

VALUE RELEVANCE OF BOOK AND TAX INCOME: A MACROECONOMIC CONDITIONS PERSPECTIVE

Mingjun Zhou, DePaul University

ABSTRACT

This paper tests how macroeconomic conditions affect the value relevance of book and tax income. Based on regression coefficient estimates, more than 8% in the value relevance of book income is dependent on the interaction with a proxy for the macroeconomy. For a possible policy change where tax rules have a greater influence on financial accounting, the erosion of earnings quality will be more pronounced during economic expansion than contraction. Under such policy change, investors may lose additional information for them to price earnings based on stages of the economy.

JEL: E30, H25, M41

KEYWORDS: book income, tax income, book-tax conformity, earnings quality, macroeconomic conditions

INTRODUCTION

The income reporting system in the U.S. has its distinct feature. The management of a public company prepares two income measures, one under the Generally Accepted Accounting Principles (book income) and the other according to tax accounting rules promulgated by the government (tax income). Proponents of book-tax conformity argue that closing this dual-reporting arrangement will mitigate information asymmetry and the opportunistic reporting behaviors of managers (Desai 2005, Joint Committee on Taxation 2006). Opponents argue that accounting quality will be undermined if book income is conformed to tax income. Specifically, Hanlon, Laplante and Shevlin (2005, hereafter HLS) suggest that book income is more value relevant than tax income for U.S. capital market participants. This study provides detailed analysis on the underlying macroeconomic factor that contributes to book income's greater value relevance. The debate is still on-going (see Atwood et al 2010) about the costs and benefits of book-tax conformity and the resulting changes in accounting quality. The analyses here suggests that if the conformity were to be increased toward tax income, market participants would be handicapped to price accounting earnings based on state of the economy.

This paper follows the stream of literature considering value relevance among the fundamental characteristics of earnings quality (Francis and Schipper 1999, Barth et al 2008). Extant literature measures value relevance as the relation between accounting information (earnings) and the buy-and-hold stock returns into the following months that could be earned with foreknowledge of such information (returns). Building on this aspect of value relevance, HLS use book and tax income to predict buy-and-hold stock returns in the future. They document that book income exhibits significantly greater value relevance than tax income in the regression coefficients and the R-square measures. Since relevance is the foundation of earnings quality, the finding in HLS supports opponents' view that financial statements quality will be affected if book income conforms to tax income.

This paper, investigates the relation between the macroeconomic factor and the value relevance of book and tax income. Using a regression model where changing macroeconomic conditions interact with book and tax income, the results show that the value relevance of book income is an increasing function of the macroeconomy. The result indicates that book income exhibits more (less) value relevance during economic expansion (contraction); but the value relevance of tax income appears to be insensitive to the state of the economy. This probably is due to the higher conditional accounting conservatism that was inherent in financial reporting. Under conditional conservatism, firms delay the recognition of good news but report bad news timely. On the other hand, the computations of tax income tend to accelerate income

recognition and delay loss deduction. Most recent research by Kim and Pevzner (2010) find that conditional accounting conservatism has information benefits to shareholders, and stock market reacts stronger (weaker) to good (bad) earnings news. My research setting on the value relevance of book and tax income provides additional insights into the information benefits of conditional conservatism.

Overall, the empirical evidence in this study suggests that conditional conservatism is decision-useful to market participants as they price earnings based on macroeconomic conditions. The recognition of a firm's good result tends to be delayed under conditional conservatism and investors may place a positive premium on the book earnings already reported as they assess firm performance when the macroeconomy is booming. When the economy is contracting, however, conditional conservatism leads to lower verification requirements and more timely recognition for losses. Atwood et al (2011) find that there is less persistence in the loss reported under IFRS than that under U.S. GAAP, since losses may be recognized more timely under IFRS (Barth et al. 2008).

A timely recognition of losses will lead investors to attach lower weight on the current negative results and focus on firm performance in the future as the investment opportunity set improves with the recovery of general business conditions. Therefore, we would expect that the value-relevance of book income would be dependent on the external economic environment facing the firm. By comparing value relevance of book and tax income in the context of macroeconomic conditions, the paper provides additional evidence on the decision-usefulness of accounting income measures as they relate to conditional conservatism. This study also supplements the cross-country study in Atwood et al. (2010) where high book-tax conformity is shown to be associated with lower earnings persistence and a weaker relation between earnings and future cash flows. Different from Atwood et al's, this study focuses on the value-relevance aspect of earnings quality, and offers additional insights into the pricing of book and tax income by market participants based on macroeconomic conditions. At the policy level, Congress seems to be more willing to influence the accounting standard-setting process as it just did with mark-to-market accounting in recent memory. Ali and Hwang (2000) identify that the value relevance of accounting information is lower for countries where government bodies set accounting rules.

Amid the book-tax conformity debate, regulatory bodies could make computing taxable income a priority, especially under the current political rhetoric of U.S. federal budget deficit and closing corporate tax loopholes. In the current dual-reporting arrangement, managers have more freedom in exercising their discretions through financial reporting, and investors could have larger information set for decision-making based on such estimates. A possible conformity proposal where tax rules place a greater influence on financial accounting may weaken the ability of financial statements to reflect a firm's economic position and performance. The following section reviews the prior literature in the area of value relevance and conservatism. It is followed by the hypothesis development. Section 3 and 4 describes empirical design and results. I conclude with a summary of findings and suggestions for future research

LITERATURE REVIEW

The distinct difference in financial and tax accounting in the U.S. illustrates the underlying objectives for each type of reporting. For tax purposes, corporations usually need to recognize revenue when cash is received, despite the use of accrual accounting method. This is consistent with the "wherewithal-to-pay" policy in the Internal Revenue Code (IRC). Under IRC corporations must "clearly reflect income" (IRC Section 446(b)) and, for example, they cannot defer revenue recognition by accounting for unearned revenue for tax purposes. Conservatism, in the sense of being prudent in revenue recognition, is not a consideration for the Treasury Department that promulgates tax accounting rules. On the contrary, conservatism has played an important role in financial reporting since the inception of the US GAAP (Watts, 2003). Specifically, the conditional conservatism documented in extant knowledge (Kim and Pevzner 2010) places a higher threshold in recognizing revenues (delaying the recognition good news) and a more timely recognition of bad news (lower recognition thresholds for losses).

The use of accruals in financial accounting is used to represent the underlying economic picture of a firm while facing a mandated reporting period (e.g. a fiscal year period). At the cut-off time by fiscal year end, managers need to use their own estimates in reporting firm revenues/expenses and gains/losses. In doing so, managers use accruals that signal to investors about the management's private information about firm performance (Dechow 1994, Bagnoli and Watts 2005). This financial reporting process is very different from the "clearly reflect income" requirement for tax purposes based on cash receipts.

Furthermore, conditional conservatism guides the estimates for accruals so that accounting numbers do not provide misleading information. Extant knowledge also documents the information benefits of conservatism. Conservatism in revenue recognition may reduce the extent to which earnings are manipulated (Chen et al., 2007). Using prudence in financial reporting also improves the information quality of financial statements (Fan and Zhang, 2007). In general, the literature indicates that conservatism in financial accounting improves the information quality, or value-relevance of accounting numbers to investors. Balachandran and Mohanram (2008) find that value relevance of firm book value declines after decreasing level of firm conservatism. Their results show that greater conservatism contributes to a stronger market response to accounting numbers. Policy-makers, in this respect, should therefore consider adopting conservative accounting policies (Barth et al. 2001).

Following the conservatism and value-relevance literature, Kim and Pevzner (2010) use conditional-conservatism measures and find that stock market reaction to good (bad) news earnings surprise is stronger for firms that are more conservative. This paper contributes to the book-tax conformity debate through the lens of conservatism and the resulting value-relevance of book and tax income. Proponents of book-tax conformity argue that the management estimates inherent in financial reporting leads to greater extent of earnings manipulation by managers (e.g. Desai 2005, Desai and Dharmapala 2009). Opponents of book-tax conformity argue that conforming book income to tax income will make accounting numbers less relevant to market participants (e.g. Hanlon et al 2005). This paper focus on the value-relevance aspect of this debate, testing whether conditional conservatism in financial accounting would make book income more value relevant than tax income. Building on prior literature, my incremental contribution is to measure the impact of conditional conservatism through changing macro-economic conditions. The next section continues with the hypothesis development.

HYPOTHESIS DEVELOPMENT AND METHODOLOGY

Providing relevant information to financial statement users is one of the major objectives of financial reporting. To operationalize the measurement of relevance, Francis and Schipper (1999) use an earnings-returns approach where value-relevance is reflected by the relation between accounting income and the buy-and-hold stock returns into the future months that could be earned with foreknowledge of such accounting income. Following this value-relevance methodology, HLS find book income to exhibit greater relevance than tax income and suggest that, if accounting rules for book income conform closely to the laws and regulations for tax income, then financial statements available to public investors would be less relevant. Consequently, shareholders would have to incur additional costs to obtain relevant information by other means through other stakeholders.

Extant knowledge also documents that firms with large gaps between book and tax income have lower earnings quality in terms of earnings persistence (e.g. Lev and Nissim 2004, Hanlon 2005). One interpretation is that book income relies on accrual estimates and they are subject to manipulation by managers for opportunistic reporting purposes. Tax income is generally less prone to such manipulations because less discretion is allowed in the reporting of revenues (income) and expenses (deductions).

A second interpretation, however, can also be made by emphasizing the role of accruals in reflecting a firm's economic position and performance (e.g. Dechow 1994). Book income prepared under GAAP is to provide a summary measure to investors, while tax income serves the main objective of collecting revenue for the government. The nature of these different objectives illustrates the potential loss of relevance under book-tax conformity. While the estimation of accruals in financial accounting is not

immune to human decision errors and opportunistic behavior, it may still have information benefits for market participants to assess firm value. For example, Ball et al (2000) find that market valuation is much less related to reported earnings in code-oriented countries where book and tax income are very closely linked. This paper examine whether the value-relevance of book and tax income varies with general business conditions. If at least part of the variations in the value-relevance can be attributed to the external economic environment facing a firm, then we may conclude that the information contained in book income is not entirely subjective and reflects the underlying economic performance to a certain extent. The application of timely recognition of bad news and delayed recognition of good news under conditional conservatism also implies that market participants would price book income accordingly to reflect the underlying economic performance of a firm. Under tax accounting rules, however, conditional conservatism is not widely applied as tax regulations generally accelerates the recognition of income and defer the deduction for losses. Therefore, I hypothesize that the value relevance of book income should be increasing with the level of economic activity as investors take into account the conditional accounting conservatism in financial reporting within the broad context of the macroeconomy. Tax income, on the other hand, serves the purpose of revenue collection for the government and this objective implies that it will not provide as much value relevance to capital market participants. Therefore, the prediction is:

H 1: The value relevance of book income increases with macroeconomic activities.

H 2: The value relevance of tax income does not vary with macroeconomic conditions.

To provide a more intuitive presentation, the Chicago Fed National Activity Index is used as a proxy for economic conditions. Its change over time is observed with the R²s in the following regression models used HLS:

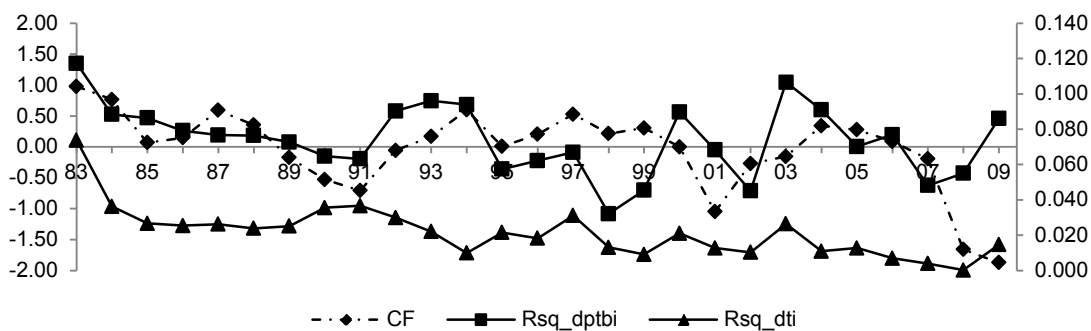
$$R_{j,t} = a_0 + a_1 \Delta PTBI_{jt} + e_{jt} \tag{1}$$

And

$$R_{j,t} = b_0 + b_1 \Delta TI_{jt} + e_{jt} \tag{2}$$

Where $R_{j,t}$ is the buy-and-hold market-adjusted return to security j over the 16-month return window starting at the beginning of the fiscal year; $\Delta PTBI$ is the yearly change of pre-tax book income and ΔTI is the change of tax income. Figure 1 shows the extension of HLS through 2009 from the initial 1983-2001 sample period. Sample selection and variable measurement are based on that of HLS. The respected data values can be found in Table 1.

Figure 1: The Explained Variances and Macroeconomic Conditions, 1983-2009



Rsq_dptbi , with its value charted on the right-hand vertical axis, is the explained variance in the annual regressions $R_{j,t} = a_0 + a_1 \Delta PTBI_{jt} + e_{jt}$; Rsq_dti is the explained variance in the annual regressions of $R_{j,t} = a_0 + a_1 \Delta TI_{jt} + e_{jt}$, charted on the right-hand vertical axis; CF , with its value charted on the left-hand vertical axis, is the annual average of the Chicago Fed National Activity Index.

Figure 1 suggests that, at a visual level, the R^2 s of $\Delta PTBI$ from the annual regressions correspond to the macroeconomic conditions indicated by CF . The variance in the market-adjusted returns explained by tax income, on the other hand, is more stable across time. The following sections proceed with further empirical evidence on the value relevance of book and tax income using Compustat/CRSP firm-year observations. The data item number is identified in italics to facilitate replication efforts.

RESULTS AND DISCUSSIONS

Pre-tax book income (*pi* minus *mii*) and income tax expense information are obtained from Compustat Xpressfeed. I start from the baseline year of 1983 in HLS and extend through fiscal year 2009. Financial and utility firms are excluded (SIC codes 6000-6999 and 4900-4999). Non-U.S corporations are dropped, so are firm-year observations in which fiscal year end changes. Based on the HLS, tax income is the "gross-up" amount of current tax expense times the top U.S. statutory tax rate on corporations applicable to that fiscal year, then subtracting the change in Net Operating Loss (NOL) carryforwards (*tlcf*). Current tax expense is measured as the sum of current federal income tax expense (*txfed*) and current foreign tax expense (*txfo*), or if the former is missing, then the difference between total income tax expense (*txt*) and deferred taxes (*txdi*).

Table 1: Explained variances (R^2) and the Chicago FED National Activity Index

Year	$R_{jt} = a_0 + a_1 \Delta PTBI_{jt} + e_{jt}$			$R_{jt} = b_0 + b_1 \Delta TI_{jt} + e_{jt}$		CF
	<i>N</i>	a_1	R^2	b_1	R^2	
1983	3110	0.929	0.117	0.753	0.074	0.98
1984	3393	0.814	0.088	0.463	0.036	0.76
1985	3271	0.984	0.086	0.498	0.027	0.07
1986	3256	0.768	0.079	0.398	0.025	0.15
1987	3525	0.676	0.077	0.349	0.026	0.59
1988	3571	0.776	0.076	0.336	0.024	0.35
1989	3456	0.751	0.073	0.353	0.025	-0.17
1990	3418	0.731	0.065	0.436	0.036	-0.53
1991	3274	0.853	0.063	0.557	0.037	-0.71
1992	3455	0.996	0.090	0.482	0.030	-0.06
1993	3730	1.095	0.096	0.381	0.022	0.17
1994	4109	1.063	0.094	0.255	0.010	0.60
1995	4164	0.999	0.057	0.561	0.022	0.01
1996	4391	0.871	0.062	0.447	0.018	0.20
1997	4491	1.021	0.067	0.660	0.031	0.53
1998	4407	0.642	0.032	0.383	0.013	0.22
1999	4050	0.943	0.045	0.410	0.009	0.30
2000	4018	1.118	0.090	0.519	0.021	0.00
2001	3724	0.827	0.068	0.349	0.013	-1.05
2002	3472	0.491	0.045	0.228	0.010	-0.27
2003	3152	1.197	0.107	0.483	0.026	-0.16
2004	3258	1.215	0.091	0.272	0.011	0.34
2005	3195	1.226	0.070	0.309	0.013	0.28
2006	3115	1.078	0.077	0.231	0.007	0.09
2007	3043	0.788	0.048	0.153	0.004	-0.20
2008	2962	0.440	0.055	0.027	0.000	-1.66
2009	2521	0.800	0.086	0.341	0.015	-1.87

Table 1 lists the ordinary-least-squares regression coefficient estimates for a_1 and b_1 in equation (1) and (2), as well as the R^2 for both equations based on annual cross-section regressions. Table 2 lists the summary statistics for the variables of changes in book (tax) income and stock returns, all of which are winsorized at the 1 and 99 percentile level to be consistent with HLS and mitigate the influence of extreme observations.

Table 2: Summary Statistics

Panel A: $R_{jt}, \Delta PTBI$ and ΔTI (Extension of Hanlon et al 1983-2009)							
Variable	Mean	Std Dev	Minimum	10th Pctl	50th Pctl	90th Pctl	Maximum
$\Delta PTBI$	0.012	0.205	-0.922	-0.157	0.009	0.165	1.503
ΔTI	0.011	0.237	-1.452	-0.147	0.001	0.160	1.925
R_{jt}	-0.001	0.687	-1.120	-0.713	-0.116	0.796	4.004

Panel B: R, R_TAX and control variables (Extension of Lev and Nissim 1973-2008)							
Variable	Mean	Std Dev	Minimum	10th Pctl	50th Pctl	90th Pctl	Maximum
R*	0.178	0.501	-0.962	-0.304	0.108	0.691	11.377
B/P	0.776	0.579	0.057	0.240	0.617	1.518	4.035
E/P	0.105	0.088	0.002	0.029	0.080	0.207	0.705
BETA	1.033	0.563	-0.373	0.347	1.000	1.757	3.269
VOL	0.106	0.049	0.035	0.054	0.094	0.173	0.343
SIZE	5.570	2.059	1.182	2.843	5.543	8.295	11.211

In Panel A, R_{jt} is the buy-and-hold market adjusted return to security j over the 16-month window from the first month of the fiscal year to four months after the fiscal year-end. $\Delta PTBI$ is change in pretax book income ΔTI is change in tax income. In panel B, R is the buy-and-hold return measured from May 1 of the subsequent year. B is book value at fiscal year-end (all sample firms have December fiscal year end). P is market value of common equity at fiscal year-end. E is earnings (income before extraordinary items). $BETA$ (systematic risk) is estimated using monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year. VOL (idiosyncratic volatility) is the root-mean-squared error from the $BETA$ regression. $SIZE$ (logarithm of market value of equity) is measured at the end of April of the subsequent year. B/P , E/P , $BETA$, VOL and $SIZE$ variables are winsorized at the 0.5 and 99.5 level.

Table 1 lists the ordinary-least-squares regression coefficient estimates for a_1 and b_1 in equation (1) and (2), as well as the R^2 for both equations based on annual cross-section regressions. Table 2 lists the summary statistics for the variables of changes in book (tax) income and stock returns, all of which are winsorized at the 1 and 99 percentile level to be consistent with HLS and mitigate the influence of extreme observations. To test the impact of economic activity on the value relevance of book and tax income, I design the empirical test using a pooled cross-section time-series regression model:

$$R_{j,t} = c_0 + c_1 \Delta PTBI_{jt} + c_2 \Delta TI_{jt} + c_3 CF_t + c_4 \Delta PTBI_{jt} \cdot CF_t + c_5 \Delta TI_{jt} \cdot CF_t + e_{jt} \quad (3)$$

$R_{j,t}$ is the buy-and-hold market-adjusted return (based on CRSP value-weighted return) to security j over the 16-month time-window. CF , The Chicago Fed National Activity Index takes the value of zero when the U.S. economy is growing at historical par and a standard deviation of one, with a positive reading indicating growth above historical average. Its use helps the researcher observe the time-series variation in the value relevance of book and tax income through a continuous and normalized proxy for the general economy. The coefficients c_4 and c_5 captures the extent to which the value relevance of book and tax income is a function of the macroeconomy. In terms of partial derivatives:

$$\frac{\partial R_{j,t}}{\partial \Delta PTBI_{j,t}} = c_1 + c_4 \cdot CF_t$$

and

$$\frac{\partial R_{j,t}}{\partial \Delta TI_{j,t}} = c_2 + c_5 \cdot CF_t$$

Most recent advancement in econometric techniques by Petersen (2009) and further featured by Gow et al. (2010) on its application in accounting research has made the unbiased estimation based on a pooled panel data set possible by allowing a two-dimensional clustering of the regression residuals. This two-dimensional clustering is applied in the regression model and test how macroeconomic conditions influence the structural relationship between expected returns and book/tax income.

Table 3: Value Relevance and Macroeconomic Conditions: 1983-2009, with Two-Dimensional Clustering (Firm and Year)

Panel A: Full Sample: (n=95531)						
	Coeff	Std.Err	t			
Intercept	-0.014	0.025	-0.58			
$\Delta PTBI$	0.838	0.038	21.52***			
ΔTI	0.137	0.018	7.41***			
CF	-0.104	0.041	-2.53***			
$\Delta PTBI*CF$	0.078	0.027	2.91***			
$\Delta TI*CF$	0.035	0.035	1.02			

Panel B: Partitions based on the sign of PTBI and TI							
1) Positive PTBI, n=63643				3) Nonpositive PTBI, n=31888			
	Coeff	Std.Err	t		Coeff	Std.Err	t
Intercept	0.051	0.026	1.92**	Intercept	-0.214	0.035	-6.01***
$\Delta PTBI$	1.162	0.054	21.46***	$\Delta PTBI$	0.355	0.059	6.01***
ΔTI	0.198	0.028	6.97***	ΔTI	0.044	0.019	2.28***
CF	-0.117	0.049	-2.36***	CF	-0.139	0.044	-3.12***
$\Delta PTBI*CF$	0.097	0.052	1.86*	$\Delta PTBI*CF$	-0.081	0.044	-1.82*
$\Delta TI*CF$	0.022	0.055	0.38	$\Delta TI*CF$	0.009	0.025	0.35

2) Positive TI, n=63182				4) Nonpositive TI, n=32349			
	Coeff	Std.Err	t		Coeff	Std.Err	t
Intercept	0.041	0.025	1.59	Intercept	-0.214	0.035	-6.01***
$\Delta PTBI$	1.140	0.039	28.93***	$\Delta PTBI$	0.355	0.059	6.01***
ΔTI	0.148	0.037	3.92***	ΔTI	0.044	0.019	2.28***
CF	-0.103	0.044	-2.32***	CF	-0.139	0.044	-3.12***
$\Delta PTBI*CF$	0.149	0.039	3.75***	$\Delta PTBI*CF$	-0.081	0.044	-1.82*
$\Delta TI*CF$	-0.013	0.071	-0.17	$\Delta TI*CF$	0.009	0.025	0.35

$R_{j,t} = c_0 + c_1\Delta PTBI_{j,t} + c_2\Delta TI_{j,t} + c_3CF_t + c_4\Delta PTBI_{j,t} \cdot CF_t + c_5\Delta TI \cdot CF_t + e_{j,t}$ $R_{j,t}$ is the buy-and-hold market adjusted return to security j over the 16-month window from the first month of the fiscal year to four months after the fiscal year-end. $\Delta PTBI$ = change in pretax book income ΔTI =change in tax income. CF =Chicago Fed National Activity Index, take the value of zero when the economy is growing at historical average and a standard deviation of 1 (positive value means above-average growth. *, **, *** indicates significance at 1%, 5% and 10% level.

Table 3 has the main results. All t-statistics are based on two-dimensional clustering at the firm and year level. The results based on the full sample first confirms the finding by HLS that book income has greater value relevance ($c_1 = 0.838, t = 21.52$) than tax income ($c_2 = 0.137, t = 7.41$). But more importantly, c_4 is positive and significant ($c_4 = 0.078, t = 2.91$) whereas c_5 is not ($t=1.02$). These results suggest that investors' pricing of book income is a function of general economic conditions. The value relevance of tax income, however, seems to be inert to the level of macroeconomic activities. Comparing the regression coefficients when $CF=1$ versus $CF=0$, the results suggest that more than 8% [$0.078 / (0.838 + 0.078)$] in the value relevance of book income is dependent on the interaction with the Chicago Fed Index. If book income conforms to that of tax income, then investors will lose the additional value relevance to help them price accounting earnings based on the overall performance of the economy.

Following HLS and as a sensitivity test, I also estimate the difference in the value relevance between book income and tax income by partitioning the full sample into four partitions based on the sign of PTBI

and BI. Panel B of Table 3 has the detailed results based on the four partitions (Positive PTBI, Positive TI, Non-positive PTBI and Non-positive TI). The first two largest partitions (Positive PTBI and Positive TI) exhibit virtually identical results with that of the full sample. Similar to that in HLS, in the non-positive TI sub-sample the sign on ΔTI is negative, and the interaction between ΔTI and CF is insignificant. In the non-positive PTBI sub-sample the value relevance of $\Delta PTBI$ is still greater than that of ΔTI , but the effect of economic conditions on the relation between stock returns and $\Delta PTBI$ is reversed in comparison with the first two partitions.

Overall, the results in Table 3 indicate that macroeconomic conditions affect the value relevance of book and tax income differently. The value relevance of book income, as measured by $\frac{\partial R_{j,t}}{\partial \Delta PTBI_{j,t}}$, appears to be an increasing function of economic activity ($c_4 > 0, t = 2.91$). The value relevance of tax income, as measured by $\frac{\partial R_{j,t}}{\partial \Delta TI_{j,t}}$, does not seem to be affected by the level of economic activities (c_5 not significantly different from zero). Therefore both Hypothesis 1 and 2 are supported by the empirical evidence.

The Value Relevance Inference Under the Lev-Nissim Tax Fundamental

The main regression analysis section, extends the framework of HLS and find that macroeconomic conditions affect the value relevance of book and tax income. To investigate whether this research inference is applicable to a research framework other than that of HLS, I test the extent to which macroeconomic conditions affect the value relevance of the tax fundamental measure in Lev and Nissim (2004). The tax fundamental measure in Lev and Nissim (R_TAX) is a multinomial variable, taking the value of 1 through 5 for the quintiles of the tax-to-book income ratio for each year and two-digit SIC code. The tax-book income ratio is then constructed as:

$$TAX = \frac{\text{Taxable Income} \times (1-t)}{\text{Net Income}} \quad (4)$$

where tax income is measured by "grossing-up" income tax expense with the applicable top statutory rate t , then times $(1 - t)$ to make it comparable with net income. For this testing, the sample period of 1973-2000 in the Lev-Nissim study is extended to 1973-2008 (adding 2009 data requires observations for fiscal year 2010, which is not yet available to the author through the data vendors). I follow the sample criteria, restricting the sample to firms with positive earnings in the current year, and since TAX is a ratio of tax income to net income, restricting TAX between zero and one. The test of how investors price the information within R_TAX in stock returns is expressed in the following model:

$$R = \alpha + \beta_1 SIZE + \beta_2 B/P + \beta_3 E/P + \beta_4 BETA + \beta_5 VOL + \beta_6 R_TAX + \beta_7 R_DEF + \beta_8 R_CFO + e \quad (5)$$

R is the 12-month buy-and-hold return from May 1 following the end of fiscal year. All sample years have December fiscal year end. Firms with delisted returns on CRSP during the 12-months buy-and-hold period are removed from sample to prevent potential delisting biases (Schumway 1997). Firm B is book value at fiscal year-end. P is market value of common equity at fiscal year-end. E is earnings (income before extraordinary items). $BETA$ is the systematic risk, estimated using monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year. VOL , the idiosyncratic volatility, is the root-mean-squared error from the $BETA$ regression. $SIZE$ (logarithm of market value of equity) is measured at the end of April of the subsequent year. R_DEF and R_CFO are calculated similarly to that of R_TAX , except that DEF is equal to the negative of the ratio of deferred taxes to average total assets and CFO is the ratio of cash flow from operations to net income. Deferred tax is the sum of deferred federal taxes ($txdfed$) and foreign income

taxes (*txdfo*), or, when either one is missing, as total deferred taxes (*txdi*). Deferred taxes are deflated by average total assets. Cash flows are measured as the difference between income before extraordinary items (*ib*) and accruals, where

$$\text{Accruals} = (\Delta\text{CA} - \Delta\text{Cash}) - (\Delta\text{CL} - \Delta\text{STD}) - \Delta\text{DTL} - \text{Dep.}$$

ΔCA =change in current assets (*act*)

ΔCash =change in cash and cash equivalents (*che*)

ΔCL =change in current liabilities (*lct*)

ΔSTD =change in debt included in current liabilities (*dlc*)

ΔDTL =change in the deferred tax liability (*txditc*)

Dep=depreciation and amortization expense (*dp*).

Lev and Nissim find that the coefficient on R_TAX is positive and significant in predicting the subsequent returns (R) in the early sample period (1973-1992), but not their late period (1992-2000). They also posit that during the 1990s investors seem to “became increasingly adept at using the forward-looking information in tax income” (p.1068). But as Lev and Nissim also point out, there may be as well the possibility that investors also price in the information that is “correlated with” the ratio of tax-to-book income. As Table 1 suggests, much of the years after 1992 and before 2000 has been under a protracted and above-historical-average economic growth in the U.S. To test the extent to which macroeconomic conditions influence the pricing of R_TAX by market participants, equation (5) is extended with the interaction term between R_TAX and CF :

$$R = \alpha + \beta_1 SIZE + \beta_2 B/P + \beta_3 E/P + \beta_4 BETA + \beta_5 VOL + \beta_6 R_TAX + \beta_7 R_DEF + \beta_8 R_CFO + \beta_9 CF + \beta_{10} R_TAX \cdot CF + \beta_{11} R_DEF \cdot CF + \beta_{12} R_CFO \cdot CF + e \quad (6)$$

Table 4: Cross-Section Time-Series Regression of One-Year Ahead Stock Return (May 1 - April 30) on Tax Fundamentals and Macroeconomic Conditions (CF): 1973-2008, with Two-Dimensional Clustering (Firm and Year).

	1973 - 2008 (excluding 1998)			1973-2008 (including 1998)		
	Coeff.	Std.Err	t-stat	Coeff.	Std.Err	t-stat
Intercept	0.114	0.101	1.13	0.086	0.102	0.841
SIZE	-0.014	0.011	-1.22	-0.012	0.011	-1.082
B/P	0.046	0.026	1.79**	0.048	0.026	1.878**
E/P	0.357	0.136	2.63**	0.319	0.137	2.318**
BETA	-0.025	0.033	-0.74	-0.016	0.034	-0.483
VOL	0.338	0.505	0.67	0.504	0.518	0.974
R_TAX	0.009	0.003	3.36***	0.008	0.003	2.934***
R_DEF	-0.004	0.001	-2.87***	-0.005	0.002	-3.080***
R_CFO	0.013	0.003	5.09***	0.014	0.003	5.380***
CF	0.016	0.059	0.27	0.021	0.059	0.354
R_TAX*CF3	-0.008	0.004	-2.06**	-0.009	0.004	-2.277**
R_DEF*CF3	0.003	0.002	1.35	0.003	0.002	1.146
R_CFO*CF3	0.000	0.003	-0.09	0.000	0.003	-0.099

R is the 12-months buy-and-hold return measured from May 1 of the subsequent year. *B* is book value at fiscal year-end. *P* is market value of common equity at fiscal year-end. *E* is earnings (income before extraordinary items). *BETA* is the systematic risk, estimated using monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year. *VOL*, the idiosyncratic volatility, is the root-mean-squared error from the *BETA* regression. *SIZE* (logarithm of market value of equity) is measured at the end of April of the subsequent year. *R_TAX* is a ranking quintile variable within each year and SIC two-digit industry between 1 and 5 based on the ratio of tax-to-net income. *R_DEF* and *R_CFO* (cash flow from operations) are calculated similarly, except that *DEF* is equal to the negative of the ratio of deferred taxes to average total assets. *CF*=Chicago Fed National Activity Index, take the value of zero when the economy is growing at historical average and a standard deviation of 1 (positive value means above-average growth). All firm-year observations are December fiscal year end *B/P*, *E/P*, *BETA*, *VOL* and *SIZE* variables are winsorized at the 0.5 and 99.5 level as is the case in Lev and Nissim. *, **, *** indicate significance at 1%, 5% and 10% level.

Table 4 has the results for model (6). The test is implemented in two parts. The first is without sample year 1998, as suggested by Lev and Nissim because the subsequent stock return period, from May 1999 to April 2000, covers the peak of the stock market bubble. The results including sample period 1998 are virtually the same. The interaction term R_TAX*CF is significant and suggest that macroeconomic conditions influence investors' pricing of tax fundamental. In contrast, consistent with prior literature on the persistence of cash flows, R_CFO exhibit no significant change in its relationship with subsequent stock returns across different macroeconomic environments.

Since I use the SAS code for two-dimensional clustering made available by Ian Gow, which does not allow modeling with many dummy variables such as the fixed effects model with two-digit SIC codes as dummies, a fix-effect industry regression model is applied in Table 5 using industry-fixed effect (two-digit SIC code) in Lev and Nissim. The results in Table 5 give similar inferences. In sum, the results in this section indicate that the value relevance of the tax fundamental in Lev and Nissim also appear to be a function of the macroeconomy.

Table 5: Cross-Section Time-Series Regression of One-Year Ahead Stock Return (May 1 - April 30) on Tax Fundamentals and Macroeconomic Conditions (CF): 1973-2008, with Industry Fixed Effects (SIC Two-Digit Industries)

	1973 - 2008 (excluding 1998)			1973-2008 (including 1998)		
	Coeff.	Std.Err	t-stat	Coeff.	Std.Err	t-stat
<i>SIZE</i>	-0.017	0.002	-8.79***	-0.014	0.002	-7.26***
<i>B/P</i>	0.054	0.007	7.55***	0.057	0.007	7.69***
<i>E/P</i>	0.357	0.042	8.59***	0.328	0.043	7.54***
<i>BETA</i>	-0.022	0.006	-3.96***	-0.015	0.006	-2.64***
<i>VOL</i>	0.327	0.072	4.54***	0.492	0.075	6.56***
<i>R_TAX</i>	0.009	0.002	4.03***	0.008	0.002	3.51***
<i>R_DEF</i>	-0.004	0.002	-1.9**	-0.004	0.002	-2.08**
<i>R_CFO</i>	0.013	0.002	6.18***	0.014	0.002	6.14***
<i>CF</i>	0.014	0.019	0.7	0.020	0.020	0.97
<i>R_TAX*CF3</i>	-0.008	0.003	-2.3**	-0.009	0.004	-2.42**
<i>R_DEF*CF3</i>	0.003	0.003	0.89	0.002	0.003	0.72
<i>R_CFO*CF3</i>	0.000	0.003	0.11	0.000	0.003	0.09

R is the 12-months buy-and-hold return measured from May 1 of the subsequent year. *B* is book value at fiscal year-end. *P* is market value of common equity at fiscal year-end. *E* is earnings (income before extraordinary items). *BETA* is the systematic risk, estimated using monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year. *VOL*, the idiosyncratic volatility, is the root-mean-squared error from the *BETA* regression. *SIZE* (logarithm of market value of equity) is measured at the end of April of the subsequent year. *R_TAX* is a ranking quintile variable within each year and SIC two-digit industry between 1 and 5 based on the ratio of tax-to-net income. *R_DEF* and *R_CFO* (cash flow from operations) are calculated similarly, except that *DEF* is equal to the negative of the ratio of deferred taxes to average total assets. *CF*=Chicago Fed National Activity Index, take the value of zero when the economy is growing at historical average and a standard deviation of 1(positive value means above-average growth). All firm-year observations are December fiscal year end *B/P*, *E/P*, *BETA*, *VOL* and *SIZE* variables are winsorized at the 0.5 and 99.5 level as is the case in Lev and Nissim.

CONCLUSION

The objective of this study is to examine the underlying factor that makes book income more value-relevant than tax income. The analysis uses U.S. firm-year observations from 1983 to 2009 and, following prior literature, use the earnings-return relation to measure the extent to which accounting numbers are value relevant to market participants. Next, the paper investigates the relation between value relevance and macroeconomic conditions. The empirical results show that more than 8% in the value relevance of book income is dependent on its interaction with the macroeconomy. Considering value relevance an important characteristic of earnings quality, I suggest that earnings quality may be affected

when tax rules have more influence on financial accounting. It appears that the value relevance of book income is an increasing function of economic activities while that of tax income is not. This finding informs the current book-tax conformity debate, since the potential erosion of earnings quality from book-tax conformity will be more pronounced in macroeconomic expansion than contraction.

The theoretical construct in the study is the value relevance of accounting numbers. My research follows the stream of literature on how to operationalize the measurement of value relevance as a conceptual construct and, therefore, is subject to the criticism thereof (see Barth et al. 2001 for a summary of the value-relevance literature and its limitations). Finally, possible venues for future research would be to look at how accounting conservatism affects the value relevance of book and tax income on a country-by-country basis. Policy makers in different countries may draw from the future research findings that are specific to each country's background.

REFERENCES

- Atwood, T.J., Drake M., Myers L (2010) "Book-Tax Conformity, Earnings Persistence and the Association between Earnings and Future Cash Flows" *Journal of Accounting and Economics* 50, 111-125
- Atwood, T.J., Drake M., Myers J. and L. Myers (2011) "Do Earnings Reported under IFRS Tell Us More About Future Earnings and Cash Flows?" *Journal of Accounting and Public Policy* 30: 103 -121.
- Ali, A., and Hwang L (2000) "Country-Specific Factors Related To Financial Reporting and the Value Relevance of Accounting Data" *Journal of Accounting Research* 38 (1) 1-20.
- Barth, M. W. Landsman and M. Lang (2008) "International Accounting Standards and Accounting Quality" *Journal of Accounting Research* 46 (3) 467-498.
- Barth, M., Beaver, W., Landsman, W (2001) "The Relevance of Value-Relevance Literature for Financial Accounting Standard Setting: Another View" *Journal of Accounting and Economics* 31, 77-104.
- Bagnoli, M., Watts, S.G (2005) "Conservative Accounting Choices" *Management Science* 51, 786 -801
- Chen, Q., Hemmer, T., Zhang, Y (2007) "On the Relation Between Conservatism in Accounting Standards and Incentives For Earnings Management" *Journal of Accounting Research* 45 (3), 541-565.
- Dechow, P.M (1994) "Accounting Earnings and Cash Flows as Measures of Firm Performance: the Role of Accounting Accruals" *Journal of Accounting and Economics* 18: 3-42.
- Desai, M. (2005) "The Degradation of Reported Corporate Profits" *Journal of Economic Perspectives* 19 (4) 171-192
- Desai, M and D. Dharmapala "Earnings Management, Corporate Tax Shelters, and Book-Tax Alignment" *National Tax Journal*, Vol. 62, 2009, pp. 169-186.
- Fan, Q. and Zhang, Z.(2007) "Accounting Conservatism, Information Aggregation and the Quality of Financial Reporting" Working Paper, UC-Berkeley.
- Francis, J and Schipper. K (1999) "Have financial statements lost their relevance?" *Journal of Accounting Research* 37 (2) 319-352.
- Gow, I., Ormazabal G., and Taylor D (2010) "Correcting for Cross-sectional and Time-series Dependence in Accounting Research" *The Accounting Review* 85 (2): 483-512.

Hanlon, M.,Laplante S., and Shevlin T (2005) "Evidence for the Possible Information Loss of Conforming Book Income and Tax Income" *Journal of Law and Economics* 48(2): 407-422.

Hanlon, M (2005) "The Persistence and Pricing of Earnings, Accruals, and Cash Flows When Firms Have Large Book-Tax Differences" *The Accounting Review* 80: 137-166.

Joint Committee on Taxation (2006) "Present law and background relating to corporate tax reform: issues of conforming book income and tax income and capital cost recovery"

Kim. B H., and M. Pevzner (2010) "Conditional accounting conservatism and future negative surprises: an empirical investigation" *Journal of Accounting and Public Policy* 29: 311 - 329.

Lev. B. and Nissim D (2004) "Tax Income, Future Earnings and Equity Values" *The Accounting Review* 79 (4) 1039-1074.

Petersen, M (2009) "Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches" *Review of Financial Studies* 22 (1): 435-480.

Schumway, T (1997) "The Delisting Bias in CRSP Data" *The Journal of Finance* 52, 327-340.

Stock, J and Watson M. (1999) "Forecasting Inflation" *Journal of Monetary Economics* 44, 293-335.

Watts, R. (2003) "Conservatism in Accounting, Part II: Evidence and Research Opportunities" *The Accounting Horizons* 17 (4)

BIOGRAPHY

Mingjun Zhou can be contacted at DePaul University. Email: mzhou4@depaul.edu