t+1}$	Coef.	P>|t|	VIF
LPTBTD	0.004**	0.026	1.46
LNTBTD	0.005**	0.016	1.38
PTBI	0.665***	0	2.64
LPTBTDPTBI	-0.147***	0	1.92
LNTBTDPTBI	-0.185***	0	1.2
ROA	0.001**	0.016	1.05
DIV	0.002	0.997	1.04
RND	0.288***	0	1.03
MTB	0.001***	0	1.03
SIZE	0.006***	0	1.5
Year Dummy		YES	
Num of obs		3,254	
Adj R-squared		0.505	
F(stat)		238.5	
Mean VIF		1.46	

$PTBI_{t+1}$ stands for one year ahead Pretax Book Income. LPTBTD and LNTBTD are the partitioned components of Temporary BTDs where upper 70% of positive temporary BTDs are LPTBTD and lower 70 % of negative temporary BTDs are LNTBTD. PTBI is Pretax Book Income scaled by average assets. LPTBTDPTBI is an interaction variable between large positive temporary BTD and scaled Pretax Income. LNTBTDPTBI is an interaction variable between large negative temporary BTDs and scaled Pretax Income. ROA is the return on asset. DIV is current dividends scaled by the total asset. RND is the research and development expenditures scaled by the total sales. MTB is the ratio of market price to book price. Size is the size of a particular company. The year is a dummy variable for a year. *, **, *** represent statistical significance at the 10%, 5% and 1% levels(two-tailed test). VIF is the variance inflation factor which was conducted to deal with multicollinearity.

Table 5. The effect of LPTBTD and LNTBTD on the Net Income, Pretax Income and Income Expense

	NET INCOME			PRETAX INCOME			INCOME TAX EXPENSE		
	Coef.	P>|t|	VIF	Coef.	P>|t|	VIF	Coef.	P>|t|	VIF
LPTBTD	-1915	0.848	1.39	-3819	0.74	1.39	7622***	0.001	1.39
LNTBTD	-5370***	0	1.36	-6340***	0	1.36	2738	0.322	1.36
ROA	3551***	0	1.03	4230***	0	1.03	4796***	0	1.03
DIV	1620	0.717	1.03	2040	0.693	1.03	1160	0.259	1.03
RND	1708***	0	1.02	2010***	0	1.02	4110***	0	1.02
MTB	9047***	0	1.02	1060***	0	1.02	2173***	0	1.02
SIZE	8160***	0	1.01	1040***	0	1.01	1980***	0	1.01
Year-Dummy	YES			YES			YES		
Num of obs	3,328			3,328			3,328		
Adj R2	0.27			0.31			0.285		
F(stat)	113.2			137.4			121.9		
VIF	1.28			1.28			1.28		

regression analysis considering the relationship between pretax income and large temporary BTDs. As it is anticipated, the outcome of the regression analysis shows the negative relationship between large temporary BTDs and pretax earnings. However, the hypothesis is partially supported by the regression result. More precisely, LNTBTD's coefficient is highly significant (p-value <0.01) where LPTBTD's coefficient isn't significant. According to my results, we can conclude that the firm years with large negative temporary BTDs tend to have less pretax income. The same outcome was found in Jackson(2015) with some discrepancies because he analyzed the relationsh ip between total temporary BTD and Pretax Income. Jackson(2015) concluded that there is a strong negative association between temporary BTDs and pretax income. Taking this into consideration, It can be stated that my regression result is partially consistent with research done by Jackson(2015). However, we found a positive interconnection between tax expense and large temporary BTDs. But, as the Table 5 shows only LPTBTD has a highly significantly positive value. While oppositely, LNTBTD's value isn't significant. To sum, it can be declared that firms with large positive temporary BTDs will have larger income tax expense. The explanatory power of all regression analysis in three columns is between 27 and 31%. Multicollinearity was avoided in all regressions because the mean variation inflation factor equals to 1.28. The number of missing observations equals to 427.

V. Conclusions

This paper examines the influence of temporary book-tax differences on various earnings quality measures for the KOSPI companies in South Korea. The most of hypotheses are based on the most prominent research papers which considered crucial to understanding BTD and earnings quality. As previous research done by Park(2013) proved that there is significantly positive relation between deferred tax expenses and discretionary accruals, we found that there is a strong positive connection between discretionary accruals and large temporary book-tax differences. Ultimately, It means large temporary BTDs lead to the lower earnings quality. Furthermore, results of the second hypothesis indicated that companies with large temporary BTDs will have less persistent earnings compare to companies with small temporary BTDs. Interpreting persistence as an equivalent of earnings quality, it can be concluded that firms with large temporary BTDs have lower earnings quality than those with small temporary BTDs. Finally, large temporary BTDs' impact on future earnings was evaluated. Findings show that large negative temporary BTDs are negatively related to net income and pretax income while large positive temporary BTDs are positively related to income tax expense. These results were partially supported by the previous research done by Jackson(2015). However, large temporary BTDs affect on future earnings can't be ignored. Overall, investors have various alternative indicators of earnings quality to identify companies' performance using large temporary BTD as a proxy.

This paper's contribution can be anchored by providing multiple ways of measuring earnings quality using large temporary BTDs. Moreover, it combines most recent works of literature and their findings in a single paper to give a better alternative to the reader. Moreover, not only recent data was used in the paper, but also research data was obtained from South Korean companies which can be considered a different approach. In addition to this, data covers the years after the world economic crisis which makes BTDs a worthy topic to revisit. Last but not least, it includes the most frequent indicators of earnings quality using large temporary BTDs as proxies.

Like other researches, this paper is not an exception when it comes to limitations. Sample size can be one of the limits which this paper has. In addition, robustness checking wasn't part of the study which can be a limit for this research. There is still a room for making the results robust enough to come up with a much more certain conclusion. This is what the future study can work on.

Acknowledgments

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