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Increased Understanding of Accounting for Income Taxes through Effective Tax Rate Calculations and Reconciliations

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Abstract

This paper provides insights on the effective tax rate in order to better understand accounting for income taxes particularly as it relates to ASC 740, "Accounting for Income Taxes." Because of the importance of taxes in key firm decisions and the inherent complexity of the topic, accounting educators should carefully consider the adequacy and scope of their coverage of ASC 740 in their accounting courses. This paper provides practical and helpful teaching tools for an instructor to implement in the classroom. It also adds to the education literature with a practical analysis of the fundamentals of the effective tax rate, its calculation and its underlying components. Our analysis reveals several interesting findings including the differing effects of certain temporary differences on various tax rates.

Introduction

This paper provides for an increased understanding of accounting for income taxes by examining tax rate calculations and reconciliations. As usually discussed in introductory accounting courses, tax expense can be one of the largest amounts on an entity's income statement. In the U.S., the current maximum federal income tax statutory tax rate (STR) of 35% remains a major factor in the determination of a company's net income. Under generally accepted accounting principles (GAAP), accounting for income taxes has evolved from APB 11, to Statement of Financial Accounting Standards (SFAS) 96, to the current Accounting Standards Codification (ASC) 740 (Formerly SFAS 109, "Accounting for Income Taxes") requirements. The Financial Accounting Standards Board (FASB) continues to enhance accounting for income taxes with FASB Interpretation No. 48 (FIN 48) for reporting tax benefits on uncertain tax positions (FASB 2006).

The focus of this paper will be on a practical analysis of one key aspect of ASC 740, the effective tax rate (ETR), which will increase students' understanding of and insight into income tax accounting. However, we also provide in the following section, a general overview of ASC 740 to explain certain key concepts necessary for a better understanding of ETR, such as book-tax differences. The remainder of this paper is organized with the following sections: Background and purpose, ASC 740: Review of the Basics, Effective tax rate,, ETR worksheet and Summary.

Background and Purpose

Background

The ETR, part of the ASC 740 income tax disclosure requirements, is often the focal point for analysts and users of Securities and Exchange Commission (SEC)-required filings, based upon the ETR suspected link to financial statement earnings management and restatements (e.g. Badertscher, et al, 2006). However, many accounting

students have difficulty learning (and educators have difficulty imparting) the technical content of ASC 740 and its related pronouncements and regulations. Part of this problem lies in the subject overlap between financial reporting and income tax accounting. The necessary understanding of both the financial reporting concepts and income tax law requirements underpinning the standards and disclosure requirements presents a formidable challenge to students and instructors alike. Often, this topic is presented in an undergraduate second intermediate course in financial accounting, where there is no pre-requisite income tax accounting (especially one on corporate income taxes). Consequently just enough tax accounting is conveyed to be able to get at the underlying financial accounting issues.

Even where appropriate prerequisites are enforced, the financial accounting instructor is typically not the same instructor who imparted the tax knowledge, and usually the underlying corporate tax concepts were not taught with the downstream ASC 740 topic in mind. Moreover, advanced financial topics, including the tax consequences related to consolidations, are not yet understood by the intermediate accounting student. Even if students have sufficient knowledge and appreciation of corporate income tax accounting and its relation to income tax expense determination, they often feel overwhelmed by this topic. To meet these challenges, it is essential that students learning income tax accounting be made aware of the importance of this topic. One way to provide for this awareness is to emphasize the importance of ETR to other accounting and finance topics, including capital budgeting, financial leveraging and cost of capital topics, all of which use some measure of tax rate in their underlying theory and calculations. Unfortunately, when these topics are covered, instructors often use a single tax rate that is assumed to represent some vague concept like marginal tax rate, maximum federal statutory rate or even an effective tax rate, usually without much additional discussion on their theoretical underpinnings and measurement problems. Thus, in some sense, accounting for income taxes integrates too much (financial reporting and income tax accounting) and integrates too little (linkage with other accounting and finance subjects) at the same time! Another way of expressing this problem is that students are required to go through the complex exercise of appropriate interperiod income tax allocation and expense determination, without seeing the benefit of the better measurement being put to use in related accounting and finance applications. There is much work and knowledge needed to understand ASC 740. The payoff is improved accounting and finance analyses, including rate reconciliations and other disclosures.

Purpose

The purpose of this paper is to provide an informative and practical discussion of the fundamentals of ETR calculations and reconciliations to help educators better explain the complexities involved in accounting for income taxes. The ETR is a critical component of ASC 740 which has a dramatic effect on the financial reporting for public companies.

We address this issue by putting tax expense determination in the context of ETR calculation and its reconciliation with other important tax rate measures, including the statutory tax rate and the current tax rate (CTR). In the process, we formulate and demonstrate, through examples, how temporary differences (TD) and permanent differences (PD) may interact with each other by providing a taxonomy that breaks down temporary differences into book-over-tax (BOT) and tax-over-book (TOB), as well as the more traditional future deductible (gross deferred tax asset) versus future taxable (deferred tax liability) amounts resulting in turn from book-tax asset and liability measurement differences. Students who better understand the rate and reconciliation calculations will not only better understand income tax expense determination, but also understand the tax rate issues that are raised in other curricular contexts. In addition, our analysis reveals several interesting findings and exposes some misconceptions about the effective tax rate, particularly the effect of BOT temporary differences. This paper also provides practical and helpful teaching tools for an instructor to implement in accounting for income taxes and related coursework.

Unfortunately, the ETR has been sometimes confused in the media and literature with other rates or has sometimes been just referred to as the tax rate. In a Wall Street Journal article on Tyco's 4th quarter loss (Maremont 2002) it was stated "Tyco has generated controversy by a rapid reduction in its tax rate in recent years to below 19%". Dyer, in a Financial Times article on Bristol-Myers Squibb's earnings (Dyer 2003), said "as a result of the wrong tax rate for the inventory restatement, 2002 earnings per share increased..." Kranhold, in another Wall Street Journal article

regarding GE (Kranhold 2007), stated "Analysts estimated that lower tax rates at GE's industrial and financial business boosted earnings by three to four cents." "A Rubik's Cube may in fact be easier to figure out than the meaning of GE's results." wrote Scott Davis, an analyst with Morgan Stanley. For taxes, particularly for public companies subject to SEC reporting via the 10Q and 10K filings, the focal point for investors, analysts and the media in general is often the ETR.

The AICPA Model Tax Curriculum (AICPA 1999) recommends for undergraduate accounting majors, six credit hours of tax coursework with an emphasis on business entities, including regular corporations. In order for students to understand differences between financial and tax accounting, the AICPA suggests the practical experience of working through a Federal Form 1120: U.S. corporate income tax return, reconciling book and tax differences through the Form 1120 Schedule M-1. The AICPA in 1999 strongly recommended change to the tax curricula with a de-emphasis on individual taxation. According to the AICPA Board of Examiners in the Uniform CPA Examination Content Specifications decision paper of 2002 (AICPA 2002), the Financial Accounting and Reporting Section covers disclosures and relevant SFAS on income taxes. Also the Uniform CPA Exam covers business entities taxation quite heavily in the Regulation section (AICPA 2002).

Our paper makes several contributions. Primarily, this paper provides a much needed practical explanation of the ETR. The academic literature has offered little explanation of the components of the ETR and even fewer good examples. A student trying to understand the workings of the ETR from the academic literature would have a very difficult time (as perhaps would many practitioners or academics). Although some accounting textbooks provide a good discussion of ASC 740, there is a lack of foundational and analytical material on ETR. This article will provide detailed examples with various basic scenarios for ETR components particularly the treatment of temporary and permanent differences. We have also tested this article's methods in the classroom over several semesters with evidence of significant improvement in student understanding of accounting for income taxes. Further, the literature also has not examined the effects of book-over-tax (BOT) versus tax-over-book (TOB) temporary differences (with their interaction with permanent differences) and their differential impact on ETR which this paper examines and analyzes.

ASC 740: Review of the Basics

The purpose of this overview is to provide a basic ASC 740 framework for our discussion of the effective tax rate. The objectives of ASC 740 are to:

> Recognize (a) the amount of taxes payable or refundable for the current year and (b) deferred tax liabilities and assets for the future tax consequences of events that have been recognized in an enterprise's financial statements or tax returns. (SFAS 109 pg. 4)

An important aspect that ASC 740 sought to develop regarding accounting for income taxes was the classification and disclosure of current and deferred taxes on both the company's income statement and balance sheet. APB 11 used the term "timing differences" to refer to differences in book versus tax recognition (expense or income) that eventually reversed. ASC 740 includes timing differences as defined by APB 11 plus other reversing differences (e.g. book versus tax basis amounts) and refers to them as temporary differences. Interestingly, ASC 740 does not explicitly refer by term to the other major book-tax difference so that "*permanent differences*" is replaced with "*events that do not have tax consequences.*" For expository purposes we will use the older permanent difference terminology. For example, interest on a municipal bond is interest revenue for reporting purposes, but is non-taxable.

Book-Tax Asset and Liability Differences

ASC 740 requires the asset and liability approach to determination of deferred income taxes. End-of-period temporary differences between book asset and liability balances and their corresponding tax balances determine the need for deferred liability and gross deferred asset amounts with the periodic change to these amounts affecting the tax expense for the period. Therefore, entries will be recorded for the deferred tax consequences for originating and reversing TD, based on the periodic change in the deferred tax asset and liability accounts.

ASC 740 recognizes that there are significant differences between financial accounting rules (i.e. GAAP) and tax accounting rules (e.g. under the jurisdiction's tax laws and regulations – for the U.S., the Internal Revenue Code (IRC) is the governing income tax law and regulations). Often these financial ("book") and tax accounting ("tax") rule differences are referred to as "book-tax" differences.

As required under GAAP, when an expense is accrued, a corresponding liability is recognized. For example, if a warranty has been accrued, then a warranty payable is credited on the books (referred to as Lb). On the tax balance sheet, no liability (referred to as Lt) is recognized because no tax deduction is allowed until the warranty work is performed. Therefore for the period, comparing the book and tax balances sheets, we have an excess of Lb>Lt which requires the recognition of a gross deferred tax asset (DTA) to indicate that a future deduction will be realized for tax purposes, creating a future reduction in taxable income (TI) when the Lb is settled. This transaction will cause a reduction of the book tax expense through a current recognition of the tax benefit associated with the increase in DTA[1]. Similarly, when a book asset (A_b) is different than the tax asset (A_t), the difference will lead to a future recovery of the implied net book asset ($A_b > A_t$), and associated increase in future taxable income, which requires a recognition of a deferred tax liability (DTL). The relationship and effects between the book balance sheet and the tax balance sheet are summarized in Table 1.

Two major concepts under ASC 740 are current tax and deferred tax, the sum of which determines total tax expense. Current tax is the amount of tax due in the current period based on a company's taxable income (or equivalently on pretax accounting income adjusted for any permanent and temporary differences) in the various jurisdictions where it conducts its business activities. Deferred tax (or benefit) is the tax effect attributable to temporary differences, measured by the period's change in the net deferred tax asset or deferred tax liability accounts.

ASC 740 separates temporary differences between the periods into two groups: taxable temporary differences (TTD) and deductible temporary differences (DTD). Generally book-tax differences are expressed as current period originating expenses or income. A key here is that these book-tax differences are *temporary*, meaning that by definition the tax difference will *reverse* or zero out in future periods. TTD are differences that cause taxable income for the current year to be reduced by either a deferral of book income or an acceleration of a taxable expense or loss (creating a DTE and DTL or reversal of DTA). Examples of TTD would include: accelerated tax (greater than book) depreciation, installment gain (tax treatment allows a portion of income to be deferred). Examples of DTD would include: warranty expense (tax rules require payment before deductible), advances for goods and services (usually requires tax recognition when received).

Book-Over-Tax (BOT) versus Tax-Over-Book (TOB)

Under ASC 740 it is technically important to link differences in current and future (i.e. deferred) tax to the book and tax balance sheet accounts. Instead of using the DTD and TTD classifications, another expression of book-tax differences that is consistent with the asset liability approach of ASC 740 is to use the classification of BOT (book-over-tax) and TOB (tax-over-book) for both permanent and temporary differences. BOT differences occur when the accrual or adjustment initially net effects pre-tax accounting income. Conversely, TOBs result when the tax return is net affected before the impact on reported income. For temporary differences, this breakdown will help students to better link the change in book and tax balance sheets amounts to the establishment of deferred accounts. For

[1] We will discuss shortly the requirement of meeting the "more likely than not" standard of actually benefiting from this future deductible amount, which is dependent on the availability of future taxable income.

permanent differences (PD)[2], this breakdown will help students reconcile the ETR to CTR and ETR to STR. PDs also impact the book-tax comparison differently than TDs.[3]

The following table provides examples that summarize BOT and TOB classifications (with book and tax balance sheet differences) and their relation to establishment of DTA and DTL accounts. As illustrated in Table 2, a BOT would include booking accrued bad debt expense, resulting in a lower book asset (A_b) than tax asset basis (A_t), creating a DTA. Similarly, if revenue is accrued per books, while an installment sale method is used for the tax return, A_b (installment receivable) will exceed A_t, creating a DTL resulting from the future increase in taxable income when the receivable is recovered. An example of a TOB would be when tax depreciation (e.g. MACRS) exceeds book depreciation (e.g. straight-line) in originating periods, leaving an $A_b > A_t$ and the resulting DTL. It should be noted that BOTs provided an opportunity for companies to manage their incomes by under - or over - accruing the reported amounts. The distinction between BOT and TOB will become more significant as we discuss ETR reconciliation in later sections.

ASC 740 also requires characterization of deferred accounts for financial statements, as either current or non-current based on the classifications of the underlying asset or liability.[4]

Valuation Allowance

One final overview point regarding deferred tax accounts. ASC 740 requires that the DTA, which represents the future tax benefit that the company expects to realize from temporary differences, must meet a more likely than not standard of realization. The standard requires there is a "likelihood of more than 50%" of realizing the deferred tax benefit in order for there to be a current period benefit realized. If any part of the deferred tax asset does not meet that standard, then a valuation account (contra account to deferred tax asset with a credit referred to herein as ALW) must be established with a corresponding increase to the income tax expense. As we will discuss later, the ALW similar to the PD will affect ETR and be a reconciling item to the statutory tax rate. SFAS 109 and its related interpretations is a very complex accounting standard with many nuances.

Effective Tax Rate (ETR)

ASC 740 states that a company shall disclose a reconciliation of the significant items in the income tax expense as a dollar amount or as a percentage to pretax income based on statutory tax rates. This has come to be known as the "rate rec" of the effective tax rate (ETR). Benchmarking a company's tax position including the ETR is often misunderstood by analysts due in part to not understanding current and deferred tax concepts (Smith et al. 2008). As part of the income tax note disclosure for public companies, in the financial statements, it is important that accounting students understand this critical concept of the ETR through their coursework. Therefore, this paper provides additional educational insights, for accounting students and the instructors, on a rather underdeveloped aspect of accounting for income taxes, the ETR.

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[2] A PD arises when a book deduction (e.g. fines) or book income (e.g. municipal interest) is recognized that will not be recognized for tax, either in the current or any future period. Because the tax treatment will never be the same as book, it is not appropriate to set up any kind of deferred asset or liability account for a PD.

[3] Regarding PDs, an evaluation of the balance sheet effect between book and tax will determine the ultimate effect of the PD. For example, municipal interest (a BOT) will increase earnings for books and therefore the retained earnings (RE_b), whereas tax stockholders' equity would be directly increased for tax purposes via the tax return. Thus there are no net balance sheet differences for PDs. As discussed later, PD will affect ETR and be a reconciling item to the statutory and current tax rates.

[4] For simplicity purposes here, we will not distinguish between current and non-current categories henceforth. Also, there are occasions when there is no underlying book asset or liability to refer to. In these cases the timing of reversal dictates balance sheet classification.

ETR Analysis and Examples

First of all, let us look at the components of the ETR as it is commonly used. It is a ratio or fraction of two factors. The numerator is total tax expense. The denominator is pretax income. The fraction is:

$$\text{Effective Tax Rate (ETR)} = \frac{\text{Total Tax Expense (TTE)}}{\text{Pretax Income (PTI)}}$$

The interplay and significance of the factors affecting the numerator and denominator will be discussed further. ETR is a rate or percent of tax in relation to PTI. As noted above, TTE is the sum of the Current Tax Expense (CTE) and the Deferred Tax Expense (DTE). The following is the formula for TTE:

Total Tax Expense (TTE) = Current Tax Expense (CTE) + Deferred Tax Expense (DTE)

The tax rate (STR) that is used for TTE is typically the top statutory income tax rate in the jurisdiction or country of where the company is based. We will assume for our purposes unless stated otherwise, the jurisdiction is the U.S. and the top current income tax rate is 35% (if a foreign jurisdiction is used, there will be an assumption for the STR for that jurisdiction). But it is important to note that companies that have international operations must reflect worldwide income tax effects under ASC 740. The formulas for CTE and DTE are:

CTE = Taxable Income (TI) x Tax Rate (STR)
DTE = Total Temporary Differences (TD) x Tax Rate (STR)

As noted above under ASC 740, DTE is derived from the net change in the deferred tax asset (DTA) and deferred tax liability (DTL) balance sheet accounts for the period; the DTE formula shown above is merely a shorthand expression but the balance sheet deferred tax accounts must be reconciled particularly to capture unusual transactions such as an acquisition (e.g. with a difference in book and tax balance sheet bases).

The reason for the separation of CTE and DTE is that under ASC 740, there is a distinction between income tax expense and amounts payable for the current period (CTE) and future periods (DTE). Note that taxable income (TI) is the amount of income subject to income tax in these jurisdictions for the current year.

Tax over Book and Book over Tax Examples: ETR and CTR

The following examples (shown in tables below) illustrate several effects for TOB and BOT, specifically ETR and CTR effect. Examples 1 and 2 shown in Table 3, will use temporary differences (TD) only, with Example 1 using a TOB in year one (originating year), and reversal in year 2. Example 2 will use a BOT in year one (originating year) and reversal in year two. For both examples, Company A has pretax income (as per GAAP) before TD of $100,000 in year 1 and $100,000 also in year 2. In Example 1, year 1, they claim a depreciation expense on their tax return which is $10,000 greater than the book depreciation (TOB). In year 2, book depreciation will exceed tax depreciation by $10,000. For Example 2, Company A accrues for books a warranty expense and payable for $10,000 in year 1, which for tax purposes is deductible only in the year paid (shown in year 2). Assume a STR of 35%.

Note the effects also on the deferred tax accounts. For Example 1, the balance sheet change from the TOB (Net A_b > Net A_t) creates a DTL. For Example 2, the BOT balance sheet effect (Net A_b < Net A_t) creates a DTA (refer back to Table 2). For both examples, because these are TD, the deferred tax accounts will reverse out to a zero balance at the end of year 2. Note also for the examples, the TTE = CTE + DTE (or –DTB: deferred tax benefit). The deferred tax expense (or benefit) component of the TTE is technically determined from the change in the net DTA and DTL from the prior to the current year (Smith *et al.* 2007).

Note that the ETR for both examples over both years remains the same at .35 or the STR. These examples demonstrate several points. First, in isolation (with*out* any other ETR components), temporary differences have no effect on ETR separately, whether initiating as a TOB (Example 1) or BOT (Example 2) and reversing the following year. Also there is no ETR effect when both TOB and BOT temporary differences are present. This net change ETR effect of zero is despite differences in the numerator and denominator which nevertheless offset each other. When PTI increases or decreases, so does TTE proportionately, giving the same result or ETR. Second, TOB and BOT do

affect the numerator and denominator of ETR differently. Third, the differing effect of the temporary differences as TOB and BOT on the numerator and denominator could be significant when considering more complex ETR calculations (e.g. when permanent differences and valuation account are present) and other effects (e.g. current tax rate, earnings).

Current Tax Rate Compared to ETR with Book Over Tax (BOT) and Tax Over Book (TOB)

The current tax rate (CTR) is another tax rate that is derived from the following fraction:

$$CTR = \frac{CTE}{PTI}$$

Note the variability of the CTR compared to the stability of the ETR. The income tax payable (ITP) is equivalent to the CTE as defined earlier. We use the CTE as the numerator and maintain PTI as the denominator. The focus of this article is ETR and the only tax rate that is required for disclosure under ASC 740. However there are other tax rates, particularly the CTR that is often the focus of corporate tax departments as part of the corporate treasury function. That is because the CTR best reflects the tax expense that affects current cash flow and can be impacted most easily by tax planning (e.g. through TOB and BOT). Once again, the CTE is TI multiplied by the STR equaling ITP or basically representing the amount of income tax the company must pay to the government (note there can be significant differences from the actual income tax return liability and the ITP, for example due to tax methods for consolidated tax returns). Accordingly the CTR should be understood for its significance beyond the ASC 740 lack of coverage. Also provided is a reconciliation of the CTR to the ETR. The only real difference between CTR and the ETR is DTE (or DTB) which emphasizes the fact that the real tax expense variable is from temporary differences as a BOT or TOB. The effect of alternative tax rates such as the CTR is an important financial topic since "tax rates" are often used without a detailed analysis in various financial disciplines. Also in terms of studying potential earnings manipulation, by using CTR these trends may be more apparent than looking only at ETR. CTR, as demonstrated above, does not "wash out" the changes in the numerator (CTE) and the denominator (PTI) as easily as is done with the ETR. Although the discussion of alternative tax rates such as CTR is interesting (and to be explored by these authors in a forthcoming article), we will now resume our focus on ETR.

Tax Over Book (TOB) and Book Over Tax (BOT) Interplay with Permanent Differences (PD) and Allowance (ALW) Effect

Next in a progression of more complex ETR issues, let us consider the effect of the permanent differences (PD) and the valuation account (ALW). As noted earlier, the ALW is required by ASC 740 when there is evidence that the DTA does not meet the "more likely than not" standard of expected realization of tax benefit. The PD is a non-reversing book-tax difference (e.g. non-deductible fines for tax). Refer to Table 2 to review how PD are mapped as TOB or BOT.

In Table 4 in Example 3, we extend Example 1 to show effect of a TOB with a PD and ALW. For Example 4, we extend Example 2 to show effect of a BOT with a PD and ALW. The difference (from Examples 1 and 2) is that for Examples 3 and 4 we use Year 2 to illustrate PD and ALW effect with no TOB (Example 3, Year 2) and with no BOT (Example 4, Year 2).

This series of examples illustrates several dramatic effects on the ETR calculation. First, in Example 3, the PD and ALW with TOB do affect the ETR because of its disproportionate effect by increasing the numerator (TTE) while decreasing the denominator (PTI). In Example 4 with the BOT and PD and ALW, the same disproportionate effect on numerator and denominator occurs but even more magnified. PD and ALW do affect the ETR because of its effect on the numerator (increases TTE) with no effect on the denominator, PTI for ALW, but also with denominator effect for PD.

Book Over Tax (BOT) not Tax Over Book (TOB) with Permanent Differences (PD) and Allowance (ALW) Affects ETR

Most significantly, as shown in Example 4 for year 2, there is a subtle but interesting compounding effect of the ALW, PD and BOT. As noted earlier, we established that the BOT and/or TOB in *isolation* has no net effect on the

ETR. However, the BOT, because of its effect on the denominator, PTI, when combined with the ALW or PD effect, has a compounding change effect on the ETR. Note with*out* the BOT (year 2), the denominator would have been $95,000 without the DTB decrease to the TTE of the tax effect of the BOT of $3,500, with a resulting ETR of .3868 instead of .3912! However in contrast you will see from Example 3 that with*out* the TOB (year 2) there is *no* change to the ETR compared to the ETR with the TOB in year 1. This is a very dramatic effect that has not been focused on in the literature where often it is assumed TOB or BOT (both temporary differences) have no effect on ETR (Schmidt 2006 alluded to effect of certain items that are technically temporary differences but treated like permanent items e.g. undistributed earnings under APB 23). Prior literature has shown certain book-tax differences have been used for earnings manipulation (Badertscher et al. 2006). But as have shown here via Example 4, there is an added incentive to under report certain BOT (e.g. book warranty expense) by having a compounding favorable decrease to ETR (for example in year 2 the BOT is eliminated, equivalent to underreporting a book expense thereby increase PTI or earnings while in as shown year 2 ETR is decreased).

ETR Reconciliation

Let us now discuss the rate reconciliation (referred to typically as the "rate rec"). The rate rec merely takes the PTI times the statutory rate (STR) and adjusts for the tax effect of any items that affect the ETR (e.g. ALW, PD). The rate rec using percents is shown above for Examples 3 and 4 (see Table 5). Note that the PD or ALW do affect ETR so they are shown as reconciling items. Importantly due to the way the percent option is calculated by using the tax effected dollar (e.g. PD x STR) over the PTI, the same dollar amount will have a differing effect on the ETR when PTI changes (e.g. that's why BOT affects the ETR in combination with PD and ALW).

Notice you do not see any reconciling items for the TOB or any TD for that matter because any TD do not direct effect the ETR. Note in this example, as explained above, the unique compounding effect of the TOB is captured through the ETR effect of the PTI (e.g. as the denominator for ETR reconciling items). Other items not discussed that are often reconciling items are different jurisdictional tax rates when foreign jurisdiction income is included in combined financial statements.

Related Topics

There are many other topical areas regarding the ETR we have not covered as part of the scope for this article. ASC 740 covers all income taxes for the company including international operations, therefore any taxable foreign operations must be reported with the same disclosure requirements as for the main jurisdiction. The international area is a complex area which requires tax technical skills, for example regarding treatment of foreign subsidiaries versus foreign branches. Note also that APB 23 provides for a "permanent reinvestment" exception that allows for avoidance of recording deferred tax expense for foreign subsidiaries earnings. The effect of foreign operations can have a significant effect on ETR. Other areas include treatment of tax reserves (formerly known as tax cushion), state and local tax benefits and the various current developments under ASC 740 such as earlier mentioned FIN 48. These topics are beyond the scope of this article.

ETR Worksheet

We have also provided an Excel™ workbook (see Appendix A for an example of the completed template), that an instructor could use as part of the classroom study of ETR. It provides for four functional scenarios: No PD or TD, TOB, BOT, TD& PD&VA. The instructor may want to challenge their students to first develop a basic ETR model and perhaps release portions of the spreadsheet after the students' attempt on their own.

One way students could utilize the included workbook would be to input the examples above in the discussion section and compare the results – they should come out the same. Users of the workbook will also be able to confirm the interesting finding of this article regarding the unique ETR compounding effect of BOT with PD or ALW (and not for TOB with PD or ALW). As with any working template, the function of changing dependent values (e.g. book expense, tax expense) and seeing the effect on derived values (e.g. CTE, TTE, CTR or ETR) can be quite satisfying to the user and reinforce the learning experience. We believe due to the intricacies of the ETR, a functional model such as this proves very helpful when dealing with the numerous variables and their interactions. Students may wish

to use the workbook as a starting point to solve assigned problems that have the various permanent and temporary differences of either variety. Finally, the workbook indicates input areas versus protected formula areas that process those inputs.

The workbook incorporates generally all the topics we have discussed in this article, including temporary differences (TOB and BOT), permanent differences and valuation account. The tax journal entry to the various accounts (e.g. TTE, DTE, DTA, DTL, ITP, ALW) is also functional. A rate reconciliation is also provided and is calculated based on the components (e.g. PD, ALW, and STR).

Summary

This paper provides a detailed analysis of the fundamental components and mechanics of the ETR. The ETR is a critical factor in accounting for income taxes under ASC 740 which has risen in importance in the accounting profession. This article makes several contributions. It provides helpful insights on ASC 740 and the ETR which accounting educators can utilize in the accounting coursework. We demonstrate through detailed examples the varying effects and interplay of important components of ETR (and CTR) including temporary and permanent differences and valuation allowance, as well as the resulting tax journal entries. Our analysis reveals several interesting findings and exposes some misconceptions about the ETR, particularly the effect of certain temporary differences (i.e. BOT) in conjunction with valuation allowances and permanent differences. This article also provides an interactive workbook (along with the examples) on ASC 740 and ETR that instructors can use as teaching tools for accounting for income taxes coursework.

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Note[5]

[5] This article does not provide legal, tax or other advice and is for general informational purposes.

Table 1
Deferred Tax Consequences from Asset and Liability Comparisons

Temporary Difference:	Book Balance Sheet (A_b: L_b)		Tax Balance Sheet (A_t: L_t)	Net Book	Future Tax Effect	DTA/DTL
Tax>Book difference	A_b	>	A_t	Net Asset	TI+	DTL
Book>Tax difference	A_b	<	A_t	Net Liability	TI-	DTA
Book>Tax difference	L_b	>	L_t	Net Liability	TI-	DTA
Tax>Book difference	L_b	<	L_t	Net Asset	TI+	DTL

Deferred Tax Asset (DTA), Deferred Tax Liability (DTL)

Table 2
Examples of Tax-over-Book (TOB) and Book-over-Tax (BOT) Differences

Difference Type	PD	Net A_b < Net A_t DTA	Net A_b > Net A_t DTL
Book-Over-Tax (BOT)	Interest on Municipal Bonds, Fines	Accrued Warranty Expense, Bad Debt Expense	Accrued Revenue books, Installment for Tax
Tax-Over-Book (TOB)	Dividends received deduction	% of completion tax and completed contacts for books	MACRS over SL Depreciation

Permanent Difference (PD), Straight-Line (SL) Deprecation

Table 3
Tax-over-Book (TOB) & Book-over-Tax (BOT) Examples

Type of Temporary Difference (TD):	Example 1: TOB		Example 2: BOT	
	Year 1	**Year 2**	**Year 1**	**Year 2**
Pretax income-before_TD	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Depreciation expense	10,000			
Depreciation expense		10,000		
Warranty expense			10,000	
Warranty expense				10,000
Pretax income (PTI)	100,000	90,000	90,000	100,000
Taxable income-CTI	90,000	100,000	100,000	90,000
Debit (Credit)				
Total Tax Expense (TTE)	35,000	31,500	31,500	35,000
Income Taxes Payable (TP, also CTE)	(31,500)	(35,000)	(35,000)	(31,500)
Deferred Tax Assets (DTA)	3,500	(3,500)		
Deferred Tax Liabilities (DTL)			(3,500)	3,500
ETR calculation:				
Total tax expense (TTE)	$ 35,000	$ 31,500	$ 31,500	$ 35,000
Pretax income (PTI)	100,000	90,000	90,000	100,000
ETR = (TTE)/ (PTI)	35.00%	35.00%	35.00%	35.00%
CTR calculation:				
Current tax expense (CTE)	$ 31,500	$ 35,000	$ 35,000	$ 31,500
CTR = (CTE)/ (PTI)	31.50%	38.89%	38.89%	31.50%
DTE = (DTB)/PTI	3.50%	-3.89%	-3.89%	3.50%
Reconciliation to ETR	35.00%	35.00%	35.00%	35.00%

Table 4
TOB & BOT Examples

	Example 3		Example 4	
Type of TD:	TOB w/PD/ALW		BOT w/PD/ALW	
	Year 1	**Year2**	**Year 1**	**Year2**
Pretax income-before TD	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Depreciation exp. (TOB)	10,000			
Warranty exp.(BOT)			10,000	
Permanent difference (PD):				
- Fines (for books, not tax)	5,000	5,000	5,000	5,000
Valuation account (ALW):				
- Adjustment to DTA	1,750	1,750	1,750	1,750
Pretax income	95,000	95,000	85,000	95,000
Taxable income-CTI	90,000	100,000	100,000	100,000
ITP (CTE)	31,500	35,000	35,000	35,000
DTE(DTB)	3,500		(3,500)	
DTA/(DTL)		(3,500)		3,500
- ALW	(1,750)	(1,750)	(1,750)	(1,750)
ETR calculation:				
Total tax expense (TTE)*	$ 36,750	$ 36,750	$ 33,250	$ 36,750
Pretax income (PTI)	95,000	95,000	85,000	95,000
ETR = (TTE)/ (PTI)	38.68%	38.68%	39.12%	38.68%
Reconciliation to STR (%):				
Hypothetical Tax at STR	35.00%	35.00%	35.00%	35.00%
PD (e.g. fines)	1.84	1.84	2.06	1.84
ALW	1.84	1.84	2.06	1.84
ETR	38.68%	38.68%	39.12%	38.68%
CTR calculation:				
Current tax expense (CTE)	31,500	35,000	35,000	35,000
CTR = (CTE)/ (PTI)	33.15%	38.89%	41.18%	38.89%
DTE = (DTB)/PTI	5.53%	-0.21%	-2.06%	-0.21%
Reconciliation to ETR	38.68%	38.68%	39.12%	38.68%

Tax-over-Book (TOB), Book-over-Tax (BOT), Deferred Tax Asset Allowance (ALW), Statutory Tax Rate (STR), Current Tax Rate (CTR), Effective Tax Rate (ETR), Income Tax Payable (ITP)

Table 5
Rate Reconciliation

	$	%
Hypothetical Tax at Statutory Rate	29,750	35.00%
Fines	1,750	2.06%
Valuation Account change	1,750	2.06%
Total Tax Expense/ETR	33,250	39.12%

Effect Tax Rate (ETR)

Appendix A
Effective Tax Rate Worksheet

Book Income Statement:	1 - No Perm. & No Temporary	2 - Temp. book>tax (BOT)	3 - Temp. tax>book (TOB)	4 - TD, PD & ALW
Revenue:				
Operations	$ 100,000	$ 100,000	$ 100,000	$ 100,000
*Muni. Interest***				
Interest				
Total Income	100,000	100,000	100,000	100,000
Expenses:				
Salaries				
*Depreciation***		10,000		10,000
*Warranty***				
*Bad debts***				
*Fines***				5,000
Other				
Total Expenses	-	10,000	-	15,000
Pretax Income (PTI)	$ 100,000	$ 90,000	$ 100,000	$ 85,000
Permanent Differences (PD):				
Muni interest income		-	-	-
Fines		-	-	(5,000)
Total permanent diffs. (net)	-	-	-	(5,000)

Book Income Statement:	1 - No Perm. & No Temporary	2 - Temp. book>tax (BOT)	3 - Temp. tax>book (TOB)	4 - TD, PD & ALW
Temporary Differences (TD)				
Book>tax differences (BOT):				
Depreciation		10,000	-	10,000
Warranty expenses		-	-	-
Bad Debt expenses		-	-	-
Total BOT		10,000	-	10,000
Tax>Book differences (TOB):				
*Depreciation***			10,000	
*Warranty expenses***				
*Bad Debt expenses***				
Total TOB		-	10,000	-
Total Temporary Differences	-	10,000	(10,000)	10,000
Taxable Income (TI)	**$ 100,000**	**$ 100,000**	**$ 90,000**	**$ 100,000**
Statutory Tax Rate (STR)	35.00%	35.00%	35.00%	35.00%
Income Tax Payable (ITP)	35,000	35,000	31,500	35,000
Current Tax Rate (CTR)	35.00%	38.89%	31.50%	41.18%
Deferred Tax Expense (DTE)	-	(3,500)	3,500	(3,500)
Valuation Allowance (ALW) **				1,750
Total Tax Expense (TTE)	$ 35,000	$ 31,500	$ 35,000	$ 33,250
Effective Tax Rate (ETR)*	**35.00%**	**35.00%**	**35.00%**	**39.12%**

Book Income Statement:	**1 - No Perm. & No Temporary**		**2 - Temp. book>tax (BOT)**		**3 - Temp. tax>book (TOB)**		**4 - TD, PD & ALW**	
ETR Reconciliation:								
	$	**%**	**$**	**%**	**$**	**%**	**$**	**%**
Hypothetical Tax at U.S. rate	35,000	35.00%	31,500	35.00%	35,000	35.00%	29,750	35.00%
Muni Interest	-	0.00%	-	0.00%	-	0.00%	-	0.00%
Fines	-	0.00%	-	0.00%	-	0.00%	1,750	2.06%
Valuation allowance	-	0.00%	-	0.00%	-	0.00%	1,750	2.06%
Income Tax Provision	**$ 35,000**	**35.00%**	**$ 31,500**	**35.00%**	**$ 35,000**	**35.00%**	**$ 33,250**	**39.12%**

*** ETR = Total Tax Expense/Pretax Income**

***** to adjust BOT, TOB, PD or ALW change these cells only.***

Tax Journal Entry:	**Dr.**	**Cr.**	**Dr.**	**Cr.**	**Dr.**	**Cr.**	**Dr.**	**Cr.**
Total Tax Expense (TTE)	35,000		31,500		35,000		33,250	
Deferred Tax Asset (DTA)	-		3,500		-		3,500	
Income Tax Payable (ITP)		35,000		35,000		31,500		35,000
Deferred Tax Liability (DTL)		-		-		3,500		-
Valuation Allowance (ALW)		-		-		-		1,750