TAX AGGRESIVENESS AND INCREMENTAL INFORMATION CONTENT OF

TAXABLE INCOME

by

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INTRODUCTION

This paper investigates two research questions. The first one is whether taxable income has information content incremental to book income, and the second question is whether the incremental information content of taxable income is attenuated when companies are tax aggressive. The grossed up taxable income (=income tax expense divided by statutory tax rate) is used as a proxy for taxable income because the taxable income is not publicly available. Taxable income differs from book income due to the permanent differences and temporary differences (Spiceland, Sepe and Nelson 2011). Therefore, my first research question is equivalent to testing whether these permanent and temporary differences have valuation relevance in the capital market. The prediction in my second research question is based on the intuition that the incremental information content of taxable income will be diminished when sample firms are tax aggressive because the capital market may take the taxable income from tax aggressive firms as less reliable. I select 3,020 publicly traded U.S. firms as my sample covering the fiscal year 1987 through 2012 (15,207 firm/years) and collect book income, income tax expense, and net operating loss from annual COMPUSTAT and stock returns from monthly CRSP. Test results show that the taxable income has incremental information content in explaining the cross-sectional variations in the annual stock returns and the incremental information content of taxable income is attenuated by the corporate tax aggressiveness.

BOOK INCOME AND TAXABLE INCOME

Book income

Book income is "promulgated largely by the Financial Accounting Standards Boards" and it is the income reported to shareholders and appears on firms' financial statements (Hanlon, Laplante and Shevlin 2005). General Accepted Accounting Principles computes the book income before taxes as the difference between revenues and expenses, and accounting for book income is based on the accrual rules (Spiceland, Sepe and Nelson 2011). Book income is subject to earnings management (Chen, Dhaliwal and Trombley 2012). According to my understanding, earnings management is the use of accounting methods to depict an overly positive image of the firms' financial situations.

Taxable Income

Taxable income is reported to the U.S. Internal Revenue Service and is the amount of income to be taxed (Hanlon, Laplante and Shevlin 2005). Taxable income is computed based on tax law as the difference between taxable revenues and allowable deductions (Spiceland, Sepe and Nelson 2011). In addition, the tax code as reflected in the calculation of taxable income is not concerned with providing information useful to shareholders and other interested parties about the performance of the firm (Hanlon, Laplante and Shevlin 2005). Taxable income is used to determine the taxes the companies are required to pay.

Financial reporting and tax reporting are characterized by different revenue and expense recognition rules (Chen, Dhaliwal and Trombley 2012). GAAP requires the matching principle to be followed. The matching principle means that revenue is

recognized when earned and expense is recognized as incurred. In contrast, tax-reporting rules may accelerate or defer recognition of revenues to the time period when cash is paid or received. Both taxable income and book income (pretax income) are two alternative measures of U.S. corporate performances.

Chen, Dhaliwal and Trombley (2012) state that companies have different incentives in reporting book income and taxable income. Companies prefer to pay the least amount of taxes and defer the payment as late as possible. As companies use book income in contracting (compensation plans and debt covenants) and stock valuations, they generally prefer high level of book income. In contrast, companies prefer reporting low level of taxable income since the taxable income is used as the basis for figuring out the amount of tax payments.

TEMPORARY AND PERMANENT DIFFERENCES

Plesko (2002) states that the difference between book income and taxable income comes from two types of measurement differences in the accounting systems: temporary difference and permanent difference. Temporary differences appear when tax and financial reporting recognize the same total amount of income or expense over different time periods or in different patterns. Therefore, timing issues are the main causes of temporary differences. Permanent differences occur when income or an expense is recognized under one system but never under the other.

Temporary Differences

Temporary differences generate deferred tax assets and deferred tax liabilities. Examples of temporary differences include the difference between depreciation expense and depreciation deductions, foreign sales, merger and acquisition activities, and net

operating loss carry forwards (Graham, Raedy and Shackelford 2011).

Deferred tax liability occurs when taxable income is less than book income (Spiceland, Sepe and Nelson 2012). Deferred tax liability means it is the firm's responsibility to pay more tax in the future because it did not pay tax in the past even though book income was incurred. The longer the company can defer paying taxes, the longer it can use the cash to invest or support business operations.

The most common cause of deferred tax liability is depreciation. When a company buys property, plant, or equipment, it would prefer to depreciate the value of the PP&E either slowly or quickly depending on specific situations. For the shareholders, management would prefer to depreciate PP&E slowly to show higher book income. For tax purpose, company management would prefer to have accumulated depreciation, which lowers taxable and tax liability.

Taxes remitted to the government will be lower early in an asset's life due to accelerated depreciation, but taxable income and tax liability will be higher in future years once the asset is fully depreciated for tax purposes but is still being depreciated for book purposes. Thus, a liability is reported on the company's GAAP balance sheet that measures the amount of the future tax liability that will be owed when the book depreciation becomes greater than the tax depreciation (Graham, Raedy and Shackelford 2011).

When the book basis of liability is higher than the tax basis of liability, it generates deferred tax asset. The deferred tax asset means that companies pay more taxes currently relative to book income and they have built up the rights to pay less tax in the future. The right to pay less tax in the future is called deferred tax assets (Spiceland,

Sepe and Nelson 2011).

Graham, Raedy and Shackelford (2011) report that most companies report net deferred tax asset. For instance, for the treatment of bad debts, GAAP rules set up an allowance account (thus reducing the basis of the accounts receivable balance) while tax law does not. Thus, assets (and income) will generally be lower for financial reporting purposes than for tax purposes. Therefore, taxes paid to the government will be higher this year than the tax expense recorded on the company's books. However, taxes paid will be lower in future years when the bad debt is written off for tax purposes. Thus, on the balance sheet of the company, a tax asset is included that measures the amount of future tax benefit that will be available when the same bad debts that were expensed under GAAP this year are deducted for tax purposes in future years.

Permanent differences

A permanent difference is created when an income item or expense amount is included in taxable income or book income but will never be included in the computation of the other. Permanent differences do not arise from timing issues, but rather are permanent in nature (Graham, Raedy and Shackelford 2011).

For example, municipal bond interest is not included in taxable income but is included in book income. Consequently, permanent differences do not create deferred tax assets or liabilities. Instead, permanent differences cause effective tax rates (income tax expense per book divided by pretax book income) to differ from the statutory tax rates. For example, municipal bond interest is included in pretax book income, but no book tax expense is recorded. Thus, earning municipal bond interest income results in a lower effective tax rate.

Some examples of permanent book-tax differences include: interest received from investments in bonds issued by state and municipal governments (not taxable), investment expenses incurred to obtain tax-exempt income (not tax deductible), or life insurance proceeds received upon the death of an insured executive (not taxable) (Spiceland, Sepe and Nelson 2011).

TAX AGGRESSIVENESS AND INCREMENTAL INFORMATION CONTENT OF TAXABLE INCOME

Both book income and taxable income play important roles in determining stock price, therefore taxable income "exhibits incremental explanatory power" (Chen, Dhaliwal and Trombley 2012). Hanlon, Laplante, and Shevlin (2005) ran the incremental information content test to evaluate the incremental information content of taxable income and book income. They found that both book income and taxable income explain companies' stock returns. Both book income and taxable income have statistically significant coefficients, meaning that not only book income but also estimated taxable income provides incremental information to the market. In addition, Ayers, Jiang, and Laplante (2009) found out that the information content of estimated taxable income (compared with the information content in book income) is lower for firms with high levels of tax planning and higher for firms with low levels of book earnings quality.

Chen, Dhaliwal and Trombley (2012) go even further by reporting that tax planning (tax-aggressive approach) is an important driver of the information content of taxable income and book income. The goal of tax planning is to reduce both tax expense per book and the cash required to satisfy the companies' tax obligation. One type of tax planning is tax shelters, a permanent tax planning mechanism that generates permanent

differences between book and taxable income, therefore leaving book income unchanged while reducing tax expense and increasing net income. Tax planning mechanisms can also generate temporary differences between book and tax income, therefore leaving book net income unchanged while reducing actual tax payments currently. Chen, Dhaliwal and Trombley (2012) also add that companies use tax planning to lower companies' effective tax rate (*ETR*), which captures only the effect of permanent differences that reduces book tax expense. Current effective tax rate (*curETR*), in a broader sense, explains how tax planning reduces tax payments while leaving book tax expense unchanged, capturing tax planning that creates both permanent and temporary differences. Chen, Dhaliwal and Trombley (2012) found that "where the sum of book income is positive, the *CurETR* calculation directly measures tax aggressiveness, so lower *CurETR* responds to more tax aggressiveness, even to the point where the current tax can become negative." I will discuss *curETR* later in the paper, where it plays an important role in shaping the second hypothesis.

<div align="center">HYPOTHESIS DEVELOPMENT</div>

Hanlon, Laplante, and Shevlin (2005) report that estimated taxable income summarizes information reflected in stock returns that is not captured by book income. Therefore, my first hypothesis stated in the alternative form is:

HYPOTHESIS #1: Estimated taxable income has incremental information content over book income. In other words, the estimated taxable income provides stockholders with valuable information to help determine the companies' stock prices.

Ayers, Jiang, and Laplante (2009) find that high tax planning firms have relatively less informative taxable income than firms with lower levels of tax planning. Therefore, my second hypothesis in the alternative form is:

HYPOTHESIS #2: Estimated taxable income of tax aggressive firms has less incremental information content than taxable income of less tax aggressive firms.

SAMPLE, DESCRIPTIVE STATISTICS AND RESEARCH DESIGN

Sample and Descriptive Statistics

The sample consists of 3,020 firms with required annual financial statement information on the 2013 XpressFeed annual COMPUSTAT and monthly stock returns on 2013 CRSP excluding financial institutions (SIC codes 6000-6999), utilities (SIC codes 4900-4999), firms incorporated outside the United States, and firms changing fiscal year end. The final sample consists of 15,207 firm/years from 1987 to 2012. My first year was 1987 because I required the statement cash flows data in computing cash effective tax rate following Ayers et al. (2009).

I conduct a market association test to test whether the estimated taxable income has incremental information content. The dependent variable is 16-month event windows ending 4 months after the fiscal year-end to ensure that market participants have received the company's annual income numbers. I calculate the book income by deducting minority interest (MII) from pre-tax book income (PI). What I have in parenthesis represents mnemonics of annual COMPUSTAT data items.

Because tax return data are not publicly available, I estimate the taxable income by grossing up current tax expense by the top U.S. statutory tax rate (46% for 1986 and prior tax years, 40% for 1987, 34% for tax years 1988 through 1993, and 35% thereafter).

Taxable income is estimated in two steps. First, I add the current federal income tax expense (TXFED) and current foreign tax expense (TXFO) to derive current tax expense, and divide the sum by the top U.S. statutory tax rate. Second, I subtract the change in net operating loss carryforwards (ΔTXCF) from the first step measure to obtain taxable income. If federal income tax expense is missing from COMPUSTAT, I estimate TI as the difference between total income tax expense and deferred taxes, divided by the top statutory tax rate for year t, less the change in NOL carryforwards. The following summarizes the computation of these two income numbers:

$$Book\ Income_{it} = PI_{it} - MII_{it}$$
$$Taxable\ Income_{it} = \frac{\left(TXFED_{it} + TXFO_{it}\right)}{Tax\ Rate_t} - \Delta TXCF_{it}$$

Dyreng, Hanlon, and Maydew (2008) define tax aggressive firms as those that are able to sustain a low effective tax rate over multiple years. Therefore, I use the ETR as a proxy for its tax aggressiveness. I measure the tax aggressive firms as those in the lowest quintile (20%) of accumulated effective tax rates for each year and two-digit SIC industry.

B. Research Design

To test Hypothesis #1, I estimate the following equation and expect to find α_2 to be positive and significant:

$$R_{it} = \alpha_0 + \alpha_1 \Delta BI_{it} + \alpha_2 \Delta TI_{it} + \varepsilon_{it} \quad (1)$$

,where R_{it} is the market-adjusted return for a firm's common stock over a 16-month return window which starts at the beginning of a fiscal year and ends 4 months after the

end of fiscal year t. The market-adjusted return is calculated as the difference between companies' annual stock return and the market average return. There are two types of market-adjusted return: value-weighted return and equal-weighted return. According to the Value-weighted Index, a "true value weighted index should weight stocks in the portfolio based on how cheap they appear based on the selected value factors as opposed to market cap." Equal-weighted return method equally weights all companies, regardless of sizes. ΔBI_{it} is the change in book income deflated by the market value of equity at the start of fiscal year t. Change in book income is equal to book income for year t minus book income for year t-1. Book income is calculated by deducting minority interest (MII) from pre-tax book income (PI). ΔTI_{it} is the change in estimated taxable income deflated by market value of equity at the start of fiscal year t.

To test Hypothesis #2, I estimate the following equation and expect to find β_3 to be negative and significant:

$$R_{it} = \beta_0 + \beta_1 \Delta BI_{it} + \beta_2 \Delta TI_{it} + \beta_3 D_{it} \Delta TI_{it} + \varepsilon_{it} \quad (2)$$

To derive this second equation, I add an interactive independent variable $(D_{it} \Delta TI_{it})$ to the original equation. In this equation, D_{it} is a dummy variable taking the value of 1 for tax aggressive firms and 0 otherwise.

When $D_{it} = 0$, the equation becomes:

$$R_{it} = \beta_0 + \beta_1 \Delta BI_{it} + \beta_2 \Delta TI_{it} + \varepsilon_{it} \quad (3)$$

Therefore, $D_{it} = 0$ signals that firms are not tax aggressive, and the independent variable adds no value to the original equation.

If $D_{it} = 1$, the equation will then become:

$$R_{it} = \beta_{0} + \beta_{1}\Delta BI_{it} + \beta_{2}\Delta TI_{it} + \beta_{3}\Delta TI_{it} + \varepsilon_{it} \quad (4)$$

GAAP_ETR = the ratio between the sum of the difference between current year

tax expenses (*TXT*) and deferred tax expense (*TXDI*) over the five-year period and the

sum of book income (*BI*) over the same five-year period. Ayers, Jiang, and Laplante

(2009) state that the traditional measure of *ETR* has its limitations. Since *ETR* is an

accrual-based measure of tax avoidance and measures the actual taxes paid with error, the

accrued expense often differs from actual payment to the government due to challenges

by the IRS or mistakes made in estimating current tax expense (Dyrang et al. 2008). The

second limitation is that *ETR* excludes the benefit of the deduction for stock options,

meaning that the current tax expense is overstated for firms with stock option deductions.

An alternative measure of tax avoidance is the cash method for calculating *ETR*:

Cash_ETR = cash taxes paid divided by the book income each summed over five

years period.

According to Chen, Dhaliwal and Trombley (2012), current effective tax rate

(*curETR*) is used to capture the effect of tax planning while leaving tax expense

unchanged. Where the sum of book income is positive, the *CurETR* calculation directly

measures tax aggressiveness, so lower *CurETR* corresponds to more tax aggressiveness.

When total book income is negative, this relationship reverses. In this case, since I

assume that book income is positive, I expect low *CurETR*.

<div align="center">TEST RESULTS</div>

<div align="center">*Incremental information content test*</div>

Table 1 has descriptive statistics of my final sample. Table 2 and Table 3 show

test results on hypothesis 1. Table 2 presents regression results with value-weighted

annual returns while Table 3 presents regression results with equal-weighted annual returns. Test results in Tables 2 and 3 support hypothesis 1 (the estimated taxable income has incremental information content over the book income):

$$R_{it} = \alpha_0 + \alpha_1 \Delta BI_{it} + \alpha_2 \Delta TI_{it} + \varepsilon_{it}$$

The coefficients on ΔBI and ΔTI are positive and significant for both types of returns. In Table 2 with the value weighted market returns, ΔBI coefficient = 1.40312 and t-statistic = 28.81 (p < 0.0001); and ΔTI coefficient = 0.50618 and t-statistic = 10.58 (p < 0.0001). In Table 3 with the equally weighted market returns, ΔBI coefficient = 1.34731 with t-stats = 31.10 (p < 0.0001); and ΔTI parameter = 0.5377 with t-stats = 12.64 (p < 0.0001). Although book income has more significant coefficient, the coefficient on taxable income is also significant. Book income exhibits significant information content, and taxable income also has incremental information content over book income. In summary, the results indicate that investors use both book income and taxable income as measures of firm performance.

Tax Aggressiveness Test

Tables 4 through 7 present test results for hypothesis 2 (The tax aggressive firms have less incremental information content of the estimated taxable income than other firms). Tables 4 and 5 are GAAP_ETR and Tables 5 and 5 are based on Cash_ETR. Tables 4 and 6 use the value weighted returns for the market return and Table 5 and 7 use the equally weighted returns.

$$R_{it} = \beta_0 + \beta_1 \Delta BI_{it} + \beta_2 \Delta TI_{it} + \beta_3 D_{it} \Delta TI_{it} + \varepsilon_{it}$$

As stated before, D is a dummy variable, with a value equals to either 0 or 1. In this case, we examine the equation with D = 1 for tax aggressive firms, with tax

aggressive firms as those in the lowest quintile of accumulated effective tax rates for each year and two-digit SIC industry. For these firms, the equation then becomes:

$$R_{it} = \beta_0 + \beta_1 \Delta BI_{it} + \beta_2 \Delta TI_{it} + \beta_3 \Delta TI_{it} + \varepsilon_{it} \quad (4)$$

As predicted by Hypothesis 2, tax-aggressive firms have less incremental information content of the estimated taxable income than other firms; i.e., the coefficients on $D_{it}\Delta TI_{it}$ for table 4,5,6,7 are negative and significant (-0.3226, -0.28040, -0.30868, -0.28780 and t-statistics = -4.35, -4.25, -4.22 and -4.42) (all values of $p < 0.0001$). Meanwhile, the coefficients on ΔTI_{it} are still positive and significant (0.60353, 0.62232, 0.61569, 0.63981 and t-stats = 11.44, 13.25, 11.32, 13.22 (all values of $p < 0.0001$). In summary, the information content of taxable income is diminished when companies are tax aggressive to minimize their tax payments.

<div align="center">LIMITATIONS</div>

My study is subject to certain limitations. I estimated taxable income from financial statements available to the general markets, meaning that this calculation can contain measurement errors (Ayers et al. 2009). In addition, though this study assesses the value of information content of taxable income to the public, I am not able to verify whether the source of information content comes from temporary differences or permanent differences.

<div align="center">CONCLUSIONS</div>

In this paper, I examine the information content of taxable income incremental to book income. In other words, I try to determine if taxable income provides valuable information to investors regarding corporate performance. Another purpose of this paper is to assess whether the information content of taxable income is diminished when firms

are tax aggressive. Based on the results of the incremental information content test and tax aggressiveness test, I conclude that taxable income contains incremental information content useful to investors. In addition, I find that the tax aggressiveness reduces the usefulness of taxable income, since tax aggressive firms show a lower level of incremental information content than non-tax aggressive firms. In summary, my results are consistent with the hypothesis that taxable income contains valuable information to investors. In addition, it is also useful to the public to acknowledge that taxable income of high tax aggressive firms has less information content relative to taxable income of less tax aggressive firms.

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Table 1					
Descriptive Statistics					
	Q1	**Median**	**Q3**	**Mean**	**Sigma**
ΔBI	-0.021	0.010	0.037	0.007	0.105
ΔTI	-0.027	0.005	0.035	0.003	0.107
Value Weighted Return	-0.254	-0.016	0.284	0.083	0.538
Equally Weighted Return	-0.295	-0.068	0.206	0.013	0.485
GAAP ETR	0.327	0.371	0.401	0.479	2.125
CASH ETR	0.241	0.327	0.406	0.494	2.635

Table 1 is based on 15,207 firm/year observations. ΔBI is the annual change in book income and ΔTI is the annual changes in taxable income. Both variables are normalized by the market value of equity at the start of fiscal year.
GAAP ETR is the effective tax rate under GAAP and CASH ETR is the effective tax rate based on tax payments.

Table 2			
Incremental Information Content of Taxable Income			
	Value Weighted		**Equally Weighted**
Intercept	0.072***		0.002
	(17.60)		(0.59)
ΔBI	1.403***		1.347***
	(28.81)		(31.10)
ΔTI	0.506***		0.538***
	(10.58)		(12.64)
n	15,207		15,207
Adjusted R^2 (%)	11.93		14.21

Table 2 regresses 16 months annual stock returns on
annual changes in book income and annual changes in
taxable income. The dependent variable is market-adjusted
using either value weighted or equally weighted returns.
Two idenpendent variables are normalized by the market value of
equity at the start of fiscal year. *** denotes statistical significance
at the 1% level.

Table 3			
Tax Aggressiveness and Incremental Information Content of Taxable Income (GAAP ETR)			
	Value Weighted		**Equally Weighted**
Intercept	0.072***		0.002
	(17.56)		(0.54)
ΔBI	1.392***		1.338***
	(28.57)		(30.85)
ΔTI	0.603***		0.622***
	(11.44)		(13.25)
D*ΔTI	-0.323		-0.280
	(-4.35)		(-4.25)
n	15,207		15,207
Adjusted R^2 (%)	12.04		14.30

Table 3 regresses 16 months annual stock returns on annual changes in book income, annual changes in taxable income, and the product of GAAP ETR dummy and taxable income. D takes 1 when GAAP ETR belongs to the first quintile and 0 otherwise. The dependent variable is market-adjusted using either value weighted or equally weighted returns. The book income and taxable income are normalized by the market value of equity at the start of fiscal year. *** denotes statistical significance at the 1% level.

Table 4			
Tax Aggressiveness and Incremental Information Content of Taxable Income (CASH ETR)			
	Value Weighted		**Equally Weighted**
Intercept	0.072***		0.002
	(17.56)		(0.54)
ΔBI	1.392***		1.338***
	(28.57)		(30.85)
ΔTI	0.603***		0.622***
	(11.44)		(13.25)
D*ΔTI	-0.323		-0.280
	(-4.35)		(-4.25)
n	15,207		15,207
Adjusted R^2 (%)	12.04		14.30

Table 4 regresses 16 months annual stock returns on annual changes in book income, annual changes in taxable income, and the product of CASH ETR dummy and taxable income. D takes 1 when CASH ETR belongs to the first quintile and 0 otherwise. The dependent variable is market-adjusted using either value weighted or equally weighted returns. The book income and taxable income are normalized by the market value of equity at the start of fiscal year. *** denotes statistical significance at the 1% level.

ABSTRACT

It has been widely known that book income plays an important role in helping investors determining the stock prices of companies. However, most investors are uncertain about the information content of taxable income, mostly because taxable income is not publicly provided. The grossed up book income is used as a proxy for taxable income because the data on taxable income is not publicly available. In this paper, I examine the information content of taxable income to see if taxable income helps investors determine companies' stock prices. The prediction in my second research question is based on the intuition that the quality of taxable income will be diminished when firms are tax aggressive to minimize their tax payments.